



Junos OS Basics Feature Guide for the QFX Series

Release

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Juniper Networks hardware and software products are Year 2000 compliant. Junos OS has no known time-related limitations through the year 2038. However, the NTP application is known to have some difficulty in the year 2036.

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Table of Contents

	About the Documentation	xxiii
	Documentation and Release Notes	xxiii
	Supported Platforms	xxiii
	Using the Examples in This Manual	xxiii
	Merging a Full Example	xxiv
	Merging a Snippet	xxiv
	Documentation Conventions	xxv
	Documentation Feedback	xxvii
	Requesting Technical Support	xxvii
	Self-Help Online Tools and Resources	xxvii
	Opening a Case with JTAC	xxviii
Part 1	Autoinstallation	
Chapter 1	Understanding Autoinstallation	3
	Understanding Autoinstallation of Configuration Files	3
	Typical Uses for Autoinstallation	3
	Autoinstallation Configuration Files and IP Addresses	3
	Typical Autoinstallation Process on a New Switch	4
	Configuring Autoinstallation of Configuration Files (CLI Procedure)	5
	Upgrading Software by Using Automatic Software Download	7
	Verifying Autoinstallation Status	8
	Verifying That Automatic Software Download Is Working Correctly	9
Part 2	Basic System Management	
Chapter 2	Understanding Basic System Management	13
	Compressing the Current Configuration File	14
	Configuring a DNS Name Server for Resolving a Hostname into Addresses	15
	Configuring Console and Auxiliary Port Properties	15
	Configuring the Hostname of the Router or Switch	16
	Configuring the Junos OS to Determine Conditions That Trigger Alarms on Different Interface Types	17
	Configuring Junos OS to Disable Protocol Redirect Messages on the Router or Switch	17
	Configuring Junos OS to Disable the Reporting of IP Address and Timestamps in Ping Responses	18
	Configuring Junos OS to Extend the Default Port Address Range	18
	Configuring the Junos OS to Select a Fixed Source Address for Locally Generated TCP/IP Packets	19
	Configuring System Alarms to Appear Automatically Upon Login	19

Configuring Time-Based User Access	20
Configuring the Timeout Value for Idle Login Sessions	21
Including the Year or Millisecond in Timestamps	22
Mapping the Hostname of the Switch to IP Addresses	23
Modifying the Default Time Zone for a Router or Switch Running Junos OS	23
Rebooting and Halting a Device	24
Reaching a Domain Name System Server	25
Reverting to the Default Factory Configuration by Using the request system zeroize Command	27
Saving Core Files Generated by Junos OS Processes	28
Specifying the Physical Location of the Switch	29
Specifying Access Privileges for Junos OS Operational Mode Commands	29
Updating the IANA Time Zone Database on Junos OS Devices	31
Importing and Installing Time Zone Files	32
Configuring a Custom Time Zone	33
Viewing Core Files from Junos OS Processes	33
Example: Configuring the Name of the Switch, IP Address, and System ID	34

Part 3

Chapter 3

Command Line Interface (CLI)

Understanding the CLI	37
CLI User Interface Overview	37
CLI Overview	37
CLI Key Features	38
CLI Command Modes	38
Configuring Login Tips	40
Format for Specifying Filenames and URLs in Junos OS CLI Commands	40
Getting Started with Enhanced Layer 2 Software	41
Understanding Enhanced Layer 2 Software Support	42
Using the ELS Translator Tool	42
Configuring a VLAN	43
Configuring the Native VLAN Identifier	44
Configuring Layer 2 Interfaces	44
Configuring Layer 3 Interfaces	45
Configuring an IRB Interface	45
Configuring an Aggregated Ethernet Interface and Configuring LACP on That Interface	46
Enhanced Layer 2 CLI Configuration Statement and Command Changes	47
Junos OS Operational Mode Commands That Combine Other Commands	55
Overview of Junos OS CLI Operational Mode Commands	56
CLI Command Categories	56
Commonly Used Operational Mode Commands	57
Overview of Navigating the CLI	58
CLI Command Hierarchy	59
CLI Configuration Statements	59
Moving Among Hierarchy Levels	59
Understanding the Brief, Detail, Extensive, and Terse Options of Junos OS Operational Commands	60

	Understanding Junos OS CLI Configuration Mode	61
	Configuration Mode Commands	62
	Configuration Statements and Identifiers	63
	Configuration Statement Hierarchy	65
Part 4	Dynamic Host Control Protocol (DHCP)	
Chapter 4	Understanding DHCP	71
	Understanding DHCP Services for Switches	71
	DHCP Client/Server Model	71
	Using DHCP	72
	DHCP Relay Servers and DHCP Servers	72
	Legacy DHCP and Extended DHCP for Server Versions	73
	Configuring DHCP on a Switch	74
	How DHCP Works	74
	Configuring a DHCP Client (CLI Procedure)	75
	Configuring a DHCP Server on Switches (CLI Procedure)	76
	Configuring an Extended DHCP Server on a Switch	77
	Configuring a Legacy DHCP Server on a Switch (CLI Procedure)	77
Part 5	Internet Control Message Protocol (ICMP)	
Chapter 5	Understanding ICMP	83
	Configuring Junos OS to Disable the Reporting of IP Address and Timestamps in Ping Responses	83
	Configuring Junos OS to Disable the Routing Engine Response to Multicast Ping Packets	84
	Configuring the Junos OS ICMPv4 Rate Limit for ICMPv4 Routing Engine Messages	84
	Configuring Junos OS to Disable Sending Protocol Redirect Messages on EX Series Switches (CLI Procedure)	84
Part 6	Guest Virtual Machines (VMs)	
Chapter 6	Understanding Guest VMs	89
	Launching a Guest Virtual Machine (VM) to Run a Third Party Application on Junos OS Release 13.2X51-D15	89
	Understanding Guest VMs	90
	Prerequisites for Setting up a Virtual Build Environment in the JunosV App Engine	90
	Setting up the Virtual Build Environment for the JunosV App Engine	93
	Downloading and Installing the JunosV App Engine Software	93
	Launching the VNC Server	94
	Launching the FreeBSD Virtual Build Environment (VBE) Virtual Machine (VM)	94
	Installing the Junos SDK Packages on the Virtual Build Environment	95
	Prerequisites for Using the Virtual Build Environment	96
	Obtaining Junos SDK Certificate Request File and Certificate Key File for the Virtual Build Environment	96
	Processing and Obtaining the Certificate File	97

Prerequisites for Packaging the Guest VM	97
Launching the Guest VM on the CentOS Server	97
Copying Required Application to Package with the Guest VM	98
Editing Packaging Tool Scripts	99
Executing Packaging Scripts	101
Copying the Third Party Application to the Switch	101
Configure the Provider Name, License Type, and Deployment Scope	101
Configure the Guest VM Options	102
Launching a Guest Virtual Machine (VM) to Run a Third Party Application on	
Junos OS Release 13.2X51-D20	106
Understanding Guest VMs	107
Troubleshooting Tips	107
Copying the Third Party Application to the Switch	107
Install the Third Party Application on the Switch	107
Configure the Guest VM Options to Launch the Guest VM on the Host	108

Part 7

In-Service Software Upgrade (ISSU)

Chapter 7

Understanding ISSU	117
In-Service Software Upgrade (ISSU) System Requirements	117
In-Service Software Upgrade (ISSU) Protocol and Process Support	117
Understanding In-Service Software Upgrade (ISSU)	119
In-Service Software Upgrade Process	119
Performing an In-Service Software Upgrade (ISSU)	120
Preparing the Switch for Software Installation	120
Upgrading the Software Using ISSU	121
Verifying a Unified In-Service Software Upgrade	122

Part 8

Non-Stop Software Upgrade (NSSU)

Chapter 8

Understanding NSSU	127
Understanding Nonstop Software Upgrade on a Virtual Chassis and Mixed Virtual	
Chassis	127
Requirements for Performing an NSSU	128
How an NSSU Works	129
Virtual Chassis and Mixed Virtual Chassis	129
NSSU Limitations	130
NSSU and Junos OS Release Support	130
Overview of NSSU Configuration and Operation	131
Understanding Nonstop Software Upgrade on a Virtual Chassis Fabric	131
Requirements for Performing an NSSU	132
How an NSSU Works	133
Virtual Chassis Fabric	133
NSSU Limitations	134
NSSU and Junos OS Release Support	134

	Overview of NSSU Configuration and Operation	135
	Configuring Line-Card Upgrade Groups for Nonstop Software Upgrade (CLI Procedure)	136
	Upgrading Software on a Virtual Chassis and Mixed Virtual Chassis Using Nonstop Software Upgrade	138
	Preparing the Switch for Software Installation	138
	Upgrading the Software Using NSSU	140
	Upgrading Software on a Virtual Chassis Fabric Using Nonstop Software Upgrade	142
	Preparing the Switch for Software Installation	142
	Upgrading the Software Using NSSU	144
Part 9	Licenses	
Chapter 9	Using Licenses	153
	Junos OS Feature Licenses	153
	Software Features That Require Licenses on the QFX Series	154
	Junos OS Feature License Keys	155
	Release-Tied License Keys and Upgrade Licenses on MX Series Routers	156
	Licensable Ports on MX5, MX10, and MX40 Routers	157
	Port Activation on MX104 Routers	158
	Generating License Keys	159
	Adding New Licenses (CLI Procedure)	161
	Deleting a License (CLI Procedure)	162
	Saving License Keys	163
	Verifying Junos OS License Installation	164
	Displaying Installed Licenses	164
	Displaying License Usage	165
Part 10	Login Classes	
Chapter 10	Understanding Login Classes	169
	Configuring Junos OS User Accounts	169
	Configuring the Junos OS to Display a System Login Announcement	170
	Configuring Junos OS to Display a System Login Message	170
Part 11	Network Time Protocol (NTP)	
Chapter 11	Understanding NTP	175
	Understanding NTP Time Servers	175
	Configuring NTP Authentication Keys	176
	Configuring the NTP Time Server and Time Services	177
	Configuring the Switch to Operate in Client Mode	177
	Configuring the Router or Switch to Operate in Symmetric Active Mode	178
	Configuring the Router or Switch to Operate in Broadcast Mode	178
	Configuring the Router or Switch to Operate in Server Mode	179
	Configuring the Switch to Listen for Broadcast Messages Using NTP	179

	Configuring the Switch to Listen for Multicast Messages Using NTP	180
	Setting the Date and Time	180
	Synchronizing and Coordinating Time Distribution Using NTP	181
	Configuring NTP	181
	Configuring the NTP Boot Server	181
	Specifying a Source Address for an NTP Server	182
	Example: Configuring NTP	183
	Example: Configuring NTP as a Single Time Source for Router and Switch Clock Synchronization	186
Part 12	Packet Flow Accelerator Diagnostics Software	
Chapter 12	Understanding Packet Flow Accelerator Diagnostics Software	189
	Understanding Packet Flow Accelerator Diagnostics Software and Other Utilities	189
	Understanding External and Internal Ports and Network Interface Card Ports	190
	Understanding Packet Flow Accelerator Diagnostics Software Tests and Scripts	191
	Understanding the ikondia Command	192
	Understanding Basic Functionality Tests	193
	Understanding and Running Ethernet Tests and Scripts	194
	Understanding and Using Stress Tests	199
	Understanding and Running PTP Tests	200
	Understanding QFX-PFA-4Q Module LED Tests	201
	Understanding Packet Flow Accelerator Diagnostics Utilities	202
	Sample Output for Packet Accelerator Diagnostics Software	206
	Installing Ethernet and PTP Scripts	212
	Installing Ethernet and PTP Scripts	212
	Installing Packet Flow Accelerator Diagnostics Software	214
	Installing Packet Flow Accelerator Diagnostics Software	214
	Verifying That the QFX-PFA-4Q Expansion Module Is Installed	214
	Downloading the Packet Flow Diagnostics Software	215
	Copying the Packet Flow Diagnostics Software Package to the Switch	216
	Install the Packet Flow Diagnostics Software on the Switch	216
	Configure the Guest VM Options to Launch the Guest VM on the Host	217
	Verifying That the Guest VM is Working	220
	Accessing the Guest VM	220
	Verifying That the FPGA Module Is Working	222
	Validating Connections Between QFX5100-24Q-AA Switch Network Ports and QFX-PFA-4Q Module Ports	223
	Uninstalling the Guest VM	225
Part 13	Passwords	
Chapter 13	Understanding Passwords	229
	Configuring the Root Password	229
	Recovering the Root Password	231
	Example: Changing the Requirements for Junos OS Plain-Text Passwords	232

Chapter 14	Precision Time Protocol (PTP)	235
	Understanding Transparent Clocks in Precision Time Protocol	236
	Configuring Transparent Clock Mode for Precision Time Protocol	236
Part 14	Recovery Installation	
Chapter 15	Understanding Recovery Installation	241
	Creating an Emergency Boot Device	241
	Creating a Snapshot and Using It to Boot a QFX3500 and QFX3600 Series Switch	242
	Creating a Snapshot on a USB Flash Drive and Using It to Boot the Switch	243
	Creating a Snapshot on an Internal Flash Drive and Using it to Boot the Switch	243
	Creating a Snapshot on the Alternate Slice of the Boot Media	244
	Creating a Snapshot and Using It to Boot a Device	244
	Creating a Snapshot on an External USB Flash Drive and Using It to Boot the Device	245
	Performing a Recovery Installation Using an Emergency Boot Device	246
	Recovering from a Failed Software Installation	247
Part 15	Routine Monitoring	
Chapter 16	Understanding Routine Monitoring	253
	Monitoring System Process Information	253
	Monitoring System Properties	254
	Monitoring Interface Status and Traffic	255
Part 16	Standard Software Installation and Upgrade	
Chapter 17	Understanding Standard Software Installation and Upgrade	259
	Junos OS Package Names	259
	Software Installation Overview	260
	Creating an Emergency Boot Device	260
	Upgrading Jloader Software on QFX Series Devices	262
	Jloader Software Version 1.1.4 Guidelines	264
	Upgrading Jloader Software on a QFX3500 Switch	265
	Upgrading Jloader Software on a QFabric System	268
	Upgrading Software	273
	Downloading Software Files with a Browser	274
	Accessing Software Downloaded to a Remote Location	275
	Connecting to the Console Port	275
	Backing Up the Current Configuration Files	275
	Installing a Standard Software Package	275
	Upgrading to an ELS-Based Software Package	277

Part 17	System Snapshot	
Chapter 18	Understanding System Snapshot	283
	Understanding System Snapshot	283
	Creating a Snapshot and Using It to Boot a QFX3500 and QFX3600 Series Switch	284
	Creating a Snapshot on a USB Flash Drive and Using It to Boot the Switch	284
	Creating a Snapshot on an Internal Flash Drive and Using it to Boot the Switch	285
	Creating a Snapshot on the Alternate Slice of the Boot Media	285
	Creating a Snapshot and Using It to Boot a Device	286
	Creating a Snapshot on an External USB Flash Drive and Using It to Boot the Device	286
	Verifying That a System Snapshot Was Created on a QFX Series Switch	287
Part 18	Zero Touch Provisioning (ZTP)	
Chapter 19	Understanding ZTP	291
	Understanding Zero Touch Provisioning	291
	Understanding Zero Touch Provisioning	291
	Zero Touch Provisioning Process	293
	Zero Touch Provisioning Restart Process Triggers	296
	Configuring Zero Touch Provisioning	298
	Monitoring Zero Touch Provisioning	303
	Using the Console to Monitor Zero Touch Provisioning	303
	Using System Log Alerts to Monitor Zero Touch Provisioning	304
	Using Error Messages to Monitor Zero Touch Provisioning	304
	Using System Log Files to Monitor Zero Touch Provisioning	304
	Using the show dhcp client binding Command	305
	Using the show dhcp client statistics Command	305
Part 19	Configuration Statements and Operational Commands	
Chapter 20	Basic System Management Configuration Statements	309
	arp (System)	311
	auxiliary	312
	checksum	313
	compress-configuration-files (System)	314
	console (Physical Port)	315
	default-address-selection	316
	domain-name	317
	domain-search	317
	ethernet (Alarm)	318
	host-name	318
	icmpv4-rate-limit	319
	internet-options	320
	link-down	321
	location	322
	login-alarms	323

	management-ethernet (Alarm)	324
	max-configurations-on-flash	325
	name-server	325
	no-ping-record-route	326
	no-ping-time-stamp	326
	no-redirects (IPv4 Traffic)	327
	optional	328
	ports	328
	retry	329
	saved-core-context	330
	saved-core-files	330
	source-port (Port Addresses)	331
	static-host-mapping	332
	system	333
	time-format	338
	time-zone	339
	traceoptions (Layer 2 Learning)	341
	uid	343
	use-imported-time-zones	343
Chapter 21	DHCP Configuration Statements	345
	client-identifier (DHCP Client)	345
	lease-time	346
	retransmission-attempt	347
	retransmission-interval	348
	server-address	349
	update-server	350
	vendor-option	351
Chapter 22	ICMP Configuration Statements	353
	no-multicast-echo	353
Chapter 23	NSSU Configuration Statements	355
	fpcs (NSSU Upgrade Groups)	356
	member (NSSU Upgrade Groups)	357
	nssu	358
	rcp-count	360
	upgrade-group	361
Chapter 24	Login Classes Configuration Statements	363
	access-end	364
	access-start	364
	allow-commands	365
	allow-configuration	366
	allowed-days	366
	announcement	367
	authentication (Login)	368
	class (Defining Login Classes)	369
	class (Assigning a Class to an Individual User)	370
	deny-commands	370

	deny-configuration	371
	idle-timeout	372
	load-key-file	373
	login	374
	login-tip	375
	message	375
	user (Access)	376
Chapter 25	NTP Configuration Statements	377
	authentication-key	378
	boot-server (NTP)	379
	broadcast	380
	broadcast-client	381
	multicast-client	381
	ntp	382
	peer	383
	server (NTP)	384
	source-address (NTP, RADIUS, System Logging, or TACACS+)	385
	trusted-key	386
Chapter 26	Password Configuration Statements	387
	authentication (Login)	388
	change-type	389
	format	390
	maximum-length	391
	minimum-changes	392
	minimum-length	393
	minimum-lower-cases	394
	minimum-numeric	395
	minimum-punctuations	396
	minimum-upper-cases	397
	password (Login)	398
	permissions	398
	retry-options	399
	root-authentication	401
	ssh-dsa	402
	ssh-rsa	402
	user (Access)	403
Chapter 27	PTP Configuration Statement	405
	e2e-transparent	405
Chapter 28	Autoinstallation Operational Commands	407
	show system autoinstallation status	408
Chapter 29	Basic System Management Operational Commands	411
	commit	413
	clear log	418
	clear chassis display message	419
	clear system commit	422
	clear system reboot	423

	file	427
	file archive	429
	file checksum md5	431
	file checksum sha1	432
	file checksum sha-256	433
	file compare	434
	file delete	438
	file list	439
	file rename	441
	file show	443
	load	445
	ping	447
	request chassis beacon	451
	request chassis fpc	453
	request chassis pic	457
	request chassis routing-engine master	461
	request message	466
	request system configuration rescue delete	467
	request system configuration rescue save	468
	request system halt	469
	request system logout	475
	request system power-off	476
	request system reboot	481
	request system storage cleanup	484
	request system zeroize	494
	restart	499
	save	510
Chapter 30	CLI Operational Commands	513
	show cli	514
	show cli authorization	516
	show cli directory	520
	show cli history	521
Chapter 31	ISSU Operational Commands	523
	request system software in-service-upgrade	524
	show chassis in-service-upgrade	537
Chapter 32	NSSU Operational Commands	541
	request system software nonstop-upgrade	542
	show chassis nonstop-upgrade	552
Chapter 33	Licensing Operational Commands	555
	request system license add	556
	request system license delete	557
	request system license save	558
	show system license	559
Chapter 34	NTP Operational Commands	567
	show ntp associations	568
	show ntp status	570

Chapter 35	Routine Monitoring Operational Commands	573
	show chassis alarms	575
	show chassis beacon	590
	show chassis environment	592
	show chassis environment fpc	656
	show chassis environment pem	682
	show chassis environment routing-engine	691
	show chassis fan	696
	show chassis firmware	709
	show chassis fpc	720
	show chassis hardware	758
	show chassis lcd	933
	show chassis led	947
	show chassis location	957
	show chassis mac-addresses	961
	show chassis pic	966
	show chassis routing-engine	982
	show chassis temperature-thresholds	1004
	show chassis zones	1023
	show host	1029
	show log	1030
	show subscribers	1033
	show system alarms	1051
	show system audit	1054
	show system boot-messages	1062
	show system buffers	1069
	show system certificate	1076
	show system commit	1078
	show system configuration archival	1081
	show system configuration rescue	1082
	show system connections	1084
	show system core-dumps	1103
	show system directory-usage	1117
	show system processes	1121
	show system reboot	1149
	show system resource-cleanup processes	1152
	show system services service-deployment	1154
	show system software	1155
	show system statistics	1163
	show system storage	1198
	show system uptime	1206
	show system users	1211
	show system virtual-memory	1216
	show version	1274
	start shell	1287
	test configuration	1289
	traceroute	1290
	traceroute monitor	1294

Chapter 36	Standard Software Installation and Upgrade Operational Commands . .	1297
	request system software add	1298
	request system software delete	1307
	request system software download	1311
	request system software rollback	1313
	request system software validate	1317
	rollback	1321
	show system rollback	1322
Chapter 37	System Snapshot Operational Commands	1325
	request system snapshot	1326

List of Figures

Part 3	Command Line Interface (CLI)	
Chapter 3	Understanding the CLI	37
	Figure 1: Commands That Combine Other Commands	55
	Figure 2: CLI Command Hierarchy	59
	Figure 3: Command Output Options	60
	Figure 4: Configuration Mode Hierarchy of Statements	65
Part 4	Dynamic Host Control Protocol (DHCP)	
Chapter 4	Understanding DHCP	71
	Figure 5: DHCP Client/Server Model	72
	Figure 6: DHCP Four-Step Transfer	74
Part 12	Packet Flow Accelerator Diagnostics Software	
Chapter 12	Understanding Packet Flow Accelerator Diagnostics Software	189
	Figure 7: Ports on the QFX5100-24Q-AA switch and QFX-PFA-4Q module	190

List of Tables

	About the Documentation	xxiii
	Table 1: Notice Icons	xxv
	Table 2: Text and Syntax Conventions	xxv
Part 3	Command Line Interface (CLI)	
Chapter 3	Understanding the CLI	37
	Table 3: ELS Support	42
	Table 4: Enhanced Layer 2 CLI Changes	47
	Table 5: Commonly Used Operational Mode Commands	57
	Table 6: Summary of Configuration Mode Commands	62
	Table 7: Configuration Mode Top-Level Statements	64
Part 4	Dynamic Host Control Protocol (DHCP)	
Chapter 4	Understanding DHCP	71
	Table 8: Legacy DHCP and Extended DHCP Server Hierarchy Levels	73
	Table 9: DHCP Client Settings	75
Part 7	In-Service Software Upgrade (ISSU)	
Chapter 7	Understanding ISSU	117
	Table 10: ISSU Protocol Support	117
Part 9	Licenses	
Chapter 9	Using Licenses	153
	Table 11: Junos OS Feature Licenses and Model Numbers for QFX Series Devices	154
	Table 12: Upgrade Licenses for Enhancing Port Capacity	158
	Table 13: Port Activation License Model for MX104 Routers	159
Part 12	Packet Flow Accelerator Diagnostics Software	
Chapter 12	Understanding Packet Flow Accelerator Diagnostics Software	189
	Table 14: External and Internal Ports on the QFX5100-24Q-AA Switch and the QFX-PFA-4Q Module	190
	Table 15: Base Tests	193
	Table 16: Ethernet Tests and Scripts	195
	Table 17: 10-Gigabit Ethernet Channel Mappings on the QFX-PFA-4Q module F-ports	196

	Table 18: 10-Gigabit Ethernet Channel Mappings on the QFX-PFA-4Q module C-ports	196
	Table 19: Exact Connectivity Between C-Ports and A-Ports	197
	Table 20: Stress Tests	199
	Table 21: PTP Tests	200
	Table 22: PTP Script	201
	Table 23: QFX-PFA-4Q Module LED Test	202
	Table 24: Utilities	203
	Table 25: Command-Line Arguments	205
	Table 26: File Format Details	206
	Table 27: Dual In-Line Memory Modules	206
	Table 28: Validating Ports	223
Part 15	Routine Monitoring	
Chapter 16	Understanding Routine Monitoring	253
	Table 29: Summary of System Process Information Output Fields	253
	Table 30: Summary of Key System Properties Output Fields	254
Part 16	Standard Software Installation and Upgrade	
Chapter 17	Understanding Standard Software Installation and Upgrade	259
	Table 31: Junos OS and Jloader Software Compatibility Matrix for the QFX3500 Switch and QFX3500 Node Device	262
	Table 32: Junos OS and Jloader Software Compatibility Matrix for the QFX3008-I Interconnect Device	263
	Table 33: Junos OS and Jloader Software Compatibility Matrix for the QFX3600-I Interconnect Device and QFX3600 Node Device	263
	Table 34: Uboot Software Release and Jloader Software Compatibility Matrix	263
Part 19	Configuration Statements and Operational Commands	
Chapter 28	Autoinstallation Operational Commands	407
	Table 35: show system autoinstallation status Output Fields	408
Chapter 29	Basic System Management Operational Commands	411
	Table 36: request system storage cleanup Output Fields	486
Chapter 30	CLI Operational Commands	513
	Table 37: show cli Output Fields	514
	Table 38: show cli authorization Output Fields	516
	Table 39: show cli directory Output Fields	520
	Table 40: show cli history Output Fields	521
Chapter 31	ISSU Operational Commands	523
	Table 41: show chassis in-service-upgrade Output Fields	537
Chapter 32	NSSU Operational Commands	541
	Table 42: show chassis nonstop-upgrade Output Fields	552
Chapter 33	Licensing Operational Commands	555

	Table 43: show system license Output Fields	559
Chapter 34	NTP Operational Commands	567
	Table 44: show ntp associations Output Fields	568
	Table 45: show ntp status Output Fields	570
Chapter 35	Routine Monitoring Operational Commands	573
	Table 46: show chassis alarms Output Fields	581
	Table 47: show chassis led Output Fields	590
	Table 48: show chassis environment Output Fields	599
	Table 49: show chassis environment fpc Output Fields	659
	Table 50: show chassis environment pem Output Fields	684
	Table 51: show chassis environment routing-engine Output Fields	693
	Table 52: show chassis fan Output Fields	698
	Table 53: show chassis firmware Output Fields	712
	Table 54: show chassis fpc Output Fields	728
	Table 55: Routing Engines Displaying DIMM Information	761
	Table 56: show chassis hardware Output Fields	765
	Table 57: show chassis lcd Output Fields	935
	Table 58: show chassis led Output Fields	948
	Table 59: show chassis location Output Fields	959
	Table 60: show chassis mac-addresses Output Fields	963
	Table 61: show chassis pic Output Fields	970
	Table 62: show chassis routing-engine Output Fields	985
	Table 63: show chassis temperature-thresholds Output Fields	1006
	Table 64: show chassis zones Output Fields	1024
	Table 65: show subscribers Output Fields	1036
	Table 66: show system alarms Output Fields	1052
	Table 67: show system buffers Output Fields	1072
	Table 68: show system certificate Output Fields	1076
	Table 69: show system commit Output Fields	1078
	Table 70: show system connections Output Fields	1087
	Table 71: show system core-dumps Output Fields	1106
	Table 72: show system directory-usage Output Fields	1119
	Table 73: show system processes Output Fields	1128
	Table 74: show system resource-cleanup processes Output Fields	1152
	Table 75: show system services service-deployment Output Fields	1154
	Table 76: show system storage Output Fields	1201
	Table 77: show system uptime Output Fields	1208
	Table 78: show system users Output Fields	1213
	Table 79: show system virtual-memory Output Fields	1219
	Table 80: traceroute Output Fields	1292
	Table 81: traceroute monitor Output Fields	1295

About the Documentation

- Documentation and Release Notes on page xxiii
- Supported Platforms on page xxiii
- Using the Examples in This Manual on page xxiii
- Documentation Conventions on page xxv
- Documentation Feedback on page xxvii
- Requesting Technical Support on page xxvii

Documentation and Release Notes

To obtain the most current version of all Juniper Networks® technical documentation, see the product documentation page on the Juniper Networks website at <http://www.juniper.net/techpubs/>.

If the information in the latest release notes differs from the information in the documentation, follow the product Release Notes.

Juniper Networks Books publishes books by Juniper Networks engineers and subject matter experts. These books go beyond the technical documentation to explore the nuances of network architecture, deployment, and administration. The current list can be viewed at <http://www.juniper.net/books>.

Supported Platforms

For the features described in this document, the following platforms are supported:

- QFX Series standalone switches

Using the Examples in This Manual

If you want to use the examples in this manual, you can use the **load merge** or the **load merge relative** command. These commands cause the software to merge the incoming configuration into the current candidate configuration. The example does not become active until you commit the candidate configuration.

If the example configuration contains the top level of the hierarchy (or multiple hierarchies), the example is a *full example*. In this case, use the **load merge** command.

If the example configuration does not start at the top level of the hierarchy, the example is a *snippet*. In this case, use the **load merge relative** command. These procedures are described in the following sections.

Merging a Full Example

To merge a full example, follow these steps:

1. From the HTML or PDF version of the manual, copy a configuration example into a text file, save the file with a name, and copy the file to a directory on your routing platform.

For example, copy the following configuration to a file and name the file **ex-script.conf**. Copy the **ex-script.conf** file to the **/var/tmp** directory on your routing platform.

```
system {
  scripts {
    commit {
      file ex-script.xml;
    }
  }
}
interfaces {
  fxp0 {
    disable;
    unit 0 {
      family inet {
        address 10.0.0.1/24;
      }
    }
  }
}
```

2. Merge the contents of the file into your routing platform configuration by issuing the **load merge** configuration mode command:

```
[edit]
user@host# load merge /var/tmp/ex-script.conf
load complete
```

Merging a Snippet

To merge a snippet, follow these steps:

1. From the HTML or PDF version of the manual, copy a configuration snippet into a text file, save the file with a name, and copy the file to a directory on your routing platform.

For example, copy the following snippet to a file and name the file **ex-script-snippet.conf**. Copy the **ex-script-snippet.conf** file to the **/var/tmp** directory on your routing platform.

```
commit {
  file ex-script-snippet.xml; }
```

2. Move to the hierarchy level that is relevant for this snippet by issuing the following configuration mode command:

```
[edit]
user@host# edit system scripts
[edit system scripts]
```

3. Merge the contents of the file into your routing platform configuration by issuing the **load merge relative** configuration mode command:

```
[edit system scripts]
user@host# load merge relative /var/tmp/ex-script-snippet.conf
load complete
```

For more information about the **load** command, see [CLI Explorer](#).

Documentation Conventions

[Table 1 on page xxv](#) defines notice icons used in this guide.

Table 1: Notice Icons

Icon	Meaning	Description
	Informational note	Indicates important features or instructions.
	Caution	Indicates a situation that might result in loss of data or hardware damage.
	Warning	Alerts you to the risk of personal injury or death.
	Laser warning	Alerts you to the risk of personal injury from a laser.
	Tip	Indicates helpful information.
	Best practice	Alerts you to a recommended use or implementation.

[Table 2 on page xxv](#) defines the text and syntax conventions used in this guide.

Table 2: Text and Syntax Conventions

Convention	Description	Examples
Bold text like this	Represents text that you type.	To enter configuration mode, type the configure command: user@host> configure

Table 2: Text and Syntax Conventions (*continued*)

Convention	Description	Examples
Fixed-width text like this	Represents output that appears on the terminal screen.	<code>user@host> show chassis alarms</code> <code>No alarms currently active</code>
<i>Italic text like this</i>	<ul style="list-style-type: none"> Introduces or emphasizes important new terms. Identifies guide names. Identifies RFC and Internet draft titles. 	<ul style="list-style-type: none"> A policy <i>term</i> is a named structure that defines match conditions and actions. <i>Junos OS CLI User Guide</i> RFC 1997, <i>BGP Communities Attribute</i>
<i>Italic text like this</i>	Represents variables (options for which you substitute a value) in commands or configuration statements.	Configure the machine's domain name: [edit] root@# set system domain-name <i>domain-name</i>
Text like this	Represents names of configuration statements, commands, files, and directories; configuration hierarchy levels; or labels on routing platform components.	<ul style="list-style-type: none"> To configure a stub area, include the stub statement at the [edit protocols ospf area area-id] hierarchy level. The console port is labeled CONSOLE.
< > (angle brackets)	Encloses optional keywords or variables.	stub <default-metric metric>;
(pipe symbol)	Indicates a choice between the mutually exclusive keywords or variables on either side of the symbol. The set of choices is often enclosed in parentheses for clarity.	broadcast multicast (string1 string2 string3)
# (pound sign)	Indicates a comment specified on the same line as the configuration statement to which it applies.	rsvp { # Required for dynamic MPLS only
[] (square brackets)	Encloses a variable for which you can substitute one or more values.	community name members [<i>community-ids</i>]
Indentation and braces ({ })	Identifies a level in the configuration hierarchy.	[edit] routing-options { static { route default { nexthop <i>address</i> ; retain; } } }
;(semicolon)	Identifies a leaf statement at a configuration hierarchy level.	
GUI Conventions		
Bold text like this	Represents graphical user interface (GUI) items you click or select.	<ul style="list-style-type: none"> In the Logical Interfaces box, select All Interfaces. To cancel the configuration, click Cancel.

Table 2: Text and Syntax Conventions (*continued*)

Convention	Description	Examples
> (bold right angle bracket)	Separates levels in a hierarchy of menu selections.	In the configuration editor hierarchy, select Protocols>Ospf .

Documentation Feedback

We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation. You can provide feedback by using either of the following methods:

- Online feedback rating system—On any page of the Juniper Networks TechLibrary site at <http://www.juniper.net/techpubs/index.html>, simply click the stars to rate the content, and use the pop-up form to provide us with information about your experience. Alternately, you can use the online feedback form at <http://www.juniper.net/techpubs/feedback/>.
- E-mail—Send your comments to techpubs-comments@juniper.net. Include the document or topic name, URL or page number, and software version (if applicable).

Requesting Technical Support

Technical product support is available through the Juniper Networks Technical Assistance Center (JTAC). If you are a customer with an active J-Care or Partner Support Service support contract, or are covered under warranty, and need post-sales technical support, you can access our tools and resources online or open a case with JTAC.

- JTAC policies—For a complete understanding of our JTAC procedures and policies, review the *JTAC User Guide* located at <http://www.juniper.net/us/en/local/pdf/resource-guides/7100059-en.pdf>.
- Product warranties—For product warranty information, visit <http://www.juniper.net/support/warranty/>.
- JTAC hours of operation—The JTAC centers have resources available 24 hours a day, 7 days a week, 365 days a year.

Self-Help Online Tools and Resources

For quick and easy problem resolution, Juniper Networks has designed an online self-service portal called the Customer Support Center (CSC) that provides you with the following features:

- Find CSC offerings: <http://www.juniper.net/customers/support/>
- Search for known bugs: <http://www2.juniper.net/kb/>
- Find product documentation: <http://www.juniper.net/techpubs/>
- Find solutions and answer questions using our Knowledge Base: <http://kb.juniper.net/>

- Download the latest versions of software and review release notes:
<http://www.juniper.net/customers/csc/software/>
- Search technical bulletins for relevant hardware and software notifications:
<http://kb.juniper.net/InfoCenter/>
- Join and participate in the Juniper Networks Community Forum:
<http://www.juniper.net/company/communities/>
- Open a case online in the CSC Case Management tool: <http://www.juniper.net/cm/>

To verify service entitlement by product serial number, use our Serial Number Entitlement (SNE) Tool: <https://tools.juniper.net/SerialNumberEntitlementSearch/>

Opening a Case with JTAC

You can open a case with JTAC on the Web or by telephone.

- Use the Case Management tool in the CSC at <http://www.juniper.net/cm/>.
- Call 1-888-314-JTAC (1-888-314-5822 toll-free in the USA, Canada, and Mexico).

For international or direct-dial options in countries without toll-free numbers, see <http://www.juniper.net/support/requesting-support.html>.

PART 1

Autoinstallation

- [Understanding Autoinstallation on page 3](#)

CHAPTER 1

Understanding Autoinstallation

- [Understanding Autoinstallation of Configuration Files on page 3](#)
- [Configuring Autoinstallation of Configuration Files \(CLI Procedure\) on page 5](#)
- [Upgrading Software by Using Automatic Software Download on page 7](#)
- [Verifying Autoinstallation Status on page 8](#)
- [Verifying That Automatic Software Download Is Working Correctly on page 9](#)

Understanding Autoinstallation of Configuration Files

Autoinstallation is the automatic configuration of a device over the network from a preexisting configuration file that you create and store on a configuration server—typically a Trivial File Transfer Protocol (TFTP) server. You can use autoinstallation to configure new devices automatically and to deploy multiple devices from a central location in the network.

You enable autoinstallation so that the switches in your network implement autoinstallation when they are powered on. To configure autoinstallation, you specify a configuration server, an autoinstallation interface, and a protocol for IP address acquisition.

This topic describes:

- [Typical Uses for Autoinstallation on page 3](#)
- [Autoinstallation Configuration Files and IP Addresses on page 3](#)
- [Typical Autoinstallation Process on a New Switch on page 4](#)

Typical Uses for Autoinstallation

Typical uses for autoinstallation of the software include:

- To deploy and update multiple devices from a central location in the network.
- To update a device—Autoinstallation occurs when a device that has been manually configured for autoinstallation is powered on.

Autoinstallation Configuration Files and IP Addresses

For the autoinstallation process to work, you must store one or more host-specific or default configuration files on a configuration server in the network and have a service

available—typically Dynamic Host Configuration Protocol (DHCP)—to assign an IP address to the switch.

You can set up the following configuration files for autoinstallation on the switch:

- **network.conf**—Default configuration file for autoinstallation, in which you specify IP addresses and associated hostnames for devices on the network.
- **switch.conf**—Default configuration file for autoinstallation with a minimum configuration sufficient for you to telnet to the device and configure it manually.
- **hostname.conf**—Host-specific configuration file for autoinstallation on a device that contains all the configuration information necessary for the switch. In the filename, **hostname** is replaced with the hostname assigned to the switch.

If the server with the autoinstallation configuration file is not on the same LAN segment as the new device, or if a specific device is required by the network, you must configure an intermediate device directly attached to the new switch, through which the new switch can send TFTP, Boot Protocol (BOOTP), and Domain Name System (DNS) requests. In this case, you specify the IP address of the intermediate device as the location to receive TFTP requests for autoinstallation.

Typical Autoinstallation Process on a New Switch

When the switch configured for autoinstallation is powered on, it performs the following autoinstallation tasks:

1. The switch sends out DHCP or BOOTP requests on each connected interface simultaneously to obtain an IP address.

If a DHCP server responds to these requests, it provides the switch with some or all of the following information:

- An IP address and subnet mask for the autoinstallation interface.
- The location of the (typically) TFTP server, Hypertext Transfer Protocol (HTTP) server, or FTP server on which the configuration file is stored.
- The name of the configuration file to be requested from the TFTP server.
- The IP address or hostname of the TFTP server.

If the DHCP server provides the server's hostname, a DNS server must be available on the network to resolve the name to an IP address.

- The IP address of an intermediate device if the configuration server is on a different LAN segment from the switch.

2. After the switch acquires an IP address, the autoinstallation process on the switch attempts to download a configuration file in the following ways:
 - a. If the DHCP server specifies the host-specific configuration file **hostname.conf**, the switch uses that filename in the TFTP server request. The autoinstallation process on the new switch makes three unicast TFTP requests for **hostname.conf**. If these attempts fail, the switch broadcasts three requests to any available TFTP server for the file.
 - b. If the switch does not locate a **hostname.conf** file, the autoinstallation process sends three unicast TFTP requests for a **network.conf** file that contains the switch's hostname-to-IP-address mapping information. If these attempts fail, the switch broadcasts three requests to any available TFTP server for the file.
 - c. If the switch fails to find a **network.conf** file that contains a hostname entry for the switch, the autoinstallation process sends out a DNS request and attempts to resolve the switch's IP address to a hostname.
 - d. If the switch determines its hostname, it sends a TFTP request for the **hostname.conf** file.
 - e. If the switch is unable to map its IP address to a hostname, it sends TFTP requests for the default configuration file **switch.conf**. The TFTP request procedure is the same as for the **network.conf** file.
3. After the switch locates a configuration file on a TFTP server, the autoinstallation process downloads the file, installs the file on the switch, and commits the configuration.

**Related
Documentation**

- [Configuring Autoinstallation of Configuration Files \(CLI Procedure\) on page 5](#)
- [Connecting and Configuring an EX Series Switch \(CLI Procedure\)](#)
- [Connecting and Configuring an EX Series Switch \(J-Web Procedure\)](#)
- [Configuration Files Terms](#)

Configuring Autoinstallation of Configuration Files (CLI Procedure)

Autoinstallation is the automatic configuration of a device over the network from a pre-existing configuration file that you create and store on a configuration server—typically a Trivial File Transfer Protocol (TFTP) server. You can use autoinstallation to automatically deploy multiple devices from a central location in the network.

To specify autoinstallation to run when you power on a switch already installed in your network, you can enable it by specifying one or more interfaces, protocols, and configuration servers to be used for autoinstallation.

Before you explicitly enable and configure autoinstallation on the switch, perform these tasks as needed for your network's configuration:

- Have a service available—typically Dynamic Host Configuration Protocol (DHCP)—to assign an IP address to the switch
- Configure a DHCP server on your network to meet your network requirements. You can configure a switch to operate as a DHCP server. For more information, see [“Configuring a DHCP Server on Switches \(CLI Procedure\)” on page 76](#).
- Create one of the following configuration files, and store it on a TFTP server (or HTTP server or FTP server) in the network:
 - A host-specific file with the name **hostname.conf** for each switch undergoing autoinstallation. Replace **hostname** with the name of a switch. The **hostname.conf** file typically contains all the configuration information necessary for the switch with this hostname.
 - A default configuration file named **switch.conf** with the minimum configuration necessary to enable you to telnet into the new switch for further configuration.
- Physically attach the switch to the network using a Gigabit Ethernet port.
- If you configure the DHCP server to provide only the TFTP server hostname, add an IP address-to-hostname mapping entry for the TFTP server to the DNS database file on the Domain Name System (DNS) server in the network.
- If the switch is not on the same network segment as the DHCP server (or other device providing IP address resolution), configure an existing device as an intermediate device to receive TFTP and DNS requests and forward them to the TFTP server and the DNS server. You must configure the LAN or serial interface on the intermediate device with the IP addresses of the hosts providing TFTP and DNS services. Connect this interface to the switch.
- If you are using **hostname.conf** files for autoinstallation, you must also complete the following tasks:
 - Configure the DHCP server to provide a **hostname.conf** filename to each switch. Each switch uses its **hostname.conf** filename to request a configuration file from the TFTP server. Copy the necessary **hostname.conf** configuration files to the TFTP server.
 - Create a default configuration file named **network.conf**, and copy it to the TFTP server. This file contains IP-address-to-hostname mapping entries. If the DHCP server does not send a **hostname.conf** filename to a new switch, the switch uses **network.conf** to resolve its hostname based on its IP address.

Alternatively, you can add the IP-address-to-hostname mapping entry for the switch to a DNS database file.

The switch uses the hostname to request a **hostname.conf** file from the TFTP server.

To configure autoinstallation:

1. Specify the URL address of one or more servers from which to obtain configuration files.

```
[edit system]
user@switch# set autoinstallation configuration-servers tftp://tftpconfig.sp.com
```



NOTE: You can also use an FTP address, for example, `ftp://user:password@sftpconfig.sp.com`.

2. Configure one or more Ethernet interfaces to perform autoinstallation and one or two procurement protocols for each interface. The switch uses the protocols to send a request for an IP address for the interface:

```
[edit system]
user@switch# set autoinstallation interfaces ge-0/0/0 bootp
```

**Related
Documentation**

- [Verifying Autoinstallation Status on page 8](#)
- [Understanding Autoinstallation of Configuration Files on page 3](#)
- [Understanding DHCP Services for Switches on page 71](#)

Upgrading Software by Using Automatic Software Download

The automatic software download feature uses the Dynamic Host Configuration Protocol (DHCP) message exchange process to download and install software packages. You configure the automatic software download feature on switches that act as DHCP clients. You must enable automatic software download on a switch before the software upgrade can occur.

You configure a path to a software package file on the DHCP server. The server communicates the path to the software package file through DHCP server messages.

If you enable automatic software download, the DHCP client switch compares the software package name in the DHCP server message with the name of the software package that booted the switch. If the software packages are different, the DHCP client switch downloads and installs the software package specified in the DHCP server message.

Before you upgrade software by using automatic software download, ensure that you have configured DHCP services for the switch, including configuring a path to a boot server and a boot file.

To configure a path to a boot server and a boot file:

1. Configure the name of the boot server advertised to DHCP clients. The client uses a boot file located on the boot server to complete DHCP setup. This configuration is equivalent to DHCP Option 66:

```
[edit system services dhcp]
user@switch# set boot-server (address | hostname)
```

2. Set the boot file advertised to DHCP clients. After the client receives an IP address and the boot file location from the DHCP server, the client uses the boot image stored in the boot file to complete the DHCP setup. This configuration is equivalent to DHCP Option 67:

```
[edit system services dhcp]
```

```
user@switch# set boot-file filename
```

To enable automatic software download on a switch that acts as a DHCP client:

```
[edit chassis]  
user@switch# set auto-image-upgrade
```

After automatic software download is enabled on your DHCP client switch and after DHCP services are enabled on your network, an automatic software download can occur at any time as part of the DHCP message exchange process.

If an automatic software download occurs, you see the following message on the switch:

```
Auto-image upgrade started  
On successful installation system will reboot automatically
```

The switch reboots automatically to complete the upgrade.

**Related
Documentation**

- [Verifying That Automatic Software Download Is Working Correctly on page 9](#)
- [Understanding Software Installation on EX Series Switches](#)
- [Configuring a DHCP Server on Switches \(CLI Procedure\) on page 76](#)
- [Configuring DHCP Services \(J-Web Procedure\)](#)
- [Understanding DHCP Services for Switches on page 71](#)

Verifying Autoinstallation Status

Purpose Display the status of the autoinstallation feature.

Action From the CLI, enter the **show system autoinstallation status** command.

Sample Output

```
user@switch> show system autoinstallation status  
Autoinstallation status:  
Master state: Active  
Last committed file: None  
Configuration server of last committed file: 10.25.100.1  
Interface:  
  Name: ge-0/0/0  
  State: Configuration Acquisition  
  Acquired:  
    Address: 192.168.124.75  
    Hostname: host-ge-000  
    Hostname source: DNS  
    Configuration filename: switch-ge-000.conf  
    Configuration filename server: 10.25.100.3  
  Address acquisition:  
    Protocol: DHCP Client  
    Acquired address: None  
    Protocol: RARP Client  
    Acquired address: None  
Interface:  
  Name: ge-0/0/1  
  State: None  
  Address acquisition:
```



```

Protocol: DHCP Client
Acquired address: None
Protocol: RARP Client
Acquired address: None

```

Meaning The output shows the settings configured for autoinstallation. Verify that the values displayed are correct for the switch when it is deployed on the network.

Related Documentation

- [Configuring Autoinstallation of Configuration Files \(CLI Procedure\) on page 5](#)

Verifying That Automatic Software Download Is Working Correctly

Purpose Verify that the automatic software download feature is working correctly.

Action Use the **show system services dhcp client *interface-name*** command to verify that the automatic software download feature has been used to install a software package.

```

user@switch> show system services dhcp client ge-0/0/1.0
Logical Interface Name      ge-0/0/1.0
Hardware address            00:0a:12:00:12:12
Client Status               bound
Vendor Identifier           ether
Server Address              10.1.1.1
Address obtained            10.1.1.89
Lease Obtained at           2009-08-20 18:13:04 PST
Lease Expires at            2009-08-22 18:13:04 PST

DHCP Options :
Name: name-server, Value: [ 10.209.194.131, 2.2.2.2, 3.3.3.3 ]
Name: server-identifier, Value: 10.1.1.1
Name: router, Value: [ 10.1.1.80 ]
Name: boot-image,
Value: jinstall-ex-4200-9.6R1.5-domestic-signed.tgz
Name: boot-image-location,
Value: 10.1.1.25:/bootfiles/

```

Meaning The output from this command shows the name and location of the software package under DHCP options when automatic software download was last used to install a software package. The sample output in DHCP options shows that the last DHCP server message to arrive on the DHCP client had a boot server address of 192.168.1.165 and a boot file named jinstall-ex-4200-9.6R1.5-domestic-signed.tgz. If automatic software download was enabled on this client switch during the last DHCP message exchange, these values were used by the switch to upgrade the software.

Related Documentation

- [Upgrading Software by Using Automatic Software Download on page 7](#)
- [Understanding DHCP Services for Switches on page 71](#)

PART 2

Basic System Management

- [Understanding Basic System Management on page 13](#)

CHAPTER 2

Understanding Basic System Management

- [Compressing the Current Configuration File on page 14](#)
- [Configuring a DNS Name Server for Resolving a Hostname into Addresses on page 15](#)
- [Configuring Console and Auxiliary Port Properties on page 15](#)
- [Configuring the Hostname of the Router or Switch on page 16](#)
- [Configuring the Junos OS to Determine Conditions That Trigger Alarms on Different Interface Types on page 17](#)
- [Configuring Junos OS to Disable Protocol Redirect Messages on the Router or Switch on page 17](#)
- [Configuring Junos OS to Disable the Reporting of IP Address and Timestamps in Ping Responses on page 18](#)
- [Configuring Junos OS to Extend the Default Port Address Range on page 18](#)
- [Configuring the Junos OS to Select a Fixed Source Address for Locally Generated TCP/IP Packets on page 19](#)
- [Configuring System Alarms to Appear Automatically Upon Login on page 19](#)
- [Configuring Time-Based User Access on page 20](#)
- [Configuring the Timeout Value for Idle Login Sessions on page 21](#)
- [Including the Year or Millisecond in Timestamps on page 22](#)
- [Mapping the Hostname of the Switch to IP Addresses on page 23](#)
- [Modifying the Default Time Zone for a Router or Switch Running Junos OS on page 23](#)
- [Rebooting and Halting a Device on page 24](#)
- [Reaching a Domain Name System Server on page 25](#)
- [Reverting to the Default Factory Configuration by Using the request system zeroize Command on page 27](#)
- [Saving Core Files Generated by Junos OS Processes on page 28](#)
- [Specifying the Physical Location of the Switch on page 29](#)
- [Specifying Access Privileges for Junos OS Operational Mode Commands on page 29](#)
- [Updating the IANA Time Zone Database on Junos OS Devices on page 31](#)

- [Viewing Core Files from Junos OS Processes on page 33](#)
- [Example: Configuring the Name of the Switch, IP Address, and System ID on page 34](#)

Compressing the Current Configuration File

By default, the current operational configuration file is compressed and is stored in the file **juniper.conf.gz** in the **/config** file system, along with the last three committed versions of the configuration. If you have large networks, the current configuration file might exceed the available space in the **/config** file system. Compressing the current configuration file enables the file to fit in the file system, typically reducing the size of the file by 90 percent. You might want to compress your current operation configuration files when they reach 3 megabytes (MB) in size.

When you compress the current configuration file, the names of the configuration files change. To determine the size of the files in the **/config** file system, issue the **file list /config detail** command.



NOTE: We recommend that you compress the configuration files (this is the default) to minimize the amount of disk space that they require.

- If you want to compress the current configuration file, include the **compress-configuration-files** statement at the **[edit system]** hierarchy level:

```
[edit system]
compress-configuration-files;
```

Commit the current configuration file to include the **compression-configuration-files** statement. Commit the configuration again to compress the current configuration file:

```
[edit system]
user@host# set compress-configuration-files
user@host# commit
commit complete
user@host# commit
commit complete
```

- If you do not want to compress the current operational configuration file, include the **no-compress-configuration-files** statement at the **[edit system]** hierarchy level:

```
[edit system]
no-compression-configuration-files;
```

Commit the current configuration file to include the **no-compress-configuration-files** statement. Commit the configuration again to uncompress the current configuration file:

```
[edit system]
user@host# commit
commit complete
user@host# commit
commit complete
```

- Related Documentation**
- *Junos OS Commit Model for Router or Switch Configuration*
 - [compress-configuration-files on page 314](#)

Configuring a DNS Name Server for Resolving a Hostname into Addresses

To have the router or switch resolve hostnames into addresses, you must configure one or more Domain Name System (DNS) name servers by including the **name-server** statement at the **[edit system]** hierarchy level:

```
[edit system]
name-server {
    address;
}
```

The following example shows how to configure two DNS name servers:

```
[edit]
user@switch# set system name-server 192.168.1.253
[edit]
user@switch# set system name-server 192.168.1.254
[edit]
user@switch# show
system {
    name server {
        192.168.1.253;
        192.168.1.254;
    }
}
```

- Related Documentation**
- [name-server on page 325](#)

Configuring Console and Auxiliary Port Properties

The console port and auxiliary port on a switch provide out-of-band remote access to the switch. You can configure the console and auxiliary ports so that an external data terminal may be connected to the switch. The console port is enabled by default. The console port speed is 9600 baud, except on OCX Series devices, on which it is 115200 baud. The auxiliary port is disabled by default.

By default, terminal connections to the console and auxiliary ports are secure. When you configure the console and auxiliary ports as insecure, root logins are not allowed to establish terminal connections, and superusers and anyone with a user identifier (UID) of 0 are not allowed to establish terminal connections in multiuser mode.

To configure the console and auxiliary port properties on the switch:

1. To specify that the console port session should terminate if the connection to the data carrier is lost:

```
[edit system ports]
user@switch# set console log-out-on-disconnect
```

2. To specify the auxiliary port terminal type:

```
[edit system ports]
user@switch# set auxiliary type (ansi | small-xterm | vt100 | xterm)
```

For example, to specify the auxiliary port terminal type of **xterm** with a display of 80 columns by 65 rows:

```
[edit system ports]
user@switch# set auxiliary type xterm
```

3. To check the configuration:

```
[edit system ports]
user@switch# show
console log-out-on-disconnect;
auxiliary type xterm;
```

- Related Documentation
- [auxiliary on page 312](#)
 - [console \(Physical Port\) on page 315](#)
 - [ports on page 328](#)

Configuring the Hostname of the Router or Switch

The hostname of the device provides its identification for many purposes. Junos OS uses the configured hostname as part of the command prompt, to prepend log files and other accounting information, as well as in other places where knowing the device identity is useful. We recommend that the hostname be descriptive and memorable.

Optionally, instead of configuring the hostname at the **[edit system]** hierarchy level, you can use a configuration group, as shown in this procedure. This is a recommended best practice for configuring the hostname, especially if the device has dual Routing Engines. This procedure uses groups called **re0** and **re1** as an example.

To set the hostname:

1. Include the **host-name** statement in the configuration.

The name value must be less than 256 characters.

```
[edit groups group-name system]
host-name hostname;
```

For example:

```
[edit groups re0 system]
root@# set host-name san-jose-router

[edit groups re1 system]
root@# set host-name san-jose-router1
```

2. If you used one or more configuration groups, apply the configuration groups, substituting the appropriate group names.

For example:


```
[edit]
user@host# set apply-groups [re0 re1]
```

3. Commit the changes.

```
[edit]
root@# commit
```

The hostname subsequently appears in the device CLI prompt.

```
san-jose-router@#
```

Related Documentation

- *Understanding Hostnames*

Configuring the Junos OS to Determine Conditions That Trigger Alarms on Different Interface Types

For the different types of PICs, you can configure which conditions trigger alarms and whether they trigger a red or yellow alarm. Red alarm conditions light the **RED ALARM** LED and trigger an audible alarm if one is connected. Yellow alarm conditions light the **YELLOW ALARM** LED and trigger an audible alarm if one is connected.



NOTE: By default, any failure condition on the integrated-services interface (Adaptive Services PIC) triggers a red alarm.

To configure conditions that trigger alarms and that can occur on any interface of the specified type, include the **alarm** statement at the **[edit chassis]** hierarchy level.

```
[edit chassis]
alarm {
  interface-type {
    alarm-name (red | yellow | ignore);
  }
}
```

alarm-name is the name of an alarm.

Related Documentation

- *System-Wide Alarms and Alarms for Each Interface Type*
- *Chassis Conditions That Trigger Alarms*
- *Silencing External Devices Connected to Alarm Relay Contacts*

Configuring Junos OS to Disable Protocol Redirect Messages on the Router or Switch

By default, the router or switch sends protocol redirect messages. To disable the sending of redirect messages by the router or switch, include the **no-redirects** statement at the **[edit system]** hierarchy level:

```
[edit system]
no-redirects;
```

To reenable the sending of redirect messages on the router or switch, delete the **no-redirects** statement from the configuration.

To disable the sending of redirect messages on a per-interface basis, include the **no-redirects** statement at the **[edit interfaces *interface-name* unit *logical-unit-number* family *family*]** hierarchy level.

**Related
Documentation**

- [Configuring Junos OS to Ignore ICMP Source Quench Messages](#)
- [Configuring Junos OS to Select a Fixed Source Address for Locally Generated TCP/IP Packets](#)
- [Junos OS Network Interfaces Library for Routing Devices](#)

Configuring Junos OS to Disable the Reporting of IP Address and Timestamps in Ping Responses

When you issue the **ping** command with the **record-route** option, the Routing Engine displays the path of the ICMP echo request packets and timestamps in the ICMP echo responses by default.

You can configure the Routing Engine to disable the setting of the **record-route** option in the IP header of the ping request packets. Disabling the **record-route** option prevents the Routing Engine from recording and displaying the path of the ICMP echo request packets in the response.

- To configure the Routing Engine to disable the setting of the **record route** option, include the **no-ping-record-route** statement at the **[edit system]** hierarchy level:

```
[edit system]  
no-ping-record-route;
```

- To disable the reporting of timestamps in the ICMP echo responses, include the **no-ping-time-stamp** option at the **[edit system]** hierarchy level:

```
[edit system]  
no-ping-time-stamp;
```

By configuring the **no-ping-record-route** and **no-ping-timestamp** options, you can prevent unauthorized persons from discovering information about the provider edge (PE) router or switch and its loopback address.

**Related
Documentation**

- [Configuring Junos OS to Disable the Routing Engine Response to Multicast Ping Packets on page 84](#)

Configuring Junos OS to Extend the Default Port Address Range

By default, the upper range of a port address is 5000. You can increase the range from which the port number can be selected to decrease the probability that someone can determine your port number.

- To configure the Junos OS to extend the default port address range, include the **source-port** statement at the **[edit system internet-options]** hierarchy level:

```
[edit system internet-options]
source-port upper-limit upper-limit;
```

upper-limit *upper-limit* is the upper limit of a source port address and can be a value from 5000 through 65,355.

Related Documentation

- [Configuring Junos OS to Disable TCP RFC 1323 Extensions](#)
- [Configuring Junos OS ARP Learning and Aging Options for Mapping IPv4 Network Addresses to MAC Addresses](#)
- [source-port on page 331](#)

Configuring the Junos OS to Select a Fixed Source Address for Locally Generated TCP/IP Packets

By default, the source address included in locally generated Transmission Control Protocol/IP (TCP/IP) packets, such as FTP traffic, and in User Datagram Protocol (UDP) and IP packets, such as Network Time Protocol (NTP) requests, is chosen as the local address for the interface on which the traffic is transmitted. This means that the local address chosen for packets to a particular destination might change from connection to connection based on the interface that the routing protocol has chosen to reach the destination when the connection is established. If multiple equal-cost next hops are present for a destination, locally generated packets use the **lo0** address as a source.

- To configure the software to select a fixed address to use as the source for locally generated IP packets, include the **default-address-selection** statement at the **[edit system]** hierarchy level:

```
[edit system]
default-address-selection;
```

If you include the **default-address-selection** statement in the configuration, the Junos OS chooses the system default address as the source for most locally generated IP packets. The default address is usually an address configured on the **lo0** loopback interface. For example, if you specified that SSH and telnet use a particular address, but you also have **default-address selection** configured, the system default address is used.

Related Documentation

- [Configuring Junos OS to Disable Protocol Redirect Messages on the Router or Switch on page 17](#)
- [default-address-selection on page 316](#)

Configuring System Alarms to Appear Automatically Upon Login

You can configure Juniper Networks routers and switches to run the **show system alarms** command whenever a user with the login class **admin** logs in to the router or switch. To

do so, include the **login-alarms** statement at the **[edit system login class admin]** hierarchy level.

```
[edit system login class admin]
login-alarms;
```

For more information on the **show system alarms** command, see the [CLI Explorer](#).

**Related
Documentation**

- *System Alarms on J Series Routers*
- [show system alarms on page 1051](#)

Configuring Time-Based User Access

The Junos OS enables you to configure time-based restrictions for user access to log in to a device. This is useful for restricting the time and duration of user logins for all users belonging to a login class. You can specify the days of the week when users can log in, the access start time, and the access end time.

- To configure user access on specific days of the week, without any restrictions on the duration of login, include the **allowed-days** statement only.

```
[edit system]
login {
  class class-name {
    allowed-days [ days-of-the-week ];
  }
}
```

- To configure user access on all the days of the week for a specific duration, include the **access-start** and **access-end** statements only.

```
[edit system]
login {
  class class-name {
    access-start HH:MM;
    access-end HH:MM;
  }
}
```

- To configure user access on specific days of the week for a specified duration, include the **allowed-days**, **access-start**, and **access-end** statements.

```
[edit system]
login {
  class class-name {
    allowed-days [ days-of-the-week ];
    access-start HH:MM;
    access-end HH:MM;
  }
}
```

Specify the start time and end time in **HH:MM** (24-hour) format, where **HH** represents the hours and **MM** represents the minutes.



NOTE: Access start time and end time that spans across 12:00 AM on a specified day results in the user having access until the next day, even if the access day is not explicitly configured. For instance, the following configuration results in the user having access until 6:00 AM on Tuesday and Thursday, although the `allowed-days` statement specifies access only on Monday and Wednesday:

```
[edit system]
login {
  class operator-night-shift {
    allowed-days [ monday wednesday ];
    access-start 2000;
    access-end 0600;
  }
}
```

Related Documentation

- [Examples: Configuring Time-Based User Access](#)
- [Defining Junos OS Login Classes](#)
- [access-end](#)
- [access-start](#)
- [allowed-days](#)
- [access-end on page 364](#)
- [access-start on page 364](#)
- [allowed-days on page 366](#)

Configuring the Timeout Value for Idle Login Sessions

An idle login session is one in which the CLI operational mode prompt is displayed but there is no input from the keyboard. By default, a login session remains established until a user logs out of the router or switch, even if that session is idle. To close idle sessions automatically, you must configure a time limit for each login class. If a session established by a user in that class remains idle for the configured time limit, the session automatically closes.

To define the timeout value for idle login sessions, include the **idle-timeout** statement at the **[edit system login class *class-name*]** hierarchy level:

```
[edit system login class class-name]
idle-timeout minutes;
```

Specify the number of minutes that a session can be idle before it is automatically closed.

If you have configured a timeout value, the CLI displays messages similar to the following when timing out an idle user. It starts displaying these messages 5 minutes before timing out the user.

```
user@host# Session will be closed in 5 minutes if there is no activity.  
Warning: session will be closed in 1 minute if there is no activity  
Warning: session will be closed in 10 seconds if there is no activity  
Idle timeout exceeded: closing session
```

If you configure a timeout value, the session closes after the specified time has elapsed, unless the user is running telnet or monitoring interfaces using the **monitor interface** or **monitor traffic** command.

- Related Documentation**
- *Defining Junos OS Login Classes*
 - *idle-timeout (System-Login)*

Including the Year or Millisecond in Timestamps

By default, the timestamp recorded in a standard-format system log message specifies the month, date, hour, minute, and second when the message was logged, as in the following example:

```
Aug 21 12:36:30
```

To include the year, the millisecond, or both in the timestamp, include the **time-format** statement at the **[edit system syslog]** hierarchy level:

```
[edit system syslog]  
time-format (year | millisecond | year millisecond);
```

However, the timestamp for traceoption messages is specified in milliseconds by default, and is independent of the **[edit system syslog time-format]** statement.

The modified timestamp is used in messages directed to each destination configured by a **file**, **console**, or **user** statement at the **[edit system syslog]** hierarchy level, but not to destinations configured by a **host** statement.

The following example illustrates the format for a timestamp that includes both the millisecond (401) and the year (2006):

```
Aug 21 12:36:30.401 2006
```



NOTE: Messages logged in structured-data format include the year and millisecond by default. If you include the structured-data statement at the **[edit system syslog file filename]** hierarchy level along with the **time-format** statement, the **time-format** statement is ignored and messages are logged in structured-data format.

For information about the structured-data statement, see *Logging Messages in Structured-Data Format*. For information about the contents of a structured-data message, see the [System Log Explorer](#).

- Related Documentation**
- *Single-Chassis System Logging Configuration Overview*
 - *Examples: Configuring System Logging*

Mapping the Hostname of the Switch to IP Addresses

To map a hostname of a switch to one or more IP addresses, include the **inet** statement at the **[edit system static-host-mapping hostname]** hierarchy level:

```
[edit system]
static-host-mapping {
  hostname {
    inet [ addresses ];
    alias [ aliases ];
  }
}
```

hostname is the name specified by the **host-name** statement at the **[edit system]** hierarchy level.

For each host, you can specify one or more aliases.

Related Documentation

- [Reaching a Domain Name System Server on page 25](#)
- [Example: Configuring the Name of the Router, IP Address, and System ID](#)
- [static-host-mapping on page 332](#)

Modifying the Default Time Zone for a Router or Switch Running Junos OS

The default local time zone on the router or switch is UTC (Coordinated Universal Time, formerly known as Greenwich Mean Time, or GMT).

- To modify the local time zone, include the **time-zone** statement at the **[edit system]** hierarchy level:

```
[edit system]
time-zone (GMT hour-offset | time-zone);
```

You can use the **GMT hour-offset** option to set the time zone relative to UTC (GMT) time. By default, **hour-offset** is 0. You can configure this to be a value from **-14** to **+12**.

You can also specify the **time-zone** value as a string such as PDT (Pacific Daylight Time) or WET (Western European Time), or specify the continent and major city.



NOTE: Junos OS complies with the POSIX time-zone standard, which is counter-intuitive to the way time zones are generally indicated relative to UTC. A time zone ahead of UTC (east of the Greenwich meridian) is commonly indicated as GMT +*n*; for example, the Central European Time (CET) zone is indicated as GMT +1. However, this is not true for POSIX time zone designations. POSIX indicates CET as GMT-1. If you include the `set system time-zone GMT+1` statement for a router in the CET zone, your router time will be set to one hour behind GMT, or two hours behind the actual CET time. For this reason, you might find it easier to use the POSIX time-zone strings, which you can list by entering `set system time-zone ?`.

For the time zone change to take effect for all processes running on the router or switch, you must reboot the router or switch.

The following example shows how to change the current time zone to **America/New_York**:

```
[edit]
user@host# set system time-zone America/New_York
[edit]
user@host# show
system {
    time-zone America/New_York;
}
```

**Related
Documentation**

- [Understanding NTP Time Servers on page 175](#)
- [Updating the IANA Time Zone Database on Junos OS Devices on page 31](#)

Rebooting and Halting a Device

To reboot the switch, issue the **request system reboot** command.

```
user@switch> request system reboot ?
Possible completions:
<[Enter]>          Execute this command
all-members        Reboot all virtual chassis members
at                 Time at which to perform the operation
both-routing-engines Reboot both the Routing Engines
fast-boot          Enable fast reboot
in                 Number of minutes to delay before operation
local              Reboot local virtual chassis member
member             Reboot specific virtual chassis member (0..9)
message            Message to display to all users
other-routing-engine Reboot the other Routing Engine
|                 Pipe through a command
{master:0}
```

```
user@switch> request system reboot
Reboot the system ? [yes,no] (no) yes
Rebooting switch
```




NOTE: Not all options shown in the preceding command output are available on all QFX Series, OCX Series, and EX4600 devices. For example, the `fast-boot` option is available only on the QFX5100 switch. See the documentation for the `request system reboot` command for details about options.

Similarly, to halt the switch, issue the `request system halt` command.



CAUTION: Before entering this command, you must have access to the switch's console port in order to bring up the Routing Engine.

```
user@switch> request system halt ?
Possible completions:
<[Enter]>          Execute this command
all-members        Halt all virtual chassis members
at                 Time at which to perform the operation
backup-routing-engine  Halt backup Routing Engine
both-routing-engines Halt both Routing Engines
in                 Number of minutes to delay before operation
local              Halt local virtual chassis member
member             Halt specific virtual chassis member (0..9)
message            Message to display to all users
other-routing-engine Halt other Routing Engine
|                  Pipe through a command
```



NOTE: When you issue this command on an individual component in a QFabric system, you will receive a warning that says “Hardware-based members will halt, Virtual Junos Routing Engines will reboot.” If you want to halt only one member, use the `member` option. You cannot issue this command from the QFabric CLI.

Issuing the `request system halt` command on the switch halts the Routing Engine. To reboot a Routing Engine that has been halted, you must connect through the console.

Related Documentation

- [clear system reboot on page 423](#)
- [request system reboot on page 481](#)
- [request system halt on page 469](#)
- [request system power-off on page 476](#)
- [Connecting a QFX Series Device to a Management Console](#)

Reaching a Domain Name System Server

Domain name system (DNS) servers are used for resolving hostnames to IP addresses.

For redundancy, it is a best practice to configure access to multiple DNS servers. You can configure a maximum of three DNS servers. The approach is similar to the way Web

browsers resolve the names of a Web site to its network address. Additionally, Junos OS enables you configure one or more domain names, which it uses to resolve hostnames that are not fully qualified (in other words, the domain name is missing). This is convenient because you can use a hostname in configuring and operating Junos OS without the need to reference the full domain name. After adding DNS server addresses and domain names to your Junos OS configuration, you can use DNS resolvable hostnames in your configuration and commands instead of IP addresses.

Optionally, instead of configuring the name server at the **[edit system]** hierarchy level, you can use a configuration group, as shown in this procedure. This is a recommended best practice for configuring the name server. This procedure uses a group called **global** as an example.

Before you begin, configure your DNS servers with the hostname and an IP address for your Junos OS device. It does not matter which IP address you assign as the address of your Junos OS device in the DNS server, as long it is an address that reaches your device. Normally, you would use the management interface IP address, but you can choose the loopback interface IP address, or a network interface IP address, or even configure multiple addresses on the DNS server.

To configure the router or switch to resolve hostnames into addresses:

1. Reference the IP addresses of your DNS servers.

```
[edit groups group-name system]
name-server {
  address;
}
```

The following example shows how to reference two DNS servers:

```
[edit groups global system]
user@host# set name-server 192.168.1.253
user@host# set name-server 192.168.1.254

user@host# show
name server {
  192.168.1.253;
  192.168.1.254;
}
```

2. (Optional) Configure the name of the domain in which the device itself is located.

This is a good practice. Junos OS then uses this configured domain name as the default domain name to append to hostnames that are not fully qualified.

```
[edit system]
domain-name domain-name;
```

The following example shows how to configure the domain name:

```
[edit groups global system]
user@host# set domain-name company.net

user@host# show
domain-name company.net;
```

3. (Optional) Configure a list of domains to be searched.

If your device can reach several different domains, you can configure these as a list of domains to be searched. Junos OS then uses this list to set an order in which it appends domain names when searching for the IP address of a host.

```
[edit groups global system]
domain-search [ domain-list ];
```

The domain list can contain up to six domain names, with a total of up to 256 characters.

The following example shows how to configure two domains to be searched. This example configures Junos OS to search the company.net domain and then the domainone.net domain and then the domainonealternate.com domain when attempting to resolve unqualified hosts.

```
[edit groups global system]
domain-search [ company.net domainone.net domainonealternate.com ]
```

4. If you used a configuration group, apply the configuration group, substituting **global** with the appropriate group name.

```
[edit]
user@host# set apply-groups global
```

5. Commit the configuration.

```
user@host# commit
```

6. Verify the configuration.

If you have configured your DNS server with the hostname and an IP address for your Junos OS device, you can issue the following commands to confirm that DNS is working and reachable. You can either use the configured hostname to confirm resolution to the IP address or use the IP address of your device to confirm resolution to the configured hostname.

```
user@host> show host host-name
user@host> show host host-ip-address
```

For example:

```
user@host> show host san-jose-router1
san-jose-router1.company.net
san-jose-router1.company.net has address 192.168.187.1

user@host> show host 192.168.187.1
1.187.168.192.in-addr.arpa domain name pointer san-jose-router1.company.net.
```

Related Documentation

- [Understanding DNS](#)

Reverting to the Default Factory Configuration by Using the request system zeroize Command

The **request system zeroize** command is a standard Junos OS operational mode command that removes all configuration information and resets all key values. The operation unlinks

all user-created data files, including customized configuration and log files, from their directories. The switch then reboots and reverts to the factory-default configuration.

To completely erase user-created data so that it is unrecoverable, use the **request system zeroize media** command.



CAUTION: Before issuing **request system zeroize**, use the **request system snapshot** command to back up the files currently used to run the switch to a secondary device.

To revert to the factory-default configuration by using the **request system zeroize** command:

1. `user@switch> request system zeroize`
warning: System will be rebooted and may not boot without configuration
Erase all data, including configuration and log files? [yes,no] (yes)
2. Type **yes** to remove configuration and log files and revert to the factory default configuration.
3. Complete the initial configuration of the switch.

Related Documentation

- [request system zeroize on page 494](#)

Saving Core Files Generated by Junos OS Processes

By default, when an internal Junos OS process generates a core file, the file and associated context information are saved for debugging purposes in a compressed tar file named **/var/tmp/process-name.core.core-number.tgz**. The contextual information includes the configuration and system log message files.

- To disable the saving of core files and associated context information:

```
[edit system]  
no-saved-core-context;
```

- To save the core files only:

```
[edit system]  
saved-core-files number;
```

Where **number** is the number of core files to save and can be a value from 1 through 10.

- To save the core files along with the contextual information:

```
[edit system]  
saved-core-context;
```

Related Documentation

- [Viewing Core Files from Junos OS Processes on page 33](#)

Specifying the Physical Location of the Switch

To specify the physical location of the switch, specify the following options for the **location** statement at the **[edit system]** hierarchy level:

- **altitude *feet***—Number of feet above sea level.
- **building *name***—Name of the building, 1 to 28 characters in length. If the string contains spaces, enclose it in quotation marks (" ").
- **country-code *code***—Two-letter country code.
- **floor *number***—Floor in the building.
- **hcoord *horizontal-coordinate***—Bellcore Horizontal Coordinate.
- **lata *service-area***—Long-distance service area.
- **latitude *degrees***—Latitude in degree format.
- **longitude *degrees***—Longitude in degree format.
- **npa-nxx *number***—First six digits of the phone number (area code and exchange).
- **postal-code *postal-code***—Postal code.
- **rack *number***—Rack number.
- **vcoord *vertical-coordinate***—Bellcore Vertical Coordinate.

The following example shows how to specify the physical location of the switch:

```
[edit system]
location {
  altitude feet;
  building name;
  country-code code;
  floor number;
  hcoord horizontal-coordinate;
  lata service-area;
  latitude degrees;
  longitude degrees;
  npa-nxx number;
  postal-code postal-code;
  rack number;
  vcoord vertical-coordinate;
}
```

Related Documentation

- [Example: Configuring the Name of the Switch, IP Address, and System ID on page 34](#)

Specifying Access Privileges for Junos OS Operational Mode Commands

You can specify extended regular expressions by using the **allow-commands** and **deny-commands** statements to define a user's access privileges to individual operational mode commands. Doing so takes precedence over a login class permissions bit set for

a user. You can include one **deny-commands** and one **allow-commands** statement in each login class.

To explicitly provide use of an individual operational mode command that would otherwise be denied, include the **allow-commands** statement at the **[edit system login class *class-name*]** hierarchy level:

```
[edit system login class class-name]  
allow-commands "regular-expression";
```

To explicitly deny access to an individual operational mode command that would otherwise be supported, include the **deny-commands** statement at the **[edit system login class *class-name*]** hierarchy level:

```
[edit system login class class-name]  
deny-commands "regular-expression";
```

If the regular expression contains any spaces, operators, or wildcard characters, enclose the expression in quotation marks. Regular expressions are not case-sensitive.

```
allow-commands "show interfaces";
```



NOTE: Modifiers are not supported within the regular expression string to be matched. If a modifier is used, then nothing is matched.

For example, the deny command **set protocols** does not match anything, whereas **protocols** matches *protocols*.

Explicitly providing access to operational mode commands using the **allow-commands** statement adds to the regular permissions set using the **permissions** statement. Likewise, explicitly denying access to operational mode commands using the **deny-commands** statement removes permissions for the specified commands from the default permissions provided by the **permissions** statement.

For example, if a login class has the permission **view** and the **allow-commands** statement includes the **request system software add** command, the specified login class user can install software, in addition to the permissions specified by the **view** permissions flag. Likewise, if a login class has the permission **all** and the **deny-commands** statement includes the **request system software add** command, the specified login class user can perform all operations allowed by the **all** permissions flag, except installing software using the **request system software add** command.

If you allow and deny the same commands, the **allow-commands** permissions take precedence over the permissions specified by **deny-commands**. For example, if you include **allow-commands "request system software add"** and **deny-commands "request system software add"**, the login class user is allowed to install software using the **request system software add** command.

If you specify a regular expression for **allow-commands** and **deny-commands** with two different variants of a command, the longest match is always executed.

For example, if you specify a regular expression for **allow-commands** with the **commit-synchronize** command and a regular expression for **deny-commands** with the **commit** command, users assigned to such a login class would be able to issue the **commit synchronize** command, but not the **commit** command. This is because **commit-synchronize** is the longest match between **commit** and **commit-synchronize**, and it is specified for **allow-commands**.

Likewise, if you specify a regular expression for **allow-commands** with the **commit** command and a regular expression for **deny-commands** with the **commit-synchronize** command, users assigned to such a login class would be able to issue the **commit** command, but not the **commit-synchronize** command. This is because **commit-synchronize** is the longest match between **commit** and **commit-synchronize**, and it is specified for **deny-commands**.

Anchors are required when specifying complex regular expressions with **allow-commands** or **deny-commands** statements. For example, when specifying multiple commands using the pipe (|) symbol for **allow-commands**, the following syntax is incorrect: **allow-commands = "(monitor.*)|(ping.*)|(show.*)|(exit)"** . Instead, you must specify the expression using the following syntax: **allow-commands = "(^monitor) | (^ping) | (^show) | (^exit)"** OR **allow-commands = "^ (monitor | ping | show | exit)"**

Related Documentation

- *Example: Configuring Access Privileges for Operational Mode Commands*
- *Regular Expressions for Allowing and Denying Junos OS Operational Mode Commands*
- *allow-commands*
- *deny-commands*

Updating the IANA Time Zone Database on Junos OS Devices

Junos OS devices use the tz database, also known as the IANA Time Zone Database to manage time zones. This database is periodically updated by IANA to reflect political and time changes. As such, you may need from time to time to update this file to ensure the Junos devices continue to accurately reflect worldwide time zones and daylight savings time intervals.

To update the IANA Time Zone Database, perform the following steps:

1. [Importing and Installing Time Zone Files on page 32](#)
2. [Configuring a Custom Time Zone on page 33](#)

Importing and Installing Time Zone Files

The IANA Time Zone Database is maintained by the Internet Assigned Numbers Authority (IANA), which is a department of the Internet Corporation for Assigned Names and Numbers (ICANN). You can download the latest IANA Time Zone Database file from the following URL: <http://www.iana.org/time-zones>.

The following steps will guide you through one method of installing the file to your device. However, depending on your network access and other preferences, you may need to modify these steps.

1. Log into the Junos device.
2. If you are in the CLI interface, open the shell interface.

```
device@user# start shell
```

3. Create a **tz** directory in the **/var/tmp** and navigate to that directory.

```
# mkdir /var/tmp/tz
# cd /var/tmp/tz
```

4. Using FTP, download the time zone files archive.



NOTE: FTP must be enabled on your device before you can use FTP. FTP is enabled by adding the **ftp** statement into the **[edit system services]** hierarchy.

```
# ftp ftp.iana.org/tz
# bin
# get tzdata-latest.tar.gz
```



NOTE: If needed, you can edit the above untarred files to create or modify the time zones.

5. Select the names of time zone files to compile and feed them to the following script. For example, to generate **northamerica** and **asia** tz files:

```
# /usr/libexec/ui/compile-tz northamerica asia
```

6. Enable the use of the generated tz files using the CLI:

```
[edit]
# set system use-imported-time-zones
[edit]
# set system time-zone ?
```

This should show the newly generated tz files in **/var/db/zoneinfo/**.

7. Set the time zone and commit the configuration:

```
[edit]
# set system time-zone <your-time-zone>
# commit
```


- Verify that the time zone change has taken effect:

```
[edit]
# run show system uptime
```

Configuring a Custom Time Zone

To use a custom time zone, follow these steps:

- Download a time zones archive (from a known or designated source) to the router or switch. Compile the time zone archive using the `zic` time zone compiler, which generates `tz` files.
- Using the CLI, configure the router or switch to enable the use of the generated `tz` files as follows:

```
[edit]
user@host# set system use-imported-time-zones
```

- Display the imported time zones (saved in the directory `/var/db/zoneinfo/`):

```
[edit]
user@host# set system time-zone ?
```

If you do not configure the router to use imported time zones, the Junos OS default time zones are shown (saved in the directory `/usr/share/zoneinfo/`).

Related Documentation

- *Modifying the Default Time Zone for a Router or Switch Running Junos OS*
- *NTP Overview*
- [Understanding NTP Time Servers on page 175](#)
- [Example: Configuring NTP as a Single Time Source for Router and Switch Clock Synchronization on page 186](#)
- *use-imported-time-zones*

Viewing Core Files from Junos OS Processes

When an internal Junos OS process generates a core file, the output found at `/var/crash/` and `/var/tmp/` can now be viewed. This provides a quick method of finding core issues across large networks.

Use the CLI command `show system core-dumps` to view core files.

```
root@host> show system core-dumps
-rw----- 1 root wheel 268369920 Jun 18 17:59 /var/crash/vmcore.0
-rw-rw---- 1 root field 3371008 Jun 18 17:53 /var/tmp/rpd.core.0
-rw-r--r-- 1 root wheel 27775914 Jun 18 17:59 /var/crash/kernel.0
```

Related Documentation

- *Saving Core Files from Junos OS Processes*
- [Saving Core Files Generated by Junos OS Processes on page 28](#)

Example: Configuring the Name of the Switch, IP Address, and System ID

The following example shows how to configure the switch name, map the name to an IP address and alias, and configure a system identifier:

```
[edit]
user@switch# set system host-nameswitch-sjl
[edit]
user@switch# set system static-host-mapping switch-sjl inet 192.168.1.77
[edit]
user@switch# set system static-host-mapping switch-sjl alias sjl
[edit]
user@switch# set system static-host-mapping switch-sjl sysid 1921.6800.1077
[edit]
user@switch# show
system {
    host-name switch-sjl;
    static-host-mapping {
        switch-sjl {
            inet 192.168.1.77;
            alias sjl;
            sysid 1921.6800.1077;
        }
    }
}
```

Related Documentation

- *Getting Started Guide for Routing Devices*

PART 3

Command Line Interface (CLI)

- [Understanding the CLI on page 37](#)

CHAPTER 3

Understanding the CLI

- [CLI User Interface Overview on page 37](#)
- [Configuring Login Tips on page 40](#)
- [Format for Specifying Filenames and URLs in Junos OS CLI Commands on page 40](#)
- [Getting Started with Enhanced Layer 2 Software on page 41](#)
- [Junos OS Operational Mode Commands That Combine Other Commands on page 55](#)
- [Overview of Junos OS CLI Operational Mode Commands on page 56](#)
- [Overview of Navigating the CLI on page 58](#)
- [Understanding the Brief, Detail, Extensive, and Terse Options of Junos OS Operational Commands on page 60](#)
- [Understanding Junos OS CLI Configuration Mode on page 61](#)

CLI User Interface Overview

- [CLI Overview on page 37](#)
- [CLI Key Features on page 38](#)
- [CLI Command Modes on page 38](#)

CLI Overview

The command-line interface (CLI) is the software interface you use to access, monitor, configure, troubleshoot, and manage a device running Junos OS. You can access the CLI either from the console or through a network connection. The CLI is a Juniper Networks-specific command shell that runs on top of a FreeBSD UNIX-based operating system kernel.

The CLI provides a variety of UNIX utilities, such as Emacs-style keyboard sequences, which allows you to perform the following actions:

- Move around on a command line and scroll through recently executed commands.
- Match regular expressions to locate and replace values and identifiers in a configuration.
- Filter command output.
- Log file entries.
- Store and archive device files on a UNIX-based file system.

You can exit the CLI environment and create a UNIX C shell or Bourne shell to navigate the file system, manage processes, and perform other tasks.

CLI Key Features

The CLI commands and statements follow a hierarchical organization and have consistent syntax. The CLI provides the following features for ease of use:

- Consistent command names—Commands that provide the same type of function have the same name, regardless of the portion of the software on which they are operating. For example, all **show** commands display software information and statistics, and all **clear** commands erase various types of system information.
- Lists and short descriptions of available commands—Information about available commands is provided at each level of the CLI command hierarchy. If you type a question mark (?) at any level, you see a list of the available commands along with a short description of each command. This means that if you already are familiar with the Junos OS, you can use many of the CLI commands without referring to the documentation.
- Command completion—Command completion for command names (keywords) and for command options is available at each level of the hierarchy. To complete a command or option that you have partially typed, press Tab or the Spacebar. If the partially typed letters begin a string that uniquely identifies a command, the complete command name appears. Otherwise, a beep indicates that you have entered an ambiguous command, and the possible completions are displayed. Completion also applies to other strings, such as filenames, interface names, usernames, and configuration statements.

CLI Command Modes

The CLI has two modes, operational mode and configuration mode.

- Operational mode—This mode displays the current status of the device. In operational mode, you enter commands to monitor and troubleshoot Junos OS and devices and network connectivity. Operational mode is indicated by the > prompt—for example, **user@switch> clear**
- Configuration mode—A Junos OS device configuration is stored as a hierarchy of statements. In configuration mode, you can define all properties of the Juniper Networks Junos OS, including interfaces, VLANs, Virtual Chassis information, user access, and several system hardware properties. To enter configuration mode, enter the **configure** command. Configuration mode is indicated by the # prompt and includes the current location in the configuration hierarchy—for example:

```
[edit interfaces ge-0/0/12]  
user@switch#
```

In configuration mode, you are actually viewing and changing the candidate configuration file. The candidate configuration allows you to make configuration changes without causing operational changes to the current operating configuration, called the active configuration. When you commit the changes you added to the candidate configuration,

the system updates the active configuration. Candidate configurations enable you to alter your configuration without causing potential damage to your current network operations.

To activate your configuration changes, enter the **commit** command.

When you commit the candidate configuration, you can require an explicit confirmation for the commit to become permanent by using the **commit confirmed** command. This is useful for verifying that a configuration change works correctly and does not prevent management access to the switch. After you issue the **commit confirmed** command, you must issue another **commit** command within the defined period of time (10 minutes by default), or the system reverts to the previous configuration.

You can also activate your configuration changes and exit configuration mode with a single command, **commit and-quit**. This command succeeds only if there are no mistakes or syntax errors in the configuration.

To return to operational mode, go to the top of the configuration hierarchy and then quit—for example:

```
[edit interfaces ge-0/0/12]
user@switch# top
[edit]
user@switch# exit
```

When you monitor and configure a device running Junos OS, you may need to switch between operational mode and configuration mode. When you change to configuration mode, the command prompt also changes. The operational mode prompt is a right angle bracket (>) and the configuration mode prompt is a pound sign (#).

When you log in to the switch and type the **cli** command, you are automatically in operational mode. To switch to configuration mode, type the **configure** command or the **edit** command.

The CLI prompt changes from **user@switch>** to **user@switch#**, and a banner appears to indicate the hierarchy level.

To return to operational mode as well as commit your changes, enter **command and-quit**. To return to operational mode without committing any of your changes, enter **exit**.

To display the output of an operational mode command, such as **show**, while in configuration mode, issue the **run** configuration mode command and then specify the operational mode command.

Related Documentation

- [Configuring Login Tips on page 40](#)
- [Overview of Navigating the CLI on page 58](#)
- *CLI User Guide*
- *Other Tools to Configure and Monitor Devices Running Junos OS*

Configuring Login Tips

The Junos OS CLI provides the option of configuring login tips for the user. By default, the **tip** command is not enabled when a user logs in.

- To enable tips, include the **login-tip** statement at the **[edit system login class *class-name*]** hierarchy level:

```
[edit system login class class-name]  
login-tip;
```

Adding this statement enables the **tip** command for the class specified, provided the user logs in using the CLI.

Related Documentation

- [CLI User Interface Overview on page 37](#)
- [Defining Junos OS Login Classes](#)
- [login-tip on page 375](#)

Format for Specifying Filenames and URLs in Junos OS CLI Commands

In some CLI commands and configuration statements—including **file copy**, **file archive**, **load**, **save**, **set system login user *username* authentication *load-key-file***, and **request system software add**—you can include a filename. On a routing matrix, you can include chassis information (for example, **lcc0**, **lcc0-re0**, or **lcc0-re1**) as part of the filename.

A *routing matrix* is a multichassis architecture composed of either one TX Matrix router and from one to four T640 routers connected to the TX Matrix router, or one TX Matrix Plus router and from one to four T1600 routers connected to the TX Matrix Plus router. From the perspective of the user interface, the routing matrix appears as a single router. On a routing matrix composed of the TX Matrix router and T640 routers, the TX Matrix router controls all the T640 routers. On a routing matrix composed of a TX Matrix Plus router and T1600 routers, the TX Matrix Plus router controls all the T1600 routers.

You can specify a filename or URL in one of the following ways:

- **filename**—File in the user's current directory on the local CompactFlash card (not applicable on the QFX Series). You can use wildcards to specify multiple source files or a single destination file. Wildcards are not supported in HTTP or FTP.



NOTE: Wildcards are supported only by the **file (compare | copy | delete | list | rename | show)** commands. When you issue the **file show** command with a wildcard, it must resolve to one filename.

- **path/filename**—File on the local flash disk.
- **/var/filename** or **/var/path/filename**—File on the local hard disk. You can also specify a file on a local Routing Engine for a specific T640 router or a T1600 router in a routing matrix:


```
user@host> file delete lcc0-re0:/var/tmp/junk
```

- **a:filename** or **a:path/filename**—File on the local removable media. The default path is / (the root-level directory). The removable media can be in MS-DOS or UNIX (UFS) format.
- **hostname:/path/filename**, **hostname:filename**, **hostname:path/filename**, or **"scp://hostname/path/filename"**—File on an scp/ssh client. This form is not available in the worldwide version of Junos OS. The default path is the user's home directory on the remote system. You can also specify **hostname** as **username@hostname**.
- **ftp://hostname/path/filename**—File on an FTP server. You can also specify **hostname** as **username@hostname** or **username:password@hostname**. The default path is the user's home directory. To specify an absolute path, the path must start with %2F; for example, **ftp://hostname/%2Fpath/filename**. To have the system prompt you for the password, specify **prompt** in place of the password. If a password is required and you do not specify the password or **prompt**, an error message is displayed:

```
user@host> file copy ftp://username@ftp.hostname.net/filename
file copy ftp.hostname.net: Not logged in.
```

```
user@host> file copy ftp://username:prompt@ftp.hostname.net/filename
Password for username@ftp.hostname.net:
```

- **re0:/path/filename** or **re1:/path/filename**—File on a local Routing Engine. You can also specify a file on a local Routing Engine for a specific T640 router or a T1600 router in a routing matrix:

```
user@host> show log lcc0-re1:chassisd
```



NOTE: You cannot specify a URL for a file on an HTTP server, because HTTP URLs are not writable.

Related Documentation

- *Format for Specifying IP Addresses, Network Masks, and Prefixes in Junos OS Configuration Statements*
- *Default Directories for Junos OS File Storage on the Router or Switch*

Getting Started with Enhanced Layer 2 Software

- [Understanding Enhanced Layer 2 Software Support on page 42](#)
- [Using the ELS Translator Tool on page 42](#)
- [Configuring a VLAN on page 43](#)
- [Configuring the Native VLAN Identifier on page 44](#)
- [Configuring Layer 2 Interfaces on page 44](#)
- [Configuring Layer 3 Interfaces on page 45](#)
- [Configuring an IRB Interface on page 45](#)

- [Configuring an Aggregated Ethernet Interface and Configuring LACP on That Interface on page 46](#)
- [Enhanced Layer 2 CLI Configuration Statement and Command Changes on page 47](#)

Understanding Enhanced Layer 2 Software Support

Enhanced Layer 2 software (ELS) is automatically supported if your device is running a Junos OS release that supports it. You do not need to take any action to enable ELS, and you cannot disable ELS.

ELS is available on the following EX Series switches and QFX Series devices.

Table 3: ELS Support

Device	Initial ELS Release
EX4300 switches	13.2X50-D10
EX4600 switches	13.2X51-D25
EX9200 switches	12.3R2
QFX3500 switches	13.2X50-D15
QFX3600 switches	13.2X50-D15
QFX5100 switches	13.2X51-D10

ELS is supported on the EX4300, EX4600, and EX9200 switches for all Junos OS releases, starting with the initial releases shown in [Table 3 on page 42](#).

ELS support was introduced on QFX3500 and QFX3600 switches in Junos OS Release 13.2X50-D15. ELS is only supported on the software package that supports Virtual Chassis (the `jinstall-qfx-3-*` software package) for QFX3500 and QFX3600 switches.

For QFX5100 switches, ELS support was introduced in Junos OS Release 13.2X51-D10 and is supported on the `jinstall-qfx-5-*` software package.



NOTE: ELS is not supported on software packages that can be installed in a QFabric system.

Using the ELS Translator Tool

The ELS Translator is a web-based tool that converts Junos OS Layer 2 configurations to Enhanced Layer 2 Software (ELS) configurations. This conversion tool supports all Juniper Networks EX Series, MX Series, and QFX Series platforms with ELS installed. The ELS Translator is hosted on Juniper Networks Customer Support website for EX Series switches, MX Series Universal Edge routers, and QFX Series switches and is available to registered users, internal users, partners, and premium service contract customers. You

need to login using your Juniper Networks user name and password to access the ELS Translator tool.

[Click](#) to access the ELS translator tool.

If you are upgrading from a version of Junos OS that does not support ELS to a version of Junos OS that supports ELS, we recommend updating your configuration with the ELS Translator Tool using the following procedure:

1. Log onto your device using the console port.



NOTE: Only perform this procedure from the console port. You will lose connectivity to your device if you perform this procedure from a management port or any other interface.

2. Copy your entire existing configuration into another file. Save the file to a remote location. See *Saving a Configuration to a File*.
3. Retain the portion of your existing configuration related to management network connectivity (such as **[edit system]**). Delete all other top-level configuration hierarchy levels (such as **[edit interfaces]**, **[edit protocols]**, and **[edit vlans]**). Issue a **commit** operation to remove the deleted configuration hierarchy levels.
4. Perform the software upgrade. Reboot your device to complete the upgrade. See [“Software Installation Overview” on page 260](#)



NOTE: Maintain your console port connection during the reboot.

5. [Click](#) to access the ELS translator tool in a web browser. Follow the instructions on the page to update your configuration.
6. Return to your console port connection. When the switch has rebooted to complete the software upgrade, copy the configuration from the ELS Translator Tool onto your switch. See *Uploading a Configuration File*.
7. Commit the new configuration.



NOTE: It is possible a script might not translate correctly, so review translated scripts carefully before loading the converted configuration on your switch or other device.

Configuring a VLAN

You can configure one or more VLANs to perform Layer 2 bridging. The Layer 2 bridging functions include integrated routing and bridging (IRB) for support for Layer 2 bridging and Layer 3 IP routing on the same interface. EX Series and QFX Series switches can function as Layer 2 switches, each with multiple bridging, or broadcast, domains that

participate in the same Layer 2 network. You can also configure Layer 3 routing support for a VLAN.

To configure a VLAN:

1. Create the VLAN by setting the unique VLAN name and configuring the VLAN ID:

```
[edit]
user@host# set vlans vlan-name vlan-id vlan-id-number
```

2. Assign at least one interface to the VLAN:

```
[edit]
user@host# set interface interface-name family ethernet-switching vlan members vlan-name
```

Configuring the Native VLAN Identifier

EX Series and QFX Series switches support receiving and forwarding routed or bridged Ethernet frames with 802.1Q VLAN tags. Typically, trunk ports, which connect switches to each other, accept untagged control packets but do not accept untagged data packets. You can enable a trunk port to accept untagged data packets by configuring a native VLAN ID on the interface on which you want the untagged data packets to be received.

To configure the native VLAN ID:

1. On the interface on which you want untagged data packets to be received, set the interface mode to trunk, which specifies that the interface is in multiple VLANs and can multiplex traffic between different VLANs.

```
[edit interfaces]
user@host# set interface-name unit logical-unit-number family ethernet-switching
interface-mode trunk
```

2. Configure the native VLAN ID and assign the interface to the native VLAN ID:

```
[edit interfaces]
user@host# set interface-name native-vlan-id number
```

3. Assign the interface to the native VLAN ID:

```
[edit interfaces]
user@host# set interface-name unit logical-unit-number family ethernet-switching vlan
members native-vlan-id-number
```

Configuring Layer 2 Interfaces

To ensure that your high-traffic network is tuned for optimal performance, explicitly configure some settings on the switch's network interfaces.

To configure a Gigabit Ethernet interface or 10-Gigabit Ethernet interface for trunk interface mode:

```
[edit]
user@host# set interfaces interface-name unit logical-unit-number family ethernet-switching
interface-mode trunk
```

To configure a Gigabit Ethernet interface or 10-Gigabit Ethernet interface for access interface mode:

```
[edit]
user@host# set interfaces interface-name unit logical-unit-number family ethernet-switching
interface-mode access
```

Configuring Layer 3 Interfaces

To configure a Layer 3 interface, you must assign an IP address to the interface. You assign an address to an interface by specifying the address when configuring the protocol family. For the inet or inet6 family, configure the interface IP address.

You can configure interfaces with a 32-bit IP version 4 (IPv4) address and optionally with a destination prefix, sometimes called a subnet mask. An IPv4 address utilizes a 4-octet dotted decimal address syntax (for example, 192.16.1.1). An IPv4 address with destination prefix utilizes a 4-octet dotted decimal address syntax with a destination prefix appended (for example, 192.16.1.1/30).

To specify an IP address for the logical unit using IPv4:

```
[edit]
user@host# set interfaces interface-name unit logical-unit-number family inet address ip-address
```

You represent IP version 6 (IPv6) addresses in hexadecimal notation using a colon-separated list of 16-bit values. You assign a 128-bit IPv6 address to an interface.

To specify an IP address for the logical unit using IPv6:

```
[edit]
user@host# set interfaces interface-name unit logical-unit-number family inet6 address ip-address
```

Configuring an IRB Interface

Integrated routing and bridging (IRB) provides support for Layer 2 bridging and Layer 3 IP routing on the same interface. IRB enables you to route packets to another routed interface or to another VLAN that has a Layer 3 protocol configured. IRBs allow the device to recognize packets that are being sent to local addresses so that they are bridged (switched) whenever possible and are routed only when necessary. Whenever packets can be switched instead of routed, several layers of processing are eliminated. An interface named irb functions as a logical router on which you can configure a Layer 3 logical interface for VLAN. For redundancy, you can combine an IRB interface with implementations of the Virtual Router Redundancy Protocol (VRRP) in both bridging and virtual private LAN service (VPLS) environments.

To configure an IRB interface:

1. Create a Layer 2 VLAN by assigning it a name and a VLAN ID:

```
[edit]
user@host# set vlans vlan-name vlan-id vlan-id
```

2. Create an IRB logical interface:

```
[edit]
user@host# set interface irb unit logical-unit-number family inet address ip-address
```

3. Associate the IRB interface with the VLAN:

```
[edit]
user@host# set vlans vlan-name l3-interface irb.logical-unit-number
```

Configuring an Aggregated Ethernet Interface and Configuring LACP on That Interface

Use the link aggregation feature to aggregate one or more links to form a virtual link or link aggregation group (LAG). The MAC client can treat this virtual link as if it were a single link to increase bandwidth, provide graceful degradation as failure occurs, and increase availability.

To configure an aggregated Ethernet interface:

1. Specify the number of aggregated Ethernet interfaces to be created:

```
[edit chassis]
user@host# set aggregated-devices ethernet device-count number
```

2. Specify the name of the link aggregation group interface:

```
[edit interfaces]
user@host# set interfaces aex
```

3. Specify the minimum number of links for the aggregated Ethernet interface (*aex*), that is, the defined bundle, to be labeled “up”:

```
[edit interfaces]
user@host# set aex aggregated-ether-options minimum-links number
```

4. Specify the link speed for the aggregated Ethernet bundle:

```
[edit interfaces]
user@host# set aex aggregated-ether-options link-speed link-speed
```

5. Specify the members to be included within the aggregated Ethernet bundle:

```
[edit interfaces]
user@host# set interface-name ether-options 802.3ad aex
user@host# set interface-name ether-options 802.3ad aex
```

6. Specify an interface family for the aggregated Ethernet bundle:

```
[edit interfaces]
user@host# set aex unit 0 family inet address ip-address
```

For aggregated Ethernet interfaces on the device, you can configure the Link Aggregation Control Protocol (LACP). LACP bundles several physical interfaces to form one logical interface. You can configure aggregated Ethernet with or without LACP enabled.

When LACP is enabled, the local and remote sides of the aggregated Ethernet links exchange protocol data units (PDUs), containing information about the state of the link. You can configure Ethernet links to actively transmit PDUs, or you can configure the links to passively transmit them, sending out LACP PDUs only when they receive them from another link. One side of the link must be configured as active for the link to be up.

To configure LACP:

1. Enable one side of the aggregated Ethernet link as active:

```
[edit interfaces]
user@host# set aex aggregated-ether-options lacp active
```

2. Specify the interval at which the interfaces send LACP packets:

```
[edit interfaces]
user@host# set aex aggregated-ether-options lacp periodic interval
```

Enhanced Layer 2 CLI Configuration Statement and Command Changes

The enhanced Layer 2 Command Line Interface (CLI) feature is introduced in Junos OS Release 12.3R2. The enhanced Layer 2 CLI feature changes the CLI for some Layer 2 features on EX Series switches. This enhanced CLI will be used to configure Layer 2 features on future EX Series hardware platforms, and also to configure Layer 2 features on other Juniper Networks products.



NOTE: Starting with Junos OS Release 14.1X53-D10 for EX4300 and EX4600 switches, when enabling xSTP, you can enable it on some or all interfaces included in a VLAN. For example, if you configure VLAN 100 to include interfaces ge-0/0/0, ge-0/0/1, and ge-0/0/2, and you want to enable MSTP on interfaces ge-0/0/0 and ge-0/0/2, you can specify the `set protocols mstp interface ge-0/0/0` and `set protocols mstp interface ge-0/0/2` commands. In this example, you did not explicitly enable MSTP on interface ge-0/0/1; therefore, MSTP is not enabled on this interface.

The following tables provide a list of existing commands that were moved to new hierarchies or changed on EX Series switches as part of this CLI enhancement effort. The table is provided as a high-level reference only. For detailed information about these commands, use the links to the configuration statements provided in the table or see the technical documentation.

Table 4: Enhanced Layer 2 CLI Changes

Original Hierarchy	Changed Hierarchy	Change Description
<pre> ethernet-switching-options { analyzer { name { ... } } } </pre>	<pre> forwarding-options { analyzer { name { ... } } } </pre>	Statements moved to different hierarchy.
<pre> ethernet-switching-options { authentication-whitelist { ... } } </pre>	<pre> switch-options { ... authentication-whitelist { ... } } </pre>	Hierarchy renamed.
<pre> ethernet-switching-options { bpdu-block { ... } } </pre>	<pre> protocols { layer2-control { bpdu-block { ... } } } </pre>	Statement moved to different hierarchy.

Table 4: Enhanced Layer 2 CLI Changes (*continued*)

Original Hierarchy	Changed Hierarchy	Change Description
<pre> ethernet-switching-options { dot1q-tunneling { ether-type (0x8100 0x88a8 0x9100); ... } } </pre>	<pre> interfaces <i>interface-name</i> { ether-options { ethernet-switch-profile { tag-protocol-id [<i>tpids</i>]; } } } interfaces <i>interface-name</i> { aggregated-ether-options { ethernet-switch-profile { tag-protocol-id [<i>tpids</i>]; } } } </pre>	Statement replaced with new statement and moved to different hierarchy.
<pre> ethernet-switching-options { interfaces <i>interface-name</i> { no-mac-learning; ... } } </pre>	<pre> switch-options { interfaces <i>interface-name</i> { no-mac-learning; ... } } </pre>	Hierarchy renamed.
<pre> ethernet-switching-options { mac-notification { notification-interval <i>seconds</i>; ... } } </pre>	—	Statements deleted.
<pre> ethernet-switching-options { mac-table-aging-time <i>seconds</i>; ... } </pre>	<pre> protocols { l2-learning { global-mac-table-aging-time <i>seconds</i>; ... } } </pre>	Statement replaced with new statement and moved to different hierarchy.
<pre> ethernet-switching-options { nonstop-bridging; } </pre>	<pre> protocols { layer2-control { nonstop-bridging { } } } </pre>	Statement moved to different hierarchy.
<pre> ethernet-switching-options { port-error-disable { disable-timeout <i>timeout</i>; ... } } </pre>	<pre> interfaces <i>interface-name</i> family ethernet-switching { recovery-timeout <i>seconds</i>; } } </pre>	Statement replaced with a new statement.

Table 4: Enhanced Layer 2 CLI Changes (*continued*)

Original Hierarchy	Changed Hierarchy	Change Description
<pre> ethernet-switching-options { redundant-trunk-group { group <i>name</i> { description; interface <i>interface-name</i> { primary; } preempt-cutover-timer <i>seconds</i>; ... } } } </pre>	<pre> switch-options { redundant-trunk-group { group <i>name</i> { description; interface <i>interface-name</i> { primary; } preempt-cutover-timer <i>seconds</i>; ... } } } </pre>	Hierarchy renamed.
<pre> ethernet-switching-options { secure-access-port { interface (all <i>interface-name</i>) { (dhcp-trusted no-dhcp-trusted); static-ip <i>ip-address</i> { mac <i>mac-address</i>; vlan <i>vlan-name</i>; } } } vlan (all <i>vlan-name</i>) { (arp-inspection no-arp-inspection); dhcp-option82 { disable; circuit-id { prefix <i>hostname</i>; use-interface-description; use-vlan-id; } remote-id { prefix (<i>hostname</i> mac none); use-interface-description; use-string <i>string</i>; } vendor-id [<i>string</i>]; } (examine-dhcp no-examine-dhcp); } (ip-source-guard no-ip-source-guard); } </pre>	<pre> vlans <i>vlan-name</i> forwarding-options{ dhcp-security { arp-inspection; group <i>group-name</i> { interface <i>interface-name</i> { static-ip <i>ip-address</i> { mac <i>mac-address</i>; } } overrides { no-option-82; trusted; } } ip-source-guard; no-dhcp-snooping; option-82 { circuit-id { prefix { host-name; routing-instance-name; } use-interface-description (device logical); use-vlan-id; } remote-id { host-name; use-interface-description (device logical); use-string <i>string</i>; } vendor-id { use-string <i>string</i>; } } } } </pre>	<p>Statements moved to different hierarchy.</p> <p>NOTE: The statement examine-dhcp does not exist in the changed hierarchy. Instead, DHCP snooping is enabled automatically when other DHCP security features are enabled on a VLAN. See <i>Configuring Port Security (CLI Procedure)</i> for additional information.</p>

Table 4: Enhanced Layer 2 CLI Changes (*continued*)

Original Hierarchy	Changed Hierarchy	Change Description
<pre> ethernet-switching-options { secure-access-port { dhcp-snooping-file { location <i>local_pathname</i> <i>remote_URL</i>; timeout <i>seconds</i>; write-interval <i>seconds</i>; } } } </pre>	<pre> system [processes [dhcp-service dhcp-snooping-file <i>local_pathname</i> <i>remote_URL</i>; write-interval <i>interval</i>; }] } </pre>	Statement moved to different hierarchy.
<pre> ethernet-switching-options { secure-access-port vlan (all <i>vlan-name</i>) { mac-move-limit } } </pre>	<pre> vlangs <i>vlan-name</i> switch-options { mac-move-limit } </pre>	Statement moved to different hierarchy.
<pre> ethernet-switching-options { static { vlan <i>vlan-id</i> { mac <i>mac-address</i> next-hop <i>interface-name</i>; ... } } } </pre>	<pre> vlangs { <i>vlan-name</i> { switch-options { interface <i>interface-name</i> { static-mac <i>mac-address</i>; ... } } } } </pre>	Statement replaced with new statement and moved to different hierarchy.
<pre> ethernet-switching-options { storm-control { (...) } } </pre>	<pre> forwarding-options { storm-control-profiles <i>profile-name</i> { (...) } } interfaces <i>interface-name</i> unit <i>number</i> family ethernet-switching { storm-control <i>storm-control-profile</i>; } } </pre>	Storm control configuration is done in two steps. The first step is to create a storm control profile at the [edit forwarding-options] hierarchy, and the second step is to bind the profile to a logical interface at the [edit interfaces] hierarchy. See <i>Example: Configuring Storm Control to Prevent Network Outages on EX Series Switches</i> for additional information.
<pre> ethernet-switching-options { traceoptions { file <i>filename</i> <files <i>number</i>> <no-stamp> <replace> <size <i>size</i>> <world-readable> no-world-readable>; flag <i>flag</i> <disable>; ... } } </pre>	—	Statements removed.

Table 4: Enhanced Layer 2 CLI Changes (*continued*)

Original Hierarchy	Changed Hierarchy	Change Description
<pre> ethernet-switching-options { unknown-unicast-forwarding { (...) } } </pre>	<pre> switch-options { unknown-unicast-forwarding { (...) } } </pre>	Hierarchy renamed.
<pre> ethernet-switching-options { voip { interface (all [interface-name access-ports]) { forwarding-class (assured-forwarding best-effort expedited-forwarding network-control); vlan vlan-name; ... } } } </pre>	<pre> switch-options { voip { interface (all [interface-name access-ports]) { forwarding-class (assured-forwarding best-effort expedited-forwarding network-control); vlan vlan-name; ... } } } </pre>	Hierarchy renamed.
<pre> interfaces interface-name { ether-options { link-mode mode; speed (auto-negotiation speed) } } </pre>	<pre> interfaces interface-name { link-mode mode; speed speed } </pre>	Statements moved to different hierarchy.
<pre> interfaces interface-name { unit logical-unit-number { family ethernet-switching { native-vlan-id vlan-id } } } </pre>	<pre> interfaces interface-name { native-vlan-id vlan-id } </pre>	Statement moved to different hierarchy.
<pre> interfaces interface-name { unit logical-unit-number { family ethernet-switching { port-mode mode } } } </pre>	<pre> interfaces interface-name { unit logical-unit-number { family ethernet-switching { interface-mode mode } } } </pre>	Statement replaced with a new statement.
<pre> interfaces vlan </pre>	<pre> interfaces irb </pre>	Statement replaced with a new statement.

Table 4: Enhanced Layer 2 CLI Changes (*continued*)

Original Hierarchy	Changed Hierarchy	Change Description
<pre> protocols { igmp-snooping { traceoptions { file filename <files number> <no-stamp> <replace> <size maximum-file-size> <world-readable no-world-readable>; flag flag <flag-modifier> <disable>; } vlan (all vlan-identifier) { disable; data-forwarding { receiver { install; source-vlans vlan-name; } source { groups ip-address; } } immediate-leave; interface (all interface-name) { multicast-router-interface; static { group multicast-ip-address; } } proxy { source-address ip-address; } robust-count number; } } } </pre>	<pre> protocols { igmp-snooping { vlan vlan-name { immediate-leave; interface interface-name { group-limit <1..65535> host-only-interface multicast-router-interface; immediate-leave; static { group multicast-ip-address { source <> } } } } l2-querier { source-address ip-address; } proxy { source-address ip-address; } query-interval number; query-last-member-interval number; query-response-interval number; robust-count number; traceoptions { file filename <files number> <no-stamp> <replace> <size maximum-file-size> <world-readable no-world-readable>; flag flag <flag-modifier>; } } } </pre>	IGMP snooping is configured on a VLAN.
<pre> vlans { vlan-name { dot1q-tunneling { customer-vlans (id native range); layer2-protocol-tunneling all protocol-name { drop-threshold number; shutdown-threshold number; ... } } } } </pre>	<pre> interface interface-name { encapsulation extended-vlan-bridge; flexible-vlan-tagging; native-vlan-id number; unit logical-unit-number { input-vlan-map action; output-vlan-map action; vlan-id number; vlan-id-list [vlan-id vlan-id-vlan-id]; } } </pre>	Statements replaced with new statements and moved to different hierarchy

Table 4: Enhanced Layer 2 CLI Changes (*continued*)

Original Hierarchy	Changed Hierarchy	Change Description
<pre> vlsns { vln-nme { filter{ input filter-nme output filter-nme; ... } } } </pre>	<pre> vlsns { vln-nme { forwarding-options { filter{ input filter-nme output filter-nme; ... } } } } </pre>	Statements moved to different hierarchy.
<pre> vlsns { vln-nme { interface interface-nme { egress; ingress; mapping (native (push swap) policy tag (push swap)); pvlan-trunk; ... } } } </pre>	—	Statements removed. You can assign interfaces to a VLAN using the [edit interfaces <i>interface-nme</i> unit <i>logical-unit-number</i> family ethernet-switching vln members <i>vln-nme</i>] hierarchy.
<pre> vlsns { vln-nme { isolation-id id-number; ... } } </pre>	—	Statement removed.
<pre> vlsns { vln-nme { l3-interface vln.logical-interface-number; ... } } </pre>	<pre> vlsns { vln-nme { l3-interface irb.logical-interface-number; ... } } </pre>	Syntax changed.
<pre> vlsns { vln-nme { l3-interface-ingress-counting layer-3-interface-nme; ... } } </pre>	—	Statement removed. Ingress traffic is automatically tracked.

Table 4: Enhanced Layer 2 CLI Changes (*continued*)

Original Hierarchy	Changed Hierarchy	Change Description
<pre> vlands { vlan-name { mac-limit limit action action; ... } } </pre>	<pre> vlands { vlan-name { switch-options { interface-mac-limit limit { packet-action action; ... } } } } vlands { vlan-name { switch-options { interface interface-name { interface-mac-limit limit { packet-action action; ... } } } } } </pre>	Statements moved to different hierarchies and renamed.
<pre> vlands { vlan-name { mac-table-aging-time seconds; ... } } </pre>	<pre> protocols { l2-learning { global-mac-table-aging-time seconds; ... } } </pre>	Statement moved to different hierarchy and renamed.
<pre> vlands { vlan-name { no-local-switching; ... } } </pre>	—	Statement removed.
<pre> vlands { vlan-name { no-mac-learning; ... } } </pre>	<pre> vlands { vlan-name { switch-options { no-mac-learning limit ... } } } </pre>	Statement moved to different hierarchy.
<pre> vlands { vlan-name { primary-vlan vlan-name; ... } } </pre>	—	Statement removed.

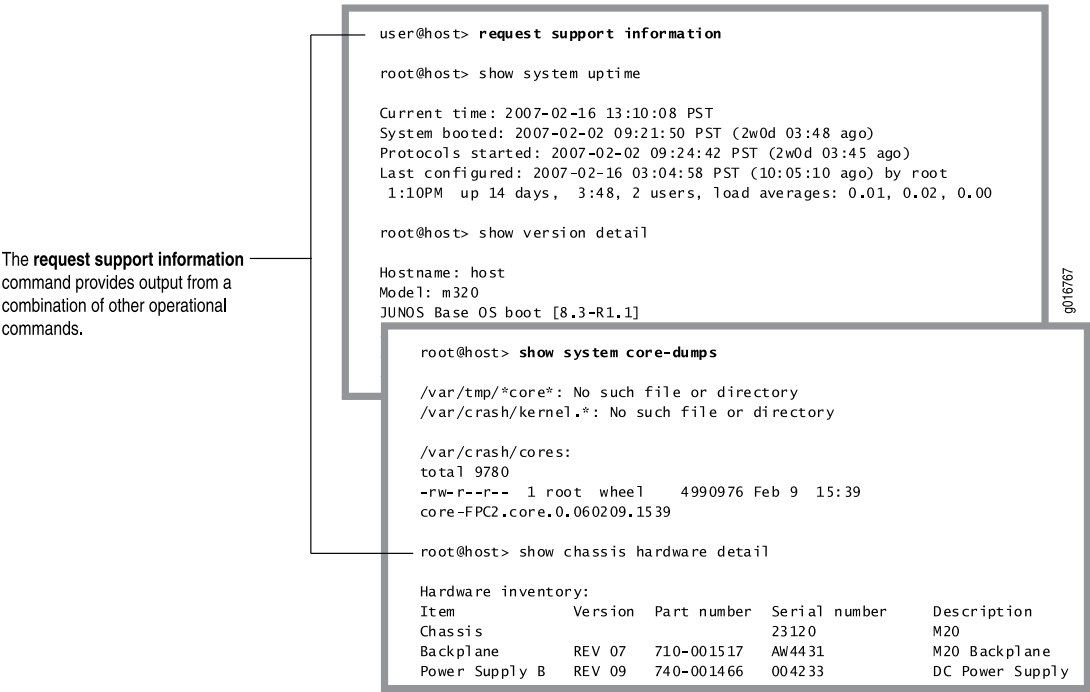
Table 4: Enhanced Layer 2 CLI Changes (*continued*)

Original Hierarchy	Changed Hierarchy	Change Description
<pre>vlan { vlan-name { vlan-prune; ... } }</pre>	—	Statement removed.
<pre>vlan { vlan-name { vlan-range vlan-id-low-vlan-id-high; ... } }</pre>	<pre>vlan { vlan-name { vlan-id-list [vlan-id-numbers]; ... } }</pre>	Statement replaced with new statement.

Junos OS Operational Mode Commands That Combine Other Commands

In some cases, some Junos OS operational commands are created from a combination of other operational commands. These commands can be useful shortcuts for collecting information about the device, as shown in [Figure 1 on page 55](#).

Figure 1: Commands That Combine Other Commands



- Related Documentation
- [Overview of Junos OS CLI Operational Mode Commands on page 56](#)
 - [Understanding the Brief, Detail, Extensive, and Terse Options of Junos OS Operational Commands on page 60](#)

Overview of Junos OS CLI Operational Mode Commands

This topic provides an overview of Junos OS CLI operational mode commands and contains the following sections:

- [CLI Command Categories on page 56](#)
- [Commonly Used Operational Mode Commands on page 57](#)

CLI Command Categories

When you log in to a device running Junos OS and the CLI starts, there are several broad groups of CLI commands:

- Commands for controlling the CLI environment—Some set commands in the **set** hierarchy configure the CLI display screen. For information about these commands, see *Understanding the Junos OS CLI Modes, Commands, and Statement Hierarchies*.
- Commands for monitoring and troubleshooting—The following commands display information and statistics about the software and test network connectivity. Detailed command descriptions are provided in the *Junos OS Interfaces Command Reference*.
 - **clear**—Clear statistics and protocol database information.
 - **mtrace**—Trace mtrace packets from source to receiver.
 - **monitor**—Perform real-time debugging of various software components, including the routing protocols and interfaces.
 - **ping**—Determine the reachability of a remote network host.
 - **show**—Display the current configuration and information about interfaces, routing protocols, routing tables, routing policy filters, system alarms, and the chassis.
 - **test**—Test the configuration and application of policy filters and autonomous system (AS) path regular expressions.
 - **traceroute**—Trace the route to a remote network host.
- Commands for connecting to other network systems—The **ssh** command opens Secure Shell connections, and the **telnet** command opens telnet sessions to other hosts on the network. For information about these commands, see the [CLI Explorer](#).
- Commands for copying files—The **copy** command copies files from one location on the router or switch to another, from the router or switch to a remote system, or from a remote system to the router or switch. For information about these commands, see the [CLI Explorer](#).
- Commands for restarting software processes—The commands in the **restart** hierarchy restart the various Junos OS processes, including the routing protocol, interface, and SNMP. For information about these commands, see the [CLI Explorer](#).
- A command—**request**—for performing system-level operations, including stopping and rebooting the router or switch and loading Junos OS images. For information about this command, see the [CLI Explorer](#).

- A command—**start**—to exit the CLI and start a UNIX shell. For information about this command, see the [CLI Explorer](#).
- A command—**configure**—for entering configuration mode, which provides a series of commands that configure Junos OS, including the routing protocols, interfaces, network management, and user access. For information about the CLI configuration commands, see “[Understanding Junos OS CLI Configuration Mode](#)” on page 61.
- A command—**quit**—to exit the CLI. For information about this command, see the [CLI Explorer](#).
- For more information about the CLI operational mode commands, see the [CLI Explorer](#).

Commonly Used Operational Mode Commands

Table 5 on page 57 lists some operational commands you may find useful for monitoring router or switch operation. For a complete description of operational commands, see the Junos OS command references.



NOTE: The QFX3500 switch does not support the IS-IS, OSPF, BGP, MPLS, and RSVP protocols.

Table 5: Commonly Used Operational Mode Commands

Items to Check	Description	Command
Software version	Versions of software running on the router or switch	show version
Log files	Contents of the log files	monitor
	Log files and their contents and recent user logins	show log
Remote systems	Host reachability and network connectivity	ping
	Route to a network system	traceroute
Configuration	Current system configuration	show configuration
Manipulate files	List of files and directories on the router or switch	file list
	Contents of a file	file show
Interface information	Detailed information about interfaces	show interfaces

Table 5: Commonly Used Operational Mode Commands (*continued*)

Items to Check	Description	Command
Chassis	Chassis alarm status	show chassis alarms
	Information currently on craft display	show chassis craft-interface
	Router or switch environment information	show chassis environment
	Hardware inventory	show chassis hardware
Routing table information	Information about entries in the routing tables	show route
Forwarding table information	Information about data in the kernel's forwarding table	show route forwarding-table
IS-IS	Adjacent routers or switches	show isis adjacency
OSPF	Display standard information about OSPF neighbors	show ospf neighbor
BGP	Display information about BGP neighbors	show bgp neighbor
MPLS	Status of interfaces on which MPLS is running	show mpls interface
	Configured LSPs on the router or switch, as well as all ingress, transit, and egress LSPs	show mpls lsp
	Routes that form a label-switched path	show route label-switched-path
RSVP	Status of interfaces on which RSVP is running	show rsvp interface
	Currently active RSVP sessions	show rsvp session
	RSVP packet and error counters	show rsvp statistics

Related Documentation

- [Junos OS Operational Mode Commands That Combine Other Commands on page 55](#)
- [Understanding the Brief, Detail, Extensive, and Terse Options of Junos OS Operational Commands on page 60](#)

Overview of Navigating the CLI

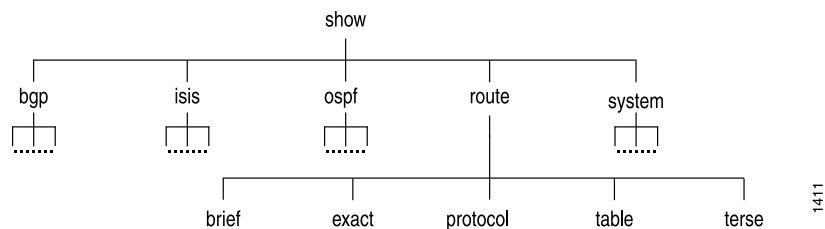
This topic describes how to navigate the CLI.

- [CLI Command Hierarchy on page 59](#)
- [CLI Configuration Statements on page 59](#)
- [Moving Among Hierarchy Levels on page 59](#)

CLI Command Hierarchy

CLI commands are organized in a hierarchy. Commands that perform a similar function are grouped together under the same level of the hierarchy. For example, all commands that display information about the system and the system software are grouped under the **show system** command, and all commands that display information about the routing table are grouped under the **show route** command. [Figure 2 on page 59](#) illustrates a portion of the **show** command hierarchy.

Figure 2: CLI Command Hierarchy



To execute a command, you enter the full command name, starting at the top level of the hierarchy. For example, to display a brief view of your Ethernet switching options for your interfaces, use the command **show ethernet-switching-options interfaces**.

CLI Configuration Statements

The configuration statement hierarchy has two types of statements: *container statements*, which are statements that contain other statements, and *leaf statements*, which do not contain other statements. All of the container and leaf statements together form the *configuration hierarchy*.

The **protocols** statement is a top-level statement at the trunk of the configuration tree. The **ospf**, **area**, and **interface** statements are all subordinate container statements of a higher statement (they are branches of the hierarchy tree), and the **hello-interval** statement is a leaf on the tree.

Moving Among Hierarchy Levels

You can use the CLI commands to navigate the levels of the configuration statement hierarchy:

- **edit**— Moves to an existing configuration statement hierarchy or creates a hierarchy and moves to that level.
- **exit**— Moves up the hierarchy to the previous level where you were working. This command is, in effect, the opposite of the **edit** command. Alternatively, you can use the **quit** command. The **exit** and **quit** commands are interchangeable.
- **up**— Moves up the hierarchy one level at a time.
- **top**— Moves directly to the top level of the hierarchy.

Related Documentation

- [CLI User Interface Overview on page 37](#)
- [CLI User Guide](#)

Understanding the Brief, Detail, Extensive, and Terse Options of Junos OS Operational Commands

The Junos OS operational mode commands can include **brief**, **detail**, **extensive**, or **terse** options. You can use these options to control the amount of information you want to view.

1. Use the ? prompt to list options available for the command. For example:

```
user@host> show interfaces fe-1/1/1 ?
Possible completions:
<[Enter]>          Execute this command
brief              Display brief output
descriptions       Display interface description strings
detail             Display detailed output
extensive          Display extensive output
media              Display media information
snmp-index         SNMP index of interface
statistics         Display statistics and detailed output
terse              Display terse output
|                  Pipe through a command
```

2. Choose the option you wish to use with the command. (See [Figure 3 on page 60.](#))

Figure 3: Command Output Options

Command output with the **brief** option.

```
user@host> show interfaces fe-1/1/1 brief
Physical interface: fe-1/1/1, Enabled, Physical link is Down
Link-level type: Ethernet, MTU: 1514, Speed: 100mbps, Loopback:
Disabled, Source filtering: Disabled,
Flow control: Enabled
Device flags : Present Running Down
Interface flags: Hardware-Down SNMP-Traps Internal: 0x4000
Link flags   : None
```

Command output with the **terse** option.

```
user@host> show interfaces fe-1/1/1 terse
Interface      Admin Link Proto Local Remote
fe-1/1/1      up    down
```

Command output with the **extensive** option.

```
user@host> show interfaces fe-1/1/1 extensive
Physical interface: fe-1/1/1, Enabled, Physical link is Down
Interface index: 141, SNMP ifIndex: 33, Generation: 24
Link-level type: Ethernet, MTU: 1514, Speed: 100mbps, Loopback:
Disabled, Source filtering: Disabled,
Flow control: Enabled
Device flags : Present Running Down
Interface flags: Hardware-Down SNMP-Traps Internal: 0x4000
Link flags   : None
CoS queues   : 4 supported, 4 maximum usable queues
Hold-times   : Up 0 ms, Down 0 ms
Current address: 00:90:69:d0:f8:9e, Hardware address: 00:90:69:d0:f8:9e
Last flapped : 2007-02-02 09:26:25 PST (2w0d 03:40 ago)
Statistics last cleared: Never
Traffic statistics:
Input bytes :          0          0 bps
Output bytes :          0          0 bps
Input packets:          0          0 pps
Output packets:          0          0 pps
---(more)---
```

- Related Documentation**
- [Overview of Junos OS CLI Operational Mode Commands on page 56](#)
 - [Controlling the Scope of an Operational Mode Command](#)

Understanding Junos OS CLI Configuration Mode

You can configure all properties of Junos OS, including interfaces, general routing information, routing protocols, and user access, as well as several system hardware properties.

As described in *Understanding the Junos OS CLI Modes, Commands, and Statement Hierarchies*, a router configuration is stored as a hierarchy of statements. In configuration mode, you create the specific hierarchy of configuration statements that you want to use. When you have finished entering the configuration statements, you commit them, which activates the configuration on the router.

You can create the hierarchy interactively or you can create an ASCII text file that is loaded onto the router or switch and then committed.

This topic covers:

- [Configuration Mode Commands on page 62](#)
- [Configuration Statements and Identifiers on page 63](#)
- [Configuration Statement Hierarchy on page 65](#)

Configuration Mode Commands

Table 6 on page 62 summarizes each CLI configuration mode command. The commands are organized alphabetically.

Table 6: Summary of Configuration Mode Commands

Command	Description
activate	Remove the inactive: tag from a statement, effectively reading the statement or identifier to the configuration. Statements or identifiers that have been activated take effect when you next issue the commit command.
annotate	Add comments to a configuration. You can add comments only at the current hierarchy level.
commit	Commit the set of changes to the database and cause the changes to take operational effect.
copy	Make a copy of an existing statement in the configuration.
deactivate	Add the inactive: tag to a statement, effectively commenting out the statement or identifier from the configuration. Statements or identifiers marked as inactive do not take effect when you issue the commit command.
delete	Delete a statement or identifier. All subordinate statements and identifiers contained within the specified statement path are deleted with it.
edit	Move inside the specified statement hierarchy. If the statement does not exist, it is created.
exit	Exit the current level of the statement hierarchy, returning to the level prior to the last edit command, or exit from configuration mode. The quit and exit commands are synonyms.
extension	Manage configurations that are contributed by SDK application packages. Either display or delete user-defined configuration contributed by the named SDK application package. A configuration defined in any native Junos OS package is never deleted by the extension command.
help	Display help about available configuration statements.
insert	Insert an identifier into an existing hierarchy.
load	Load a configuration from an ASCII configuration file or from terminal input. Your current location in the configuration hierarchy is ignored when the load operation occurs.

Table 6: Summary of Configuration Mode Commands (*continued*)

Command	Description
quit	Exit the current level of the statement hierarchy, returning to the level prior to the last edit command, or exit from configuration mode. The quit and exit commands are synonyms.
rename	Rename an existing configuration statement or identifier.
replace	Replace identifiers or values in a configuration.
rollback	Return to a previously committed configuration. The software saves the last 10 committed configurations, including the rollback number, date, time, and name of the user who issued the commit configuration command.
run	Run a top-level CLI command without exiting from configuration mode.
save	Save the configuration to an ASCII file. The contents of the current level of the statement hierarchy (and below) are saved, along with the statement hierarchy containing it. This allows a section of the configuration to be saved, while fully specifying the statement hierarchy.
set	Create a statement hierarchy and set identifier values. This is similar to edit except that your current level in the hierarchy does not change.
show	Display the current configuration.
status	Display the users currently editing the configuration.
top	Return to the top level of configuration command mode, which is indicated by the [edit] banner.
up	Move up one level in the statement hierarchy.
update	Update a private database.
wildcard	Delete a statement or identifier. All subordinate statements and identifiers contained within the specified statement path are deleted with it. You can use regular expressions to specify a pattern. Based on this pattern, you search for items that contain these patterns and delete them.

Configuration Statements and Identifiers

You can configure router or switch properties by including the corresponding statements in the configuration. Typically, a statement consists of a keyword, which is fixed text, and, optionally, an identifier. An identifier is an identifying name that you can define, such as

the name of an interface or a username, which enables you and the CLI to differentiate among a collection of statements.

[Table 7 on page 64](#) describes top-level CLI configuration mode statements.

Table 7: Configuration Mode Top-Level Statements

Statement	Description
access	Configure the Challenge Handshake Authentication Protocol (CHAP). For information about the statements in this hierarchy, see the <i>Junos OS Administration Library for Routing Devices</i> .
accounting-options	Configure accounting statistics data collection for interfaces and firewall filters. For information about the statements in this hierarchy, see the <i>Network Management Administration Guide for Routing Devices</i> .
chassis	Configure properties of the router chassis, including conditions that activate alarms and SONET/SDH framing and concatenation properties. For information about the statements in this hierarchy, see the <i>Junos OS Administration Library for Routing Devices</i> .
class-of-service	Configure class-of-service parameters. For information about the statements in this hierarchy, see the <i>Class of Service Feature Guide for Routing Devices</i> .
firewall	Define filters that select packets based on their contents. For information about the statements in this hierarchy, see the <i>Routing Policies, Firewall Filters, and Traffic Policers Feature Guide for Routing Devices</i> .
forwarding-options	Define forwarding options, including traffic sampling options. For information about the statements in this hierarchy, see the <i>Junos OS Network Interfaces Library for Routing Devices</i> .
groups	Configure configuration groups. For information about statements in this hierarchy, see the <i>Junos OS Administration Library for Routing Devices</i> .
interfaces	Configure interface information, such as encapsulation, interfaces, virtual channel identifiers (VCIs), and data-link connection identifiers (DLCIs). For information about the statements in this hierarchy, see the <i>Junos OS Network Interfaces Library for Routing Devices</i> .
policy-options	Define routing policies, which allow you to filter and set properties in incoming and outgoing routes. For information about the statements in this hierarchy, see the <i>Routing Policies, Firewall Filters, and Traffic Policers Feature Guide for Routing Devices</i> .
protocols	Configure routing protocols, including BGP, IS-IS, LDP, MPLS, OSPF, RIP, and RSVP. For information about the statements in this hierarchy, see the chapters that discuss how to configure the individual routing protocols in the <i>Junos OS Routing Protocols Library for Routing Devices</i> and the <i>Junos OS MPLS Applications Library for Routing Devices</i> .
routing-instances	Configure multiple routing instances. For information about the statements in this hierarchy, see the <i>Junos OS Routing Protocols Library for Routing Devices</i> .

Table 7: Configuration Mode Top-Level Statements (*continued*)

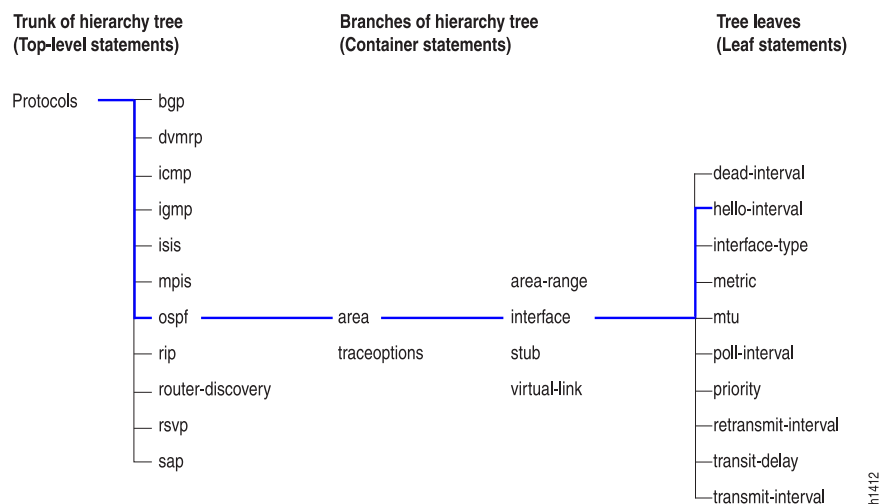
Statement	Description
routing-options	Configure protocol-independent routing options, such as static routes, autonomous system numbers, confederation members, and global tracing (debugging) operations to log. For information about the statements in this hierarchy, see the <i>Junos OS Routing Protocols Library for Routing Devices</i> .
security	Configure IP Security (IPsec) services. For information about the statements in this hierarchy see the <i>Junos OS Administration Library for Routing Devices</i> .
snmp	Configure SNMP community strings, interfaces, traps, and notifications. For information about the statements in this hierarchy, see the <i>Network Management Administration Guide for Routing Devices</i> .
system	Configure systemwide properties, including the hostname, domain name, Domain Name System (DNS) server, user logins and permissions, mappings between hostnames and addresses, and software processes. For information about the statements in this hierarchy, see the <i>Junos OS Administration Library for Routing Devices</i> .

For specific information on configuration statements, see the Junos OS configuration guides.

Configuration Statement Hierarchy

The Junos OS configuration consists of a hierarchy of *statements*. There are two types of statements: *container statements*, which are statements that contain other statements, and *leaf statements*, which do not contain other statements (see [Figure 4 on page 65](#)). All of the container and leaf statements together form the *configuration hierarchy*.

Figure 4: Configuration Mode Hierarchy of Statements



Each statement at the top level of the configuration hierarchy resides at the trunk (or root level) of a hierarchy tree. The top-level statements are container statements, containing other statements that form the tree branches. The leaf statements are the

leaves of the hierarchy tree. An individual hierarchy of statements, which starts at the trunk of the hierarchy tree, is called a *statement path*. [Figure 4 on page 65](#) illustrates the hierarchy tree, showing a statement path for the portion of the protocol configuration hierarchy that configures the hello interval on an interface in an OSPF area.

The **protocols** statement is a top-level statement at the trunk of the configuration tree. The **ospf**, **area**, and **interface** statements are all subordinate container statements of a higher statement (they are branches of the hierarchy tree); and the **hello-interval** statement is a leaf on the tree which in this case contains a data value: the length of the hello interval, in seconds.

The CLI represents the statement path shown in [Figure 4 on page 65](#) as **[edit protocols ospf area *area-number* interface *interface-name*]** and displays the configuration as follows:

```
protocols {
  ospf {
    area 0.0.0.0 {
      interface so-0/0/0 {
        hello-interval 5;
      }
      interface so-0/0/1 {
        hello-interval 5;
      }
    }
  }
}
```

The CLI indents each level in the hierarchy to indicate each statement's relative position in the hierarchy and generally sets off each level with braces, using an open brace at the beginning of each hierarchy level and a closing brace at the end. If the statement at a hierarchy level is empty, the braces are not printed.

Each leaf statement ends with a semicolon. If the hierarchy does not extend as far as a leaf statement, the last statement in the hierarchy ends with a semicolon.

The configuration hierarchy can also contain "oneliners" at the last level in the hierarchy. Oneliners remove one level of braces in the syntax and display the container statement, its identifiers, the child or leaf statement and its attributes all on one line. For example, in the following sample configuration hierarchy, the line **level 1 metric 10** is a oneliner because the **level** container statement with identifier **1**, its child statement **metric**, and its corresponding attribute **10** all appear on a single line in the hierarchy:

```
[edit protocols]
isis {
  interface ge-0/0/0.0 {
    level 1 metric 10;
  }
}
```

Likewise, in the following example, **dynamic-profile *dynamic-profile-name* aggregate-clients;** is a oneliner because the **dynamic-profile** statement, its identifier ***dynamic-profile-name***,

and leaf statement **aggregate-clients** all appear on one line when you run the **show** command in the configuration mode:

```
[edit forwarding-options]
user@host# show
dhcp-relay {
  dynamic-profile dynamic-profile-name aggregate-clients;
}
```

Related Documentation

- *Entering and Exiting the Junos OS CLI Configuration Mode*

PART 4

Dynamic Host Control Protocol (DHCP)

- [Understanding DHCP on page 71](#)

CHAPTER 4

Understanding DHCP

- [Understanding DHCP Services for Switches on page 71](#)
- [Configuring a DHCP Client \(CLI Procedure\) on page 75](#)
- [Configuring a DHCP Server on Switches \(CLI Procedure\) on page 76](#)

Understanding DHCP Services for Switches

A Dynamic Host Configuration Protocol (DHCP) server on a switch can provide many valuable TCP/IP network services. For example, DHCP can dynamically allocate the four required IP parameters to each computer on the LAN: IP address, network mask, switch address, and name server address. Additionally, DHCP on the switch can automatically upgrade software on client systems.

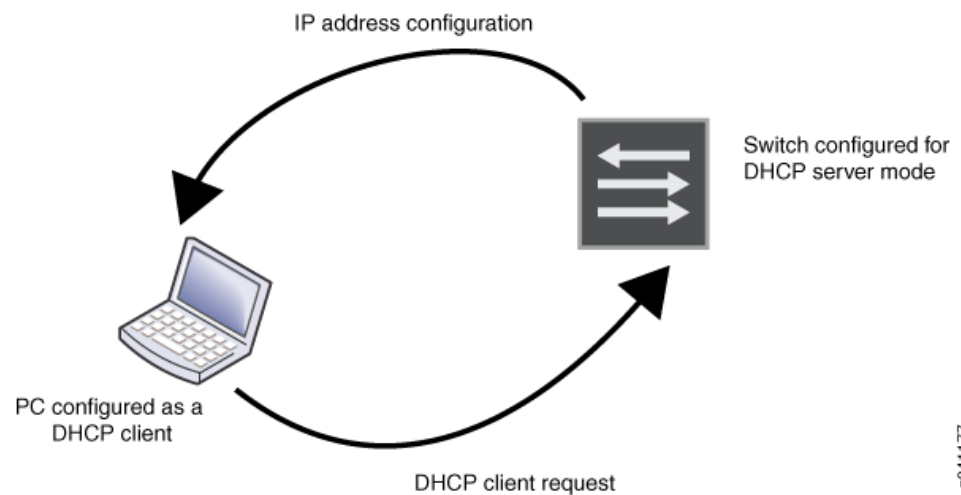
This topic describes:

- [DHCP Client/Server Model on page 71](#)
- [Using DHCP on page 72](#)
- [DHCP Relay Servers and DHCP Servers on page 72](#)
- [Legacy DHCP and Extended DHCP for Server Versions on page 73](#)
- [Configuring DHCP on a Switch on page 74](#)
- [How DHCP Works on page 74](#)

DHCP Client/Server Model

DHCP IP address allocation works on a client/server model in which the server, in this case a switch, assigns the client reusable IP information from an address pool. A DHCP client might receive offer messages from multiple DHCP servers and can accept any one of the offers; however, the client usually accepts the first offer it receives. See [Figure 5 on page 72](#).

Figure 5: DHCP Client/Server Model



Using DHCP

DHCP automates network-parameter assignment to network devices. Even in small networks, DHCP is useful because it makes it easy to add new machines to the network.

DHCP access service minimizes the overhead required to add clients to the network by providing a centralized, server-based setup, which means that you do not have to manually create and maintain IP address assignments for clients. In addition, when you use DHCP to manage a pool of IP addresses among hosts, you reduce the number of IP addresses needed on the network. DHCP does this by leasing an IP address to a host for a limited period of time, allowing the DHCP server to share a limited number of IP addresses. DHCP also provides a central database of devices that are connected to the network and eliminates duplicate resource assignments. In addition to IP addresses for clients, DHCP provides other configuration information, particularly the IP addresses of local caching Domain Name System (DNS) resolvers, network boot servers, or other service hosts.

Another valuable DHCP feature is automatic software download for installation of software packages on switches. DHCP clients configured for automatic software download receive messages as part of the DHCP message exchange process—when the software package name in the DHCP server message is different from that of the software package that booted the DHCP client switch, the new software is downloaded and installed. See [“Upgrading Software by Using Automatic Software Download” on page 7](#).

DHCP Relay Servers and DHCP Servers

You can configure a switch either as a DHCP server or as a DHCP relay server, but not both. Whereas a DHCP server replies to a client with an IP address, a DHCP relay server relays DHCP messages to and from the configured DHCP server, even if the client and server are on different IP networks.

Configure a switch to be a DHCP relay agent if you have locally attached hosts and a remote DHCP server. For directions on configuring a DHCP relay server, see *DHCP/BOOTP Relay for Switches Overview*.

Legacy DHCP and Extended DHCP for Server Versions

Two versions of both DHCP server and DHCP relay agent are available on EX Series, QFX Series, and OCX Series switches. The original legacy DHCP server and legacy DHCP relay agent can be used in the same network as the extended DHCP servers and extended DHCP relay agent—extended DHCP is also referred to as virtual router (VR) aware DHCP.

You cannot configure legacy DHCP and extended DHCP versions on the same switch. Because the newer extended DHCP server version has more features, we recommend that you configure the extended DHCP server if it is supported by the switch. See *EX Series Switch Software Features Overview* for a list of switches that support the extended DHCP server.

The extended DHCP server version has the following added features:

- Graceful Routing Engine switchover (GRES), which provides mirroring support for clients. For details, see *High Availability Features for EX Series Switches Overview*.
- Virtual routing and forwarding (VRF), which allows multiple instances of a routing table to simultaneously coexist on the same switch. For details, see *Understanding Virtual Routing Instances on EX Series Switches*.



NOTE: Legacy DHCP supports the circuit ID and the remote ID fields for the relay agent option (option 82). Extended DHCP for the relay agent option supports only circuit ID. See *EX Series Switch Software Features Overview* for a list of switches that support extended DHCP (VR-aware DHCP).

Legacy DHCP and extended DHCP servers can be configured at the hierarchy levels shown in [Table 8 on page 73](#):

Table 8: Legacy DHCP and Extended DHCP Server Hierarchy Levels

DHCP Service	Hierarchy
Extended DHCP server	<code>edit system services dhcp-local-server</code>
Extended DHCP address pool	<code>edit access address-assignment pool</code>
Legacy DHCP server	<code>edit system services dhcp</code>
Legacy DHCP relay	<code>edit forwarding-options helpers bootp</code>
Extended DHCP relay	<code>edit forwarding-options dhcp-relay</code>
Legacy DHCP address pool	<code>edit system services dhcp pool</code>

DHCP clients on a switch are always configured at the hierarchy level `[edit interfaces interface-name family dhcp]`.

Configuring DHCP on a Switch

A DHCP configuration consists of two parts: the configuration for a DHCP server and the configuration for DHCP clients. The DHCP server configuration is simple if you accept the default configurations.

When you configure a legacy DHCP server, you only need to define the DHCP server name and the interface on the switch. You can use the default configuration for the rest of the settings. When you configure an extended DHCP server, you need to only define a DHCP pool, indicate IP addresses for the pool, and create a server group. You can use the default configuration for the rest of the settings.

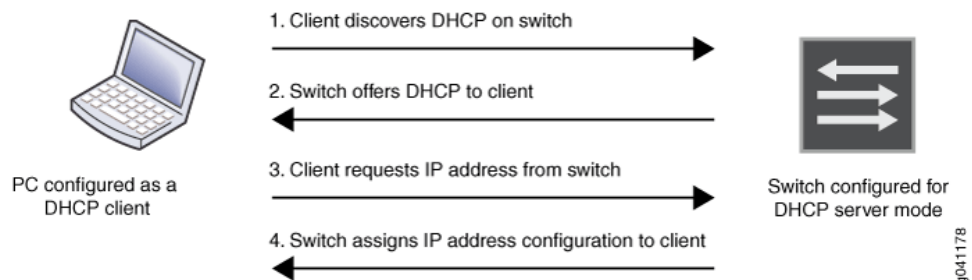
For directions for configuring either a legacy DHCP server or an extended DHCP server, see [“Configuring a DHCP Server on Switches \(CLI Procedure\)” on page 76](#).

To configure a DHCP client, set the client’s DHCP interface address in the **[edit interfaces interface-name unit 0 family inet dhcp]** hierarchy. For directions for configuring a DHCP client on a switch, see [“Configuring a DHCP Client \(CLI Procedure\)” on page 75](#).

How DHCP Works

DHCP consists of a four-step transfer process beginning with a broadcast DHCP discovery message from the client. As the second step, the client receives a DHCP offer message from the server. This message includes the IP address and mask, and some other specific parameters. The client then sends a DHCP request message to accept the IP address and other parameters that it received from the server in the previous step. The DHCP server sends a DHCP response message and removes the now-allocated address from the DHCP address pool. See [Figure 6 on page 74](#).

Figure 6: DHCP Four-Step Transfer



NOTE: Because the DHCP discovery message from the client is a broadcast message and because broadcast messages cross other segments only when they are explicitly routed, you might have to configure a DHCP relay agent on the switch interface so that all DHCP discovery messages from the clients are forwarded to one DHCP server.

Related Documentation

- [Configuring a DHCP Client \(CLI Procedure\) on page 75](#)
- [Configuring a DHCP Server on Switches \(CLI Procedure\) on page 76](#)

- [Configuring an Extended DHCP Relay Server on EX Series Switches \(CLI Procedure\)](#)
- [Configuring a DHCP SIP Server \(CLI Procedure\)](#)
- [Upgrading Software by Using Automatic Software Download on page 7](#)
- [Monitoring DHCP Services](#)

Configuring a DHCP Client (CLI Procedure)

A Dynamic Host Configuration Protocol (DHCP) server can provide many valuable TCP/IP network services. DHCP can dynamically allocate IP parameters, such as an IP address, to clients, and it can also deliver software upgrades to clients.

DHCP configuration consists of two components, configuration of DHCP clients and configuration of a DHCP server. Client configuration determines how clients send a message requesting an IP address, whereas a DHCP server configuration enables the server to send an IP address configuration back to the client. This topic describes configuring a DHCP client. For directions for configuring a DHCP server, see [“Configuring a DHCP Server on Switches \(CLI Procedure\)” on page 76](#) or [Configuring a DHCP Server on Switches \(CLI Procedure\)](#).

You can change DHCP client configurations from the switch, using client identifiers to indicate which clients you want to configure.

To configure a DHCP client, you configure an interface to belong to the DHCP family and specify additional attributes, as desired:

```
[edit]
user@switch# set interfaces interface-name unit number family inet dhcp
configuration-statement
```

The options that you can configure are listed in [Table 9 on page 75](#). Replace the variable *configuration-statement* with one or more of the statements listed in this table. If you do not explicitly configure these options, the switch uses default values for them.

Table 9: DHCP Client Settings

Configuration Statement	Description
client-identifier	Unique client ID—By default this consists of the hardware type (01 for Ethernet) and the MAC address (a.b.c.d). For this example, the value would be 01abcc.
lease-time	Time in seconds that a client holds the lease for an IP address assigned by a DHCP server. If a client does not request a specific lease time, then the server sends the default lease time. The default lease time on a Junos OS DHCP server is 1 day.
retransmission-attempt	Number of times the client attempts to retransmit a DHCP packet.
retransmission-interval	Time between transmission attempts.
server-address	IP address of the server that the client queries for an IP address.

Table 9: DHCP Client Settings (*continued*)

Configuration Statement	Description
update-server	TCP/IP settings learned from an external DHCP server to the DHCP server running on the switch are propagated.
vendor-option	Vendor class ID (CPU's manufacturer ID string) for the DHCP client.

**Related
Documentation**

- [Configuring a DHCP Server on Switches \(CLI Procedure\) on page 76](#)
- [Understanding DHCP Services for Switches on page 71](#)

Configuring a DHCP Server on Switches (CLI Procedure)



NOTE: This task uses Junos OS for EX Series switches that does not support the Enhanced Layer 2 Software (ELS) configuration style. If your switch runs software that supports ELS, see *Configuring a DHCP Server on Switches (CLI Procedure)*. For ELS details, see “[Getting Started with Enhanced Layer 2 Software](#)” on page 41.

A Dynamic Host Configuration Protocol (DHCP) server can provide two valuable TCP/IP network services. DHCP can dynamically allocate IP parameters, such as an IP address, to clients and it can also deliver software upgrades to clients.

A DHCP configuration consists of two components—an optional reconfiguration of default settings on DHCP clients and the configuration of a DHCP server. This topic covers configuration of the DHCP server. For information about reconfiguring a DHCP client, see “[Configuring a DHCP Client \(CLI Procedure\)](#)” on page 75.

You can configure either of two versions of a DHCP server on a switch— the extended server version or the legacy server version. We recommend that you configure the extended server unless you need to keep your DHCP server configuration backward-compatible with the legacy server version.

This topic includes the following tasks:

1. [Configuring an Extended DHCP Server on a Switch on page 77](#)
2. [Configuring a Legacy DHCP Server on a Switch \(CLI Procedure\) on page 77](#)

Configuring an Extended DHCP Server on a Switch

To configure an extended DHCP server, you must configure a DHCP pool, indicate IP addresses for the pool, and create a server group. Additional configurations are optional.

Do not assign addresses that are already in use in the network to address pools. The extended DHCP server does not check whether addresses are already in use before it assigns them to clients.

1. Create an address pool for DHCP IP addresses:

```
[edit]
user@switch# set access address-pool address-pool
```

2. Configure an address-assignment pool that can be used by different client applications for DHCP dynamic assignment:

```
[edit access address-assignment]
user@switch# set pool address-pool-name
```

3. Create a server group on the switch, providing a group name and an interface name for DHCP:

```
[edit system services dhcp-local-server]
user@switch# set group group-name interface interface-name
```

4. (Optional) Process the information protocol data units (PDUs):

```
[edit system services dhcp-local-server]
user@switch# set overrides process-inform
```

5. (Optional) Redefine the order of attribute matching for pool selection:

```
[edit system services dhcp-local-server]
user@switch# set pool-match-order ip-address-first
```

6. (Optional) Enable dynamic reconfiguration triggered by the DHCP extended server for all DHCP clients or only for the DHCP clients serviced by the specified group of interfaces:

```
[edit system services dhcp-local-server]
user@switch# set reconfigure

[edit system services dhcp-local-server group group-name]
user@switch# set reconfigure
```

Configuring a Legacy DHCP Server on a Switch (CLI Procedure)

To configure a legacy DHCP server, you must configure a pool of IP addresses for dynamic assignment. You only need to supply a series of network addresses. Additional configurations are optional.

1. Configure a pool of IP addresses for dynamic assignment:

```
[edit system services dhcp]
user@switch# set pool network-range
```



NOTE: Step 2 through Step 15 are for assigning global values at the `[edit system services dhcp]` hierarchy level. You can also assign the same values to a specific pool by using those same commands at the `[edit system services dhcp pool network-range]` hierarchy level.

2. (Optional) Change the domain search list used to resolve hostnames:

```
[edit system services dhcp]
user@switch# set domain-search [ domain-list ]
```

3. (Optional) Change the domain name server (DNS) name that the DHCP server advertises to clients:

```
[edit system services dhcp]
user@switch# set name-server address
```

4. (Optional) Change the DHCP options:

```
[edit system services dhcp]
user@switch# set option id-number
```

5. (Optional) Change the devices advertised to clients:

```
[edit system services dhcp]
user@switch# set router address
```

6. (Optional) Configure the name of the boot server advertised to DHCP clients. The client uses a boot file located on the boot server to complete the DHCP setup. This configuration step is equivalent to DHCP Option 66:

```
[edit system services dhcp]
user@switch# set boot-server (address | hostname)
```

7. (Optional) Set the boot file advertised to DHCP clients. After the client receives an IP address and the boot file location from the DHCP server, the client uses the boot image stored in the boot file to complete DHCP setup. This configuration step is equivalent to DHCP Option 67:

```
[edit system services dhcp]
user@switch# set boot-file filename
```

8. (Optional) Change the SIP server:

```
[edit system services dhcp]
user@switch# set sip-server addresses-or-names
```

For more information, see *Configuring a DHCP SIP Server (CLI Procedure)*.

9. (Optional) Change the DHCP client's hardware address:

```
[edit system services dhcp]
user@switch# set static-binding mac-address
```

10. (Optional) Change the NetBIOS name server:

```
[edit system services dhcp]
user@switch# set wins-server address
```

- Related Documentation**
- [Configuring a DHCP Client \(CLI Procedure\) on page 75](#)
 - [Configuring a DHCP SIP Server \(CLI Procedure\)](#)
 - [Understanding DHCP Services for Switches on page 71](#)

PART 5

Internet Control Message Protocol (ICMP)

- [Understanding ICMP on page 83](#)

CHAPTER 5

Understanding ICMP

- [Configuring Junos OS to Disable the Reporting of IP Address and Timestamps in Ping Responses on page 83](#)
- [Configuring Junos OS to Disable the Routing Engine Response to Multicast Ping Packets on page 84](#)
- [Configuring the Junos OS ICMPv4 Rate Limit for ICMPv4 Routing Engine Messages on page 84](#)
- [Configuring Junos OS to Disable Sending Protocol Redirect Messages on EX Series Switches \(CLI Procedure\) on page 84](#)

Configuring Junos OS to Disable the Reporting of IP Address and Timestamps in Ping Responses

When you issue the **ping** command with the **record-route** option, the Routing Engine displays the path of the ICMP echo request packets and timestamps in the ICMP echo responses by default.

You can configure the Routing Engine to disable the setting of the **record-route** option in the IP header of the ping request packets. Disabling the **record-route** option prevents the Routing Engine from recording and displaying the path of the ICMP echo request packets in the response.

- To configure the Routing Engine to disable the setting of the **record route** option, include the **no-ping-record-route** statement at the **[edit system]** hierarchy level:

```
[edit system]  
no-ping-record-route;
```

- To disable the reporting of timestamps in the ICMP echo responses, include the **no-ping-time-stamp** option at the **[edit system]** hierarchy level:

```
[edit system]  
no-ping-time-stamp;
```

By configuring the **no-ping-record-route** and **no-ping-timestamp** options, you can prevent unauthorized persons from discovering information about the provider edge (PE) router or switch and its loopback address.

- Related Documentation**
- [Configuring Junos OS to Disable the Routing Engine Response to Multicast Ping Packets on page 84](#)

Configuring Junos OS to Disable the Routing Engine Response to Multicast Ping Packets

By default, the Routing Engine responds to Internet Control Message Protocol (ICMP) echo requests sent to multicast group addresses. To disable the Routing Engine from responding to ICMP echo requests sent to multicast group addresses, include the **no-multicast-echo** statement at the **[edit system]** hierarchy level:

```
[edit system]
no-multicast-echo;
```

By configuring the Routing Engine to ignore multicast ping packets, you can prevent unauthorized persons from discovering the list of provider edge (PE) routers or switches in the network.

- Related Documentation**
- [Configuring Junos OS to Disable the Reporting of IP Address and Timestamps in Ping Responses on page 18](#)

Configuring the Junos OS ICMPv4 Rate Limit for ICMPv4 Routing Engine Messages

To limit the rate at which ICMPv4 messages can be generated and received by the Routing Engine, include the **icmpv4-rate-limit** statement at the **[edit system internet-options]** hierarchy level:

```
icmpv4-rate-limit bucket-size bucket-size packet-rate packet-rate;
```

The bucket size is the number of seconds in the rate-limiting bucket. The packet rate is the rate-limiting packets earned per second. Specify a **bucket-size** from 0 through 4294967295 seconds. The default value is 5 seconds. Specify a **packet-rate** from 0 through 4,294,967,295. The default value is 1000.

- Related Documentation**
- [icmpv4-rate-limit on page 319](#)

Configuring Junos OS to Disable Sending Protocol Redirect Messages on EX Series Switches (CLI Procedure)

EX series switches support sending ICMP redirect messages for both IPv4 and IPv6 traffic. By default, the switch sends protocol redirect messages. For security reasons, you may want to disable the switch from sending protocol redirect messages.

To disable the sending of redirect messages by the switch:

- Disable sending protocol redirect messages for the entire switch:

For IPv4 traffic:

```
[edit system]
user@switch# set no-redirects
```

For IPv6 traffic:

```
[edit system]
user@switch# set no-redirects-ipv6
```

- Disable sending the protocol redirect messages on a specific interface:

For IPv4 traffic:

```
[edit interfaces interface-name unit logical-unit-number family family]
user@switch# set no-redirects
```

For IPv6 traffic:

```
[edit interfaces interface-name unit logical-unit-number family family]
user@switch# set no-redirects-ipv6
```

To re-enable the sending of redirect messages on the switch, delete the **no-redirects** statement (for IPv4 traffic) or the **no-redirects-ipv6** statement (for IPv6 traffic) from the configuration.

**Related
Documentation**

- *Understanding the Protocol Redirect Mechanism on EX Series Switches*
- *Junos OS Network Interfaces Library for Routing Devices*

PART 6

Guest Virtual Machines (VMs)

- [Understanding Guest VMs on page 89](#)

CHAPTER 6

Understanding Guest VMs

- [Launching a Guest Virtual Machine \(VM\) to Run a Third Party Application on Junos OS Release 13.2X51-D15 on page 89](#)
- [Launching a Guest Virtual Machine \(VM\) to Run a Third Party Application on Junos OS Release 13.2X51-D20 on page 106](#)

Launching a Guest Virtual Machine (VM) to Run a Third Party Application on Junos OS Release 13.2X51-D15

- [Understanding Guest VMs on page 90](#)
- [Prerequisites for Setting up a Virtual Build Environment in the JunosV App Engine on page 90](#)
- [Setting up the Virtual Build Environment for the JunosV App Engine on page 93](#)
- [Downloading and Installing the JunosV App Engine Software on page 93](#)
- [Launching the VNC Server on page 94](#)
- [Launching the FreeBSD Virtual Build Environment \(VBE\) Virtual Machine \(VM\) on page 94](#)
- [Installing the Junos SDK Packages on the Virtual Build Environment on page 95](#)
- [Prerequisites for Using the Virtual Build Environment on page 96](#)
- [Obtaining Junos SDK Certificate Request File and Certificate Key File for the Virtual Build Environment on page 96](#)
- [Processing and Obtaining the Certificate File on page 97](#)
- [Prerequisites for Packaging the Guest VM on page 97](#)
- [Launching the Guest VM on the CentOS Server on page 97](#)
- [Copying Required Application to Package with the Guest VM on page 98](#)
- [Editing Packaging Tool Scripts on page 99](#)
- [Executing Packaging Scripts on page 101](#)
- [Copying the Third Party Application to the Switch on page 101](#)
- [Configure the Provider Name, License Type, and Deployment Scope on page 101](#)
- [Configure the Guest VM Options on page 102](#)

Understanding Guest VMs

You can use a guest virtual machine (VM) to run third party software applications. Guest VMs provide a native environment in which third party applications can be executed, and eliminate the need for porting or adapting third party applications to work on the host OS. You can use the Junos SDK Virtual Build Environment in the JunosV App Engine to package the guest VM images. Once the guest VMs are packaged, you can launch them from the Junos OS CLI.



NOTE: Only one guest VM is supported at this time.



NOTE: In Junos OS Release 14.1X53-D27, the maximum disk size of a guest VM image is the following: A zipped image is 1 Gigabyte (for example, this can be the size of the guest VM image that you copy to the switch). The maximum size of an unzipped image is 40 Gigabytes.



NOTE: In Junos OS Release 14.1X53-D30, the size of the DRAM for the guest VM is the available amount of RAM in the hypervisor. The available amount might be more or less depending on the Host OS usage.

Prerequisites for Setting up a Virtual Build Environment in the JunosV App Engine

Make sure the following prerequisites are met before you set up a Virtual Build Environment in the JunosV App Engine:

- Dedicated server running CentOS 6.2 with a 64-bit processor capable of full hardware virtualization

To find out if the server running CentOS is capable of full hardware virtualization, issue the following command at the shell:

```
egrep '(vmx|svm)' --color=always /proc/cpuinfo
```

If you receive a result with `vmx` or `svm`, the server is capable of virtualization. If you receive a null result, then the server is not capable of virtualization.

The server must have access to the Internet to download and install various Linux, Junos SDK, and JVAE packages.

- CentOS packages installed on the server:
 - `kvm`
 - `vnc`
 - `gcc`
 - `make`
 - `wget`

- libvirt
- dhcp
- dnsmasq
- bridge-utils
- flex
- bison
- gcc-c++
- glib2-devel
- vnc-server
- which
- xterm
- xorg-x11-twm
- xorg-x11-server-utils
- libXfont

You can install these packages using the **yum** tool in CentOS.



NOTE: For **yum** to work properly, the server must have Internet connectivity, and the DNS servers must be configured.

To see which packages are installed, issue the following command:

yum list installed

To install all of the packages in the list, issue the following command:

yum install kvm vnc gcc make wget libvirt dhcp dnsmasq bridge-utils flex bison gcc-c++ glib2-devel vnc-server which xterm xorg-x11-twm xorg-x11-server-utils libXfont

- Quick Emulator (QEMU) installed for managing VMs.

Issue the following commands to download and install QEMU on your server:

```
wget http://wiki.qemu.org/download/qemu-1.0.1.tar.gz
tar xvf *.gz
cd qemu-1.0.1
./configure
make
make install
```

- Virtual bridge for VM network connectivity is created.

To ensure network connectivity for the Virtual Build Environment (VBE) VM, create a virtual bridge. The virtual bridge allows you to connect the VM to the physical Ethernet interface of the host machine. After performing the following steps, you will have a virtual bridge interface named `virbr0`, which links to the `eth0` interface of the system. When the VM is created, the `virbr0` interface is added to the bridge, and the IP address of the `eth0` is assigned to the `virbr0` interface.

1. Before you configure a virtual bridge, make sure there are no virtual bridges already configured. Issue the following commands to remove any virtual bridges that have been created previously:

```
rm /etc/sysconfig/network-scripts/ifcfg-virbr0
virsh net-destroy default
virsh net-undefine default
service libvirtd restart
```

2. To create a bridge interface named virbr0 for the virtual bridge and then link it to the physical interface of the system (eth0), issue the following commands:

For example:

```
echo 10 > /var/tmp/tapno
chmod 644 /var/tmp/tapno
/etc/sysconfig/network-scripts/qifup
!/bin/sh
/sbin/ifconfig \${1} 0.0.0.0 promisc up
/usr/sbin/brctl addif virbr0 \${1}
/etc/sysconfig/network-scripts/qifdown
!/bin/sh
/sbin/ifconfig \${1} down
/usr/sbin/brctl delif virbr0 \${1}
chmod 755 /etc/sysconfig/network-scripts/qif*
/usr/sbin/brctl addbr virbr0
/usr/sbin/brctl addif virbr0 eth0
cd /etc/sysconfig/network-scripts
cp ifcfg-eth0 ifcfg-virbr0
```

3. Edit the ifcfg-eth0 file located at the **/etc/sysconfig/network-scripts/** directory and add the following line to specify that the virbr0 interface is being used as the bridge interface:

```
BRIDGE="virbr0"
```

4. Edit the ifcfg-virbr0 file located at the **/etc/sysconfig/network-scripts/** directory and modify the following values:

```
DEVICE="virbr0"
TYPE="Bridge"
```

5. Enable the VNC connection to the VM by adding the following lines to the iptables file located at the **/etc/sysconfig/** directory:

```
-A INPUT -i eth0 -j ACCEPT
-A INPUT -i virbr0 -j ACCEPT
```

6. Issue the following command to restart the network and iptables service for the changes to take effect:

```
/sbin/service iptables restart
```

7. Issue the following command to verify that all the changes have taken effect:

```
/usr/sbin/brctl show
```

The output of this command should show that the virbr0 interface is configured. Verify that there is still network connectivity to the server.

Setting up the Virtual Build Environment for the JunosV App Engine

The JunosV App Engine (JVAE) enables third party applications—applications written in Linux—to run on a guest VM. JunosV App Engine also enables third party applications to run in their native environment without porting to Junos OS.

JVAE provides a virtualized environment with a Kernel-based Virtual Machine (KVM) hypervisor, which runs on the host OS. The host OS controls the creation of virtual machines (VMs) on top of the hypervisor. The hypervisor and host OS run within a compute node. The compute node is connected to a device running Junos OS. In this case, the compute node is connected to a QFX5100 switch.

Downloading and Installing the JunosV App Engine Software

Download the following JunosV App Engine development tools, packaging tools, and sample guest OS packages located at <http://www.juniper.net/support/csc/swdist-junos-sdk/#sw> to your server:

- junos-sdk-remote-devtools-13.1R1.6.tgz
- junos-sdk-remote-pkgtools-13.1R1.6.tgz
- junos-sdk-os-13.1R1.6.tgz

1. Copy the junos-sdk-remote-devtools-13.1R1.6.tgz file to the **/usr/src/remote-devtools/** directory.

For example:

```
scp junos-sdk-remote-devtools-13.1R1.6.tgz /usr/src/remote-devtools/
```

2. Extract the junos-sdk-remote-devtools-13.1R1.6.tgz file.

For example:

```
tar -zxvf junos-sdk-remote-devtools-13.1R1.6.tgz
```

3. Install the junos-sdk-remote-devtools-13.1R1.6.

For example:

```
./setup
```

4. Copy the junos-sdk-remote-pkgtools-13.1R1.6.tgz file to the **/usr/src/remote-pkgtools** directory.

For example:

```
scp junos-sdk-remote-pkgtools-13.1R1.6.tgz /usr/src/remote-pkgtools
```

5. Extract the junos-sdk-remote-pkgtools-13.1R1.6.tgz file.

For example:

```
tar -zxvf junos-sdk-remote-pkgtools-13.1R1.6.tgz
```

6. Install the junos-sdk-remote-pkgtools-13.1R1.6 software.

For example:

```
./setup
```

7. Copy the junos-sdk-os-13.1R1.6.tgz file to the **/usr/src/sdk-os** directory.

For example:

```
scp junos-sdk-os-13.1R1.6.tgz /usr/src/sdk-os
```

8. Extract the junos-sdk-os-13.1R1.6.tgz file.

For example:

```
tar -zxvf junos-sdk-os-13.1R1.6.tgz
```

9. Install the junos-sdk-os-13.1R1.6 software.

For example:

```
./setup
```

Launching the VNC Server

Launch a VNC server, so you can access a VM.

1. Before you can launch the VNC server, use **yum** to install the **Desktop** package.

For example:

```
yum groupinstall -y Desktop
```

2. Issue the following command to set the VNC password.

You need to set the password when you use VNC for the first time.

For example:

```
vncpasswd
```

3. Issue the following command to launch the VNC server.

For example:

```
vncserver &
```

The name of the desktop is displayed.

For example:

```
vnc-test.juniper.net:1
```

4. Issue the following command to verify that the VNC viewer is working correctly.

For example:

```
vncviewer vnc-test.juniper.net:1
```

A VNC session is created on the server.

Launching the FreeBSD Virtual Build Environment (VBE) Virtual Machine (VM)

Use the Kernel-based Virtual Machine (KVM) hypervisor to launch the VBE VM.

1. Issue the following commands to launch the VBE VM.

For example:

```
cd /usr/src/remote-pkgtools/junos-sdk-remote-pkgtools
./start_vm --img /usr/src/sdk-os/junos-sdk-20110408a1/junos-sdk-20110408.img
```

This command launches the VM and returns a port number. The port number is used to establish a VNC connection to the VM.

2. Issue the following command to access the VM.

For example:

```
vncviewer localhost::<port> &
```

This command generates a VNC session to the FreeBSD VBE VM and enables the root password of **letmein**.

Installing the Junos SDK Packages on the Virtual Build Environment

Before you install the Junos SDK packages, configure an IP address and default gateway on the VBE VM, and ensure that the VBE has proper network connectivity. Also, use the **adduser** tool to create user profiles for the VBE.

1. Issue the following commands to configure the IP address and default gateway on the VBE VM:

For example:

```
ipconfig em0 inet 10.204.42.20 netmask 255.255.255.0
route add default 10.204.42.20
```

2. Issue the **adduser** command to add user profiles for the VBE.

The **adduser** command provides an interactive guided procedure.

3. Download the following Junos SDK packages located at <http://www.juniper.net/support/csc/swdist-junos-sdk/> to the VBE:

- junos-sdk-ui-sim-13.1R1.6-signed.tgz
- junos-sdk-toolchain-13.1R1.6-signed.tgz
- junos-sdk-sb-13.1R1.6-signed.tgz

4. Issue the following commands to install the Junos SDK packages.

For example:

```
pkg_add junos-sdk-sb-13.1R1.6-signed.tgz
pkg_add junos-sdk-toolchain-13.1R1.6-signed.tgz
pkg_add junos-sdk-ui-sim-13.1R1.6-signed.tgz
```

Prerequisites for Using the Virtual Build Environment

Before you can use the Virtual Build Environment to create sandboxes for development, you need to meet the following hardware and software requirements:

- Dedicated server running CentOS 6.2 with a 64-bit processor capable of full hardware virtualization
- Junos SDK Virtual Build Environment (VBE) Virtual Machine (VM) running with access to the Internet on a dedicated server
- Junos SDK packages installed on the VBE VM:
 - junos-sdk-ui-sim-13.1R1.6-signed.tgz
 - junos-sdk-toolchain-13.1R1.6-signed.tgz
 - junos-sdk-sb-13.1R1.6-signed.tgz

Obtaining Junos SDK Certificate Request File and Certificate Key File for the Virtual Build Environment

1. Log into Virtual Build Environment (VBE) Virtual Machine (VM) as root.
2. Issue the following command to launch the **sdk-certificate-request** script.

For example:

```
/usr/local/junos-sdk/13.1R1.6/bin/sdk-certificate-request
```

3. Provide the following information when the script prompts you. Press **Enter** after you provide a response.

- City, state, and country
- Organization and unit
- Provider prefix

This is the unique provider name assigned by Juniper to each SDK partner

- User string

The user string can be a project name, product name, or any generic word.

- Deployment scope

Juniper assigns this string to differentiate multiple certificate for the same partner. If Juniper did not assign this string, you can leave this field empty

- Index number

This number is also referred to as a certificate generations number. The number 1 is used for the initial certificate. After the certificate expires and a new one is requested, this number is increased incrementally.

After you provide all of the information, the script will generate the following files in the **/usr/local/junos-sdk/cert** directory:

- Certificate Key *filename_key.pem*

This file contains the Junos SDK package-signing key. Ensure that no one outside of the development organization has access to the certificate key. Do not send this file to Juniper

- Certificate Request File *filename_req.pem*

This file contains the certificate request. Send this file to Juniper for processing

Processing and Obtaining the Certificate File

1. Send the certificate request file to Juniper Junos SDK Certificate Processing Team at `sdk-cert@juniper.net`

Once the processing is complete, the Junos SDK Certificate Processing Team will send you the certificate.

2. When you receive the certificate, rename the certificate file as ***filename.pem*** and copy it to the **`/usr/local/junos-sdk/certs`** directory in the VBE VM.
3. Delete the Certificate Request File from the directory.

There should only be one key and certificate pair in the **`/usr/local/junos-sdk/certs`** directory.

Prerequisites for Packaging the Guest VM

Before you can package the guest VM, make sure you meet the following hardware and software requirements:

- Dedicated server running CentOS 6.2 with a 64-bit processor capable of full hardware virtualization.
- Junos SDK Virtual Build Environment (VBE) Virtual Machine (VM) running with access to the Internet on a dedicated server.
 - You must be able to issue a successful ping request to the VBE VM, and SSH and SCP must be enabled on the VBE VM.
 - The VBE VM must have a valid Junos SDK certificate-and-key pair in the **`/usr/local/junos-sdk/certs`** directory.
- Junos SDK packages installed on the VBE VM:
 - `junos-sdk-ui-sim-13.1R1.6-signed.tgz`
 - `junos-sdk-toolchain-13.1R1.6-signed.tgz`
 - `junos-sdk-sb-13.1R1.6-signed.tgz`

Launching the Guest VM on the CentOS Server

1. Issue the **`start_vm`** script from the Junos SDK Remote Packaging tools directory to launch the guest VM.

For example:

```
cd /usr/src/remote-pkgtools/junos-sdk-remote-pkgtools
```

```
./start_vm --img <path>/third-party-app.img -- tapno 1
```

This command launches the VM and returns a port number to which a VNC connection to the VM can be established.

2. Issue the following command to launch the guest VM

For example:

```
vncviewer localhost::port-number &
```

This command generates a VNC session to the Guest VM.

Copying Required Application to Package with the Guest VM

Before you use scp to copy the required applications contained in the **junos-sdk-remote-devtools-13.1R1.6.tgz** file to the Guest VM, configure an IP address and default gateway on the VBE VM, and ensure that the VBE has proper network connectivity.

In this example, an IP address of 10.204.42.40 has been assigned to the Guest VM, and the required application is **remote-helloworld**.

1. Issue the following commands to configure the IP address and default gateway on the VBE VM:

For example:

```
ipconfig em0 inet 10.204.42.20 netmask 255.255.255.0
route add default 10.204.42.20
```

2. Copy the **remote-helloworld** binary to the **/usr/local/bin** directory and the script to the **/etc/init.d** directory in the Guest VM.

For example:

```
scp /usr/src/remote-devtools/examples/remote-helloworld/remote-helloworld
root@10.204.42.40:/usr/local/bin
scp /usr/src/remote-devtools/examples/remote-helloworld/remote-helloworld.sh
root@10.204.42.40:/etc/init.d
```

3. Rename the **remote-helloworld.sh** script in the **/etc/init.d** folder to **remote-helloworld**.

For example:

```
cd /etc/init.d
mv remote-helloworld.sh remote-helloworld
```

4. You can now add the **remote-helloworld** application as a startup service.

For example:

```
chkconfig --add remote-helloworld
chkconfig remote-helloworld on
```

5. Shutdown the VM before packaging the application.

For example:

```
shutdown -h now
```

Editing Packaging Tool Scripts

Before you package the software, you need to modify the **sample.manifest** and **export-user-data.sh** files.

1. Modify the **sample.manifest** file to include the source and destination pairs of the application binaries and scripts to be packaged into the Guest VM.

For example:

```
cd /usr/src/remote-pkgtools/junos-sdk-remote-pkgtools
vi sample.manifest
```

Here is an example of a sample.manifest file:

```
# $Id: sample.manifest 131 2013-02-19 19:24:45Z tomwright $

# Copyright (c) 2012, Juniper Networks
# All rights reserved

# blank lines and lines beginning with # ignored

# dest (guest OS VM) user and host/IP are specified in export-user-data.sh
# dest ending with slash indicates directory

# src dest

/usr/src/remote-devtools/examples/remote-helloworld/remote-helloworld
/usr/local/bin/
/usr/src/remote-devtools/examples/remote-helloworld/remote-helloworld.sh
/etc/init.d/remote-helloworld
```

2. Modify the export-user-data.sh file to include details about the Guest VM .img file, DDL, ODL, and VBE VM details. In this example, an IP address of 10.204.42.20 has been assigned to the VBE VM

For example:

```
cd /usr/src/remote-pkgtools/junos-sdk-remote-pkgtools
vi export-user-data.sh
```

Modify the following values with the correct values:

- APP_CMD

Name of the command DDL file, including the path (.cmd.dd). Leave this variable undefined if your application does not require a user interface.

In this example,

```
APP_CMD=/usr/src/remote-devtools/examples/remote-helloworld/extensions/libdl/input/remote-helloworld.cmd
```

- APP_CNF

Name of config DDL file, including the path (.cnf.dd). Leave this variable undefined if your application does not require a user interface.

In this example,

```
APP_CNF=/usr/src/remote-devtools/examples/remote-helloworld/extensions/libdl/input/remote-helloworld.cnf
```

- APP_MANIFEST

Name of application manifest file, including the path.

In this example,

APP_MANIFEST=/usr/src/remote-pkgtools/junos-sdk-remote-pkgtools/sample.manifest

- APP_ODL

Name of ODL file, including the path (.odl). Leave this variable undefined if your application does not require formatted output.

In this example,

APP_ODL=/usr/src/remote-devtools/examples/remote-helloworld/extensions/libodl/input/remote-helloworld

- LOG_DIR

Path on development system for log files.

In this example, LOG_DIR=/var/tmp

- ROUTER_PLATFORM

router platform (aka machine) can be i386 (default), octeon, powerpc or xlr

In this example, ROUTER_PLATFORM=i386

- VBE_BSB_PATH

Path to the Junos SDK Backing Sandbox (BSB) on the VBE.

In this example, VBE_BSB_PATH=/usr/local/junos-sdk/13.1R1.6

- VBE_DSB_PATH

Path to your application code on the VBE.

In this example, VBE_DSB_PATH=/usr/home/<user1>/sandboxes/hello-world

- VBE_IP

VBE IP address or hostname.

In this example, VBE_IP=10.204.42.20

- VBE_USER

VBE user account.

In this example, VBE_USER=<user1>

- VE_SDK_DATA_DEFINED

Set this to 1.

In this example, VE_SDK_DATA_DEFINED=1

- VM_IMG

Guest OS VM file name, including the path.

In this example, VM_IMG=/root/test/third-party-app.img

- VM_IP

Guest OS VM IP address or hostname.

In this example, VM_IP=10.204.42.40

- VM_USER

Guest OS VM user account

In this example, VM_USER=root

Executing Packaging Scripts

You can now execute the Junos SDK packaging scripts to package the guest VM with the required applications into a .tgz file. The Junos SDK VBE VM must be running on the server, with SCP and SSH enabled. The scripts will prompt for the VBE VM user password that you entered in the export-user-data.sh file.

1. Issue the following commands to execute the packaging scripts.

For example:

```
cd /usr/src/remote-pkgtools/junos-sdk-remote-pkgtools
./mksb-vbe-dsb.sh
./do-setup-re-ve-pkg.sh
./update-vbe-dsb.sh
./mk-vbe-dsb.sh
```

The guest VM application packages are now available in the ship directory in the VBE VM in the sandbox location you specified in the VBE_DSB_PATH in the export-user-data.sh file.

```
cd /usr/home/user1/sandboxes/hello-world/13.1R1.6-obj/ship
ls -lrt
-rw-r--r--  1 user1 wheel          21040 Aug 22 12:44
third-party-app-i386-13.1I20130822_1944.tgz
-rw-r--r--  1 user1 wheel    223695254 Aug 22 12:45
third-party-app-i386-13.1I20130822_1944.gz
-rw-r--r--  1 user1 wheel    223767502 Aug 22 12:46
third-party-app-bundle-i386-13.1I20130822_1944.gz
```

Copying the Third Party Application to the Switch

1. Copy the third party application to the switch using either FTP or SCP:

For example:

```
root% scp //hostname/pathname/third-party-app.gz /var/tmp
```

Configure the Provider Name, License Type, and Deployment Scope

1. Configure the provider name, the license type, and the deployment scope (describes the certificate associated with the third party application), at the **[edit system]** hierarchy. The certificate contains parameters regarding the provider's partnership with Juniper Networks. Configure these options to ensure that the third party application is installed.

For example:

```
{master:0}
```

```
root# set extensions providers [ Provider Name ] license-type customer deployment-scope
[ private commercial ]
```

2. Commit the configuration.

For example:

```
{master:0}
root# commit
```

Here are the results of your configuration:

```
system {
  extensions {
    providers {
      [Provider Name] {
        license-type customer deployment-scope [ private commercial ]
      }
    }
  }
}
```

Configure the Guest VM Options

1. Configure the following options for guest VM support in the Junos OS CLI at the **[edit]** hierarchy.

- Compute cluster name
- Compute node name
- Virtual machine instance name
- Dedicated management interface for guest VM
- Third party package name
- Internal IP address of the guest VM

2. Configure the name of the compute cluster and compute node.

The name of the compute cluster must be default-cluster, and the name of the name of the compute node must be default-node, otherwise launching the guest VM fails.

For example:

```
{master:0}
root# set services app-engine compute-cluster default-cluster compute-node default-node
hypervisor
```

3. Configure the name of the virtual machine instance and the name of the third party application.



NOTE: The package names in the `show app-engine virtual-machine-package` and `show version` commands should match.

```
{master:0}
root# set services app-engine virtual-machines instance instance-name package
package-name
```

For example:

```
{master:0}
```

```
root# set services app-engine virtual-machines instance test package third-party-app ve
```

4. Associate the virtual machine instance with the configured compute cluster and compute node.



NOTE: The name of the compute cluster must be `default-cluster`, and the name of the compute node must be `default-node`, otherwise launching the guest VM fails.

```
{master:0}
```

```
root# set services app-engine virtual-machines instance instance-name compute-cluster  
name compute-node name
```

For example:

```
{master:0}
```

```
root# set services app-engine virtual-machines instance test compute-cluster default-cluster  
compute-node default-node
```

5. Configure the local management IP address.

This IP address is used for the internal bridging interface. The host uses this IP address to check the availability of the guest VM. The IP address must be `192.168.1.X`, where `X` is from 100 to 200.

```
{master:0}
```

```
root# set services app-engine virtual-machines instance instance-name local-management  
family inet address 192.168.1.X
```

For example:

```
{master:0}
```

```
root# set services app-engine virtual-machines instance test local-management family inet  
address 192.168.1.100
```

6. Configure the management interface for the guest VM.

This management interface is separate from the one used for Junos OS.



NOTE: The management interface name must be either `em0` or `em1`. The configuration will fail if you do not configure a management interface and then commit the configuration.

For example:

```
{master:0}
```

```
root # set services app-engine virtual-machines instance test management-interface em1
```

The new management interface is provisioned for the guest VM.

7. Commit the configuration.

For example:

```
{master:0}
```

```
root# commit
```

Here are the results of the configuration:

```
services {  
  app-engine {
```

```

compute-cluster default-cluster {
  compute-node default-node {
    hypervisor;
  }
}
virtual-machines {
  instance test {
    package third-party-app;
    local-management {
      family inet {
        address 192.168.1.100;
      }
    }
    compute-cluster default-cluster {
      compute-node default-node;
    }
    management-interface em1;
  }
}
}

```

8. Configure the internal IP address of the guest VM.

- (Preferred method) Log into the guest VM:

```
shell% request app-engine virtual-machine-shell guest VM name
```

For example:

```
shell% request app-engine virtual-machine-shell third-party-app
```

- (Alternate method) Log into the host shell by specifying the internal management IP address:

For example:

```
shell% ssh -JU __juniper_private4__ 192.168.1.1
```

Issue the **virsh list** command to see which VMs are running. From the output, you can see that the guest VM (named **test** in this example) is running:

```

{master:0}
shell# virsh list

```

Id	Name	State
3	vjunos1	running
4	test	running

Log into the guest VM console (named **4** in this example).

For example:

```

shell# virsh console 4
Connected to domain test
Escape character is ^]
CentOS release 6.4 (Final)
Kernel 2.6.32-358.el6.x86_64 on an x86_64

[root@localhost ~]

```

From the output, you can see that you are connected to the guest VM console (root@localhost)

Enter a valid username and password combination for the guest VM.

9. Configure the internal IP address of the guest VM on the Ethernet interface.

- Issue the **ifconfig -a** command to see the name of the management interface that is used to access the guest VM from outside of the network, and the name of the management interface that is used for internal use.

The interface names are either eth6 or eth7, or eth7 or eth8. You can associate one of the interfaces to the guest VM by issuing the **set services app-engine virtual-machines instance *name* management-interface *interface-name*** command. Use the same IP address as the one you configured using the **set services app-engine virtual-machines instance test local-management family inet address 192.168.1.100**. The MAC addresses associated with these interfaces are used for internal bridging.

For example:

```
root@localhost ifconfig -a
eth6      Link encap:Ethernet  HWaddr 52:54:00:5D:DB:01
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:982 errors:0 dropped:0 overruns:0 frame:0
          TX packets:970 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:92188 (90.0 KiB)  TX bytes:91468 (89.3 KiB)
eth7      Link encap:Ethernet  HWaddr 52:54:00:5D:DB:02
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:982 errors:0 dropped:0 overruns:0 frame:0
          TX packets:970 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:92188 (90.0 KiB)  TX bytes:91468 (89.3 KiB)
```

In this example, eth6 is a management interface that is used to access the guest VM, and eth7 is a management interface that is used for internal use.

- Issue the **ifconfig** command to configure the internal IP address on the Ethernet interface. This is the same IP address you configured in the Junos OS CLI.

For example:

```
root@localhost ifconfig eth7 192.168.1.100 netmask 255.255.255.0
```

10. Issue the following show commands to verify that everything is working correctly:

For example:

- root# **show app-engine status**

```
Compute cluster: default-cluster
                Compute node      Status
                default-node      Online
```

The status should be Online.

- root# **show app-engine virtual-machine instance**

```
VM name          Compute cluster      VM status
                test                  default-cluster      ACTIVE
```

The VM status should be active.

- root# **show app-engine virtual-machine instances show app-engine virtual-machine package**

```
VM package: cust-vm-ve
           VM disk image:
third-party-app-ve/20140409_015447/third-party-app.img.gz
           Compute cluster           Package download status
           default-cluster           DOWNLOADED
```

The package downloaded status should be either download in progress or downloaded.

- root# show interfaces terse *management-interface*

```
error: device em1 not found
```

This interface should be detached from Junos OS.

11. To remove the guest VM, delete the configuration statements and uninstall the third party software package.

For example, to remove the **app-engine** statement:

```
root # delete services app-engine
```

Commit the configuration.

For example:

```
root# commit
```

Issue the **show version** command to see what the name of the third party application package is.

Issue the **request system software delete <package-name>** command to uninstall the third party application:

For example:

```
root> request system software delete third-party-app.tgz
```

```
fpc0:
```

```
-----
Notifying sdk-vmmd ...
```

```
{master:0}
```

Related Documentation

- [QFX5100 Guest VM Data Monitoring Application \(ZIP - 2MB\)](#)
- [JunosV App Engine Quick Start Guide](#)
- [Junos SDK Packaging and Deploying Remote Applications Guide](#)
- [Junos SDK Installation Guide](#)

Launching a Guest Virtual Machine (VM) to Run a Third Party Application on Junos OS Release 13.2X51-D20

- [Understanding Guest VMs on page 107](#)
- [Troubleshooting Tips on page 107](#)
- [Copying the Third Party Application to the Switch on page 107](#)

- [Install the Third Party Application on the Switch on page 107](#)
- [Configure the Guest VM Options to Launch the Guest VM on the Host on page 108](#)

Understanding Guest VMs

You can use a guest virtual machine (VM) to run third party software applications. Guest VMs provide a native environment in which third party applications can be executed, and eliminate the need for porting or adapting third party applications to work on the host OS. You can use the Junos SDK Virtual Build Environment in the JunosV App Engine to package the guest VM images. Once the guest VMs are packaged, you can launch them from the Junos OS CLI.



NOTE: Only one guest VM is supported at this time.



NOTE: In Junos OS Release 14.1X53-D27, the maximum disk size of a guest VM image is the following: A zipped image is 1 Gigabyte (for example, this can be the size of the guest VM image that you copy to the switch). The maximum size of an unzipped image is 40 Gigabytes.



NOTE: In Junos OS Release 14.1X53-D30, the size of the DRAM for the guest VM is the available amount of RAM in the hypervisor. The available amount might be more or less depending on the Host OS usage.

Troubleshooting Tips

Configure traceoption and System Log options to troubleshoot issues that occur while you are launching a guest VM:

- `set system processes app-engine-virtual-machine-management-service traceoptions level all`
- `set system processes app-engine-virtual-machine-management-service traceoptions flag all`
- `set system syslog file messages any any`

Copying the Third Party Application to the Switch

1. Copy the third party application to the switch using any file transfer protocol:

For example:

```
root% scp //hostname/pathname/third-party-app.img.gz /var/tmp
```

Install the Third Party Application on the Switch

1. Install the third party application package on the switch.

This might take a few minutes.

For example:

```
{master:0}
root> request system software add virtual-machine-package /var/tmp/third-party-app.img.gz
Installing virtual-machine package..
Copying virtual-machine package..
Uncompressing virtual-machine package..
Finished virtual-machine package installation.
```

2. Issue the **show version** command to verify that the installation was successful.

For example:

```
{master:0}
root> show version
Apr 02 09:12:13
fpc0:
-----
Hostname: host
Model: qfx5100-96s-8q
JUNOS Base OS Software Suite [13.2-20140401_x_132_x51_vjunos.0]
JUNOS Base OS boot [13.2-20140401_x_132_x51_vjunos.0]
JUNOS Crypto Software Suite [13.2-20140401_x_132_x51_vjunos.0]
JUNOS Online Documentation [13.2-20140401_x_132_x51_vjunos.0]
JUNOS Kernel Software Suite [13.2-20140401_x_132_x51_vjunos.0]
JUNOS Packet Forwarding Engine Support (qfx-ex-x86-32)
[13.2-20140401_x_132_x51_vjunos.0]
JUNOS Routing Software Suite [13.2-20140401_x_132_x51_vjunos.0]
JUNOS Enterprise Software Suite [13.2-20140401_x_132_x51_vjunos.0]
JUNOS py-base-i386 [13.2-20140401_x_132_x51_vjunos.0]
third-party-app-ve Virtual Engine package [13.1I20130918_2234]

JUNOS Host Software [13.2-20140401_x_132_x51_vjunos.0]
```

The CLI output shows that the application named third-party-app was installed.

Configure the Guest VM Options to Launch the Guest VM on the Host

1. Configure the following options for guest VM support in the Junos OS CLI at the **[edit]** hierarchy.
 - Compute cluster name
 - Compute node name
 - Virtual machine instance name
 - Dedicated management interface for guest VM
 - Third party package name
 - Internal IP address of the guest VM
2. Configure the name of the compute cluster and compute node.

The name of the compute cluster must be default-cluster, and the name of the name of the compute node must be default-node, otherwise launching the guest VM fails.

For example:

```
{master:0}
```

```
root# set services app-engine compute-cluster default-cluster compute-node default-node
hypervisor
```

3. Configure the name of the virtual machine instance and the name of the third party application.



NOTE: The package names in the `show app-engine virtual-machine-package` and `show version` commands should match.

```
{master:0}
root# set services app-engine virtual-machines instance instance-name package
package-name
```

For example:

```
{master:0}
root# set services app-engine virtual-machines instance test package third-party-app ve
```

4. Associate the virtual machine instance with the configured compute cluster and compute node.



NOTE: The name of the compute cluster must be `default-cluster`, and the name of the compute node must be `default-node`, otherwise launching the guest VM fails.

```
{master:0}
root# set services app-engine virtual-machines instance instance-name compute-cluster
name compute-node name
```

For example:

```
{master:0}
root# set services app-engine virtual-machines instance test compute-cluster default-cluster
compute-node default-node
```

5. Configure the local management IP address.

This IP address is used for the internal bridging interface. The host uses this IP address to check the availability of the guest VM. The IP address must be `192.168.1.X`, where `X` is from 100 to 200.

```
{master:0}
root# set services app-engine virtual-machines instance instance-name local-management
family inet address 192.168.1.X
```

For example:

```
{master:0}
root# set services app-engine virtual-machines instance test local-management family inet
address 192.168.1.100
```

6. Configure the management interface for the guest VM.

This management interface is separate from the one used for Junos OS.



NOTE: The management interface name must be either `em0` or `em1`. The configuration will fail if you do not configure a management interface and then commit the configuration.

For example:

```
{master:0}
root # set services app-engine virtual-machines instance test management-interface em1
```

The new management interface is provisioned for the guest VM.

7. Commit the configuration.

For example:

```
{master:0}
root# commit
```

Here are the results of the configuration:

```
services {
  app-engine {
    compute-cluster default-cluster {
      compute-node default-node {
        hypervisor;
      }
    }
  }
  virtual-machines {
    instance test {
      package third-party-app;
      local-management {
        family inet {
          address 192.168.1.100;
        }
      }
      compute-cluster default-cluster {
        compute-node default-node;
      }
      management-interface em1;
    }
  }
}
```

8. Configure the internal IP address of the guest VM.

- (Preferred method) Log into the guest VM:

```
root> request app-engine virtual-machine-shell guest VM name
```

For example:

```
root> request app-engine virtual-machine-shell third-party-app
```

- (Alternate method) Log into the host shell by specifying the internal management IP address:

For example:

```
shell% ssh -JU _juniper_private4_ 192.168.1.1
```

Issue the **virsh list** command to see which VMs are running. From the output, you can see that the guest VM (named **test** in this example) is running:

```
{master:0}
shell# virsh list
```

Id	Name	State

```

3      vjunos1      running
4      test         running

```

Log into the guest VM console (named 4 in this example).

For example:

```

shell# virsh console 4
Connected to domain test
Escape character is ^]
CentOS release 6.4 (Final)
Kernel 2.6.32-358.el6.x86_64 on an x86_64

[root@localhost ~]

```

From the output, you can see that you are connected to the guest VM console (root@localhost)

Enter a valid username and password combination for the guest VM.

9. Configure the internal IP address of the guest VM on the Ethernet interface.

- Issue the **ifconfig -a** command to see the name of the management interface that is used to access the guest VM from outside of the network, and the name of the management interface that is used for internal use.

The interface names are either eth6 or eth7, or eth7 or eth8. You can associate one of the interfaces to the guest VM by issuing the **set services app-engine virtual-machines instance *name* management-interface *interface-name*** command. Use the same IP address as the one you configured using the **set services app-engine virtual-machines instance test local-management family inet address 192.168.1.100**. The MAC addresses associated with these interfaces are used for internal bridging.

For example:

```

root@localhost ifconfig -a
eth6      Link encap:Ethernet  HWaddr 52:54:00:5D:DB:01
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:982 errors:0 dropped:0 overruns:0 frame:0
          TX packets:970 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:92188 (90.0 KiB)  TX bytes:91468 (89.3 KiB)

eth7      Link encap:Ethernet  HWaddr 52:54:00:5D:DB:02
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:982 errors:0 dropped:0 overruns:0 frame:0
          TX packets:970 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:92188 (90.0 KiB)  TX bytes:91468 (89.3 KiB)

```

In this example, eth6 is a management interface that is used to access the guest VM, and eth7 is a management interface that is used for internal use.

- Issue the **ifconfig** command to configure the internal IP address on the Ethernet interface. This is the same IP address you configured in the Junos OS CLI.

For example:

```

root@localhost ifconfig eth7 192.168.1.100 netmask 255.255.255.0

```

10. Issue the following show commands to verify that everything is working correctly:

For example:

- root# **show app-engine status**

```

Compute cluster: default-cluster
                  Compute node      Status
                  default-node      Online

```

The status should be Online.

- root# **show app-engine virtual-machine instance**

```

VM name          Compute cluster      VM status
                test                  default-cluster      ACTIVE

```

The VM status should be active.

- root# **show app-engine virtual-machine instances show app-engine virtual-machine package**

```

VM package: cust-vm-ve
              VM disk image:
third-party-app-ve/20140409_015447/third-party-app.img.gz
                  Compute cluster      Package download status
                  default-cluster      DOWNLOADED

```

The package downloaded status should be either download in progress or downloaded.

- root# **show interfaces terse *management-interface***

```
error: device em1 not found
```

This interface should be detached from Junos OS.

11. To remove the guest VM, delete the configuration statements and uninstall the third party software package.

For example, to remove the **app-engine** statement:

```
root # delete services app-engine
```

Commit the configuration.

For example:

```
root# commit
```

Issue the **show version** command to see what the name of the third party application package is.

For example:

```

{master:0}
root> show version
fpc0:
-----
Hostname: st-96s-p2b-03
Model: qfx5100-96s-8q
JUNOS Base OS Software Suite [13.2-20140406_x_132_x51_vjunos.0]
JUNOS Base OS boot [13.2-20140406_x_132_x51_vjunos.0]
JUNOS Crypto Software Suite [13.2-20140406_x_132_x51_vjunos.0]
JUNOS Online Documentation [13.2-20140406_x_132_x51_vjunos.0]
JUNOS Kernel Software Suite [13.2-20140406_x_132_x51_vjunos.0]
JUNOS Packet Forwarding Engine Support (qfx-ex-x86-32)
[13.2-20140406_x_132_x51_vjunos.0]

```



```
JUNOS Routing Software Suite [13.2-20140406_x_132_x51_vjunos.0]
JUNOS Enterprise Software Suite [13.2-20140406_x_132_x51_vjunos.0]
JUNOS py-base-i386 [13.2-20140406_x_132_x51_vjunos.0]
  third-party-app-ve Virtual Engine package [20140409_015447]
JUNOS Host Software [13.2-20140406_x_132_x51_vjunos.0]
```

Issue the **request system software delete virtual-machine-package <package-name>** command to uninstall the third party application:

For example:

```
root> request system software delete virtual-machine-package third-party-app-ve
fpc0:
```

```
-----
Deleted virtual-machine package cust-vm-ve ...
```

**Related
Documentation**

- [QFX5100 Guest VM Data Monitoring Application \(ZIP - 2MB\)](#)
- [JunosV App Engine Quick Start Guide](#)
- [Junos SDK Packaging and Deploying Remote Applications Guide](#)
- [Junos SDK Installation Guide](#)

PART 7

In-Service Software Upgrade (ISSU)

- [Understanding ISSU on page 117](#)

CHAPTER 7

Understanding ISSU

- [In-Service Software Upgrade \(ISSU\) System Requirements on page 117](#)
- [Understanding In-Service Software Upgrade \(ISSU\) on page 119](#)
- [Performing an In-Service Software Upgrade \(ISSU\) on page 120](#)
- [Verifying a Unified In-Service Software Upgrade on page 122](#)

In-Service Software Upgrade (ISSU) System Requirements

To perform an in-service software upgrade (ISSU), your device must be running Junos OS Release 13.2X51-D15 or later.



NOTE: ISSU does not support extension application packages developed with the Junos SDK.



Video: [How Does ISSU Work on the QFX5100?](#)

- [In-Service Software Upgrade \(ISSU\) Protocol and Process Support on page 117](#)

In-Service Software Upgrade (ISSU) Protocol and Process Support

[Table 10 on page 117](#) lists the protocols and processes that are supported during an ISSU. Protocols that are not supported might cause packet loss.

Table 10: ISSU Protocol Support

Protocol	Junos OS Release
Graceful Routing Engine switchover (GRES)	Junos OS 13.2X51-D15 and later
Internet Group Management Protocol (IGMP)	Junos OS 13.2X51-D15 and later
Layer 2 MAC routes	Junos OS 13.2X51-D15 and later
Layer 3 unicast and multicast routes	Junos OS 13.2X51-D15 and later
Layer 2 multicast routes	Junos OS 13.2X51-D15 and later

Table 10: ISSU Protocol Support (*continued*)

Protocol	Junos OS Release
Link Aggregation Control Protocol (LACP) NOTE: Configure LACP before you issue an ISSU. The LACP periodic fast mode is not supported. Instead, configure the periodic slow mode. If you configure the periodic fast mode, the configuration can be committed without any commit or system log error messages, but you might experience a larger than expected amount of traffic drops. Traffic drops occur because the LACP links go down during an ISSU. Link changes are processed after an ISSU is complete.	Junos OS 13.2X51-D15 and later
Multicast Listener Discovery (MLD) snooping	Junos OS 13.2X51-D15 and later
Nonstop bridging	Junos OS 13.2X51-D15 and later
Nonstop active routing	Junos OS 13.2X51-D15 and later
Spanning tree protocols: <ul style="list-style-type: none"> • Multiple Spanning Tree Protocol (MSTP) • Rapid Spanning Tree Protocol (RSTP) • Spanning Tree Protocol (STP) • VLAN Spanning Tree Protocol (VSTP) 	Junos OS 13.2X51-D15 and later

Related Documentation

- [Understanding In-Service Software Upgrade \(ISSU\) on page 119](#)
- [Performing an In-Service Software Upgrade \(ISSU\) on page 120](#)

Understanding In-Service Software Upgrade (ISSU)

An in-service software upgrade (ISSU) enables you to upgrade between two different Junos OS releases with minimal disruption on the control plane and with minimal disruption of traffic. During an ISSU, the Junos OS runs in two separate virtual machines (VMs)—one VM is in the master role acting as the master Routing Engine, and the other VM is in the backup role acting as the backup Routing Engine. The Junos OS is upgraded on the backup VM. After a successful software upgrade, the backup VM then becomes the master VM, and the original master VM is no longer needed and is shut down.



Video: [How Does ISSU Work on the QFX5100?](#)



NOTE: ISSU is supported in Junos OS Release 13.2X51-D15 and later.

ISSU provides the following benefits:

- Eliminates network downtime during software image upgrades
- Reduces operating costs, while delivering higher service levels
- Allows fast implementation of new features
- [In-Service Software Upgrade Process on page 119](#)

In-Service Software Upgrade Process

When you request an ISSU on a standalone device:

1. The management process (mgd) verifies that non-stop routing (NSR), graceful Routing Engine switchover (GRES), and non-stop bridging (NSB) are enabled.
2. The switch downloads and validates the software package.
3. The ISSU state machine spawns the backup Routing Engine (RE) with the newer software.
4. The ISSU state machine checks to see if the backup RE has synchronized all of the data with the master RE.
5. The ISSU state machine moves the devices (for example, forwarding ASIC, FPGA, management port and serial console) from the master RE to the backup RE.
6. The mastership is switched between the REs, so the backup RE becomes the master RE.
7. The old master RE is shut down.

Related Documentation

- [In-Service Software Upgrade \(ISSU\) System Requirements on page 117](#)
- [Performing an In-Service Software Upgrade \(ISSU\) on page 120](#)

Performing an In-Service Software Upgrade (ISSU)

You can use an in-service software upgrade to upgrade the software running on the switch with minimal traffic disruption during the upgrade.



NOTE: ISSU is supported in Junos OS Release 13.2X51-D15 and later on QFX5100 switches, and in Junos OS Release 13.2X51-D25 and later on EX4600 switches.

This topic covers:

1. [Preparing the Switch for Software Installation on page 120](#)
2. [Upgrading the Software Using ISSU on page 121](#)

Preparing the Switch for Software Installation

Before you begin software installation using ISSU:



NOTE: Before you perform an in-service software upgrade, if applicable, remove the `set system internet-options no-tcp-reset drop-all-tcp` command from the configuration, otherwise the upgrade will fail and an error message will be displayed.

- Ensure that nonstop active routing (NSR) and nonstop bridging (NSB) are enabled. If enabled, disable graceful restart (GR), because NSR and GR cannot be enabled simultaneously. NSB and GR enable NSB-supported Layer 2 protocols to synchronize protocol information between the master and backup Routing Engines.

If nonstop active routing is not enabled (**Stateful Replication is Disabled**), see *Configuring Nonstop Active Routing on Switches* for information on how to enable it.

- Enable nonstop bridging (NSB). See *Configuring Nonstop Bridging on Switches (CLI Procedure)* for information on how to enable it.
- (Optional) Back up the system software—Junos OS, the active configuration, and log files—on the switch to an external storage device with the [request system snapshot](#) command.

Upgrading the Software Using ISSU

This procedure describes how to upgrade the software running on a standalone switch:



NOTE: If the Host OS software needs to be updated, you cannot perform an ISSU. Instead, perform a standard software upgrade.

To upgrade the switch using ISSU:

1. Download the software package by following the procedure in the Downloading Software Files with a Browser section in [“Upgrading Software” on page 273](#).
2. Copy the software package or packages to the switch. We recommend that you copy the file to the `/var/tmp` directory.
3. Log in to the console connection. Using a console connection allows you to monitor the progress of the upgrade.
4. Start the ISSU:
 - On the switch, enter:

```
user@switch> request system software in-service-upgrade
/var/tmp/package-name.tgz
```

where `package-name.tgz` is, for example, `jinstall-132_x51_vjunos.domestic.tgz`.



NOTE: During the upgrade, you will not be able to access the Junos OS CLI.

The switch displays status messages similar to the following messages as the upgrade executes:

```
warning: Do NOT use /user during ISSU. Changes to /user during ISSU may get
lost!
ISSU: Validating Image
ISSU: Preparing Backup RE
Prepare for ISSU
ISSU: Backup RE Prepare Done
Extracting jinstall-qfx-5-13.2X51-D15.4-domestic ...
Install jinstall-qfx-5-13.2X51-D15.4-domestic completed
Spawning the backup RE
Spawn backup RE, index 0 successful
GRES in progress
GRES done in 0 seconds
Waiting for backup RE switchover ready
GRES operational
Copying home directories
Copying home directories successful
Initiating Chassis In-Service-Upgrade
Chassis ISSU Started
ISSU: Preparing Daemons
ISSU: Daemons Ready for ISSU
```

```

ISSU: Starting Upgrade for FRUs
ISSU: FPC Warm Booting
ISSU: FPC Warm Booted
ISSU: Preparing for Switchover
ISSU: Ready for Switchover
Checking In-Service-Upgrade status
  Item           Status           Reason
  FPC 0          Online (ISSU)
Send ISSU done to chassisd on backup RE
Chassis ISSU Completed
ISSU: IDLE
Initiate em0 device handoff

```



NOTE: An ISSU might stop instead of abort if the FPC is at the warm boot stage. Also, any links that go down and up will not be detected during a warm boot of the Packet Forwarding Engine (PFE).



NOTE: If the ISSU process stops, you can look at the log files to diagnose the problem. The log files are located at `/var/log/vjunos-log.tgz`.

- Log in after the reboot of the switch completes. To verify that the software has been upgraded, enter the following command:

```
user@switch> show version
```

- Disable nonstop active routing (NSR) and enable graceful restart (GR).

See *Configuring Nonstop Active Routing on Switches* for more information.

Related Documentation

- [Understanding In-Service Software Upgrade \(ISSU\) on page 119](#)
- [request system software in-service-upgrade on page 524](#)

Verifying a Unified In-Service Software Upgrade

Purpose Verify the status of FPCs and their corresponding PICs after the most recent unified ISSU.

Action Issue the **show chassis in-service-upgrade** command on the master Routing Engine:

```

user@host> show chassis in-service-upgrade
  Item           Status           Reason
  FPC 0          Online
  FPC 1          Online
  FPC 2          Online
  PIC 0          Online
  PIC 1          Online
  FPC 3          Offline          Offlined by CLI command
  FPC 4          Online
  PIC 1          Online
  FPC 5          Online
  PIC 0          Online
  FPC 6          Online
  PIC 3          Online
  FPC 7          Online

```

Meaning See [show chassis in-service-upgrade](#) for more information.

- Related Documentation**
- *Performing a Unified ISSU*
 - *Troubleshooting Unified ISSU Problems*
 - *Managing and Tracing BFD Sessions During Unified ISSU Procedures*

PART 8

Non-Stop Software Upgrade (NSSU)

- [Understanding NSSU on page 127](#)

CHAPTER 8

Understanding NSSU

- [Understanding Nonstop Software Upgrade on a Virtual Chassis and Mixed Virtual Chassis on page 127](#)
- [Understanding Nonstop Software Upgrade on a Virtual Chassis Fabric on page 131](#)
- [Configuring Line-Card Upgrade Groups for Nonstop Software Upgrade \(CLI Procedure\) on page 136](#)
- [Upgrading Software on a Virtual Chassis and Mixed Virtual Chassis Using Nonstop Software Upgrade on page 138](#)
- [Upgrading Software on a Virtual Chassis Fabric Using Nonstop Software Upgrade on page 142](#)

Understanding Nonstop Software Upgrade on a Virtual Chassis and Mixed Virtual Chassis

Nonstop software upgrade (NSSU) enables you to upgrade the software running on all member switches in a Virtual Chassis or mixed Virtual Chassis with minimal network traffic disruption during the upgrade. For information on which switches are supported on a mixed Virtual Chassis, see *Understanding Mixed EX Series and QFX Series Virtual Chassis or Virtual Chassis Fabric*. For information on how to perform a nonstop software upgrade on a Virtual Chassis Fabric, see [“Understanding Nonstop Software Upgrade on a Virtual Chassis Fabric” on page 131](#).

Performing an NSSU provides these benefits:

- No disruption to the control plane—NSSU uses graceful Routing Engine switchover (GRES) to ensure no disruption to the control plane. During the upgrade process, interface, kernel, and routing protocol information is preserved.
- Minimal disruption to network traffic—An NSSU minimizes network traffic disruption by upgrading member switches one at a time, enabling the master and backup members to maintain their master and backup roles (although mastership will change) without disruption to traffic, and permitting traffic to continue to flow through members in line-card role that are not being upgraded.

To achieve minimal disruption to traffic, you must configure link aggregation groups (LAGs) such that the member links of each LAG reside on different Virtual Chassis members. When one member link of a LAG is down, the remaining links are up, and traffic continues to flow through the LAG.



NOTE: Because NSSU upgrades the software on each Virtual Chassis and mixed Virtual Chassis member one at a time, an upgrade using NSSU can take longer than an upgrade using the `request system software add` command.

You can reduce the amount of time an upgrade takes by configuring line-card upgrade groups. The members of a Virtual Chassis or VCF in an upgrade group are upgraded simultaneously, reducing the amount of time it takes to complete an upgrade. See [“Configuring Line-Card Upgrade Groups for Nonstop Software Upgrade \(CLI Procedure\)”](#) on page 136.

This topic covers:

- [Requirements for Performing an NSSU on page 128](#)
- [How an NSSU Works on page 129](#)
- [NSSU Limitations on page 130](#)
- [NSSU and Junos OS Release Support on page 130](#)
- [Overview of NSSU Configuration and Operation on page 131](#)

Requirements for Performing an NSSU

The following requirements apply to Virtual Chassis or mixed Virtual Chassis:

- All Virtual Chassis or mixed Virtual Chassis members and all Routing Engines must be running the same Junos OS release.
- Graceful Routing Engine switchover (GRES) must be enabled.
- For minimal traffic disruption, you must define link aggregation groups (LAGs) such that the member links reside on different Virtual Chassis or mixed Virtual Chassis members.

The following are requirements for Virtual Chassis or mixed Virtual Chassis members:

- The Virtual Chassis or mixed Virtual Chassis members must be connected in a ring topology so that no member is isolated as a result of another member being rebooted. This topology prevents the Virtual Chassis from splitting during an NSSU.
- The Virtual Chassis or mixed Virtual Chassis master and backup must be adjacent to each other in the ring topology. Adjacency permits the master and backup to always be in sync, even when the switches in line-card roles are rebooting.
- The Virtual Chassis or mixed Virtual Chassis must be preprovisioned so that the line-card role has been explicitly assigned to member switches acting in a line-card role. During an NSSU, the Virtual Chassis and mixed Virtual Chassis members must maintain their roles—the master and backup must maintain their master and backup roles (although

mastership will change), and the remaining switches must maintain their line-card roles.

- A two-member Virtual Chassis or mixed Virtual Chassis must have **no-split-detection** configured so that the Virtual Chassis or mixed Virtual Chassis does not split when an NSSU upgrades a member.

How an NSSU Works

This section describes what happens when you request an NSSU on these switches and Virtual Chassis or mixed Virtual Chassis:

- [Virtual Chassis and Mixed Virtual Chassis on page 129](#)

Virtual Chassis and Mixed Virtual Chassis

When you request an NSSU on an a Virtual Chassis or mixed Virtual Chassis:

1. The Virtual Chassis or mixed Virtual Chassis master verifies that:
 - The backup is online and running the same software version.
 - Graceful Routing Engine switchover (GRES) is enabled.
 - The Virtual Chassis or mixed Virtual Chassis member has a preprovisioned configuration.
2. The master transfers the new software image to the backup and remaining line-card role members in sequence using **rcp**.

(For QFX5100 Virtual Chassis only) Starting with Junos OS Release 14.1X53-D40, to optimize the time needed to complete an NSSU operation for a Virtual Chassis, the master uses parallel **rcp** sessions to copy the new software to multiple members at a time (rather than waiting for the copy operation to complete to each member before starting to copy the software image to the next member). The number of parallel copy operations is determined by a default algorithm based on the number of members in the Virtual Chassis, or you can configure a specific number using the **rcp-count** configuration statement. See [rcp-count](#) for details.



NOTE: If copying the new software to any member fails, NSSU aborts the upgrade process for the entire Virtual Chassis without rebooting any members, and logs the error condition. Starting with Junos OS Release 14.1X53-D40, the master performs an additional error recovery measure to remove the new software from the members to which it was already transferred.

3. The master restarts the backup with the new software, and the backup resynchronizes with the master.
4. The master loads and reboots member switches that are in the line-card role, one at a time. The master waits for each member to become online and active running the new software before rebooting the next member.

- If you configured upgrade groups, the Virtual Chassis or VCF members in the first upgrade group load the new image and restart. When the members in that upgrade group are online again, the members in the next upgrade group load the new image and restart.
 - Traffic continues to flow through the other members during this process.
5. Rebooting continues until all active members have restarted with the new software.



NOTE: If any line-card role member fails to reboot successfully, NSSU aborts the upgrade process and logs the error condition. In this case, to avoid Virtual Chassis instability, you should either back out the partial upgrade by restoring the old software and rebooting the members that were already rebooted with the new software, or try to manually reboot all members with the new software that was copied to them, so all members come online again running the same version of the software.

Starting with Junos OS Release 14.1X53-D40, NSSU automatically invokes recovery measures if the reboot fails on any line-card role member, stopping the sequential reboot process and bringing down and rebooting the entire Virtual Chassis. This action cleanly brings up all members at the same time running the new software, which recovers stable Virtual Chassis operation more quickly than having an unstable Virtual Chassis running different versions of the software trying to converge.

6. When all members that are in the line-card role have been upgraded, the master performs a graceful Routing Engine switchover, and the upgraded backup becomes the master.
7. The software on the original master is upgraded and the original master is automatically rebooted. After the original master has rejoined the Virtual Chassis, you can optionally return control to it by requesting a graceful Routing Engine switchover.

NSSU Limitations

You cannot use an NSSU to downgrade the software—that is, to install an earlier version of the software than is currently running on the switch. To install an earlier software version, use the **request system software add** command.

You cannot roll back to the previous software version after you perform an upgrade using NSSU. If you need to roll back to the previous software version, you can do so by rebooting from the alternate root partition if you have not already copied the new software version into the alternate root partition.

NSSU and Junos OS Release Support

A Virtual Chassis or mixed Virtual Chassis must be running a Junos OS release that supports NSSU before you can perform an NSSU. If a Virtual Chassis or mixed Virtual Chassis is running a software version that does not support NSSU, use the **request system software add** command. See *Understanding Mixed EX Series and QFX Series Virtual Chassis*

or *Virtual Chassis Fabric* for information on which switches are supported on a mixed Virtual Chassis.

Overview of NSSU Configuration and Operation

You must ensure that the configuration of the switch or Virtual Chassis meets the requirements described in [“Requirements for Performing an NSSU” on page 128](#). NSSU requires no additional configuration.

You perform an NSSU by executing the `request system software nonstop-upgrade` command. For detailed instructions on how to perform an NSSU, see the topics in Related Documentation.

- Related Documentation**
- [Upgrading Software on a Virtual Chassis and Mixed Virtual Chassis Using Nonstop Software Upgrade on page 138](#)
 - [Configuring Graceful Routing Engine Switchover in a Virtual Chassis \(CLI Procedure\)](#)

Understanding Nonstop Software Upgrade on a Virtual Chassis Fabric

Nonstop software upgrade (NSSU) enables you to upgrade the software running on all member switches on a Virtual Chassis Fabric (VCF) with minimal network traffic disruption during the upgrade. A VCF can contain up to 20 members—up to 2 members can be in the Routing Engine role, and up to 18 members can be configured in the line-card role. You can upgrade software for a fixed configuration or for a mixed mode of switches in a VCF. The NSSU process is similar for a Virtual Chassis; for more information on performing NSSU to upgrade a Virtual Chassis, see [“Understanding Nonstop Software Upgrade on a Virtual Chassis and Mixed Virtual Chassis” on page 127](#).

Performing an NSSU in a VCF provides these benefits:

- No disruption to the control plane—NSSU uses graceful Routing Engine switchover (GRES) and nonstop active routing (NSR) to ensure no disruption to the control plane. During the upgrade process, interface, kernel, and routing protocol information is preserved.
- Minimal disruption to network traffic—An NSSU minimizes network traffic disruption by upgrading member switches one at a time, enabling the master and backup members to maintain their master and backup roles (although mastership will change) without disruption to traffic, and permitting traffic to continue to flow through members in line-card role that are not being upgraded.

To achieve minimal disruption to traffic, you must configure link aggregation groups (LAGs) such that the member links of each LAG reside on different VCF members. When one member link of a LAG is down, the remaining links are up, and traffic continues to flow through the LAG.



NOTE: Because NSSU upgrades the software on each VCF member one at a time, an upgrade using NSSU can take longer than an upgrade using the `request system software add` command.

You can reduce the amount of time an upgrade takes by configuring line-card upgrade groups. The members of a Virtual Chassis or VCF in an upgrade group are upgraded simultaneously, reducing the amount of time it takes to complete an upgrade. See [“Configuring Line-Card Upgrade Groups for Nonstop Software Upgrade \(CLI Procedure\)”](#) on page 136.

This topic covers:

- [Requirements for Performing an NSSU on page 132](#)
- [How an NSSU Works on page 133](#)
- [NSSU Limitations on page 134](#)
- [NSSU and Junos OS Release Support on page 134](#)
- [Overview of NSSU Configuration and Operation on page 135](#)

Requirements for Performing an NSSU

The following requirements apply to VCF:

- Graceful Routing Engine switchover (GRES) must be enabled.
- Nonstop active routing (NSR) and nonstop bridging (NSB) must be enabled.



NOTE: Using NSB is recommended for any mode of VCF (preprovisioned, auto-provisioned, and non-provisioned) to avoid loss of Layer 2 control protocol adjacency during a Routing Engine switchover..



NOTE: Issue the `commit synchronize` command to enable NSB and NSR.

- For minimal traffic disruption, you must define link aggregation groups (LAGs) such that the member links reside on different VCF members.

The following are requirements for VCF members:

- Only two preprovisioned members in the Routing Engine role are supported. If more than two Routing Engines are configured, a warning will be issued, and NSSU will stop.
- The VCF members are connected in a spine-and-leaf topology. A spine-and-leaf topology prevents the VCF from splitting during an NSSU. Each leaf device must be connected to both spine devices.
- The VCF must be preprovisioned so that the line-card role has been explicitly assigned to member switches acting in a line-card role, and that the Routing Engine role has been explicitly assigned to member switches acting in a Routing Engine role. During an NSSU, the VCF members must maintain their roles—the master and backup must maintain their master and backup roles (although mastership will change), the member

switches must remain their Routing Engine roles, and the remaining switches must maintain their line-card roles.

- A two-member VCF must have **no-split-detection** configured so that the VCF does not split when an NSSU upgrades a member.

How an NSSU Works

This section describes what happens when you request an NSSU on a VCF:

- [Virtual Chassis Fabric on page 133](#)

Virtual Chassis Fabric

When you request an NSSU on a VCF:

1. The VCF master verifies that:
 - The backup is online.
 - Graceful Routing Engine switchover (GRES), nonstop active routing (NSR), and nonstop bridging (NSB) is enabled.
 - The VCF has a preprovisioned configuration.
2. The master transfers the new software image to the backup and remaining line-card role members in sequence using **rcp**.

Starting with Junos OS Release 14.1X53-D40, to optimize the time needed to complete an NSSU operation for a VCF, the master uses parallel **rcp** sessions to copy the new software to multiple members at a time (rather than waiting for the copy operation to complete to each member before starting to copy the software image to the next member). The number of parallel copy operations is determined by a default algorithm based on the number of members in the VCF, or you can configure a specific number using the **rcp-count** configuration statement. See [rcp-count](#) for details.



NOTE: If copying the new software to any line-card role member fails, NSSU aborts the upgrade process for the entire VCF without rebooting any members, and logs the error condition. Starting with Junos OS Release 14.1X53-D40, the master performs an additional error recovery measure to remove the new software from the members to which it was already transferred.

3. The master restarts the backup with the new software, and the backup resynchronizes with the master.
4. The master loads and reboots member switches that are in the line-card role, one at a time. The master waits for each member to become online and active running the new software before rebooting the next member.
 - If you configured upgrade groups, the Virtual Chassis or VCF members in the first upgrade group load the new image and restart. When the members in that upgrade

group are online again, the members in the next upgrade group load the new image and restart.

- Traffic continues to flow through the other members during this process.

5. Rebooting continues until all active members have restarted with the new software.



NOTE: If any member fails to reboot successfully (including initial reboot of the backup), NSSU aborts the upgrade process and logs the error condition. In this case, to avoid VCF instability, you should either back out the partial upgrade by restoring the old software and rebooting the members that were already rebooted with the new software, or try to manually reboot all members with the new software that was copied to them, so all members come online again running the same version of the software.

Starting with Junos OS Release 14.1X53-D40, NSSU automatically invokes recovery measures if the reboot fails on any line-card role member, stopping the sequential reboot process and bringing down and rebooting the entire VCF. This action cleanly brings up all members at the same time running the new software, which recovers stable VCF operation more quickly than having an unstable VCF running different versions of the software trying to converge.

6. When all members that are in the line-card role have been upgraded, the master performs a graceful Routing Engine switchover, and the upgraded backup becomes the master.
7. The software on the original master is upgraded and the original master is automatically rebooted. After the original master has rejoined the VCF, you can optionally return control to it by requesting a graceful Routing Engine switchover.

NSSU Limitations

You cannot use an NSSU to downgrade the software—that is, to install an earlier version of the software than is currently running on the switch. To install an earlier software version, use the **request system software add** command.

You cannot roll back to the previous software version after you perform an upgrade using NSSU. If you need to roll back to the previous software version, you can do so by rebooting from the alternate root partition if you have not already copied the new software version into the alternate root partition.

NSSU and Junos OS Release Support

NSSU is supported on a VCF in Junos OS Release 13.2X51-D20 or later. A VCF must be running a Junos OS release that supports NSSU before you can perform an NSSU.

If a VCF is running a software version that does not support NSSU, use the **request system software add** command instead to perform the upgrade.

Overview of NSSU Configuration and Operation

You must ensure that the configuration meets the requirements described in [“Requirements for Performing an NSSU” on page 128](#). NSSU requires no additional configuration.

You perform an NSSU by executing the `request system software nonstop-upgrade` command. For detailed instructions on how to perform an NSSU, see the topics in Related Documentation.

Related Documentation

- [Upgrading Software on a Virtual Chassis Fabric Using Nonstop Software Upgrade on page 142](#)
- *Configuring Graceful Routing Engine Switchover in a Virtual Chassis (CLI Procedure)*
- *Configuring Nonstop Bridging on Switches (CLI Procedure)*
- *Example: Configuring Nonstop Active Routing on Switches*
- [Configuring Line-Card Upgrade Groups for Nonstop Software Upgrade \(CLI Procedure\) on page 136](#)

Configuring Line-Card Upgrade Groups for Nonstop Software Upgrade (CLI Procedure)

Nonstop software upgrade (NSSU) enables you to upgrade software using a single command and with minimal disruption to network traffic on supporting EX Series switches. To reduce the total time required to complete an NSSU operation on all switches being upgraded, you can configure line-card upgrade groups on the following supported platforms:

- an EX6200 or EX8200 switch with redundant Routing Engines
- an EX8200 Virtual Chassis
- a QFX3500, QFX3600, and QFX5100 Virtual Chassis
- a Virtual Chassis Fabric

In its default configuration, NSSU upgrades each line card in a switch or member in a Virtual Chassis or VCF one at a time. Traffic continues to flow through the other line cards or members while each one is being restarted as part of the upgrade. This behavior allows you to minimize disruption to traffic if you have configured link aggregation groups (LAGs) such that the member links of each LAG reside on different line cards or members; as a result, when one member link of a LAG is down, the remaining links are up, and traffic continues to flow through the LAG.

When you define an upgrade group for NSSU, NSSU upgrades the line cards or members in the upgrade group at the same time instead of sequentially, reducing the total time needed to complete the upgrade on all line cards or members. To achieve minimal traffic disruption, you must define the line-card upgrade groups such that the member links of the LAGs reside on line cards or members that are in different upgrade groups. For information on how to configure LAGs, see *Configuring Aggregated Ethernet Links (CLI Procedure)*.

To configure line-card upgrade groups on a standalone EX6200 or EX8200 switch:

- To create an upgrade group and add a line card to it:

```
[edit chassis]
user@switch# set nssu upgrade-group group-name fpcs slot-number
```

For example, to create an upgrade group called **group3** and add the line card in slot 5 to it:

```
[edit chassis]
user@switch# set nssu upgrade-group group3 fpcs 5
```

If **group3** already exists, this command adds line card 5 to **group3**.

- To create an upgrade group and add multiple line cards to it:

```
[edit chassis]
user@switch# set nssu upgrade-group group-name fpcs [list-of-slot-numbers]
```

For example, to create an upgrade group called **primary** and add line cards in slots 1, 4, and 7 to it:


```
[edit chassis]
user@switch# set nssu upgrade-group primary fpcs [1 4 7]
```

If **primary** already exists, this command adds line cards in slots 1, 4, and 7 to **primary**.

To configure line-card upgrade groups on an EX8200 Virtual Chassis:

- To create an upgrade group and add a line card on a Virtual Chassis member to it:

```
[edit chassis]
user@switch# set nssu upgrade-group group-name member member-id fpcs slot-number
```

For example, to create an upgrade group called **primary-ny** and add the line card on member 1 in slot 5 to it:

```
[edit chassis]
user@switch# set nssu upgrade-group primary-ny member 1 fpcs 5
```

If **primary-ny** already exists, this command adds line card 5 on member 1 to **primary-ny**.

- To create an upgrade group that contains multiple line cards on a Virtual Chassis member:

```
[edit chassis]
user@switch# set nssu upgrade-group group-name member member-id fpcs
[list-of-slot-numbers]
```

For example, to create an upgrade group called **primary-ny** that contains the line cards in slots 1 and 2 on member 0 and in slots 3 and 4 on member 1:

```
[edit chassis]
user@switch# set nssu upgrade-group primary-ny member 0 fpcs [1 2]
```

```
[edit chassis]
user@switch# set nssu upgrade-group primary-ny member 1 fpcs [3 4]
```

To configure line-card upgrade groups on a QFX Series Virtual Chassis or mixed Virtual Chassis, or a VCF:



NOTE: For Virtual Chassis or VCFs comprised of fixed-chassis switches that do not have separate line cards, you use the **upgrade-group** configuration statement with the **fpcs** option to specify the Virtual Chassis or VCF member IDs that you want to include in an upgrade group. The member hierarchy of the **upgrade-group** statement is not used.

- To create an upgrade group and add a Virtual Chassis or VCF member to the upgrade group:

```
[edit chassis]
user@switch# set nssu upgrade-group group-name fpcs value
```

For example, to create an upgrade group called **vcf** and add a member:

```
[edit chassis]
user@switch# set nssu upgrade-group vcf fpcs 2
```

If **vcf** already exists, this command adds member 2 to **vcf**.

- To create an upgrade group that contains multiple members in a Virtual Chassis or VCF:

```
[edit chassis]
user@switch# set nssu upgrade-group group-name fpcs [list-of-slot-numbers]
```

For example, to create an upgrade group called **vcf** that contains members 1 and 2:

```
[edit chassis]
user@switch# set nssu upgrade-group vcf fpcs [1 2]
```

Related Documentation

- *Example: Configuring Line-Card Upgrade Groups for Nonstop Software Upgrade on EX Series Switches*
- *Upgrading Software on an EX6200 or EX8200 Standalone Switch Using Nonstop Software Upgrade (CLI Procedure)*
- *Upgrading Software on an EX8200 Virtual Chassis Using Nonstop Software Upgrade (CLI Procedure)*
- [Upgrading Software on a Virtual Chassis Fabric Using Nonstop Software Upgrade on page 142](#)
- *Understanding Nonstop Software Upgrade on EX Series Switches*

Upgrading Software on a Virtual Chassis and Mixed Virtual Chassis Using Nonstop Software Upgrade

You can use nonstop software upgrade (NSSU) to upgrade the software running on all member switches of a Virtual Chassis with minimal traffic disruption during the upgrade.

This topic covers:

- [Preparing the Switch for Software Installation on page 138](#)
- [Upgrading the Software Using NSSU on page 140](#)

Preparing the Switch for Software Installation

Before you begin software installation using NSSU:

- Ensure that the Virtual Chassis or mixed Virtual Chassis is configured correctly to support NSSU. Verify that:
 - The Virtual Chassis or mixed Virtual Chassis members are connected in a ring topology. A ring topology prevents the Virtual Chassis from splitting during an NSSU.
 - The Virtual Chassis or mixed Virtual Chassis master and backup are adjacent to each other in the ring topology. Adjacency permits the master and backup to always be in sync, even when the switches in line-card roles are rebooting.
 - The Virtual Chassis or mixed Virtual Chassis is preprovisioned so that the line-card role has been explicitly assigned to member switches acting in the line-card role. During an NSSU, the Virtual Chassis or mixed Virtual Chassis members must maintain their roles—the master and backup must maintain their master and backup roles

(although mastership will change), and the other member switches must maintain their line-card roles.

- A two-member Virtual Chassis has **no-split-detection** configured so that the Virtual Chassis does not split when an NSSU upgrades a member.
- Verify that the members are running the same version of the software:

```
user@switch> show version
```

If the Virtual Chassis or mixed Virtual Chassis members are not running the same version of the software, use the **request system software add** command to upgrade the software on the inconsistent members.

- Ensure that graceful Routing Engine switchover (GRES) is enabled.
- (Optional) Back up the system software—Junos OS, the active configuration, and log files—on each member to an external storage device with the **request system snapshot** command.

Upgrading the Software Using NSSU

This procedure describes how to upgrade the software running on all Virtual Chassis or mixed Virtual Chassis members using NSSU. When the upgrade completes, all members are running the new version of the software. Because a graceful Routing Engine switchover occurs during the upgrade, the original Virtual Chassis or mixed Virtual Chassis backup is the new master.

During NSSU, the master copies the new software image to all the members in the Virtual Chassis and reboots them in turn. If copying the new software to a member fails or rebooting a member fails, NSSU aborts the upgrade process and logs the error. In this case, you must manually perform recovery measures for members left in an incompatible state, to restore all members to running the same version of the software. Starting in Junos OS Release 14.1X53-D40, NSSU automatically invokes recovery measures after either of these failures, as follows:

- if NSSU aborts due to a copy error, the new image is removed from any members to which it was already copied.
- If any member fails to reboot, NSSU automatically initiates a clean Virtual Chassis restart by bringing down and rebooting the entire Virtual Chassis. All members come up running the new software at the same time. This action cleanly recovers correct Virtual Chassis operation more quickly than having an unstable Virtual Chassis running different versions of the software trying to converge.



NOTE: Junos OS software images with enhanced automation are only supported on a non-mixed Virtual Chassis with QFX5100 switches. Also, performing an NSSU from a standard Junos OS software image to a Junos OS software image with enhanced automation, or from a Junos OS software image with enhanced automation to a standard Junos OS software image is not supported.

To upgrade all members using NSSU:

1. Download the software package by following the procedure in the “Downloading Software Files with a Browser” section in [“Upgrading Software” on page 273](#).
2. Copy the software package or packages to the Virtual Chassis or mixed Virtual Chassis. We recommend that you copy the file to the `/var/tmp` directory on the master.
3. Log in to the Virtual Chassis or mixed Virtual Chassis using the console connection or the virtual management Ethernet (VME) interface. Using a console connection allows you to monitor the progress of the master switch reboot.
4. Start the NSSU:
 - On a Virtual Chassis or mixed Virtual Chassis, enter:

```
user@switch> request system software nonstop-upgrade force-host  
/var/tmp/package-name.tgz
```

where *package-name.tgz* is, for example,
install-qfx-3-13.2X50-D15.3-domestic-signed.tgz.

The switch displays status messages similar to the following messages as the upgrade executes:

```
Chassis ISSU Check Done
NSSU: Validating Image
NSSU: Preparing Backup RE
Installing image on other FPC's along with the backup

Checking pending install on fpc1
Pushing bundle to fpc1
WARNING: A reboot is required to install the software
WARNING: Use the 'request system reboot' command immediately
Completed install on fpc1

Checking pending install on fpc2
Pushing bundle to fpc2
WARNING: A reboot is required to install the software
WARNING: Use the 'request system reboot' command immediately
Completed install on fpc2

Rebooting fpc1
NSSU: Backup RE Prepare Done
Waiting for Backup RE reboot
GRES operational
Initiating Chassis In-Service-Upgrade
Chassis NSSU Started
NSSU: Preparing Daemons
NSSU: Daemons Ready for NSSU
NSSU: Starting Upgrade for FRUs
NSSU: Preparing for Switchover
NSSU: Ready for Switchover
Checking In-Service-Upgrade status
  Item          Status          Reason
  FPC 0         Online
  FPC 1         Online
  FPC 2         Online (ISSU)
Going to install image on master
WARNING: A reboot is required to install the software
WARNING: Use the 'request system reboot' command immediately
relinquish mastership
NSSU: IDLE

*** FINAL System shutdown message from user@switch ***

System going down IMMEDIATELY
```

```
Shutdown NOW!
[pid 9336]
```

5. Log in after the reboot of the original master switch completes. To verify that the software on all Routing Engines in the Virtual Chassis or mixed Virtual Chassis members has been upgraded, enter the following command:

```
user@switch> show version
```

6. To ensure that the resilient dual-root partitions feature operates correctly, copy the new Junos OS image into the alternate root partitions of all members:

```
user@switch> request system snapshot slice alternate all-members
```

Resilient dual-root partitions allow the switch to boot transparently from the alternate root partition if the system fails to boot from the primary root partition.

**Related
Documentation**

- [Understanding Nonstop Software Upgrade on a Virtual Chassis and Mixed Virtual Chassis on page 127](#)
- [Understanding Resilient Dual-Root Partitions on Switches](#)

Upgrading Software on a Virtual Chassis Fabric Using Nonstop Software Upgrade

Nonstop software upgrade (NSSU) enables you to upgrade the software running on all member switches in a Virtual Chassis Fabric (VCF) with minimal network traffic disruption during the upgrade. A VCF can contain 20 members—up to 2 members can be in the Routing Engine role, and up to 18 members can be configured in the line-card role. You can upgrade software for a fixed configuration of switches or for a mixed mode of switches in a VCF.

This topic covers:

- [Preparing the Switch for Software Installation on page 142](#)
- [Upgrading the Software Using NSSU on page 144](#)

Preparing the Switch for Software Installation

Before you begin software installation using NSSU:

- Ensure that the VCF is configured correctly to support NSSU. Verify that:
 - The VCF members are connected in a spine-and-leaf topology. A spine-and-leaf topology prevents the Virtual Chassis from splitting during an NSSU. Each leaf device must be connected to both spine devices.
 - The VCF must be preprovisioned so that the line-card role has been explicitly assigned to member switches acting in a line-card role, and that the Routing Engine role has been explicitly assigned to member switches acting in a Routing Engine role. During an NSSU, the VCF members must maintain their roles—the master and backup must maintain their master and backup roles (although mastership will change), the member switches must remain their Routing Engine roles, and the remaining switches must maintain their line-card roles.
 - Only two preprovisioned members in the Routing Engine role are supported. If more than two Routing Engines are configured, a warning will be issued, and NSSU will stop.
 - A two-member Virtual Chassis has **no-split-detection** configured so that the VCF does not split when an NSSU upgrades a member.
- Verify that the members are running the same version of the software:

```
user@switch> show version
```

If you are going to perform an NSSU on a fixed configuration of switches or a mixed mode configuration of switches that are not running the same version of the software, use the `request system software nonstop-upgrade <set [package-name package-name]> reboot` command to upgrade the software on the inconsistent members.



NOTE: This command can require up to three software images, depending on devices configured in the VCF.

For example:

```
user@switch> request system software nonstop-upgrade add set [jinstall-qfx5100.tgz
jinstall-qfx3500.tgz jinstall-ex-4300.tgz] reboot
```

- Ensure that graceful Routing Engine switchover (GRES) is enabled. To verify that they are enabled, you need to check only the state of nonstop active routing—if nonstop active routing is enabled, then graceful Routing Engine switchover is enabled.

To verify that nonstop active routing is enabled:

```
user@switch> show task replication
Stateful Replication: Enabled
RE mode: Master
```

Protocol	Synchronization Status
OSPF	Complete
BGP	Complete
PIM	Complete

If nonstop active routing is not enabled (**Stateful Replication is Disabled**), see *Example: Configuring Nonstop Active Routing on Switches* for information on how to enable it.

- Enable nonstop bridging (NSB). Enabling NSB ensures that all NSB-supported Layer 2 protocols operate seamlessly during the Routing Engine switchover that is part of the NSSU.
- (Optional) Back up the system software—Junos OS, the active configuration, and log files—on each member to an external storage device with the `request system snapshot` command.

Upgrading the Software Using NSSU

This procedure describes how to upgrade the software running on all VCF members using NSSU. When the upgrade completes, all members are running the new version of the software. Because a graceful Routing Engine switchover occurs during the upgrade, the original VCF backup is the new master.

During NSSU, the master copies the new software image to all the members in the VCF and reboots them in turn. If copying the new software to a member fails or rebooting a member fails, NSSU aborts the upgrade process and logs the error. In this case, you must manually perform recovery measures for members left in an incompatible state, to restore all members to running the same version of the software. Starting in Junos OS Release 14.1X53-D40, NSSU automatically invokes recovery measures after either of these failures, as follows:

- if NSSU aborts due to a copy error, the new image is removed from any members to which it was already copied.
- If any member fails to reboot, NSSU automatically initiates a clean VCF restart by bringing down and rebooting the entire VCF. All members come up running the new software at the same time. This action cleanly recovers stable VCF operation more quickly than having an unstable VCF running different versions of the software trying to converge.



NOTE: Junos OS software images with enhanced automation are only supported on a non-mixed VCF with QFX5100 switches. Also, performing an NSSU from a standard Junos OS software image to a Junos OS software image with enhanced automation, or from a Junos OS software image with enhanced automation to a standard Junos OS software image is not supported.

To upgrade all members using NSSU:

1. Download the software package by following the procedure in the “Downloading Software Files with a Browser” section in [“Upgrading Software” on page 273](#) and *Downloading Software Packages from Juniper Networks*. If you are upgrading the software running on a mixed mode VCF, download the software packages for each switch type.
2. Copy the software package or packages to the VCF. We recommend that you copy the file to the `/var/tmp` directory on the master.
3. Log in to the VCF using the console connection of the master or the virtual management Ethernet (VME) interface. Without the console connection, you will not be able to view any CLI output during an NSSU reboot. The console connection enables you to view CLI output during an NSSU reboot and monitor the progress of the master switch reboot.
4. Start the NSSU:

- To perform an NSSU on a fixed configuration of switches (QFX3500/QFX3600, QFX5100, or EX4300 switches), enter:

```
user@switch> request system software nonstop-upgrade force-host
/var/tmp/package-name.tgz
```

where *package-name.tgz* is, for example, *jinstall-qfx5100.tgz*.

- To perform an NSSU on a mixed mode configuration of switches (QFX3500/QFX3600, QFX5100, or EX4300 switches), enter:

```
user@switch> request system software nonstop-upgrade force-host set
[package-name.tgz package-name.tgz
package-name.tgz]
```

where *[package-name.tgz package-name.tgz package-name.tgz]* is, for example, *[jinstall-qfx5100.tgz jinstall-qfx3500.tgz jinstall-ex-4300.tgz]*.

As the upgrade executes, the switch displays status messages similar to the following sample output for an NSSU operation on a fixed configuration VCF with four QFX5100 switches:

```
user@switch> request system software nonstop-upgrade force-host
/var/tmp/jinstall-qfx-5-flex-14.1-20160918_x141X53_vjqfd.0-domestic.tgz no-validate
```

```
Chassis ISSU Check Done
[Sep 24 11:53:16]:ISSU: Validating Image
[Sep 24 11:53:16]:ISSU: Preparing Backup RE
Installing image on other FPC's along with the backup
```

```
[Sep 24 11:53:37]: Retrieving software images. This process can take several
minutes. Please be patient..
```

```
Retrieving version and model information from
/var/tmp/jinstall-qfx-5-flex-14.1-20160918_x141X53_vjqfd.0-domestic.tgz
Starting with package
/var/tmp/jinstall-qfx-5-flex-14.1-20160918_x141X53_vjqfd.0-domestic.tgz
```

```
Download done for package
/var/tmp/jinstall-qfx-5-flex-14.1-20160918_x141X53_vjqfd.0-domestic.tgz
Pushing bundle to fpc1
Pushing bundle to fpc4
Pushing bundle to fpc5
fpc1
```

```
WARNING: The software that is being installed has limited support.
WARNING: Run 'file show /etc/notices/unsupported.txt' for details.
```

```
WARNING: The software that is being installed has limited support.
WARNING: Run 'file show /etc/notices/unsupported.txt' for details.
```

Saving contents of boot area prior to installation

```
WARNING: This package will load JUNOS 14.1-20160918_x141X53_vjqfd.0
software.
WARNING: It will save JUNOS configuration files, and SSH keys
WARNING: (if configured), but erase all other files and information
WARNING: stored on this machine. It will attempt to preserve dumps
WARNING: and log files, but this can not be guaranteed. This is the
WARNING: pre-installation stage and all the software is loaded when
WARNING: you reboot the system.
```

```
POST-INSTALL...
Saving the config files ...
NOTICE: uncommitted changes have been saved in
/var/db/config/juniper.conf.pre-install
Copying jpuppet pkg to /var/sw/pkg
Copying chef pkg to /var/sw/pkg
Pushing installation package to host...
Upgrade Host OS to 14.1-20160918_x141X53_vjqfd.0...
./jinstall-qfx-5-flex-14.1-20160918_x141X53_vjqfd.0-domestic.img.gz: OK
/boot/boot
Extracting image...
Host upgrade staging completed. Need reboot to complete upgrade installation.
WARNING: Changing next boot to SSD0
WARNING: Changing boot device enable from 0x3F to 0x3F
Install jinstall-vjunos completed

WARNING: A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the
WARNING: 'request system reboot' command when software installation is
WARNING: complete. To abort the installation, do not reboot your system,
WARNING: instead use the 'request system software delete jinstall'
WARNING: command as soon as this operation completes.

Saving state for rollback ...
fpc4
WARNING: The software that is being installed has limited support.
WARNING: Run 'file show /etc/notices/unsupported.txt' for details.

WARNING: The software that is being installed has limited support.
WARNING: Run 'file show /etc/notices/unsupported.txt' for details.

Saving contents of boot area prior to installation

WARNING: This package will load JUNOS 14.1-20160918_x141X53_vjqfd.0
software.
WARNING: It will save JUNOS configuration files, and SSH keys
WARNING: (if configured), but erase all other files and information
WARNING: stored on this machine. It will attempt to preserve dumps
WARNING: and log files, but this can not be guaranteed. This is the
WARNING: pre-installation stage and all the software is loaded when
WARNING: you reboot the system.

POST-INSTALL...
Saving the config files ...
NOTICE: uncommitted changes have been saved in
/var/db/config/juniper.conf.pre-install
Copying jpuppet pkg to /var/sw/pkg
Copying chef pkg to /var/sw/pkg
Pushing installation package to host...
Upgrade Host OS to 14.1-20160918_x141X53_vjqfd.0...
./jinstall-qfx-5-flex-14.1-20160918_x141X53_vjqfd.0-domestic.img.gz: OK
/boot/boot
Extracting image...
Host upgrade staging completed. Need reboot to complete upgrade installation.
WARNING: Changing next boot to SSD0
WARNING: Changing boot device enable from 0x3F to 0x3F
Install jinstall-vjunos completed

WARNING: A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the
WARNING: 'request system reboot' command when software installation is
```

```

WARNING:    complete. To abort the installation, do not reboot your system,
WARNING:    instead use the 'request system software delete jinstall'
WARNING:    command as soon as this operation completes.

```

```

Saving state for rollback ...

```

```

fpc5
WARNING:    The software that is being installed has limited support.
WARNING:    Run 'file show /etc/notices/unsupported.txt' for details.

```

```

WARNING:    The software that is being installed has limited support.
WARNING:    Run 'file show /etc/notices/unsupported.txt' for details.

```

```

Saving contents of boot area prior to installation

```

```

WARNING:    This package will load JUNOS 14.1-20160918_x141X53_vjqfd.0
software.
WARNING:    It will save JUNOS configuration files, and SSH keys
WARNING:    (if configured), but erase all other files and information
WARNING:    stored on this machine. It will attempt to preserve dumps
WARNING:    and log files, but this can not be guaranteed. This is the
WARNING:    pre-installation stage and all the software is loaded when
WARNING:    you reboot the system.

```

```

POST-INSTALL...

```

```

Saving the config files ...
NOTICE: uncommitted changes have been saved in
/var/db/config/juniper.conf.pre-install
Copying jpuppet pkg to /var/sw/pkg
Copying chef pkg to /var/sw/pkg
Pushing installation package to host...
Upgrade Host OS to 14.1-20160918_x141X53_vjqfd.0...
./jinstall-qfx-5-flex-14.1-20160918_x141X53_vjqfd.0-domestic.img.gz: OK
/boot/boot
Extracting image...
Host upgrade staging completed. Need reboot to complete upgrade installation.
WARNING: Changing next boot to SSD0
WARNING: Changing boot device enable from 0x18 to 0x18
Install jinstall-vjunos completed

```

```

WARNING:    A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the
WARNING:    'request system reboot' command when software installation is
WARNING:    complete. To abort the installation, do not reboot your system,
WARNING:    instead use the 'request system software delete jinstall'
WARNING:    command as soon as this operation completes.

```

```

Saving state for rollback ...

```

```

[Sep 24 12:05:28]: Backup upgrade done
[Sep 24 12:05:28]: Rebooting Backup RE

```

```

Rebooting fpc1

```

```

[Sep 24 12:05:28]:ISSU: Backup RE Prepare Done
[Sep 24 12:05:28]: Waiting for Backup RE reboot
[Sep 24 12:16:44]: GRES operational
[Sep 24 12:16:44]: "Initiating Chassis In-Service-Upgrade"
Chassis ISSU Started
[Sep 24 12:16:50]:ISSU: Preparing Daemons
.
.
[Sep 24 12:17:50]:ISSU: Daemons Ready for ISSU
[Sep 24 12:17:54]:ISSU: Starting Upgrade for FRUs

```



```

FPC 5           Online (ISSU)
[Sep 24 12:45:48]: Going to install image on master

WARNING:        The software that is being installed has limited support.
WARNING:        Run 'file show /etc/notices/unsupported.txt' for details.

WARNING:        The software that is being installed has limited support.
WARNING:        Run 'file show /etc/notices/unsupported.txt' for details.

Saving contents of boot area prior to installation

WARNING:        This package will load JUNOS 14.1-20160918_x141X53_vjqfd.0
software.
WARNING:        It will save JUNOS configuration files, and SSH keys
WARNING:        (if configured), but erase all other files and information
WARNING:        stored on this machine. It will attempt to preserve dumps
WARNING:        and log files, but this can not be guaranteed. This is the
WARNING:        pre-installation stage and all the software is loaded when
WARNING:        you reboot the system.

POST-INSTALL...
Saving the config files ...
NOTICE: uncommitted changes have been saved in
/var/db/config/juniper.conf.pre-install
Copying jpuppet pkg to /var/sw/pkg
Copying chef pkg to /var/sw/pkg
Pushing installation package to host...
Upgrade Host OS to 14.1-20160918_x141X53_vjqfd.0...
./jinstall-qfx-5-flex-14.1-20160918_x141X53_vjqfd.0-domestic.img.gz: OK
/boot/boot
Extracting image...
Host upgrade staging completed. Need reboot to complete upgrade installation.
WARNING: Changing next boot to SSD0
WARNING: Changing boot device enable from 0x3F to 0x3F
Install jinstall-vjunos completed

WARNING:        A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the
WARNING:        'request system reboot' command when software installation is
WARNING:        complete. To abort the installation, do not reboot your system,
WARNING:        instead use the 'request system software delete jinstall'
WARNING:        command as soon as this operation completes.

Saving state for rollback ...
failover links
[Sep 24 12:50:22]: Rebooting Old master
Chassis NSSU Completed
[Sep 24 12:50:22]:ISSU: IDLE

5. Log in after the reboot of the original master switch completes. To verify that the
software on all Routing Engines in the VCF members has been upgraded, enter the
following command:

user@switch> show version

```

- Related Documentation**
- [request system software nonstop-upgrade on page 542](#)
 - [show chassis nonstop-upgrade on page 552](#)
 - [Configuring Graceful Routing Engine Switchover in a Virtual Chassis \(CLI Procedure\)](#)

- [Understanding Nonstop Software Upgrade on a Virtual Chassis Fabric on page 131](#)
- *Configuring Nonstop Bridging on Switches (CLI Procedure)*
- *Example: Configuring Nonstop Active Routing on Switches*
- *Example: Configuring Line-Card Upgrade Groups for Nonstop Software Upgrade on EX Series Switches*
- *Understanding Resilient Dual-Root Partitions on Switches*

PART 9

Licenses

- [Using Licenses on page 153](#)

CHAPTER 9

Using Licenses

- [Junos OS Feature Licenses on page 153](#)
- [Software Features That Require Licenses on the QFX Series on page 154](#)
- [Junos OS Feature License Keys on page 155](#)
- [Generating License Keys on page 159](#)
- [Adding New Licenses \(CLI Procedure\) on page 161](#)
- [Deleting a License \(CLI Procedure\) on page 162](#)
- [Saving License Keys on page 163](#)
- [Verifying Junos OS License Installation on page 164](#)

Junos OS Feature Licenses

Some Junos OS software features require a license to activate the feature. To enable a licensed feature, you need to purchase, install, manage, and verify a license key that corresponds to each licensed feature. To conform to Junos OS feature licensing requirements, you must purchase one license per feature per device. The presence of the appropriate software license key on your device determines whether you are eligible to configure and use the licensed feature.

To speed deployment of licensed features, Junos OS software implements an honor-based licensing structure and provides you with a 30-day grace period to use a licensed feature without a license key installed. The grace period begins when you configure the feature and your device uses the licensed feature for the first time, but not necessarily when you install the license. After the grace period expires, the system generates system log messages saying that the feature requires a license. To clear the error message and use the licensed feature properly, you must install and verify the required license.

For information about how to purchase software licenses, contact your Juniper Networks sales representative.

Related Documentation

- *License Enforcement*
- [Junos OS Feature License Keys on page 155](#)
- *Software Feature Licenses*
- [Verifying Junos OS License Installation on page 164](#)

Software Features That Require Licenses on the QFX Series



NOTE: If you try to configure a feature that is not licensed, you will receive syslog messages saying that you are using a feature that is licensable and that you do not possess a license for the feature. If you try to commit configuration changes for a feature that is not licensed, you will receive a commit warning saying that you have exceeded the allowed license limit for the feature.



NOTE: There is no separate license for Virtual Chassis like there is for Virtual Chassis Fabric.

Table 11 on page 154 lists the licenses you can purchase for each QFX Series software feature.

For information about how to purchase a software license, contact your Juniper Networks sales representative.

Table 11: Junos OS Feature Licenses and Model Numbers for QFX Series Devices

Licensed Software Feature	Supported Devices	Number of Licenses Required	Model Number
QFX Series advanced feature license for Border Gateway Protocol (BGP), Intermediate System-to-Intermediate System (IS-IS), Multi-protocol Label Switching (MPLS), and Virtual Extensible Local Area Network (VXLAN), and Open vSwitch Database (OVSDB)	QFX3500, QFX3600, QFX5100-48S, and QFX5100-48T switches	One per switch, two per Virtual Chassis, and two per Virtual Chassis Fabric	QFX-JSL-EDGE-ADV1
QFX Series advanced feature license for Border Gateway Protocol (BGP), Intermediate System-to-Intermediate System (IS-IS), Multi-protocol Label Switching (MPLS), and Virtual Extensible Local Area Network (VXLAN) and Open vSwitch Database (OVSDB)	QFX5100-24Q and QFX5100-96S switches	One per switch, two per Virtual Chassis, and two per Virtual Chassis Fabric	QFX5100-HDNSE-LIC
QFX Series advanced feature license for Border Gateway Protocol (BGP)	QFX3100 Director device	One per Node device in a network Node group	QFX-JSL-DRCTR-ADV1
QFX Series advanced feature license for Fibre Channel	QFX3500 switch	One per switch on which fibre channel ports are configured	QFX-JSL-EDGE-FC

Table 11: Junos OS Feature Licenses and Model Numbers for QFX Series Devices (*continued*)

Licensed Software Feature	Supported Devices	Number of Licenses Required	Model Number
QFX Series advanced feature license for Fibre Channel	QFX3100 Director device	One per QFX3500 Node device on which fibre channel ports are configured	QFX-JSL-DRCTR-FC
QFX Series advanced feature license for Fibre Channel - Capacity 16	QFX3100 Director device	One for up to 16 QFX3500 Node devices on which fibre channel ports are configured	QFX-JSL-DRCTR-FC-C16
QFX Series feature license for enabling fabric mode	QFX3500 and QFX3600 device	One per device	QFX3000-JSL-EDGE-FAB
QFX Series feature license for base software for QFX3000-G QFabric system	QFX3100 Director device	One per QFX3000-G QFabric system	QFX3008-JSL-DRCTR-FAB
QFX Series feature license for base software for QFX3000-M QFabric system	QFX3100 Director device	One per QFX3000-M QFabric system	QFX3000M-JSL-DRCTR-FAB
QFX and EX Series feature license for enabling Media Access Control security (MACsec)	QFX switches that support MACsec. See <i>Understanding Media Access Control Security (MACsec)</i> .	One per switch, two per Virtual Chassis,	EX-QFX-MACSEC-AGG
Virtual Chassis Fabric (VCF)	All member devices in a Virtual Chassis Fabric (VCF)	Two per Virtual Chassis Fabric (VCF)	QFX-VCF-LIC

Related Documentation

- [Junos OS Feature Licenses on page 153](#)
- [Junos OS Feature License Keys on page 155](#)
- [Generating License Keys on page 159](#)
- [Generating the License Keys for a QFabric System](#)
- [Adding New Licenses \(CLI Procedure\) on page 161](#)
- [Deleting a License \(CLI Procedure\) on page 162](#)
- [Saving License Keys on page 163](#)
- [Verifying Junos OS License Installation on page 164](#)

Junos OS Feature License Keys

Some Junos OS software features require a license to be activated. To enable each licensed feature, you must purchase, install, manage, and verify a license key that corresponds to the licensed feature.

Release-Tied License Keys and Upgrade Licenses on MX Series Routers

The Junos OS licensing infrastructure currently associates a license feature with attributes such as date, platform, and validity. In addition to these attributes, for MX Series routers running Junos OS Release 12.2 and later, a licensed feature can be associated with a release number at the time of generating the license key. This type of release-tied license key is used to validate a particular licensed feature while attempting a software upgrade. The upgrade process aborts if the release number in the license key is earlier than the Junos OS release number to which the system is being upgraded.

Additionally, an upgrade license key can be generated for a release-tied licensed feature. An upgrade license key is used for carrying forward a capacity license to the upgrade release. Although an upgrade license might be an acceptable license on the current release, it does not add to the existing capacity limit. The capacity added in the upgrade license key is valid for the upgrade software release only.

The release number embedded in the license key indicates the maximum release number up to which Junos OS can be upgraded.

As an example, assume that your system is running Junos OS Release 12.2 and is using the **scale-subscriber** licensed feature with a later release-tied upgrade license key installed. If you request a software upgrade to the later release of Junos OS, the software upgrade operation fails and the following error message is displayed:

```
mgd: error: No valid upgrade license found for feature 'scale-subscriber'.  
Aborting Software upgrade.  
Validation failed
```

In this example, to successfully upgrade to the later release of Junos OS, the release number included in the upgrade license key should be greater than or equal to the later release number. Also, you can perform software upgrades up to the previous release without any additional license keys to retain the existing scale limit.

**NOTE:**

When you install a release-tied license, the following apply:

- You can purchase an upgrade capacity license only if a base capacity license for the same scale-tier has already been generated or purchased.
- You cannot install an upgrade license if the capacity does not match any of the existing base capacity licenses on the system.
- The license installation fails when you install a lower release number license key on a higher software release number.
- A release-tied license can be installed on a Junos OS release number that is lower than or equal to the release number included in the license key. For example, a 12.2 license key is valid on Junos OS Release 12.1.
- An upgrade license is valid only on the target release number specified in the license key, but can be installed on an earlier Junos OS release. For example, a 4 K scale-tier upgrade license for Junos OS Release 12.2 can be installed on an earlier release, and the installed count of licenses remains unaltered.
- Release-tied licenses of the previous release are not deleted on upgrading Junos OS to a newer release version.

Licensable Ports on MX5, MX10, and MX40 Routers

Starting with Junos OS Release 12.2, license keys are available to enhance the port capacity on MX5, MX10, and MX40 routers up to the port capacity of an MX80 router. The MX5, MX10, and MX40 routers are derived from the modular MX80 chassis with similar slot and port assignments, and provide all functionality available on an MX80 router, but at a lower capacity. Restricting port capacity is achieved by making a set of MIC slots and ports licensable. MICs without a license are locked, and are unlocked or made usable by installing appropriate upgrade licenses.

The base capacity of a router is identified by the Ideeprom assembly ID (I2C ID), which defines the board type. However, the Junos OS licensing infrastructure allows the use of restricted ports without a license for a grace period of 30 days. After the grace period expires, the router reverts back to the base capacity if no upgrade license is purchased and installed for the locked ports. The I2C ID along with an upgrade license determine the final capacity of an MX5, MX10, or MX40 router.

The MX5, MX10, MX40, and MX80 routers support the following types of MICs:

- A built-in 10-Gigabit Ethernet MIC with four 10-Gigabit Ethernet ports
- Two front-pluggable MICs

A feature ID is assigned to every license upgrade for enhancing port capacity.

[Table 12 on page 158](#) displays the chassis types and their associated port capacity, I2C ID, base capacity, feature ID, feature name, and the final capacity after a license upgrade.

Table 12: Upgrade Licenses for Enhancing Port Capacity

Chassis Type	Port Capacity	I2C ID	Base Capacity	Feature ID and Feature Name	Upgrade Capacity
MX5	20G	0x556	Slot 1 • 1/MIC0	f1—MX5 to MX10 upgrade	Slot 1 and 2 • 1/MIC0 • 1/MIC1
MX10	40G	0x555	Slot 1 and 2 • 1/MIC0 • 1/MIC1	f2—MX10 to MX40 upgrade	Slot 2 and first 2 ports on Slot 0 • 1/MIC1 • First 2 ports on 0/MIC0
MX40	60G	0x554	Slot 1, Slot 2 and first 2 ports on Slot 0 • 1/MIC0 • 1/MIC1 • First 2 ports on 0/MIC0	f3—MX40 to MX80 upgrade	Slot 2 and all ports on Slot 0 • 1/MIC1 • All 4 ports on 0/MIC0

When installing an upgrade license for enhancing port capacity on MX5, MX10 and MX40 routers, consider the following:

- To upgrade an MX5 router to MX80 router capacity, licenses for all three features (f1, f2, f3) must be installed. All three features can be provided in a single license key.
- To upgrade an MX10 router to MX40 router capacity, installing a license key with f2 feature is sufficient.
- Non-applicable feature IDs in a license key reject the upgrade license. For example:
 - An f1 feature ID on an MX10 upgrade license key rejects the license.
 - Feature IDs f1 and f2 on an MX40 upgrade license key reject the entire license.

Port Activation on MX104 Routers

Starting with Junos OS Release 13.3, license keys are available to activate the ports on the MX104 router. MX104 routers have four built-in ports. By default, in the absence of valid licenses, all four built-in ports are deactivated. By installing licenses, you can activate any two of the four or all of the four built-in ports. For instance, you can install a license to activate the first two built-in ports (xe-2/0/0 and xe-2/0/1) or you can install a license to activate the next two built-in ports (xe-2/0/2 and xe-2/0/3). You can also install a license to activate all four built-in ports (xe-2/0/0, xe-2/0/1, xe-2/0/2, and xe-2/0/3). If you have already activated two of the built-in ports, you can install an additional license to activate the other two built-in ports on the MX104 router.

A feature ID is assigned to every license for activating the built-in ports on the MX104 router. The port license model with the feature ID is described in [Table 13 on page 159](#).

Table 13: Port Activation License Model for MX104 Routers

Feature ID	Feature Name	Functionality
F1	MX104 2X10G Port Activate (0 and 1)	Ability to activate first two built-in ports (xe-2/0/0 and xe-2/0/1)
F2	MX104 2X10G Port Activate (2 and 3)	Ability to activate next two built-in ports (xe-2/0/2 and xe-2/0/3)

Both the features are also provided in a single license key for ease of use. To activate all four ports, you must either install the licenses for both the features listed in [Table 13 on page 159](#) or the single license key for both features. If you install the single license key when feature IDs F1 and F2 are already installed, the license does not get rejected. Also, MX104 routers do not support the graceful license expiry policy. A graceful license expiry policy allows the use of a feature for a certain period of time (usually a grace period of 30 days), and reverts if the license for that feature is not installed after the grace period.

Related Documentation

- [Junos OS Feature Licenses on page 153](#)
- *License Enforcement*
- *Software Feature Licenses*
- [Verifying Junos OS License Installation on page 164](#)
- [show system license on page 559](#)

Generating License Keys

When you purchase a Junos OS software feature license for a device, you receive an e-mail containing an authorization code for the feature license from Juniper Networks. You can use the authorization code to generate a unique license key (a combination of the authorization code and the device's serial number) for the device, and then add the license key on the device.

Before generating the license keys for a device:

- Purchase the required licenses for the device. See [“Software Features That Require Licenses on the QFX Series” on page 154](#).
- Note down the authorization code in the e-mail you received from Juniper Networks when you purchased the license.
- Determine the serial number of the device. For instructions, see *Locating the Serial Number on a QFX3500 Device or Component*.

To generate the license keys for a device:



NOTE: This procedure shows you how to generate license keys on a QFX Series device, but you can follow the same procedure for any device.

1. In a browser, log in to the Juniper Networks License Management System at <https://www.juniper.net/lcrs/license.do>.

The Manage Product Licenses page appears.



NOTE: To access the licensing site, you must have a service contract with Juniper Networks and an access account. If you need help obtaining an account, complete the registration form at the Juniper Networks website <https://www.juniper.net/registration/Register.jsp>.

2. On the Generate Licenses tab, select **QFX Series Product** from the drop-down list, and click **Go**.

The Generate Licenses - QFX Series Product page appears.

3. Select the **QFX Series Product Device** option button, and click **Continue**.

The Generate Licenses - QFX Series Product Devices page appears.

4. In the **Device Serial Number** field, enter the serial number for the device.
5. In the **Authorization Code** field, enter the authorization code in the e-mail you received from Juniper Networks when you purchased the license.
6. (Optional) If you want to enter another authorization code for the same device, click **Enter More Authorization Codes** to display a new authorization code field. Enter the authorization code in this field.
7. Click **Confirm**.

The Confirm License Information page appears, displaying a summary of the information you submitted to the License Management System.

8. Review the information to ensure everything is correct and then click **Generate License**.

The Generate Licenses - QFX Series Product Devices page appears, displaying a summary of your license keys, including a link that displays the details of your new license keys.

9. Select the file format in which you want to obtain your new license keys.
10. Select the delivery method you want to use to obtain your new license keys.

To download the license keys:

- Select the **Download to this computer** option button, and click **OK**.

To e-mail the license keys:

- Select the **Send e-mail to e-mail ID** option button, and click **OK**.

Related Documentation

- [Software Features That Require Licenses on the QFX Series on page 154](#)
- [Adding New Licenses \(CLI Procedure\) on page 161](#)
- [Locating the Serial Number on a QFX3500 Device or Component](#)

Adding New Licenses (CLI Procedure)

Before adding new licenses, complete the following tasks:

- Purchase the required licenses.
- Establish basic network connectivity with the router or switch. For instructions on establishing basic connectivity, see the *Getting Started Guide* or *Quick Start Guide* for your device.



NOTE: On QFabric systems, install your licenses in the default partition of the QFabric system and not on the individual components (Node devices and Interconnect devices).

To add a new license key to the device using the CLI:

1. From the CLI operational mode, enter one of the following CLI commands:

- To add a license key from a file or URL, enter the following command, specifying the filename or the URL where the key is located:

```
user@host> request system license add filename | url
```

- To add a license key from the terminal, enter the following command:

```
user@host> request system license add terminal
```

2. When prompted, enter the license key, separating multiple license keys with a blank line.

If the license key you enter is invalid, an error appears in the CLI output when you press Ctrl+d to exit license entry mode.

3. Go on to [“Verifying Junos OS License Installation” on page 164](#).

On routers that have graceful Routing Engine switchover (GRES) enabled, after successfully adding the new license on the master Routing Engine, the license keys are automatically synchronized on the backup Routing Engine as well. However, in case GRES is not enabled, the new license is added on each Routing Engine separately. This ensures

that the license key is enabled on the backup Routing Engine during changeover of mastership between the Routing Engines.

To add a new license key to a router with dual Routing Engines without GRES:

1. After adding the new license key on the master Routing Engine, use the **request chassis routing-engine master switch** command to have the backup Routing Engine become the master Routing Engine.
2. Log in to the active Routing Engine and add the new license key, repeat the same step.



NOTE: Adding a license key to the router or switch might be delayed if a kernel resynchronization operation is in progress at that time. The following message is displayed on the CLI when the license-adding operation is about to be delayed:

A kernel re-sync operation is in progress. License update may take several minutes to complete.

Related Documentation

- [Deleting a License \(CLI Procedure\) on page 162](#)
- [Junos OS Feature Licenses on page 153](#)
- [Verifying Junos OS License Installation on page 164](#)
- [request system license add on page 556](#)

Deleting a License (CLI Procedure)

Before deleting a license, establish basic network connectivity with the router or switch. For instructions on establishing basic connectivity, see the *Getting Started Guide* or *Quick Start Guide* for your router or switch.

You have the options to delete a single license, delete all licenses, or delete a list of licenses enclosed in brackets.

1. Display the licenses available to be deleted.

```
user@host> request system license delete license-identifier-list ?
```

```
Possible completions:
```

E00468XXX4	License key identifier
JUNOS10XXX1	License key identifier
JUNOS10XXX2	License key identifier
JUNOS10XXX3	License key identifier
JUNOS10XXX4	License key identifier
[Open a set of values

2. To delete a license key or keys from a device using the CLI operational mode, select one of the following methods:

- Delete a single license by specifying the license ID. Using this option, you can delete only one license at a time.

```
user@host> request system license delete license-identifier
```

- Delete all license keys from the current device.

```
user@host> request system license delete all
```

- Delete multiple license keys from the current device. Specify the license identifier for each key and enclose the list of identifiers in brackets.

```
user@host> request system license delete license-identifier-list [JUNOS10XXX1
JUNOS10XXX3 JUNOS10XXX4 ...]
```

```
Delete license(s) ?
[yes,no] (no) yes
```

3. Go on to [“Verifying Junos OS License Installation” on page 164](#).



NOTE: Deleting a license key from the router or switch might be delayed if a kernel resynchronization operation is in progress at that time. The following message is displayed on the CLI when the license-deleting operation is about to be delayed:

A kernel re-sync operation is in progress. License update may take several minutes to complete.

Related Documentation

- [Adding New Licenses \(CLI Procedure\) on page 161](#)
- [Saving License Keys on page 163](#)
- [Junos OS Feature Licenses on page 153](#)
- [Verifying Junos OS License Installation on page 164](#)
- [request system license delete on page 557](#)

Saving License Keys

Before saving a license, establish basic network connectivity with the router or switch. For instructions on establishing basic connectivity, see the *Getting Started Guide* or *Quick Start Guide* for your router or switch.

To save the licenses installed on a device to a file using the CLI:

1. From the CLI operational mode, enter one of the following CLI commands:

- To save the installed license keys to a file or URL, enter the following command:

```
user@host> request system license save filename | url
```

For example, the following command saves the installed license keys to a file named `license.config`:

- To save a license key from the terminal, enter the following command:

```
user@host> request system license save ftp://user@host/license.config
```

2. Go on to [“Verifying Junos OS License Installation” on page 164](#).

- Related Documentation**
- [Adding New Licenses \(CLI Procedure\) on page 161](#)
 - [Deleting a License \(CLI Procedure\) on page 162](#)
 - [Junos OS Feature Licenses on page 153](#)
 - [Verifying Junos OS License Installation on page 164](#)

Verifying Junos OS License Installation

To verify Junos OS license management, perform the following tasks:

- [Displaying Installed Licenses on page 164](#)
- [Displaying License Usage on page 165](#)

Displaying Installed Licenses

Purpose Verify that the expected licenses are installed and active on the router or switch.

Action From the CLI, enter the **show system license** command.

Sample Output

```
user@host> show system license
License usage:

```

Feature name	Licenses used	Licenses installed	Licenses needed	Expiry
subscriber-acct	0	1	0	permanent
subscriber-auth	0	1	0	permanent
subscriber-addr	0	1	0	permanent
subscriber-vlan	0	1	0	permanent
subscriber-ip	0	1	0	permanent
scale-subscriber	0	1000	0	permanent
scale-l2tp	0	1000	0	permanent
scale-mobile-ip	0	1000	0	permanent

```

Licenses installed:
License identifier: E000185416
License version: 2
Features:
subscriber-acct - Per Subscriber Radius Accounting
permanent
subscriber-auth - Per Subscriber Radius Authentication
permanent
subscriber-addr - Address Pool Assignment
permanent
subscriber-vlan - Dynamic Auto-sensed Vlan
permanent
subscriber-ip - Dynamic and Static IP
permanent
```

Meaning The output shows a list of the license usage and a list of the licenses installed on the router or switch. Verify the following information:

- Each license is present. Licenses are listed in ascending alphanumeric order by license ID.
- The state of each license is **permanent**.



NOTE: A state of invalid indicates that the license key is not a valid license key. Either it was entered incorrectly or it is not valid for the specific device.

- The feature for each license is the expected feature. The features enabled are listed by license. An all-inclusive license has all features listed.
- All configured features have the required licenses installed. The Licenses needed column must show that no licenses are required.

Displaying License Usage

Purpose Verify that the licenses fully cover the feature configuration on the router or switch.

Action From the CLI, enter the **show system license usage** command.

Sample Output

```
user@host> show system license usage
```

	Licenses used	Licenses installed	Licenses needed	Expiry
Feature name				
subscriber-addr	1	0	1	29 days
scale-subscriber	0	1000	0	permanent
scale-l2tp	0	1000	0	permanent
scale-mobile-ip	0	1000	0	permanent

Meaning The output shows any licenses installed on the router or switch and how they are used. Verify the following information:

- Any configured licenses appear in the output. The output lists features in ascending alphabetical order by license name. The number of licenses appears in the third column. Verify that you have installed the appropriate number of licenses.
- The number of licenses used matches the number of configured features. If a licensed feature is configured, the feature is considered used. The sample output shows that the subscriber address pooling feature is configured.
- A license is installed on the router or switch for each configured feature. For every feature configured that does not have a license, one license is needed.

For example, the sample output shows that the subscriber address feature is configured but that the license for the feature has not yet been installed. The license must be installed within the remaining grace period to be in compliance.

PART 10

Login Classes

- [Understanding Login Classes on page 169](#)

CHAPTER 10

Understanding Login Classes

- [Configuring Junos OS User Accounts on page 169](#)
- [Configuring the Junos OS to Display a System Login Announcement on page 170](#)
- [Configuring Junos OS to Display a System Login Message on page 170](#)

Configuring Junos OS User Accounts

User accounts provide one way for users to access the router or switch. For each account, you define the login name for the user and, optionally, information that identifies the user. After you have created an account, the software creates a home directory for the user.

To create user accounts, include the **user** statement at the **[edit system login]** hierarchy level:

```
[edit system login]
user username {
  class class-name;
  class {
    (encrypted-password "password" | plain-text-password);
    ssh-rsa "public-key";
    ssh-dsa "public-key";
  }
  full-name complete-name;
  uid uid-value;
  class class-name;
}
```

Related Documentation

- [Example: Configuring User Accounts](#)
- [Example: Configuring User Login Accounts](#)
- [Junos OS User Accounts Overview](#)
- [Limiting the Number of User Login Attempts for SSH and Telnet Sessions](#)

Configuring the Junos OS to Display a System Login Announcement

By default, no login announcement is displayed. To configure a system login announcement, include the **announcement** statement at the **[edit system login]** hierarchy level:

```
[edit system login]
announcement text;
```

If the announcement text contains any spaces, enclose the text in quotation marks.

A system login *announcement* appears after the user logs in. A system login *message* appears before the user logs in.



TIP: You can use the same special characters described to format your system login announcement.

Related Documentation

- *Defining Junos OS Login Classes*
- *Configuring the Junos OS to Display a System Login Message*

Configuring Junos OS to Display a System Login Message

By default, no login message is displayed on the router or switch. To configure a system login message, include the **message** statement at the **[edit system login]** hierarchy level:

```
[edit system login]
message text;
```

If the message text contains any spaces, enclose it in quotation marks.

You can format the message using the following special characters:

- \n—New line
- \t—Horizontal tab
- \'—Single quotation mark
- \"—Double quotation mark
- \\—Backslash

The following is a sample login message configuration:

```
[edit]
system {
  login {
    message "\n\n\n\tUNAUTHORIZED USE OF THIS SYSTEM\n\tIS STRICTLY PROHIBITED!\n\n\tPlease contact\n\t'company-noc@company.com\t' to gain\n\taccess to this equipment if you need authorization.\n\n\n";
  }
}
```

```
    }  
}
```

The preceding login message configuration example produces a login message similar to the following:

```
server% telnet router1  
Trying 1.1.1.1...  
Connected to router1.  
Escape character is '^['.
```

```
UNAUTHORIZED USE OF THIS SYSTEM  
IS STRICTLY PROHIBITED!
```

```
Please contact 'company-noc@company.com' to gain  
access to this equipment if you need authorization.
```

```
router1 (ttyp0)
```

```
login:
```

A system login message appears before the user logs in. A system login announcement appears after the user logs in.

- Related Documentation**
- *Defining Junos OS Login Classes*
 - [message on page 375](#)

PART 11

Network Time Protocol (NTP)

- [Understanding NTP on page 175](#)

CHAPTER 11

Understanding NTP

- [Understanding NTP Time Servers on page 175](#)
- [Configuring NTP Authentication Keys on page 176](#)
- [Configuring the NTP Time Server and Time Services on page 177](#)
- [Configuring the Switch to Listen for Broadcast Messages Using NTP on page 179](#)
- [Configuring the Switch to Listen for Multicast Messages Using NTP on page 180](#)
- [Setting the Date and Time on page 180](#)
- [Synchronizing and Coordinating Time Distribution Using NTP on page 181](#)
- [Example: Configuring NTP on page 183](#)
- [Example: Configuring NTP as a Single Time Source for Router and Switch Clock Synchronization on page 186](#)

Understanding NTP Time Servers

The IETF defined the Network Time Protocol (NTP) to synchronize the clocks of computer systems connected to each other over a network. Most large networks have an NTP server that ensures that time on all devices is synchronized, regardless of the device location. If you use one or more NTP servers on your network, ensure you include the NTS server addresses in your Junos OS configuration.

When configuring the NTP, you can specify which system on the network is the authoritative time source, or time server, and how time is synchronized between systems on the network. To do this, you configure the router, switch, or security device to operate in one of the following modes:

- **Client mode**—In this mode, the local router or switch can be synchronized with the remote system, but the remote system can never be synchronized with the local router or switch.
- **Symmetric active mode**—In this mode, the local router or switch and the remote system can synchronize with each other. You use this mode in a network in which either the local router or switch or the remote system might be a better source of time.



NOTE: Symmetric active mode can be initiated by either the local or the remote system. Only one system needs to be configured to do so. This means that the local system can synchronize with any system that offers symmetric active mode without any configuration whatsoever. However, we strongly encourage you to configure authentication to ensure that the local system synchronizes only with known time servers.

- Broadcast mode—In this mode, the local router or switch sends periodic broadcast messages to a client population at the specified broadcast or multicast address. Normally, you include this statement only when the local router or switch is operating as a transmitter.
- Server mode—In this mode, the local router or switch operates as an NTP server.



NOTE: In NTP server mode, the Junos OS supports authentication as follows:

- If the NTP request from the client comes with an authentication key (such as a key ID and message digest sent with the packet), the request is processed and answered based on the authentication key match.
- If the NTP request from the client comes without any authentication key, the request is processed and answered without authentication.

**Related
Documentation**

- [Configuring the NTP Time Server and Time Services on page 177](#)
- [Example: Configuring NTP as a Single Time Source for Router and Switch Clock Synchronization on page 186](#)

Configuring NTP Authentication Keys

Time synchronization can be authenticated to ensure that the switch obtains its time services only from known sources. By default, network time synchronization is unauthenticated. The switch will synchronize to whatever system appears to have the most accurate time. We strongly encourage you to configure authentication of network time services.

To authenticate other time servers, include the **trusted-key** statement at the **[edit system ntp]** hierarchy level. Only time servers that transmit network time packets containing one of the specified key numbers are eligible to be synchronized. Additionally, the key needs to match the value configured for that key number. Other systems can synchronize to the local switch without being authenticated.

```
[edit system ntp]  
trusted-key [ key-numbers ];
```

Each key can be any 32-bit unsigned integer except 0. Include the **key** option in the **peer**, **server**, or **broadcast** statements to transmit the specified authentication key when

transmitting packets. The key is necessary if the remote system has authentication enabled so that it can synchronize to the local system.

To define the authentication keys, include the **authentication-key** statement at the **[edit system ntp]** hierarchy level:

```
[edit system ntp]
authentication-key key-number type type value password;
```

number is the key number, **type** is the authentication type (only Message Digest 5 [MD5] is supported), and **password** is the password for this key. The key number, type, and password must match on all systems using that particular key for authentication.

**Related
Documentation**

- [Understanding NTP Time Servers on page 175](#)
- [Example: Configuring NTP as a Single Time Source for Router and Switch Clock Synchronization on page 186](#)
- [trusted-key on page 386](#)
- [authentication-key](#)

Configuring the NTP Time Server and Time Services

When you use NTP, configure the switch to operate in one of the following modes:

- Client mode
- Symmetric active mode
- Broadcast mode
- Server mode

The following topics describe how to configure these modes of operation:

1. [Configuring the Switch to Operate in Client Mode on page 177](#)
2. [Configuring the Router or Switch to Operate in Symmetric Active Mode on page 178](#)
3. [Configuring the Router or Switch to Operate in Broadcast Mode on page 178](#)
4. [Configuring the Router or Switch to Operate in Server Mode on page 179](#)

Configuring the Switch to Operate in Client Mode

To configure the local router or switch to operate in client mode, include the **server** statement and other optional statements at the **[edit system ntp]** hierarchy level:

```
[edit system ntp]
server address <key key-number> <version value> <prefer>;
authentication-key key-number type type value password;
boot-server address;
trusted-key [ key-numbers ];
```

Specify the address of the system acting as the time server. You must specify an address, not a hostname.

To include an authentication key in all messages sent to the time server, include the **key** option. The key corresponds to the key number you specify in the **authentication-key** statement, as described in .

By default, the router or switch sends NTP version 4 packets to the time server. To set the NTP version level to 1, 2, or 3, include the **version** option.

If you configure more than one time server, you can mark one server preferred by including the **prefer** option.

The following example shows how to configure the router or switch to operate in client mode:

```
[edit system ntp]
authentication-key 1 type md5 value "$9$EgfcvX7VY4ZEcwgoHjkP5Q3CuREyv87";
boot-server 10.1.1.1;
server 10.1.1.1 key 1 prefer;
trusted-key 1;
```

Configuring the Router or Switch to Operate in Symmetric Active Mode

To configure the local router or switch to operate in symmetric active mode, include the **peer** statement at the **[edit system ntp]** hierarchy level:

```
[edit system ntp]
peer address <key key-number> <version value> <prefer>;
```

Specify the address of the remote system. You must specify an address, not a hostname.

To include an authentication key in all messages sent to the remote system, include the **key** option. The key corresponds to the key number you specify in the **authentication-key** statement.

By default, the router or switch sends NTP version 4 packets to the remote system. To set the NTP version level to 1, 2 or 3, include the **version** option.

If you configure more than one remote system, you can mark one system preferred by including the **prefer** option:

```
peer address <key key-number> <version value> prefer;
```

Configuring the Router or Switch to Operate in Broadcast Mode

To configure the local router or switch to operate in broadcast mode, include the **broadcast** statement at the **[edit system ntp]** hierarchy level:

```
[edit system ntp]
broadcast address <key key-number> <version value> <ttl value>;
```

Specify the broadcast address on one of the local networks or a multicast address assigned to NTP. You must specify an address, not a hostname. If the multicast address is used, it must be **224.0.1.1**.

To include an authentication key in all messages sent to the remote system, include the **key** option. The key corresponds to the key number you specify in the **authentication-key** statement.

By default, the router or switch sends NTP version 4 packets to the remote system. To set the NTP version level to 1, 2, or 3, include the **version** option.

Configuring the Router or Switch to Operate in Server Mode

In server mode, the router or switch acts as an NTP server for clients when the clients are configured appropriately. The only prerequisite for “server mode” is that the router or switch must be receiving time from another NTP peer or server. No other configuration is necessary on the router or switch.

To configure the local router or switch to operate as an NTP server, include the following statements at the **[edit system ntp]** hierarchy level:

```
[edit system ntp]
authentication-key key-number type type value password;
server address <key key-number> <version value> <prefer>;
trusted-key [ key-numbers ];
```

Specify the address of the system acting as the time server. You must specify an address, not a hostname.

To include an authentication key in all messages sent to the time server, include the **key** option. The key corresponds to the key number you specify in the **authentication-key** statement.

By default, the router or switch sends NTP version 4 packets to the time server. To set the NTP version level to 1, or 2, or 3, include the **version** option.

If you configure more than one time server, you can mark one server preferred by including the **prefer** option.

The following example shows how to configure the router or switch to operate in server mode:

```
[edit system ntp]
authentication-key 1 type md5 value "$9$txEruBEreWx-wtuLNdboaUjH.T3AtOESe";
server 172.17.27.46 prefer;
trusted-key 1;
```

Related Documentation

- [Understanding NTP Time Servers on page 175](#)
- [Example: Configuring NTP as a Single Time Source for Router and Switch Clock Synchronization on page 186](#)

Configuring the Switch to Listen for Broadcast Messages Using NTP

When you are using NTP, you can configure the local switch to listen for broadcast messages on the local network to discover other servers on the same subnet by including the **broadcast-client** statement at the **[edit system ntp]** hierarchy level:

```
[edit system ntp]  
broadcast-client;
```

When the switch detects a broadcast message for the first time, it measures the nominal network delay using a brief client-server exchange with the remote server. It then enters *broadcast client* mode, in which it listens for, and synchronizes to, succeeding broadcast messages.

To avoid accidental or malicious disruption in this mode, both the local and remote systems must use authentication and the same trusted key and key identifier.

**Related
Documentation**

- [Configuring the Switch to Listen for Multicast Messages Using NTP on page 180](#)
- [Configuring the NTP Time Server and Time Services on page 177](#)
- [Example: Configuring NTP as a Single Time Source for Router and Switch Clock Synchronization on page 186](#)

Configuring the Switch to Listen for Multicast Messages Using NTP

When you are using NTP, you can configure the local switch to listen for multicast messages on the local network to discover other servers on the same subnet by including the **multicast-client** statement at the **[edit system ntp]** hierarchy level:

```
[edit system ntp]  
multicast-client <address>;
```

When the switch receives a multicast message for the first time, it measures the nominal network delay using a brief client-server exchange with the remote server. It then enters *multicast client* mode, in which it listens for, and synchronizes to, succeeding multicast messages.

You can specify one or more IP addresses. (You must specify an address, not a hostname.) If you do, the router or switch joins those multicast groups. If you do not specify any addresses, the software uses **224.0.1.1**.

To avoid accidental or malicious disruption in this mode, both the local and remote systems must use authentication and the same trusted key and key identifier.

**Related
Documentation**

- [Configuring the Switch to Listen for Broadcast Messages Using NTP on page 179](#)
- [Configuring the NTP Time Server and Time Services on page 177](#)
- [Example: Configuring NTP as a Single Time Source for Router and Switch Clock Synchronization on page 186](#)

Setting the Date and Time

1. Enter operational mode in the CLI.
2. Enter the following command:

```
user@switch> set date YYYYMMDDHHMM.ss source-address
```

For example, the following command sets the date and time.

```
user@switch# set date 201102151010.55
```

3. To set the date and time from an NTP server, enter the following command:

```
user@switch# set date ntp servers
```

For example, the following command sets the date and time from an NTP server:

```
user@switch# set date ntp 200.40.40.1
```

4. To set the date and time from more than one NTP server, enter the same command:

```
user@switch# set date ntp servers
```

For example, the following command sets the date and time from more than one NTP server:

```
user@switch# set date ntp 200.40.40.1 200.40.40.2
```

Related
Documentation

- [set date](#)

Synchronizing and Coordinating Time Distribution Using NTP

Using NTP to synchronize and coordinate time distribution in a large network involves these tasks:

1. [Configuring NTP on page 181](#)
2. [Configuring the NTP Boot Server on page 181](#)
3. [Specifying a Source Address for an NTP Server on page 182](#)

Configuring NTP

- To configure NTP on the switch, include the **ntp** statement at the **[edit system]** hierarchy level:

```
[edit system]
ntp {
  authentication-key number type type value password;
  boot-server (address | hostname);
  broadcast <address> <key key-number> <version value> <tll value>;
  broadcast-client;
  multicast-client <address>;
  peer address <key key-number> <version value> <prefer>;
  server address <key key-number> <version value> <prefer>;
  source-address source-address;
  trusted-key [ key-numbers ];
}
```

Configuring the NTP Boot Server

When you boot the switch, it issues an **ntpdate** request, which polls a network server to determine the local date and time. You need to configure a server that the switch uses to determine the time when the switch boots. Otherwise, NTP will not be able to

synchronize to a time server if the server's time appears to be very far off of the local switch's time.

- To configure the NTP boot server, include the **boot-server** statement at the **[edit system ntp]** hierarchy level:

```
[edit system ntp]
boot-server (address | hostname);
```

Specify either the IP address or the hostname of the network server.

Specifying a Source Address for an NTP Server

For IP version 4 (IPv4), you can specify that if the NTP server configured at the **[edit system ntp]** hierarchy level is contacted on one of the loopback interface addresses, the reply always uses a specific source address. This is useful for controlling which source address NTP uses to access your network when it is either responding to or sending an NTP client request from your network.

To configure the specific source address that the reply will always use, and the source address that requests initiated by NTP server will use, include the **source-address** statement at the **[edit system ntp]** hierarchy level:

```
[edit system ntp]
source-address source-address;
```

source-address is a valid IP address configured on one of the switch interfaces.



NOTE: If a firewall filter is applied on the loopback interface, ensure that the source address specified for the NTP server at the **[edit system ntp]** hierarchy level is explicitly included as one of the match criteria in the firewall filter. This enables the Junos OS to accept traffic on the loopback interface from the specified source address.

The following example shows a firewall filter with the source address 10.0.10.100 specified in the **from** statement included at the **[edit firewall filter firewall-filter-name]** hierarchy:

```
[edit firewall filter Loopback-Interface-Firewall-Filter]
term Allow-NTP {
  from {
    source-address {
      172.17.27.46/32; // IP address of the NTP server
      10.0.10.100/32; // Source address specified for the NTP server
    }
  }
  then accept;
}
```

If no source address is configured for the NTP server, include the primary address of the loopback interface in the firewall filter.

- Related Documentation**
- [Understanding NTP Time Servers on page 175](#)
 - [Example: Configuring NTP as a Single Time Source for Router and Switch Clock Synchronization on page 186](#)

Example: Configuring NTP

The Network Time Protocol (NTP) provides the mechanisms to synchronize time and coordinate time distribution in a large, diverse network. NTP uses a returnable-time design in which a distributed subnet of time servers operating in a self-organizing, hierarchical primary-secondary configuration synchronizes local clocks within the subnet and to national time standards by means of wire or radio. The servers also can redistribute reference time using local routing algorithms and time daemons.

This example shows how to configure NTP:

- [Requirements on page 183](#)
- [Overview on page 183](#)
- [Configuration on page 183](#)
- [Verification on page 184](#)

Requirements

This example uses the following software and hardware components:

- Junos OS Release 11.1 or later
- A switch connected to a network on which an NTP boot server and NTP server reside

Overview

Debugging and troubleshooting are much easier when the timestamps in the log files of all switches are synchronized, because events that span a network can be correlated with synchronous entries in multiple logs. We recommend using the Network Time Protocol (NTP) to synchronize the system clocks of your switch and other network equipment.

In this example, an administrator wants to synchronize the time in a switch to a single time source. We recommend using authentication to make sure that the NTP peer is trusted. The **boot-server** statement identifies the server from which the initial time of day and date are obtained when the switch boots. The **server** statement identifies the NTP server used for periodic time synchronization. The **authentication-key** statement specifies that an HMAC-Message Digest 5 (MD5) scheme is used to hash the key value for authentication, which prevents the switch from synchronizing with an attacker's host that is posing as the time server.

Configuration

To configure NTP:

CLI Quick Configuration	<p>To quickly configure NTP, copy the following commands and paste them into the switch's terminal window:</p> <pre>[edit system] set ntp boot-server 10.1.4.1 set ntp server 10.1.4.2 set ntp authentication-key 2 type md5 value "\$9\$aHlj8"</pre>
Step-by-Step Procedure	<p>To configure NTP :</p> <ol style="list-style-type: none"> Specify the boot server: <pre>[edit system] user@switch# set ntp boot-server 10.1.4.1</pre> Specify the NTP server: <pre>[edit system] user@switch# set ntp server 10.1.4.2</pre> Specify the key number, authentication type (MD5), and key for authentication: <pre>[edit system] user@switch# set ntp authentication-key 2 type md5 value "\$9\$aHlj8"</pre>
Results	<p>Check the results:</p> <pre>[edit system] user@switch# show ntp { boot-server 10.1.4.1; authentication-key 2 type md5 value "\$9\$aHlj8"; ## SECRET-DATA server 10.1.4.2; }</pre>

Verification

To confirm that the configuration is correct, perform these tasks:

- [Checking the Time on page 184](#)
- [Displaying the NTP Peers on page 185](#)
- [Displaying the NTP Status on page 185](#)

Checking the Time

Purpose	Check the time that has been set on the switch.
Action	<p>Enter the show system uptime operational mode command to display the time.</p> <pre>user@switch> show system uptime fpc0: ----- Current time: 2009-06-12 12:49:03 PDT System booted: 2009-05-15 06:24:43 PDT (4w0d 06:24 ago) Protocols started: 2009-05-15 06:27:08 PDT (4w0d 06:21 ago) Last configured: 2009-05-27 14:57:03 PDT (2w1d 21:52 ago) by admin1 12:49PM up 28 days, 6:24, 1 user, load averages: 0.05, 0.06, 0.01</pre>

Meaning The output shows that the current date and time are June 12, 2009 and 12:49:03 PDT. The switch booted 4 weeks, 6 hours, and 24 minutes ago, and its protocols were started approximately 3 minutes before it booted. The switch was last configured by user **admin1** on May 27, 2009, and there is currently one user logged in to the switch.

The output also shows that the load average is 0.05 seconds for the last minute, 0.06 seconds for the last 5 minutes, and 0.01 seconds for the last 15 minutes.

Displaying the NTP Peers

Purpose Verify that the time has been obtained from an NTP server.

Action Enter the **show ntp associations** operational mode command to display the NTP server from switch obtained its time.

```
user@switch> show ntp associations
      remote      refid      st t when poll reach  delay  offset  jitter
=====
*ntp5.domain1.ne .GPS.          1 u  414 1024  377   3.435   4.002   0.765
```

Meaning The asterisk (*) in front of the NTP server name, or peer, indicates that the time is synchronized and obtained from this server. The delay, offset, and jitter are displayed in milliseconds.

Displaying the NTP Status

Purpose View the configuration of the NTP server and the status of the system.

Action Enter the **show ntp status** operational mode command to view the status of the NTP.

```
user@switch> show ntp status
status=0644 leap_none, sync_ntp, 4 events, event_peer/strat_chg,
version="ntpd 4.2.0-a Mon Apr 13 19:09:05 UTC 2009 (1)",
processor="powerpc", system="JUNOS9.5R1.8", leap=00, stratum=2,
precision=-18, rootdelay=2.805, rootdispersion=42.018, peer=48172,
refid=172.17.28.5,
reftime=cddd397a.60e6d7bf Fri, Jun 12 2009 13:30:50.378, poll=10,
clock=cddd3b1b.ec5a2bb4 Fri, Jun 12 2009 13:37:47.923, state=4,
offset=3.706, frequency=-23.018, jitter=1.818, stability=0.303
```

Meaning The output shows status information about the switch and the NTP.

- Related Documentation**
- [Understanding NTP Time Servers on page 175](#)
 - [ntp on page 382](#)
 - [Configuring the NTP Time Server and Time Services on page 177](#)
 - [CLI Explorer](#)
 - [Junos OS Baseline Network Operations Guide](#)

Example: Configuring NTP as a Single Time Source for Router and Switch Clock Synchronization

Debugging and troubleshooting are much easier when the timestamps in the log files of all the routers or switches are synchronized, because events that span the network can be correlated with synchronous entries in multiple logs. We strongly recommend using the Network Time Protocol (NTP) to synchronize the system clocks of routers, switches, and other network equipment.

By default, NTP operates in an entirely unauthenticated manner. If a malicious attempt to influence the accuracy of a router or switch's clock succeeds, it could have negative effects on system logging, make troubleshooting and intrusion detection more difficult, and impede other management functions.

The following sample configuration synchronizes all the routers or switches in the network to a single time source. We recommend using authentication to make sure that the NTP peer is trusted. The **boot-server** statement identifies the server from which the initial time of day and date is obtained when the router boots. The **server** statement identifies the NTP server used for periodic time synchronization. The **authentication-key** statement specifies that an HMAC-Message Digest 5 (MD5) scheme should be used to hash the key value for authentication, which prevents the router or switch from synchronizing with an attacker's host posing as the time server.

```
[edit]
system {
  ntp {
    authentication-key 2 type md5 value "$9$aHlj8gqQ1gJyJgjhGjgiiii"; # SECRET-DATA
    boot-server 10.1.4.1;
    server 10.1.4.2;
  }
}
```

Related Documentation

- [NTP Overview](#)
- [Understanding NTP Time Servers on page 175](#)
- [authentication-key](#)
- [boot-server on page 379](#)
- [server on page 384](#)
- [show ntp associations on page 568](#)
- [show ntp status on page 570](#)

PART 12

Packet Flow Accelerator Diagnostics Software

- [Understanding Packet Flow Accelerator Diagnostics Software on page 189](#)

CHAPTER 12

Understanding Packet Flow Accelerator Diagnostics Software

- [Understanding Packet Flow Accelerator Diagnostics Software and Other Utilities on page 189](#)
- [Installing Ethernet and PTP Scripts on page 212](#)
- [Installing Packet Flow Accelerator Diagnostics Software on page 214](#)

Understanding Packet Flow Accelerator Diagnostics Software and Other Utilities

You can use Packet Flow Accelerator Diagnostics software to validate the integrity of the QFX-PFA-4Q module and the QFX5100-24Q-AA switch. The Packet Flow Accelerator Diagnostics software contains standard diagnostics, orchestration diagnostics, Precision Time Protocol (PTP) and synchronization diagnostics, and other utilities. The Packet Flow Accelerator Diagnostics software runs in a guest virtual machine (VM) on the QFX5100-24Q-AA switch and requires that you configure guest VM options in the Junos OS CLI.

The QFX-PFA-4Q module contains four 40-Gigabit Ethernet QSFP+ interfaces, an FPGA module, and timing input and output interfaces to support Precision Time Protocol applications. The FPGA module contains logic that you can customize for processing compute-intensive, latency-sensitive, high-volume transactions.

Before you can run the Packet Flow Accelerator Diagnostics software and utilities, make sure you have performed the following tasks:

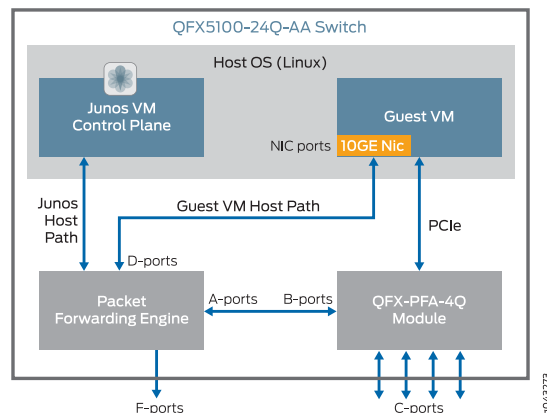
- Verify that you have installed the QFX-PFA-4Q module installed on the QFX5100-24Q-AA switch. For more information, see *Installing an Expansion Module in a QFX5100 Device*
- Make sure you have Junos OS Release 14.1X53-D27 with enhanced automation installed on the QFX5100-24Q-AA switch. For more information, see [“Upgrading Software” on page 273](#).

- Install the Packet Flow Accelerator Diagnostics software. For more information, see [“Installing Packet Flow Accelerator Diagnostics Software” on page 214.](#)
- [Understanding External and Internal Ports and Network Interface Card Ports on page 190](#)
- [Understanding Packet Flow Accelerator Diagnostics Software Tests and Scripts on page 191](#)
- [Understanding the ikondia Command on page 192](#)
- [Understanding Basic Functionality Tests on page 193](#)
- [Understanding and Running Ethernet Tests and Scripts on page 194](#)
- [Understanding and Using Stress Tests on page 199](#)
- [Understanding and Running PTP Tests on page 200](#)
- [Understanding QFX-PFA-4Q Module LED Tests on page 201](#)
- [Understanding Packet Flow Accelerator Diagnostics Utilities on page 202](#)
- [Sample Output for Packet Accelerator Diagnostics Software on page 206](#)

Understanding External and Internal Ports and Network Interface Card Ports

Packet Flow Accelerator Diagnostics software and utilities validate the data paths between the external and internal ports on the QFX5100-24Q-AA switch and QFX-PFA-4Q module. [Figure 7 on page 190](#) illustrates the names of the ports on the QFX5100-24Q-AA switch and QFX-PFA-4Q module and how they connect.

Figure 7: Ports on the QFX5100-24Q-AA switch and QFX-PFA-4Q module



[Table 14 on page 190](#) provides information on the external and internal ports and NIC ports on the QFX5100-24Q-AA switch and QFX-PFA-4Q module.

Table 14: External and Internal Ports on the QFX5100-24Q-AA Switch and the QFX-PFA-4Q Module

A-ports	Interfaces xe-0/0/24 through xe-0/0/39 on the Packet Forwarding Engine (PFE) of the QFX5100-24Q-AA switch connect to the B-ports on the FPGA module on the QFX-PFA-4Q expansion module. A-ports require corresponding B-ports on the FPGA module. You can manage these interfaces through the Junos OS.
---------	---

Table 14: External and Internal Ports on the QFX5100-24Q-AA Switch and the QFX-PFA-4Q Module (*continued*)

B-ports	Internal 10-Gigabit Ethernet ports connect to the FPGA module on the QFX-PFA-4Q module, which then connect to the A-ports on the PFE of the QFX5100-24Q-AA switch. The naming convention for these ports is determined by the guest VM. The guest VM controls the FPGA module.
C-ports	Four, front-facing 40-Gigabit Ethernet ports on the QFX-PFA-4Q module connect to the FPGA module running on the QFX5100-24Q-AA switch and the F-ports on the QFX5100-24Q-AA switch. The guest VM controls the FPGA module.
D-ports	Two 10-Gigabit Ethernet internal ports on the Packet Forwarding Engine of the QFX5100-24Q-AA switch connect to the Ethernet NIC on the QFX5100-24Q-AA switch. The naming convention for these ports is the same one used for the F-ports. You can manage these ports through the Junos OS.
F-ports	Twenty four front-facing 40-Gigabit Ethernet ports on the QFX5100-24Q-AA switch. These ports contain an "et" prefix when in 40-Gigabit Ethernet mode. If you channelize these interfaces, the prefix is "xe." You can manage these ports through the Junos OS.
NIC ports	Internal interfaces xe-0/0/40 and xe-0/0/41 on the QFX5100-24Q-AA switch connect to the PFE for use on the guest VM. The NIC ports perform the same functions as any other Linux OS NIC port. The NIC ports do not work unless the QFX-PFA-4Q module is installed.

Understanding Packet Flow Accelerator Diagnostics Software Tests and Scripts

You can run Packet Flow Accelerator Diagnostics software to test the following subsystems on the QFX-PFA-4Q module:

- FPGA
- QDR SRAM memory
- DRAM memory
- DRAM SPDs
- FPGA-connected PCI Express links
- FPGA-connected Ethernet data (QSFP interfaces)
- QSFP I2C I/O
- PTP I/O

Before you can run any test or script, you need to connect to the console connection of the guest VM. For more information, see [“Installing Packet Flow Accelerator Diagnostics Software” on page 214](#).

The following test sets are available:

- quick-test—Allows you to perform a basic test of all FPGA-attached functionality. These tests take one or two minutes to complete.
- burn-in—Allows you to exercise all FPGA-attached functionality. These tests take several hours to complete.

- individual test mode—Allows you to test a single subsystem with extra configuration options.

Understanding the ikonddiag Command

To run any of the tests, issue the **ikonddiag** command with the following arguments:



NOTE: Before you can run the tests, you need to connect to the console connection of the guest VM. For more information, see [“Installing Packet Flow Accelerator Diagnostics Software” on page 214](#).

- -t (quick-test | burn-in | <test name>)

This argument identifies the test.

- -h

This argument provides usage details for the test.

- -V

This argument provides verbose output for the tests.

For example, to run the PTP test, issue the ikonddiag -t PTP command at the guest VM prompt:

ikonddiag -t PTP

```
[2015-05-07 03:12:20][BEGIN TEST - PTP]
```

```
*****
```

```
PTP PHY interrupt: PASS
```

```
1G Ethernet PHY packet loopback test: PASS
```

```
PTP clock generation/check: PASS
```

```
UART (ToD) loopback: PASS
```

```
*****
```

```
[2015-05-07 03:13:30][END TEST PTP RESULT PASS]
```


Understanding Basic Functionality Tests

You can test basic functionality on the PCI Express interface and memory components. [Table 15 on page 193](#) lists the names of the tests and their functions.

Table 15: Base Tests

Test Name	Description	Details	Optional Arguments	Test Sets	Failure Behavior
FPGABasic	Tests basic FPGA operation.	Configures the FPGA and reads some simple registers over PCI Express.	None.	quick-test and burn-in	Any failures in this test cause the ikonddiag command to generate normal test status and error messages, and then to abort with another error message. You cannot continue testing because all tests rely on the functionality tested by this one.
PCIe	Verifies functionality and stability of bulk transfers of PCIe data.	Repeatedly loops back pseudo random data generated on the CPU to the FPGA and then back to the CPU. Returned data is verified on the CPU.	-i <n> number of repetitions (default = 1 quick-test, 10,000 burn-in) -j <n> size of individual transfer in Mebibytes (default = 100 MiB).	quick-test and burn-in	This test reports erroneous data values and offsets in data transfer. Any failures in this test will cause the ikonddiag command to output normal test status and error messages and then abort with a further error. You cannot continue further testing because all tests rely on functionality tested by this test.
DIMM	Checks SPD query functionality and verifies that correct DIMMs are installed.	Reads data from SPD device on DIMM modules ,reports contents, and checks for erroneous values and verifies: <ul style="list-style-type: none"> DIMM part data against expected part data. SPD temperature is in nominal operating range. 	None.	quick-test and burn-in	If any values are unexpected, the test reports erroneous values and provides expected values and ranges.

Table 15: Base Tests (*continued*)

Test Name	Description	Details	Optional Arguments	Test Sets	Failure Behavior
DRAMMemory	Tests data transfer functionality and stability of FPGA-attached DRAM memory devices.	<ul style="list-style-type: none"> Checks that PHYs are initialized correctly. Repeatedly does the following tasks: <ul style="list-style-type: none"> Writes to memory from the FPGA <ul style="list-style-type: none"> Each pass switches data between: zeros, ones, counter, random, zeros, random, ones, random. Loops back memory inside the FPGA (simultaneous reads and writes). Verifies memory from the FPGA 	-i <n> vary number of iterations) default = 1 for quick-test, 500 for burn-in)	quick-test and burn-in	This test reports the number of errors during verification. Number of errors are specified as an accumulated number of errors per byte-lane and DIMM module.

Understanding and Running Ethernet Tests and Scripts

The Ethernet tests and scripts test C-ports and traffic between A- and B-ports. The traffic between A- and B-ports is tested by passing the data on the F-ports. For the C-ports, you need to loop back the traffic sent on the C-ports. You can use physical copper loopback cables for this purpose. For the F-ports, you need to loop back the traffic sent on the F-ports. You can use copper loopback cables for this purpose. Include the F-ports in a VLAN. You can use the python PFAD_exec.py -t 1 script as well as the tests below. The python PFAD_exec.py -t 1 script verifies end-to-end L2 traffic on the external QSFP ports and checks the statistics on the interfaces in Junos OS and the statistics on the interfaces in the Packet Flow Diagnostics software VM. This test will fail if traffic loss is seen on any of the interfaces. There is also a provision to test all the combinations of QSFP ports as well.

Table 16 on page 195 lists the names of the Ethernet tests and their functions. For information on how to install the script, see ["Installing Packet Flow Accelerator Diagnostics Software" on page 214](#).

Table 16: Ethernet Tests and Scripts

Test Name	Description	Details	Optional Arguments	Test Sets	Failure Behavior
QSFPEthernet	Verifies functionality of Ethernet (QSFP) links.	Generates, receives, and verifies Ethernet frames are at line-rate through the FPGA module. The contents and lengths of packets consist of pseudo-random data. During operation, QSFP connections are all channelized to use 10 Gigabit Ethernet with all 32 Ethernet channels operating in parallel in full-duplex mode.	-i <n> varied number of iterations (default = 1,000 for quick-test, 1e9 for burn-in)	quick-test and burn-in	If the number of packets sent or received correctly are verified as not being equal, this test is considered a failure and the discrepancies between these quantities are reported. This test fails if the external Ethernet connections are not configured for loopback.
QSFPI2C	Checks if there is access to the four QSFP modules located on the front of the QFX-PFA-4Q module.	Performs reads of registers in the I2C modules and verifies that the results are as expected. For this test to pass, QSFP media must be inserted into all four ports on the QFX-PFA-4Q module. Any kind of external media can be used (for example, DAC cables, copper loopback, modules, and optical modules).	None.	quick-test and burn-in	This test fails if it cannot detect the presence of a QSFP module or if the values it reads back are unexpected.

Before you can run the Ethernet tests and script successfully, you need to perform the following tasks:

- Externally loop back all of the Ethernet connections (QSFP) on the QFX-PFA-4Q module.

To loop back the QSFP interfaces on the QFX-PFA-4Q module, attach copper loopback modules on the four QSFP+ interfaces installed on the QFX-PFA-4Q module.

Attach copper loopback modules on the QSFP+ interfaces (ports 10 through port 13) installed on the QFX5100-24Q-AA switch.

- Channelize ports 10 through 13 on the QFX5100-24Q-AA switch.
- Pair each of the 16 iKonDiag lanes using the equivalent Junos OS interface names with each of the corresponding Junos OS interfaces that were channelized from ports 10 through 13 on the QFX5100-24Q-AA switch.



NOTE: Each VLAN must be independent contain exactly two associated ports—one 10-Gigabit Ethernet port that is an F-port, and one 10-Gigabit Ethernet port that is an A-port.

Table 17 on page 196 shows the mappings for the 10-Gigabit Ethernet channels on the QFX-PFA-4Q module F-ports.

Table 17: 10-Gigabit Ethernet Channel Mappings on the QFX-PFA-4Q module F-ports

ikondiag Names	Description
JDFE_XE32_10G	xe-0/0/32
JDFE_XE33_10G	xe-0/0/33
JDFE_XE34_10G	xe-0/0/34
JDFE_XE35_10G	xe-0/0/35
JDFE_XE24_10G	xe-0/0/24
JDFE_XE25_10G	xe-0/0/25
JDFE_XE26_10G	xe-0/0/26
JDFE_XE27_10G	xe-0/0/27
JDFE_XE28_10G	xe-0/0/28
JDFE_XE29_10G	xe-0/0/29
JDFE_XE30_10G	xe-0/0/30
JDFE_XE31_10G	xe-0/0/31
JDFE_XE36_10G	xe-0/0/36
JDFE_XE37_10G	xe-0/0/37
JDFE_XE38_10G	xe-0/0/38
JDFE_XE39_10G	xe-0/0/39

[Table 18 on page 196](#) shows the mappings for the 10-Gigabit Ethernet channels on the QFX-PFA-4Q module C-ports.

Table 18: 10-Gigabit Ethernet Channel Mappings on the QFX-PFA-4Q module C-ports

ikondiag Names	Description
JDFE_QSFP0_10G_PORT0	QSFP port #0 10G sub-channel 0
JDFE_QSFP0_10G_PORT1	QSFP port #0 10G sub-channel 1
JDFE_QSFP0_10G_PORT2	QSFP port #0 10G sub-channel 2
JDFE_QSFP0_10G_PORT3	QSFP port #0 10G sub-channel 3

Table 18: 10-Gigabit Ethernet Channel Mappings on the QFX-PFA-4Q module C-ports (*continued*)

ikondia Names	Description
JDFE_QSFP1_10G_PORT0	QSFP port #1 10G sub-channel 0
JDFE_QSFP1_10G_PORT1	QSFP port #1 10G sub-channel 1
JDFE_QSFP1_10G_PORT2	QSFP port #1 10G sub-channel 2
JDFE_QSFP1_10G_PORT3	QSFP port #1 10G sub-channel 3
JDFE_QSFP2_10G_PORT0	QSFP port #2 10G sub-channel 0
JDFE_QSFP2_10G_PORT1	QSFP port #2 10G sub-channel 1
JDFE_QSFP2_10G_PORT2	QSFP port #2 10G sub-channel 2
JDFE_QSFP2_10G_PORT3	QSFP port #2 10G sub-channel 3
JDFE_QSFP3_10G_PORT0	QSFP port #3 10G sub channel 0
JDFE_QSFP3_10G_PORT1	QSFP port #3 10G sub-channel 1
JDFE_QSFP3_10G_PORT2	QSFP port #3 10G sub-channel 2
JDFE_QSFP3_10G_PORT3	QSFP port #3 10G sub-channel 3

[Table 19 on page 197](#) provides exact connectivity between the C-ports and A-ports.

Table 19: Exact Connectivity Between C-Ports and A-Ports

QSFP Port Number	Channel Number	Junos OS Interface
QSFP port #0	channel 0	xe-0/0/32
QSFP port #0	channel 1	xe-0/0/33
QSFP port #0	channel 2	xe-0/0/34
QSFP port #0	channel 3	xe-0/0/35
QSFP port #1	channel 0	xe-0/0/24
QSFP port #1	channel 1	xe-0/0/25
QSFP port #1	channel 2	xe-0/0/26
QSFP port #1	channel 3	xe-0/0/27
QSFP port #2	channel 0	xe-0/0/28

Table 19: Exact Connectivity Between C-Ports and A-Ports (*continued*)

QSFP Port Number	Channel Number	Junos OS Interface
QSFP port #2	channel 1	xe-0/0/29
QSFP port #2	channel 2	xe-0/0/30
QSFP port #2	channel 3	xe-0/0/31
QSFP port #3	channel 0	xe-0/0/36
QSFP port #3	channel 1	xe-0/0/37
QSFP port #3	channel 2	xe-0/0/38
QSFP port #3	channel 3	xe-0/0/39

- Add these interfaces to a VLAN.

Channelize ports 10 through 13 using the Junos CLI.

1. Configure ports 10 through 13 on PIC 1 to operate as 10-Gigabit Ethernet ports.

```
[edit chassis fpc 0 pic 1]
user@switch# set port-range 10 13 channel-speed 10g
```

2. Review your configuration and issue the **commit** command.

```
[edit]
user@switch# commit
commit complete
```

Add the 16 channelized interfaces you just configured to 16 VLANs.

To add the 16 channelized interfaces:

1. Create 16 VLANs.

```
[edit vlans]
user@switch# set v0_0 vlan-id 10
user@switch# set v0_1 vlan-id 11
user@switch# set v0_2 vlan-id 12
user@switch# set v0_3 vlan-id 13
user@switch# set v1_0 vlan-id 14
user@switch# set v1_1 vlan-id 15
user@switch# set v1_2 vlan-id 16
user@switch# set v1_3 vlan-id 17
user@switch# set v2_0 vlan-id 18
user@switch# set v2_1 vlan-id 19
user@switch# set v2_2 vlan-id 20
user@switch# set v2_3 vlan-id 21
user@switch# set v3_0 vlan-id 22
user@switch# set v3_1 vlan-id 23
user@switch# set v3_2 vlan-id 24
```

```
user@switch# set v3_3 vlan-id 25
```

2. Add the channelized interfaces to the VLANs.

```
[edit interfaces]
```

```
user@switch# set xe-0/0/24 unit 0 family ethernet-switching vlan members v0_0
user@switch# set xe-0/0/25 unit 0 family ethernet-switching vlan members v0_1
user@switch# set xe-0/0/10:0 unit 0 family ethernet-switching vlan members v0_0
user@switch# set xe-0/0/10:1 unit 0 family ethernet-switching vlan members v0_1
user@switch# set xe-0/0/10:2 unit 0 family ethernet-switching vlan members v0_2
user@switch# set xe-0/0/10:3 unit 0 family ethernet-switching vlan members v0_3
user@switch# set xe-0/0/11:0 unit 0 family ethernet-switching vlan members v1_0
user@switch# set xe-0/0/11:1 unit 0 family ethernet-switching vlan members v1_1
user@switch# set xe-0/0/11:2 unit 0 family ethernet-switching vlan members v1_2
user@switch# set xe-0/0/11:3 unit 0 family ethernet-switching vlan members v1_3
user@switch# set xe-0/0/12:0 unit 0 family ethernet-switching vlan members v2_0
user@switch# set xe-0/0/12:1 unit 0 family ethernet-switching vlan members v2_1
user@switch# set xe-0/0/12:2 unit 0 family ethernet-switching vlan members v2_2
user@switch# set xe-0/0/12:3 unit 0 family ethernet-switching vlan members v2_3
user@switch# set xe-0/0/13:0 unit 0 family ethernet-switching vlan members v3_0
user@switch# set xe-0/0/13:1 unit 0 family ethernet-switching vlan members v3_1
user@switch# set xe-0/0/13:2 unit 0 family ethernet-switching vlan members v3_2
user@switch# set xe-0/0/13:3 unit 0 family ethernet-switching vlan members v3_3
```

3. Review your configuration and issue the **commit** command.

```
[edit]
```

```
user@switch# commit
commit complete
```

Understanding and Using Stress Tests

The stress tests exercise all high-speed I/Os in parallel. The stress tests require the same external media as you used for the Ethernet tests. [Table 20 on page 199](#) lists the name of the test and its functions.

Table 20: Stress Tests

Test Name	Description	Details	Optional Arguments	Test Sets	Failure Behavior
Stress	Exercises all high-speed I/Os in parallel.	<p>Exercise all of the high-speed I/Os attached to the FPGA in parallel, including:</p> <ul style="list-style-type: none"> • DRAM • QDR • Ethernet <p>Each test subsystem is exercised in a similar fashion to the individual tests as previously described.</p>	-i <n> varied number of iterations) default = 1 for quick-test, 1,000 for burn-in)	quick-test and burn-in	<p>If any one sub-system fails, the test is stopped. The first sub-system detected to have failed is reported.</p> <p>NOTE: If multiple subsystems fail, only the first failed subsystem is reported.</p>

Understanding and Running PTP Tests

You can run PTP for hardware used with PTP. These tests are helpful if you are creating timing applications. To run the tests, you need to connect SubMiniature version B (SMB) cables, Ethernet loopback cables, and ToD loopback cables for the clocking I/O, ToD serial port, and 1-Gigabit Ethernet connectors. You must connect the SMB, Ethernet, ToD loopback cables between the 10M and PPS output and input connectors. The ToD loopback cable is a standard RJ45 cable with Pin 3 (Tx Data) connected to Pin 6 (Rx Data). In addition to the PTP tests, you can run scripts included the Packet Flow Accelerator Diagnostics software to test PTP. See [Table 22 on page 201](#) for information on the PTP scripts. The PTP scripts require you to have a Junos OS image with Enhanced Automation installed on the QFX5100-24Q-AA switch. For information on how to install the scripts, see [“Installing Packet Flow Accelerator Diagnostics Software” on page 214](#).

[Table 21 on page 200](#) lists the names of the PTP tests and their functions:

Table 21: PTP Tests

Test Name	Description	Details	Optional Arguments	Test Sets	Failure Behavior
PTP	Checks functionality of various FPGA-attached time-synchronizing features of the QFX-PFA-4Q module.	<p>Performs various tests on time-synchronizing functionality of the QFX-PFA-4Q module.</p> <p>Subtests covered by this test include:</p> <ul style="list-style-type: none"> • Verification of PFE-attached communications. • Testing of the PTP PHY <ul style="list-style-type: none"> • Basic configuration. • FPGA-attached interrupt line. • 1-Gigabit Ethernet loopback (requires external loopback media). • QFX-PFA-4Q module time-syncing related clock generators and feedback routing. • ToD UART port (requires external loop-back media). 	None.	quick-test and burn-in	A failure in any of the subsystems above causes the entire test to fail and generates a report at the end of the test that indicates the pass and fail status of the sub-tests.

[Table 22 on page 201](#) lists the name of the script and its function. This script is not part of the **ikonddiag** command. You can run this command Junos OS.

Table 22: PTP Script

Script Name	Description	Details	Optional Arguments	Test Sets	Failure Behavior
<code>./run_ptp_test</code>	Checks functionality of various FPGA-attached time-syncing features of the QFX-PFA-4Q module.	<p>Performs various tests on time-syncing functionality of the QFX-PFA-4Q module.</p> <p>Sub tests covered by this test include:</p> <ul style="list-style-type: none"> • Verification of PFE attached communications. • Testing of the PTP PHY <ul style="list-style-type: none"> • Basic configuration. • FPGA-attached interrupt line. • 1-Gigabith Ethernet loop-back (requires external loop-back media). • QFX-PFA-4Q module time-syncing related clock generators and feedback routing. • ToD UART port (requires external loop-back media). 	None.	None. This test must be run manually.	A failure in any of the subsystems above causes the entire test to fail and generates a report at the end of the test that indicates the pass and fail status of the sub-tests.

Understanding QFX-PFA-4Q Module LED Tests

The LED tests examine the LEDs on the QFX-PFA-4Q module.

To run the LED test, issue the **ikon_led_toggle** command. The test might take a few seconds to start because the FPGA is being configured. When you see the message **Toggleing LEDs. Send SIGINT (^C) to exit**, the test begins. To terminate the test, type Ctrl-C. [Table 23 on page 202](#) lists the name of the test and its function.

Table 23: QFX-PFA-4Q Module LED Test

Test Name	Description	Details	Optional Arguments	Test Sets	Failure Behavior
ikon_led_toggle	Flashes the LEDs on the QFX-PFA-4Q module for visual inspection.	<p>The following LEDs on the QFX-PFA-4Q module will repeatedly cycle through the following patterns:</p> <p>NOTE: The AL and ST LEDs are not included in this test.</p> <ul style="list-style-type: none"> • The sixteen bicolor LEDs for QSFP status cycle through green, orange, and off. • S0 and S1 LEDs cycle through green and off. • Bottom-left RJ-45 PTP status LED cycles through green, orange, and off. • Bottom-right RJ-45 PTP status LED cycles through green and off rapidly. • Alarm LEDs cycle through orange, red, and off. 	None.	None. This test must be run manually.	LEDs might not flash.

Understanding Packet Flow Accelerator Diagnostics Utilities

In addition to the Packet Flow Accelerator Diagnostic software tests, there are utilities included in the Packet Flow Accelerator Diagnostics software that you can use to further diagnose issues on the QFX-PFA-4Q module.



NOTE: Before you can run the utilities, you need to connect to the console of the guest VM. For more information on how to access the guest VM, see [“Installing Packet Flow Accelerator Diagnostics Software” on page 214](#).

Table 24 on page 203 lists the name of the utility and its function.

Table 24: Utilities

Test Name	Descriptions	Details	Expected Output and Behavior
maxtop	Reports FPGA status.	Displays information about the currently configured status of the FPGA module and whether the module is in operation. Checks to make sure very basic driver and FPGA PCI Express link operations are working correctly. If this utility exits with error(s), it is very unlikely that any further FPGA operations will work.	Output should be similar to that shown below. If this output is not shown, there might be a critical failure in the diagnostic software environment, or the PCI Express link to the FPGA is nonfunctional. MaxTop Tool 2015.1 Found 1 card(s) running MaxelerOS 2015.1 Card 0: QFX-PFA-4Q (P/N: 241124) S/N: 96362301684266423 Mem: 24GB Load average: 0.00, 0.00, 0.00 DFE %BUSY TEMP MAXFILE PID USER TIME COMMAND 0 0.0% - 2fcf249cc7... - - - -
ikon_snake	Enables snake connectivity between all 10-Gigabit Ethernet channels.	Connects the Rx channel of all 32 x 10-Gigabit Ethernet channels on the FPGA module (QSFP interfaces) to the Tx channel of the respective neighboring connection. This allows all 32 channels to be tested using just a 10-Gigabit Ethernet interface external packet generator, copper loopback modules, and a QSFP <-> 4xSFP breakout cable.	After issuing this test, all Ethernet data will be forwarded after the message 'Snake tool loaded. hit 'enter' to exit.' is displayed. NOTE: During the time before the operating message is printed, the FPGA module might be in the process of being configured, so no data is forwarded. Pressing 'enter' will exit the utility. After the test has finished, packet data continues to be forwarded until another Ethernet utility or test is run.

Table 24: Utilities (*continued*)

Test Name	Descriptions	Details	Expected Output and Behavior
ikon_eth_util all --digitalloopback	Enables digital-loopback on all 10-Gigabit Ethernet interfaces on the Enables 'snake' connectivity between all QFX-PFA-4Q module 10-Gigabit Ethernet channels.	Connects the Rx side of all 32x 10-Gigabit Ethernet channels on the FPGA module (QSFP) to the Tx side of the same channel.	<p>After issuing this test, all Ethernet data will be forwarded as described after the message 'running press return key to exit' is displayed.</p> <p>NOTE: Before the operating message is displayed, the FPGA module might be in the process of being configured, and no data will be forwarded. Pressing Enter exits the utility.</p> <p>After the test has finished, packet data continues to be forwarded until another Ethernet utility or test is run.</p>
ikon_eth_util	Enables data to pas -through QFX-PFA-4Q module QSFP ports.	<p>Allows data to pass through the QFX-PFA-4Q module QSFP ports on the QFX-PFA-4Q module.</p> <p>NOTE: Because all of the QSFP ports are channelized to 10-Gigabit Ethernet, you must use SFP breakout cables when connecting external media.</p>	<p>After issuing this test, all Ethernet data is forwarded as described after the message ' running press return key to exit ' is displayed.</p> <p>NOTE: Before the operating message is displayed, the the FPGA module might be in the process of being configured, and no data will be forwarded. Pressing 'enter' will exit the utility.</p> <p>After the test has finished, packet data will continue to be forwarded until another Ethernet utility or test is run.</p>

Table 24: Utilities (*continued*)

Test Name	Descriptions	Details	Expected Output and Behavior
maxnet -v link show	Dumps FPGA packet statistics.	<p>Displays statistics about packets sent and received on all (QSFP) links from the MAC and PHY IP cores in the FPGA. Using the 'v' option provides verbose output.</p> <p>Here are some important items to note:</p> <ul style="list-style-type: none"> Packet statistics are reset whenever the Altera FPGA is reconfigured; that is, when running different applications that make use of the FPGA. The tool only displays data for Ethernet links that are included in the FPGA design. As such, if the FPGA module has not yet been configured, or it is configured with an application that does not use some of the Ethernet links, reduced link details might be displayed. 	<p>Sample output for a single 10-Gigabit Ethernet link is as follows:</p> <pre> MaxTop Tool 2015.1 Found 1 card(s) running Max1erOS 2015.1 Card 0: QFX-PFA-4Q (P/N: 241124) S/N: 96362301684266423 Mem: 24GB Load average: 0.00, 0.00, 0.00 DFE %BUSY TEMP MAXFILE PID USER TIME COMMAND 0 0.0% - 2fcf249cc7... - - </pre>
host2mem <filename> -o <filename> -t <DDR QDRO QDRPARITY0 QDR1 QDRPARITY1>	Writes and then reads arbitrary data from QDR SRAM or DRAM.	<p>Operates by streaming the contents of a binary file to one of the memory resources on the QFX-PFA-4Q module through the FPGA, and then streams the same data back from the memory to another file.</p> <p>NOTE: You cannot only read back data from RAM because the contents are not preserved between running multiple tests.</p>	Reports PASSED or FAILED depending on whether the returned data matches the input data.

Table 25 on page 205 lists the command-line arguments for the host2mem utility.

Table 25: Command-Line Arguments

Argument	Description
-- help -h	Print out usage and exit.
-i <input file>	Input data file.

Table 25: Command-Line Arguments (*continued*)

Argument	Description
-o <output file>	Output data file.
-- test -t <test name>	Test resource. See Table 26 on page 206 for information regarding resources.
-- verbose -v	Enable verbose mode.

The file format for input and output files is identical. Data is packed consecutively as words based on the width specified in the test mode table below. The size of an input file might be less but must not exceed the total size of the resource being tested. The size of the output file is the same as the input file and, provided there are no errors, has the same content.

Table 26: File Format Details

Test Mode	Resource	Word Width	Size of Test Data
DDR	DDR SDRAM	192 B	24 GB
QDR0	QDR0 Data	16 B	32 MB
QDRPARITY0	QDR0 Parity bits	2 B	4 MB
QDR1	QDR1 Data	16 B	32 MB
QDRPARITY1	QDR1 Parity bits	2 B	4 MB

The dynamic random-access memory (DRAM) on the QFX-PFA-4Q module contains three dual in-line memory modules (DIMM3, DIMM4, DIMM6), and each data word is split across all three DIMMs. [Table 27 on page 206](#) lists the allocation of Bytes to DIMMs.

Table 27: Dual In-Line Memory Modules

0	DIMM3	63	64	DIMM4	127	128	DIMM6	191
---	-------	----	----	-------	-----	-----	-------	-----

Sample Output for Packet Accelerator Diagnostics Software

This section provides some sample output for base tests, Ethernet tests, PTP tests, and utilities.

- `ikondiag -t FPGABasic`

```
[2015-05-07 03:00:17][BEGIN TEST - FPGABasic]
[2015-05-07 03:00:17][END TEST FPGABasic RESULT PASSED]
```

- `ikondiag -t DIMM`

```
[2015-05-07 03:01:09][BEGIN TEST - DIMM]
[2015-05-07 03:01:09][END TEST DIMM RESULT PASSED]
```

```
• ikonddiag -t QSFPEthernet
[2015-05-07 03:02:33][BEGIN TEST - QSFPEthernet]

*****

Test Failed:

QSFP0_10G_PORT0: FAIL - packets received = 0/1000

QSFP0_10G_PORT1: FAIL - packets received = 0/1000

QSFP0_10G_PORT2: FAIL - packets received = 0/1000

QSFP0_10G_PORT3: FAIL - packets received = 0/1000
QSFP1_10G_PORT0: FAIL - packets received = 0/1000

QSFP1_10G_PORT1: FAIL - packets received = 0/1000

QSFP1_10G_PORT2: FAIL - packets received = 0/1000

QSFP1_10G_PORT3: FAIL - packets received = 0/1000

QSFP2_10G_PORT0: FAIL - packets received = 0/1000

QSFP2_10G_PORT1: FAIL - packets received = 0/1000

QSFP2_10G_PORT2: FAIL - packets received = 0/1000

QSFP2_10G_PORT3: FAIL - packets received = 0/1000

QSFP3_10G_PORT0: FAIL - packets received = 0/1000
QSFP3_10G_PORT1: FAIL - packets received = 0/1000

QSFP3_10G_PORT2: FAIL - packets received = 0/1000

QSFP3_10G_PORT3: FAIL - packets received = 0/1000

QSFP4_10G_PORT0: PASS - packets received = 1000/1000

QSFP4_10G_PORT1: PASS - packets received = 1000/1000
```

QSFP4_10G_PORT2: PASS - packets received = 1000/1000

QSFP4_10G_PORT3: PASS - packets received = 1000/1000

QSFP5_10G_PORT0: PASS - packets received = 1000/1000

QSFP5_10G_PORT1: PASS - packets received = 1000/1000

QSFP5_10G_PORT2: PASS - packets received = 1000/1000

QSFP5_10G_PORT3: PASS - packets received = 1000/1000

QSFP6_10G_PORT0: PASS - packets received = 1000/1000

QSFP6_10G_PORT1: PASS - packets received = 1000/1000

QSFP6_10G_PORT2: PASS - packets received = 1000/1000

QSFP6_10G_PORT3: PASS - packets received = 1000/1000

QSFP7_10G_PORT0: PASS - packets received = 1000/1000

QSFP7_10G_PORT1: PASS - packets received = 1000/1000

QSFP7_10G_PORT2: PASS - packets received = 1000/1000

QSFP7_10G_PORT3: PASS - packets received = 1000/1000

[2015-05-07 03:02:41][END TEST QSFPEthernet RESULT PASSED]

- ikonddiag -t DRAMMemory -i 3

[2015-05-07 03:03:37][BEGIN TEST - DRAMMemory]

[2015-05-07 03:04:21][END TEST DRAMMemory RESULT PASSED]

- ikonddiag -t QDRMemory -p -i 3

[2015-05-07 03:10:38][BEGIN TEST - QDRMemory]

[2015-05-07 03:10:45][END TEST QDRMemory RESULT PASSED]

- ikonddiag -t Stress -p -i 10

[2015-05-07 03:11:24][BEGIN TEST - Stress]

Test Failed:

QSFP0_10G_PORT0: PASS - packets received = 650000/650000

QSFP0_10G_PORT1: PASS - packets received = 650000/650000

QSFP0_10G_PORT2: PASS - packets received = 650000/650000

QSFP0_10G_PORT3: PASS - packets received = 650000/650000

QSFP1_10G_PORT0: PASS - packets received = 650000/650000

QSFP1_10G_PORT1: PASS - packets received = 650000/650000

QSFP1_10G_PORT2: PASS - packets received = 650000/650000

QSFP1_10G_PORT3: PASS - packets received = 650000/650000

QSFP2_10G_PORT0: PASS - packets received = 650000/650000

QSFP2_10G_PORT1: PASS - packets received = 650000/650000

QSFP2_10G_PORT2: PASS - packets received = 650000/650000

QSFP2_10G_PORT3: PASS - packets received = 650000/650000

QSFP3_10G_PORT0: PASS - packets received = 650000/650000

QSFP3_10G_PORT1: PASS - packets received = 650000/650000

QSFP3_10G_PORT2: PASS - packets received = 650000/650000

QSFP3_10G_PORT3: PASS - packets received = 650000/650000

QSFP4_10G_PORT0: PASS - packets received = 650000/650000

QSFP4_10G_PORT1: PASS - packets received = 650000/650000

QSFP4_10G_PORT2: PASS - packets received = 650000/650000

QSFP4_10G_PORT3: PASS - packets received = 650000/650000

QSFP5_10G_PORT0: PASS - packets received = 650000/650000

QSFP5_10G_PORT1: PASS - packets received = 650000/650000

QSFP5_10G_PORT2: PASS - packets received = 650000/650000

QSFP5_10G_PORT3: PASS - packets received = 650000/650000

QSFP6_10G_PORT0: PASS - packets received = 650000/650000

QSFP6_10G_PORT1: PASS - packets received = 650000/650000

QSFP6_10G_PORT2: PASS - packets received = 650000/650000

QSFP6_10G_PORT3: PASS - packets received = 650000/650000

QSFP7_10G_PORT0: PASS - packets received = 650000/650000

QSFP7_10G_PORT1: PASS - packets received = 650000/650000

QSFP7_10G_PORT2: PASS - packets received = 650000/650000

QSFP7_10G_PORT3: PASS - packets received = 650000/650000

- ikonddiag -t PTP

[2015-05-07 03:12:20][BEGIN TEST - PTP]

PTP PHY interrupt: PASS

1G Ethernet PHY packet loopback test: PASS

PTP clock generation/check: PASS

UART (ToD) loopback: PASS

[2015-05-07 03:13:30][END TEST PTP RESULT PASS]

- ikondiag -t Application -i 2

iterations = 2

[2015-05-07 03:14:11][BEGIN TEST - Application Test]

[2015-05-07 03:17:33][END TEST Application Test RESULT PASSED]

- maxtop

MaxTop Tool 2015.1

Found 1 card(s) running MaxelerOS 2015.1

Card 0: (P/N: 241124) S/N: 96362301684266423 Mem: 24GB

Load average: 0.00, 0.00, 0.00

DFE	%BUSY	TEMP	MAXFILE	PID	USER	TIME	COMMAND
0	0.0%	-	7e2198e5c0...	-	-	-	-

- ikon_eth_util --all-pass-through

Ikon Ethernet Pass Through Utility

setting portConnect_QSFP4_10G_PORT0_QSFP0_10G_PORT0 to 1

setting portConnect_QSFP4_10G_PORT1_QSFP0_10G_PORT1 to 1

setting portConnect_QSFP4_10G_PORT2_QSFP0_10G_PORT2 to 1

setting portConnect_QSFP4_10G_PORT3_QSFP0_10G_PORT3 to 1

setting portConnect_QSFP1_10G_PORT0_QSFP5_10G_PORT0 to 1

setting portConnect_QSFP1_10G_PORT1_QSFP5_10G_PORT1 to 1

setting portConnect_QSFP1_10G_PORT2_QSFP5_10G_PORT2 to 1

setting portConnect_QSFP1_10G_PORT3_QSFP5_10G_PORT3 to 1

setting portConnect_QSFP2_10G_PORT0_QSFP6_10G_PORT0 to 1

setting portConnect_QSFP2_10G_PORT1_QSFP6_10G_PORT1 to 1

setting portConnect_QSFP2_10G_PORT2_QSFP6_10G_PORT2 to 1

setting portConnect_QSFP2_10G_PORT3_QSFP6_10G_PORT3 to 1

setting portConnect_QSFP3_10G_PORT0_QSFP7_10G_PORT0 to 1

setting portConnect_QSFP3_10G_PORT1_QSFP7_10G_PORT1 to 1

setting portConnect_QSFP3_10G_PORT2_QSFP7_10G_PORT2 to 1

setting portConnect_QSFP3_10G_PORT3_QSFP7_10G_PORT3 to 1

running press return key to exit

Related Documentation

- [Installing Packet Flow Accelerator Diagnostics Software on page 214](#)
- [Installing Ethernet and PTP Scripts on page 212](#)
- [Installing an Expansion Module in a QFX5100 Device](#)

Installing Ethernet and PTP Scripts

Installing Ethernet and PTP Scripts

You can use Ethernet and PTP scripts that are included in the Packet Flow Accelerator Diagnostics software to test Ethernet and PTP functionality. Before you can install the scripts, you need to perform the following tasks:

- Make sure the QFX-PFA-4Q module is installed in the QFX5100 switch. See *Installing an Expansion Module in a QFX5100 Device*.
- Install Junos OS Release 14.1X53-D27 software with enhanced automation for the QFX5100 switch. See [“Upgrading Software” on page 273](#).
- Enable SSH and Telnet services on the switch. See *Configuring SSH Service for Remote Access to the Router or Switch* and *Configuring Telnet Service for Remote Access to a Switch*.
- Install the Packet Flow Accelerator Diagnostics Software. See [“Installing Packet Flow Accelerator Diagnostics Software” on page 214](#).

To install the scripts:

1. Log into the guest VM using the **request app-engine virtual-machine-shell *guest VM name***.

```
root> request app-engine virtual-machine-shell diagnostics
```
2. Enter a valid username and password combination for the guest VM.
3. Enter the **guest-util diag-install *guest VM IP address*** command at the shell prompt.
Use the same IP address you used for configuring the local management address for the guest VM.

```
[root@localhost ~] guest-util diag-install 192.168.1.10
```
4. Change directories to `/var/tmp` to edit the `PFAD_params.cfg` file.

```
[root@localhost ~] cd /var/tmp
```
5. Open the `PFAD_params.cfg` file using an editor of your choice.

Here is an example of what is contained in the file:

```
[params]

# log level
LOGLEVEL = 'TRACE'

# my variables
VLAN1_NAME      = 'VLAN100'
VLAN1_ID        = '100'
JUNOS_USERNAME  = 'test'
ROOT_USERNAME   = 'root'
JUNOS_PSWD      = 'juniper123'
GUEST_PSWD      = 'diag'
ROOT_PSWD       = 'root123'
```

```
# my duts
DUTS = {
    'R0': "10.204.43.170",
}
```

```
TOPOLOGY = 'IF1 = 'et-0/0/2'
              IF2 = 'et-0/0/3'
```

```
PFAD_params.cfg: unmodified: line 1
```

6. Configure the management IP address.

```
DUTS = {
    'R0': "10.204.43.170",
}
```

7. Configure the PTP interfaces.

IF1 is the primary source, and IF2 is the secondary source.

Configure IF1 as et-0/0/2, and IF2 as et-0/0/3.

```
IF1 = '2' <<<<< Change it
IF2 = '3' <<<<< Change it
```

8. Save the changes you made to the PFAD_params.cfg file.
9. Run the scripts by issuing one of the following commands at the guest VM prompt.
 - To test traffic orchestration:


```
python PFAD_exec.py -t 1
```
 - To test PTP:


```
./run_ptp_test
```
 - To test Broadsync:


```
./run_broadsync_test
```

Related Documentation

- [Understanding Packet Flow Accelerator Diagnostics Software and Other Utilities on page 189](#)
- [Installing an Expansion Module in a QFX5100 Device](#)
- [Installing Packet Flow Accelerator Diagnostics Software on page 214](#)
- [Launching a Guest Virtual Machine \(VM\) to Run a Third Party Application on Junos OS Release 13.2X51-D20 on page 106](#)
- [Upgrading Software on page 273](#)

Installing Packet Flow Accelerator Diagnostics Software

Installing Packet Flow Accelerator Diagnostics Software

You can use Packet Flow Accelerator Diagnostics software to test the FPGA module in the QFX-PFA-4Q module installed on the QFX5100-24Q-AA switch as well as the data paths between the FPGA module and the QFX5100-24Q-AA switch. The Packet Flow Accelerator Diagnostics software contains standard diagnostics, orchestration diagnostics, and Precision Time Protocol (PTP) and synchronization diagnostics. See [“Understanding Packet Flow Accelerator Diagnostics Software and Other Utilities” on page 189](#). In addition to the Packet Flow Accelerator Diagnostics software tests, there are utilities included in the Packet Flow Accelerator Diagnostics software that you can use to further diagnose issues on the QFX-PFA-4Q module. For information on how to install the QFX-PFA-4Q module, see *Installing an Expansion Module in a QFX5100 Device*.

To run the orchestration diagnostics, PTP and synchronization diagnostics, and utilities contained in the Packet Flow Accelerator Diagnostics software, you need to have a Junos OS Release 14.1X53-D27 software with enhanced automation installed on your QFX5100 switch. For information on how to download and install Junos OS software, see [“Upgrading Software” on page 273](#).

The Packet Flow Accelerator Diagnostics software runs in a guest VM on the switch and requires that you configure guest VM options in the Junos OS CLI.

Verifying That the QFX-PFA-4Q Expansion Module Is Installed

Before you install the Packet Flow Accelerator Diagnostics software, verify that the QFX-PFA-4Q module is installed.

From the CLI prompt, issue the **show chassis hardware** command.

```
{master:0}
root> show chassis hardware
Hardware inventory:
```

Item	Version	Part number	Serial number	Description
Chassis			VX3715020024	QFX5100-24Q-AA
Pseudo CB 0				
Routing Engine 0		BUILTIN	BUILTIN	QFX Routing Engine
FPC 0	REV 02	650-057155	VX3715020024	QFX5100-24Q-AA
CPU		BUILTIN	BUILTIN	FPC CPU
PIC 0		BUILTIN	BUILTIN	24x 40G-QSFP-AA
Xcvr 6	REV 01	740-032986	QD334902	QSFP+-40G-SR4
PIC 1	REV 01	711-060247	VY3115060052	QFX-PFA-4Q
Power Supply 0	REV 03	740-041741	1GA24082731	JPSU-650W-AC-AFO
Power Supply 1	REV 03	740-041741	1GA24082726	JPSU-650W-AC-AFO
Fan Tray 0				QFX5100 Fan Tray 0, Front
to Back Airflow - AFO				
Fan Tray 1				QFX5100 Fan Tray 1, Front
to Back Airflow - AFO				
Fan Tray 2				QFX5100 Fan Tray 2, Front
to Back Airflow - AFO				
Fan Tray 3				QFX5100 Fan Tray 3, Front
to Back Airflow - AFO				
Fan Tray 4				QFX5100 Fan Tray 4, Front
to Back Airflow - AFO				

From the CLI output, you can see that the four QSFP+ interfaces (4x40G QSFP+) contained in the QFX-PFA-4Q module. are installed.

Downloading the Packet Flow Diagnostics Software



NOTE: To access the download site, you must have a service contract with Juniper Networks and an access account. If you need help obtaining an account, complete the registration form at the Juniper Networks website <https://www.juniper.net/registration/Register.jsp>.

To download the Packet Flow Diagnostics software package from the Juniper Networks Support website, go to <http://www.juniper.net/support/>:

1. Using a Web browser, navigate to <http://www.juniper.net/support>.
2. Click **Download Software**.
3. In the Switching box, click **Junos OS Platforms**.
4. In the QFX Series section, click the name of the platform for which you want to download software.
5. Click the Software tab and select the release number from the Release drop-down list.
6. In the Install Package section on the Software tab, select the Install Package for the release.
A login screen appears.
7. Enter your name and password and press Enter.
8. Read the End User License Agreement, click the **I agree** radio button, and then click **Proceed**.
9. Save the **pfadiag_vm-rXXXXX.img.gz** file on your computer.
10. Open or save the Packet Flow Diagnostics software package either to the local system in the **var/tmp** directory or to a remote location. If you are saving the installation package to a remote system, make sure that you can access it using HTTP, TFTP, FTP, or scp.

Copying the Packet Flow Diagnostics Software Package to the Switch

To copy the packet flow diagnostics software package to the switch:

1. Copy the packet flow diagnostics package to the switch using any file transfer protocol:

For example:

```
root% scp //hostname/pathname/pfadiag_vm-rXXXXX.img.gz /var/tmp
```

Install the Packet Flow Diagnostics Software on the Switch

To install the packet flow diagnostics software package on the switch:

1. Install the Packet Flow Diagnostics software on the switch.

This might take a few minutes.

If the Packet Flow Diagnostics software resides locally on the switch, issue the following command:

```
{master:0}
root> request system software add virtual-machine-package
/var/tmp/pfadiag_vm-rXXXXX.img.gz
Installing virtual-machine package..
Copying virtual-machine package..
Uncompressing virtual-machine package..
Finished virtual-machine package installation.
```

2. Issue the **show version** command to verify that the installation was successful.

```
{master:0}
root> show version
fpc0:
```

Hostname: switch

Model: qfx5100-24q-aa

Junos: 14.1X53-D27_vjunos.62

JUNOS Base OS Software Suite [14.1X53-D26_vjunos.62]

JUNOS Base OS boot [14.1X53-D27_vjunos.62]

JUNOS Crypto Software Suite [14.1X53-D27_vjunos.62]

JUNOS Online Documentation [14.1X53-D27_vjunos.62]

JUNOS Kernel Software Suite [14.1X53-D27_vjunos.62]

JUNOS Packet Forwarding Engine Support (qfx-ex-x86-32) [14.1X53-D27_vjunos.62]

JUNOS Routing Software Suite [14.1X53-D27_vjunos.62]

JUNOS Enterprise Software Suite [14.1X53-D27_vjunos.62]

JUNOS py-base-i386 [14.1X53-D27_vjunos.62]

JUNOS py-extensions-i386 [14.1X53-D27_vjunos.62]

JUNOS Host Software [14.1X53-D27_vjunos.62]

Junos for Automation Enhancement

JUNOS GUEST-VM Software [pfadiag_vm-rXXXXX-ve]

```
{master:0}
```

The CLI output shows that the Packet Flow Accelerator Diagnostics software was installed.

Configure the Guest VM Options to Launch the Guest VM on the Host

To configure the guest VM options:

1. Configure the following options for guest VM support in the Junos OS CLI at the [edit] hierarchy.
 - Compute cluster name
 - Compute node name
 - VM instance name
 - Dedicated management interface for guest VM
 - Third-party package name
 - Internal IP address of the guest VM
2. Configure the name of the compute cluster and compute node.

The name of the compute cluster must be default-cluster, and the name of the name of the compute node must be default-node; otherwise, launching the guest VM fails.

```
{master:0}  
root# set services app-engine compute-cluster default-cluster compute-node default-node  
hypervisor
```

3. Configure the name of the VM instance and the name of the third party application.

```
{master:0}
root# set services app-engine virtual-machines instance instance-name package
package-name
```



NOTE: The package names in the show app-engine virtual-machine-package command and the show version command should match.

```
{master:0}
root# set services app-engine virtual-machines instance diagnostics package
pfadiag_vm-rXXXXX-ve
```

4. Associate the VM instance with the configured compute cluster and compute node.

```
{master:0}
root# set services app-engine virtual-machines instance instance-name compute-cluster
name compute-node name
{master:0}
root# set services app-engine virtual-machines instance diagnostics compute-cluster
default-cluster compute-node default-node
```



NOTE: The name of the compute cluster must be default-cluster, and the name of the compute node must be default-node; otherwise, launching the guest VM fails.

5. Configure the local management IP address.

This IP address is used for the internal bridging interface. The host uses this IP address to check the availability of the guest VM.



NOTE: Do not use 192.168.1.1 and 192.168.1.2 as IP addresses because they are used by the Host-OS and Junos OS respectively.

```
{master:0}
root# set services app-engine virtual-machines instance instance-name local-management
family inet address 192.168.1.X
{master:0}
root# set services app-engine virtual-machines instance diagnostics local-management
family inet address 192.168.1.10
```

6. Configure the management interface for the guest VM.

This management interface is separate from the one used for Junos OS.

```
{master:0}
root # set services app-engine virtual-machines instance diagnostics management-interface
em1
```



NOTE: The management interface name must be either em0 or em1. The configuration will fail if you do not configure a management interface and then commit the configuration.

The new management interface is provisioned for the guest VM.

7. Commit the configuration.

```
{master:0}  
root# commit
```

Here are the results of the configuration:

```
services {  
  app-engine {  
    compute-cluster default-cluster {  
      compute-node default-node {  
        hypervisor;  
      }  
    }  
  }  
  virtual-machines {  
    instance diagnostics {  
      package pfadiag_vm-rXXXXXX-ve;  
      local-management {  
        family inet {  
          address 192.168.1.10;  
        }  
      }  
      compute-cluster default-cluster {  
        compute-node default-node;  
      }  
      management-interface em1;  
    }  
  }  
}
```

Verifying That the Guest VM is Working

To verify that the guest VM is working:

1. Issue the following **show** commands to verify that everything is working correctly:

- root> **show app-engine status**

```
Compute cluster: default-cluster
Compute Node: default-node, Online
```

The status should be Online.

- root> **show app-engine virtual-machine instance**

VM name	Compute cluster	VM status
diagnostics	default-cluster	ACTIVE

The VM status should be active.

- root> **show app-engine virtual-machine package**

VM package:	pfadiag_vm-rXXXXX-ve
Compute cluster	Package download status
default-cluster	DOWNLOADED

Accessing the Guest VM

To access the guest VM:

1. Log into the guest VM:

- Specify the guest VM name using the **request app-engine virtual-machine-shell *guest VM name*** command:

Make sure you are logged in as root when you issue the **request app-engine virtual-machine-shell *guest VM name*** command.

```
root> request app-engine virtual-machine-shell diagnostics
```

- Enter a valid username and password combination for the guest VM.



NOTE: The first time you log in, the username is root. There is no password. After you log in, you will be prompted to create a password.

For example:

```
Maxeler Ikon Diagnostics VM r44702
```

```
diagnostics login: root
You are required to change your password immediately (root enforced)
New password:
Retype new password:
```

2. Issue the **ifconfig -a** command to see the names of the management interface that is used to access the guest VM from outside of the network, name of the management interface that is used for internal use, and the NIC ports used in the diagnostics VM.

In this example, the **heartbeat** address is the IP address that is used for internal use , the **management** interface is used for external communications, and the xe-0/0/40 and xe-0/0/41 interfaces are the NIC ports used in the diagnostics VM. The **heartbeat** is configured by default. The IP address of the **heartbeat** is the same as the IP address you configured for Junos OS.

You can associate one of the interfaces to the guest VM by issuing the **set services app-engine virtual-machines instance *name* management-interface *interface-name*** command. Use the same IP address as the one you configured using the **set services app-engine virtual-machines instance test local-management family inet address 192.168.1.10**. The MAC addresses associated with these interfaces are used for internal bridging.

```
[root@ikondia ~]# ifconfig -a
heartbeat Link encap:Ethernet HWaddr 52:54:00:5D:DB:01
  inet addr:192.168.1.10 Bcast:0.0.0.0 Mask:255.255.255.0
  inet6 addr: fe80::5054:ff:fe5d:db01/64 Scope:Link
  UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
  RX packets:282 errors:0 dropped:0 overruns:0 frame:0
  TX packets:266 errors:0 dropped:0 overruns:0 carrier:0
  collisions:0 txqueuelen:1000
  RX bytes:24955 (24.3 KiB) TX bytes:24232 (23.6 KiB)

lo        Link encap:Local Loopback
  inet addr:127.0.0.1 Mask:255.0.0.0
  inet6 addr: ::1/128 Scope:Host
  UP LOOPBACK RUNNING MTU:16436 Metric:1
  RX packets:0 errors:0 dropped:0 overruns:0 frame:0
  TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
  collisions:0 txqueuelen:0
  RX bytes:0 (0.0 b) TX bytes:0 (0.0 b)

management Link encap:Ethernet HWaddr 52:54:00:76:B3:C4
  inet6 addr: fe80::5054:ff:fe76:b3c4/64 Scope:Link
  UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
  RX packets:6 errors:0 dropped:0 overruns:0 frame:0
  TX packets:10 errors:0 dropped:0 overruns:0 carrier:0
  collisions:0 txqueuelen:1000
  RX bytes:438 (438.0 b) TX bytes:1836 (1.7 KiB)

xe-0-0-40 Link encap:Ethernet HWaddr EA:8B:BB:75:56:FE
  inet6 addr: fe80::e88b:bbff:fe75:56fe/64 Scope:Link
  UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
  RX packets:0 errors:0 dropped:0 overruns:0 frame:0
  TX packets:2 errors:0 dropped:0 overruns:0 carrier:0
  collisions:0 txqueuelen:1000
  RX bytes:0 (0.0 b) TX bytes:140 (140.0 b)

xe-0-0-41 Link encap:Ethernet HWaddr 3E:1A:00:94:ED:5B
  inet6 addr: fe80::3c1a:ff:fe94:ed5b/64 Scope:Link
  UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
  RX packets:0 errors:0 dropped:0 overruns:0 frame:0
  TX packets:3 errors:0 dropped:0 overruns:0 carrier:0
  collisions:0 txqueuelen:1000
  RX bytes:0 (0.0 b) TX bytes:230 (230.0 b)
```

Verifying That the FPGA Module Is Working

You can use the following utilities to verify that the FPGA module on the QFX-PFA-4Q module is working.

To verify that the FPGA module is working:

1. Issue the **lspci |grep "RAM memory"** command at the guest VM login prompt.

```
[root@ikondiag ~]# lspci |grep "RAM memory"
00:09.0 RAM memory: Juniper Networks Device 0078
```

The output shows that Juniper Networks Device 0078 is working.

2. Issue the **lspci |grep Co-processor** command at the guest VM login prompt:

```
[root@ikondiag ~]# lspci |grep Co-processor
:0a.0 Co-processor: Maxeler Technologies Ltd. Device 0006
```

The output shows that Maxeler Technologies Ltd. Device 0006 is working.

3. Issue the **maxtop** command at the guest VM login prompt:



NOTE: If there are errors in the command output, relaunch the guest VM.

```
[root@ikondiag ~]# maxtop
MaxTop Tool 2015.1
Found 1 card(s) running MaxelerOS 2015.1
Card 0: QFX-PFA-4Q (P/N: 241124) S/N: 96362301684266423 Mem: 24GB
```

Load average: 0.00, 0.00, 0.00

DFE	%BUSY	TEMP	MAXFILE	PID	USER	TIME	COMMAND
0	0.0%	-	2fcf249cc7...	-	-	-	-

Validating Connections Between QFX5100-24Q-AA Switch Network Ports and QFX-PFA-4Q Module Ports

You can use the **ikon_eth_util --all-pass-through** utility to validate the connections between the QFX5100-24Q-AA switch network ports and the QFX-PFA-4Q module ports.

In this example, the **ikon_eth_util --all-pass-through** utility will validate the following connections between the F-ports, A-ports, B-ports, and C-ports. [Figure 7 on page 190](#) provides the ports that are validated in this example.

Table 28: Validating Ports

F-Ports	A-Ports	B-Ports	C-Ports
xe-0/0/10:2	xe-0/0/32	JDFE_XE32_10G	JDFE_QSFPO_10G_PORT0 [External Port 0-0]
This interface is one of the 10-Gigabit Ethernet ports on the QFX5100-24Q-AA switch. You can manage these ports through the Junos OS.	This interface connects the PFE of the QFX5100-24Q-AA switch to the B-ports on the FPGA module on the QFX-PFA-4Q module.	This interface is an Internal 10-Gigabit Ethernet port on the FPGA module on the QFX-PFA-4Q module and connects to the A-ports on the PFE of the QFX5100-24Q-AA switch.	This interface is one of the front-facing 40-Gigabit Ethernet ports on the QFX-PFA-4Q module and connects to the guest VM running on the QFX5100-24Q-AA switch and the F-ports on the QFX5100-24Q-AA switch.

To validate the connections between the QFX5100-24Q-AA switch network ports and the QFX-PFA-4Q module ports:

1. Configure a VLAN and VLAN ID:

```
[edit vlans]
user@switch # set VLAN_TEST vlan-id 100
```

2. Associate the F-port and A-port in this VLAN so that the FPGA and PFE can communicate:

```
[edit interfaces]
user@switch # set xe-0/0/10:2 unit 0 family ethernet-switching vlan members VLAN_TEST
user@switch # set xe-0/0/32 unit 0 family ethernet-switching vlan members VLAN_TEST
```

3. Commit the configuration:

```
[edit]
user@switch # commit synchronize
```

4. Verify that the VLAN has been created.

```
[edit]
user@switch # run show vlans
```

Routing instance	VLAN name	Tag	Interfaces
default-switch	VLAN_TEST	100	xe-0/0/10:2.0*
default-switch	default	1	xe-0/0/32.0*

5. Issue the **ikon_eth_util --all-pass-through** command at the guest VM login prompt:

```
[root@ikondiag ~]# ikon_eth_util --all-pass-through
```

Ikon Ethernet Pass Through Utility

```

setting portConnect_JDFE_QSFP0_10G_PORT0_JDFE_XE32_10G to 1
setting portConnect_JDFE_QSFP0_10G_PORT1_JDFE_XE33_10G to 1
setting portConnect_JDFE_QSFP0_10G_PORT2_JDFE_XE34_10G to 1
setting portConnect_JDFE_QSFP0_10G_PORT3_JDFE_XE35_10G to 1
setting portConnect_JDFE_XE24_10G_JDFE_QSFP1_10G_PORT0 to 1
setting portConnect_JDFE_XE25_10G_JDFE_QSFP1_10G_PORT1 to 1
setting portConnect_JDFE_XE26_10G_JDFE_QSFP1_10G_PORT2 to 1
setting portConnect_JDFE_XE27_10G_JDFE_QSFP1_10G_PORT3 to 1
setting portConnect_JDFE_XE28_10G_JDFE_QSFP2_10G_PORT0 to 1
setting portConnect_JDFE_XE29_10G_JDFE_QSFP2_10G_PORT1 to 1
setting portConnect_JDFE_XE30_10G_JDFE_QSFP2_10G_PORT2 to 1
setting portConnect_JDFE_XE31_10G_JDFE_QSFP2_10G_PORT3 to 1
setting portConnect_JDFE_XE36_10G_JDFE_QSFP3_10G_PORT0 to 1
setting portConnect_JDFE_XE37_10G_JDFE_QSFP3_10G_PORT1 to 1
setting portConnect_JDFE_XE38_10G_JDFE_QSFP3_10G_PORT2 to 1
setting portConnect_JDFE_XE39_10G_JDFE_QSFP3_10G_PORT3 to 1
running press return key to exit

```

6. Send traffic to xe-0/0/10:2 on the QFX5100-24Q-AA switch and receive traffic on the front panel port 0-0 on the QFX-PFA-4Q module.
7. Send traffic to the front panel port 0-0 on the QFX-PFA-4Q module and receive traffic on xe-0/0/10:2 on the QFX5100-24Q-AA switch.
8. Verify the statistics for the xe-0/0/10:2 and xe-0/0/32 interfaces by issuing the **show interfaces xe-0/0/10:2 extensive** and **show interfaces xe-0/0/32 extensive** commands.
9. Verify the statistics for the JDFE_XE32_10G and JDFE_QSFP0_10G_PORT0 interfaces by issuing the **maxnet link** commands at the guest VM prompt for the Packet Flow Accelerator Diagnostics software.

```
[root@ikondiag ~]# maxnet link show JDFE_XE32_10G
```

```
JDFE_XE32_10G:
```

```

    Link Up: true
    MAC address: 00:11:22:33:44:55
    RX Enabled: true
    RX Frames: 1 ok
                0 error
                0 CRC error
                0 invalid/errored
                1 total
    TX Enabled: true
    TX Frames: 0 ok
                0 error
                0 CRC error
                0 invalid/errored
                0 total

```

```
[root@ikondiag ~]# maxnet link show JDFE_QSFP0_10G_PORT0
```

```
JDFE_QSFP0_10G_PORT0:
```

```

    Link Up: true
    MAC address: 00:11:22:33:44:55
    RX Enabled: true
    RX Frames: 0 ok
                0 error
                0 CRC error
                0 invalid/errored
                0 total

```



```
TX Enabled: true
TX Frames: 1 ok
           0 error
           0 CRC error
           0 invalid/errored
           1 total
```

Uninstalling the Guest VM

To remove the guest VM:

1. Delete the configuration statements and uninstall the Packet Flow Accelerator Diagnostics software package.

For example, to remove the **app-engine** statement:

```
root # delete services app-engine
```

2. Commit the configuration.

```
root# commit
```

3. (Optional) Issue the **show version** command to learn the name of the Packet Flow Accelerator Diagnostics software package.

```
{master:0}
root> show version
fpc0:
```

```
-----

Hostname: switch
```

```
Model: qfx5100-24q-aa
```

```
Junos: 14.1X53-D27_vjunos.62
```

```
JUNOS Base OS Software Suite [14.1X53-D27_vjunos.62]
```

```
JUNOS Base OS boot [14.1X53-D27_vjunos.62]
```

```
JUNOS Crypto Software Suite [14.1X53-D27_vjunos.62]
```

```
JUNOS Online Documentation [14.1X53-D27_vjunos.62]
```

```
JUNOS Kernel Software Suite [14.1X53-D27_vjunos.62]
```

```
JUNOS Packet Forwarding Engine Support (qfx-ex-x86-32) [14.1X53-D26_vjunos.62]
```

```
JUNOS Routing Software Suite [14.1X53-D27_vjunos.62]
```

JUNOS Enterprise Software Suite [14.1X53-D27_vjunos.62]

JUNOS py-base-i386 [14.1X53-D27_vjunos.62]

JUNOS py-extensions-i386 [14.1X53-D27_vjunos.62]

JUNOS Host Software [14.1X53-D27_vjunos.62]

Junos for Automation Enhancement

JUNOS GUEST-VM Software [pfadiag_vm-rXXXXX-ve]

{master:0}

4. Issue the **request system software delete virtual-machine-package <package-name>** command to uninstall the Packet Flow Accelerator Diagnostics software.

```
root> request system software delete virtual-machine-package pfadiag_vm-rXXXXX-ve
fpc0:
```

```
-----
Deleted virtual-machine package dpfadiag_vm-rXXXXX-ve ...
```

Related Documentation

- [Understanding Packet Flow Accelerator Diagnostics Software and Other Utilities on page 189](#)
- [Installing an Expansion Module in a QFX5100 Device](#)
- [Installing Ethernet and PTP Scripts on page 212](#)
- [Launching a Guest Virtual Machine \(VM\) to Run a Third Party Application on Junos OS Release 13.2X51-D20 on page 106](#)
- [Upgrading Software on page 273](#)

PART 13

Passwords

- [Understanding Passwords on page 229](#)

CHAPTER 13

Understanding Passwords

- [Configuring the Root Password on page 229](#)
- [Recovering the Root Password on page 231](#)
- [Example: Changing the Requirements for Junos OS Plain-Text Passwords on page 232](#)

Configuring the Root Password

The Junos OS is preinstalled on the router or switch. When the router or switch is powered on, it is ready to be configured. Initially, you log in as the user **root** with no password. The root directory of a UNIX device is the entry point to all other folders and files on that device. As a result, access to the root directory is restricted by default to a predefined user account known as the *root user*. The root user (also referred to as *superuser*) has unrestricted access and full permissions within the system. The expression “log in as root” is commonly used when an action requires the user to log into the device as the root user.



NOTE: If you configure a blank password using the `encrypted-password` statement at the `[edit system root-authentication]` hierarchy level for root authentication, you can commit a configuration but you *cannot* log in as the root user and gain root level access to the router or switch.

After you log in, you should configure the root (superuser) password by including the **root-authentication** statement at the `[edit system]` hierarchy level and configuring one of the password options:

```
[edit system]
root-authentication {
  (encrypted-password "password"| plain-text-password);
  load-key-file URL filename;
  ssh-dsa "public-key" <from hostname>;
  ssh-ecdsa "public-key" <from hostname>;
  ssh-rsa "public-key" <from hostname>;
}
```

If you configure the **plain-text-password** option, you are prompted to enter and confirm the password:

```
[edit system]
```

```

user@host# set root-authentication plain-text-password
New password: type password here
Retype new password: retype password here

```

The default requirements for plain-text passwords are:

- The password must be between 6 and 128 characters long
 - You can include most character classes in a password (uppercase letters, lowercase letters, numbers, punctuation marks, and other special characters). Control characters are not recommended.
 - Valid passwords must contain at least one change of case or character class.

You can use the **load-key-file** *URL filename* statement to load an SSH key file that was previously generated using **ssh-keygen**. The *URL filename* is the path to the file's location and name. When using this option, the contents of the key file are copied into the configuration immediately after entering the **load-key-file** *URL* statement. This command loads RSA (SSH version 1 and SSH version 2) and DSA (SSH version 2) public keys.

Optionally, you can use the **ssh-dsa**, **ssh-ecdsa**, or **ssh-rsa** statements to directly configure SSH RSA, DSA, or ECDSA keys to authenticate root logins. You can configure more than one public key for SSH authentication of root logins as well as for user accounts. When a user logs in as root, the public keys are referenced to determine whether the private key matches any of them.

To view the SSH keys entries, use the configuration mode **show** command. For example:

```

[edit system]
user@host# set root-authentication load-key-file my-host::ssh/id_dsa.pub
.file.19692 | 0 KB | 0.3 kB/s | ETA: 00:00:00 | 100%
[edit system]
user@host# show
root-authentication {
  ssh-rsa "1024 35 9727638204084251055468226757249864241630322
20740496252839038203869014158453496417001961060835872296
15634757491827360336127644187426594689320773910834481012
68312595772262546166799927831612350043866091586628382248
97467326056611921489539813965561563786211940327687806538
16960202749164163735913269396344008443 boojum@juniper.net"; #
  SECRET-DATA
}

```

Junos-FIPS software has special password requirements. FIPS passwords must be between 10 and 20 characters in length. Passwords must use at least three of the five defined character sets (uppercase letters, lowercase letters, digits, punctuation marks, and other special characters). If Junos-FIPS is installed on the router or switch, you cannot configure passwords unless they meet this standard. If you use the **encrypted-password** option, then a null-password (empty) is not permitted.

You cannot configure a blank password for **encrypted-password** using blank quotation marks (" "). You must configure a password whose number of characters range from 1 through 128 characters and enclose the password in quotation marks.

Related Documentation

- *Configuring the Root Password*
- *Example: Configuring a Plain-Text Password for Root Logins*
- *Example: Configuring SSH Authentication for Root Logins*
- [Example: Changing the Requirements for Junos OS Plain-Text Passwords on page 232](#)
- *Recovering the Root Password*

Recovering the Root Password

If you forget the root password, you can use the password recovery procedure to reset the root password.



NOTE: The root password cannot be recovered on a QFabric system.



NOTE: You need console access to the switch to recover the root password.

To recover the root password:

1. Power off the switch by switching off the AC power outlet of the device or, if necessary, by pulling the power cords out of the device's power supplies.
2. Turn off the power to the management device, such as a PC or laptop computer, that you want to use to access the CLI.
3. Plug one end of the Ethernet rollover cable supplied with the device into the RJ-45-to-DB-9 serial port adapter supplied with the device.
4. Plug the RJ-45-to-DB-9 serial port adapter into the serial port on the management device.
5. Connect the other end of the Ethernet rollover cable to the console port on the device.
6. Turn on the power to the management device.
7. On the management device, start your asynchronous terminal emulation application (such as Microsoft Windows Hyperterminal) and select the appropriate **COM** port to use (for example, **COM1**).
8. Configure the port settings as follows:
 - Bits per second: 9600
 - Data bits: 8
 - Parity: None
 - Stop bits: 1
 - Flow control: None

9. Power on the device by (if necessary) plugging the power cords into the device's power supply, or turning on the power to the device by switching on the AC power outlet the device is plugged into.

The terminal emulation screen on your management device displays the device's boot sequence.

10. When the following prompt appears, press the Spacebar to access the device's bootstrap loader command prompt:

```
Hit [Enter] to boot immediately, or space bar for command prompt.  
Booting [kernel] in 9 seconds...
```

11. At the following prompt, enter **boot -s** to start up the system in single-user mode.

```
ok boot -s
```

12. At the following prompt, enter **recovery** to start the root password recovery procedure.

```
Enter full pathname of shell or 'recovery' for root password recovery or RETURN  
for /bin/sh: recovery
```

13. Enter configuration mode in the CLI.

14. Set the root password. For example:

```
user@switch# set system root-authentication plain-text-password
```

15. At the following prompt, enter the new root password. For example:

```
New password: juniper1  
Retype new password:
```

16. At the second prompt, reenter the new root password.

17. After you have finished configuring the password, commit the configuration.

```
root@host# commit  
commit complete
```

18. Exit configuration mode in the CLI.

19. Exit operational mode in the CLI.

20. At the prompt, enter **y** to reboot the device.

```
Reboot the system? [y/n] y
```

Related Documentation

- [Configuring the Root Password](#)

Example: Changing the Requirements for Junos OS Plain-Text Passwords

This example shows how to set various maximum and minimum requirements for plain-text passwords to increase password strength.

- [Requirements on page 233](#)
- [Overview on page 233](#)
- [Configuration on page 233](#)

Requirements

This example requires a device running Junos 12.2 or greater. The **minimum-length** and **maximum-length** password requirements statements are available in earlier releases, however, you must have Junos OS Release 12.2 or greater to configure **minimum-lower-cases**, **minimum-numeric**s, **minimum-punctuations**, or **minimum-upper-cases**.

Overview

You can use a variety of requirements to strengthen plain-text passwords for greater security. Junos OS provides a number of possible configurations at the **[edit system login password]** hierarchy level that allow you to require users to create plain-text passwords that conform to a particular set of requirements that may include such things as length, number of changes, type of characters, numbers, or letter case.

Configuration

CLI Quick Configuration To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the **[edit]** hierarchy level.

```
set system login password minimum-length 12
sset system login password maximum-length 22
set system login password minimum-numeric 1
set system login password minimum-upper-cases 1
set system login password minimum-lower-cases 1
set system login password minimum-punctuations 1
```

Configuring Requirements for Plain-Text Passwords

Step-by-Step Procedure This example configures password requirements that require the user to create a password that has a minimum length of 12 characters, a maximum length of 22 characters, and that includes at least one lower-case letter, at least one upper-case letter, at least one punctuation character, and at least one numeric character.

1. Navigate to configuration mode in the **[system login password]** hierarchy level.


```
user@host> edit
[edit]
user@host# edit system login password
```
2. Set a minimum length requirement of 12 characters and a maximum length requirement of 22 characters for user passwords.


```
[edit system login password]
user@host# set minimum-length 12
[edit system login password]
user@host# set maximum-length 22
```
3. Require users to set a password that has at least one lower-case letter and at least one upper-case letter.


```
[edit system login password]
```

```
user@host# set minimum-lower-cases 1
[edit system login password]
user@host# set minimum-upper-cases 1
```

4. Require users to set a password that has at least one punctuation-class character and at least one number.

```
[edit system login password]
user@host# set minimum-punctuations 1
[edit system login password]
user@host# set minimum-numeric 1
```

Results

From configuration mode, confirm your configuration by entering the show command at the edit system login password hierarchy level. If the output does not display the intended configuration, repeat the instructions in this example to correct the configuration.

```
[edit system login password]
user@host# show
minimum-length 12;
maximum-length 22;
minimum-numeric 1;
minimum-upper-cases 1;
minimum-lower-cases 1;
```

- Related Documentation**
- *Special Requirements for Junos OS Plain-Text Passwords*
 - *password (Login)*

CHAPTER 14

Precision Time Protocol (PTP)

- [Understanding Transparent Clocks in Precision Time Protocol on page 236](#)
- [Configuring Transparent Clock Mode for Precision Time Protocol on page 236](#)

Understanding Transparent Clocks in Precision Time Protocol

The Precision Time Protocol (PTP) standardized by IEEE 1588 improves the current methods of synchronization used within a distributed network. You can use PTP across packet-based networks including, but not limited to, Ethernet networks. Queuing and buffering delays in the switch can cause variable delay to packets, which affect path delay measurements. Queuing delays vary based on the network load and also depend on the architecture of the switch.

Transparent clocks measure and adjust for packet delay. The transparent clock computes the variable delay as the PTP packets pass through the switch. The QFX5100 and EX4600 switches act as transparent clocks only and operate between the master and slave clocks in a distributed network. Transparent clocks improve synchronization between the master and slave clocks and ensure that the master and slave clocks are not impacted by the affects of packet delay variation.

The transparent clock measures the residence time (the time that the packet spends passing through the switch), adds the residence time into the correction field of the PTP packet. The slave clock accounts for the packet delay by using both the origin timestamp and the information in the correction field.

End-to-end transparent clocks are supported. With an end-to-end transparent clock, only the residence time is included in the correction field of the PTP packets. The residence time can be sent in a one-step process, which means that the timestamps are sent in one packet. In a two-step process, estimated timestamps are sent in one packet, and additional packets contain updated timestamps.

You can enable or disable a transparent clock globally for the switch. With a global configuration, the same configuration is applied to each interface. If the transparent clock is disabled, PTP packet correction fields are not updated. If the transparent clock is enabled, the PTP packet correct fields are updated.

PTP over Ethernet, UDP over IPv4 and IPv6, and unicast and multicast transparent clocks are also supported.

Related Documentation

- [Configuring Transparent Clock Mode for Precision Time Protocol on page 236](#)
- [e2e-transparent on page 405](#)
- [\[edit protocols ptp\] Hierarchy Level](#)
- [show ptp global-information](#)

Configuring Transparent Clock Mode for Precision Time Protocol

In a distributed network, you can configure Precision Time Protocol (PTP) transparent clocks to help synchronize the timing across the network.

To configure the transparent clock mode for Precision Time Protocol (PTP):

1. In configuration mode, go to the **[edit protocols ptp]** hierarchy level.

```
[edit]  
user@host# edit protocols ptp
```

2. Specify transparent clock mode:

```
[edit protocols ptp]  
user@host# set e2e-transparent
```

**Related
Documentation**

- [Understanding Transparent Clocks in Precision Time Protocol on page 236](#)
- [e2e-transparent on page 405](#)
- *[edit protocols ptp] Hierarchy Level*
- *show ptp global-information*

PART 14

Recovery Installation

- [Understanding Recovery Installation on page 241](#)

Understanding Recovery Installation

- Creating an Emergency Boot Device on page 241
- Creating a Snapshot and Using It to Boot a QFX3500 and QFX3600 Series Switch on page 242
- Creating a Snapshot and Using It to Boot a Device on page 244
- Performing a Recovery Installation Using an Emergency Boot Device on page 246
- Recovering from a Failed Software Installation on page 247

Creating an Emergency Boot Device

If Junos OS on the device is damaged in some way that prevents the software from loading properly, you can use an emergency boot device to repartition the primary disk and load a fresh installation of Junos OS. Use the following procedure to create an emergency boot device.

Before you begin, you need to download the installation media image for your device and Junos OS release from <http://www.juniper.net/customers/support/>.



NOTE: You can create the emergency boot device on another Juniper Networks switch or router, or any PC or laptop that supports Linux. The steps you take to create the emergency boot device vary, depending on the device.

To create an emergency boot device:

1. Use FTP to copy the installation media image into the `/var/tmp` directory on the device.
2. Insert a USB device into the USB port.
3. From the Junos OS command-line interface (CLI), start the shell:

```
user@device> start shell
%
```

4. Switch to the root account using the `su` command:

```
% su
Password: password
```



NOTE: The password is the root password for the device. If you logged in to the device as root, you do not need to perform this step.

5. Enter the following command on the device:

```
root@device% dd if=/var/tmp/filename of=/dev/da1 bs=16k
```

The device writes the installation media image to the USB device:

```
root@device% dd if=/var/tmp/install-media-qfx3500.junos_11.1 of=/dev/da1 bs=16k
11006+1 records in
11006+1 records out
180332544 bytes transferred in 71.764266 secs (2512846 bytes/sec)
```

6. Enter the following command:

```
root@device% dd if=/var/tmp/filename of=/dev/da0 bs=1048576
```

The device writes the installation media image to the USB device:

```
root@device% dd if=/var/tmp/jinstall-vjunos-usb-13.2.img of=/dev/da0 bs=1048576
11006+1 records in
11006+1 records out
180332544 bytes transferred in 71.764266 secs (2512846 bytes/sec)
```



NOTE: The device automatically create a recovery Junos OS image.

The “Select a recovery image” menu appears on the console when one of these switches is booted and unable to load a version of Junos OS. You can follow the instructions in the “Select a recovery image” menu to load the Junos OS image for one of these switches.

7. Log out of the shell:

```
root@device% exit
% exit
user@device>
```

Related Documentation

- [USB Port Specifications for the QFX Series](#)
- [Performing a Recovery Installation](#)
- [Performing a QFabric System Recovery Installation on the Director Group](#)
- [Performing a Recovery Installation Using an Emergency Boot Device on page 246](#)

Creating a Snapshot and Using It to Boot a QFX3500 and QFX3600 Series Switch

The system snapshot feature takes a “snapshot” of the files currently used to run the QFX Series switch—the complete contents of the `/config` and `/var` directories, which include the running Juniper Networks Junos OS, the active configuration, and the rescue configuration—and copies all of these files into an alternate (internal, meaning internal flash, or an external, meaning USB flash) memory source. You can then use these snapshots to boot the switch at the next bootup or as a backup boot option.

The system snapshot feature is especially effective as a bootup option after a partition corruption, as it is the only recovery option that allows you to completely restore the Junos OS and configuration in the event of a corrupted partition.

This topic includes the following tasks:

- [Creating a Snapshot on a USB Flash Drive and Using It to Boot the Switch on page 243](#)
- [Creating a Snapshot on an Internal Flash Drive and Using it to Boot the Switch on page 243](#)
- [Creating a Snapshot on the Alternate Slice of the Boot Media on page 244](#)

Creating a Snapshot on a USB Flash Drive and Using It to Boot the Switch

A snapshot can be created on USB flash memory after a switch is booted using files stored in internal memory.

Ensure that you have the following tools and parts available before creating a snapshot on a USB Flash drive:

- A USB flash drive that meets the QFX Series switch USB port specifications. See *USB Port Specifications for the QFX Series*.

To create a snapshot on USB flash memory and use it to boot the switch:

1. Place the snapshot into USB flash memory:

```
user@switch> request system snapshot partition
```



NOTE: This example uses the **partition** option. If you have already created a partition for the snapshot, you don't need to use the **partition** option.

2. (Optional) Perform this step if you want to boot the switch now using the snapshot stored on the external USB flash drive. If you created the snapshot as a backup, do not perform this step.

- To reboot the switch using the most recently created snapshot:

```
user@switch> request system reboot
```

- To reboot the switch using a snapshot in a specific partition on the USB flash drive:

```
user@switch> request system reboot slice 1
```

Creating a Snapshot on an Internal Flash Drive and Using it to Boot the Switch

A snapshot can be created on internal memory after a switch is booted using files stored in external memory.

To create a snapshot in internal memory and use it to boot the switch:

1. Place the snapshot files in internal memory:

```
user@switch> request system snapshot partition
```



NOTE: This example uses the `partition` option. If you have already created a partition for the snapshot, you don't need to use the `partition` option.

2. (Optional) Perform this step if you want to boot the switch now using the newly created snapshot. If you created the snapshot as a backup, do not perform this step.

- To reboot the switch using the most recently created snapshot:

```
user@switch> request system reboot
```

- To reboot the switch using a snapshot in a specific partition in internal memory:

```
user@switch> request system reboot slice 1
```

Creating a Snapshot on the Alternate Slice of the Boot Media

The alternate slice of the boot media contains a backup software image that the switch can boot from if it is unable to boot from the primary slice. When you upgrade software, the new software image gets copied only to the primary slice of the boot media.

To create a snapshot of the currently booted software image on the backup slice of the boot media:

```
user@switch> request system snapshot slice alternate
```

After the system boots up, you will see the following message before the login prompt:

WARNING: THIS DEVICE HAS BOOTED FROM THE BACKUP JUNOS IMAGE

It is possible that the primary copy of JUNOS failed to boot up properly, and so this device has booted up from the backup copy.

Please re-install JUNOS to recover the primary copy in case it has been corrupted.

The system will generate an alarm indicating that the switch has booted from the backup slice.

Related Documentation

- [Verifying That a System Snapshot Was Created on a QFX Series Switch on page 287](#)
- [Understanding System Snapshot on page 283](#)

Creating a Snapshot and Using It to Boot a Device

The system snapshot feature takes a “snapshot” of the files currently used to run the device—the complete contents of the `/config` directories, which include the running Juniper Networks Junos OS, the active configuration, and the rescue configuration, as well as the host OS—and copies all of these files into an external USB flash drive.

You can use the snapshot to boot the device at the next bootup or as a backup boot option.

The system snapshot feature is especially effective as a bootup option after a partition corruption, as it is the only recovery option that allows you to completely restore the Junos OS and configuration in the event of a corrupted partition on a switch.

This topic includes the following tasks:

- [Creating a Snapshot on an External USB Flash Drive and Using It to Boot the Device on page 245](#)

Creating a Snapshot on an External USB Flash Drive and Using It to Boot the Device

A snapshot can be created on an external USB flash drive after a device is booted using files stored in internal memory.

Ensure that you have the following tools and parts available before creating a snapshot on an external USB flash drive:

- An external USB flash drive that meets the device USB port specifications. See *USB Port Specifications for the QFX Series*.

To create a snapshot on the external USB flash drive and use it to boot the device:

1. Insert the external USB flash drive.
2. Issue the **request system snapshot** command.

```
user@device> request system snapshot
fpc0:
```

```
-----
Starting snapshot to usb (/dev/da0)
Creating snapshot on the host ..
Copying bootable disk image from host ..
Writing to usb (/dev/da0) ..
Copying 'Host OS' to '/dev/da0s1' .. (this may take a few minutes)
Copying 'JUNOS' to '/dev/da0s1' .. (this may take a few minutes)
The following filesystems were archived: / /config Host-OS
```

3. (Optional) Perform this step if you want to boot the device now using the snapshot stored on the external USB flash drive. If you created the snapshot as a backup, do not perform this step.

- Insert the external USB flash drive.
- Power cycle the device.

The external USB flash drive is detected.

- The software prompts you with the following options:

```
Junos Snapshot Installer - (c) Juniper Networks 2013
Reboot
Install Junos Snapshot [13.2-20131115_x_132_x51_vjunos.0
Boot to host shell [debug]
```

- Select **Install Junos Snapshot** to install the snapshot located on the external USB flash drive to the device.

The device copies the software from the external USB flash drive, occasionally displaying status messages. When the software is finished being copied from the

external USB flash drive to the device, the device then reboots from the internal flash storage on which the software was just installed. When the reboot is complete, the device displays the Junos OS login prompt:

```
root@device#
```

- Related Documentation**
- [Verifying That a System Snapshot Was Created on a QFX Series Switch on page 287](#)
 - [Understanding System Snapshot on page 283](#)

Performing a Recovery Installation Using an Emergency Boot Device

If Junos OS on your device is damaged in some way that prevents the software from loading correctly, you may need to perform a recovery installation using an emergency boot device (for example, a USB flash drive) to restore the default factory installation. Once you have recovered the software, you need to restore the device configuration. You can either create a new configuration as you did when the device was shipped from the factory, or if you saved the previous configuration, you can simply restore that file to the device.

If at all possible, you should try to perform the following steps before you perform the recovery installation:

1. Ensure that you have an emergency boot device to use during the installation. See [“Creating an Emergency Boot Device” on page 241](#) for information on how to create an emergency boot device.
2. Copy the existing configuration in the file `/config/juniper.conf.gz` from the device to a remote system, such as a server, or to an emergency boot device. For extra safety, you can also copy the backup configurations (the files named `/config/juniper.conf.n`, where *n* is a number from 0 through 9) to a remote system or to an emergency boot device.

You can use the system snapshot feature to complete this step. The system snapshot feature takes a “snapshot” of the files currently used to run the QFX Series switch—the complete contents of the `/config` and `/var` directories, which include the running Juniper Networks Junos OS, the active configuration, and the rescue configuration—and copies all of these files into a memory source. See [“Creating a Snapshot and Using It to Boot a QFX3500 and QFX3600 Series Switch” on page 242](#) or [“Creating a Snapshot and Using It to Boot a Device” on page 244](#).



WARNING: The recovery installation process completely overwrites the entire contents of the internal flash storage.

3. Copy any other stored files to a remote system as desired.

To reinstall Junos OS:

1. Insert the emergency boot device into the device.
2. Power cycle the device.

The emergency boot device (external USB install media) is detected. At this time, you can load the Junos OS from the emergency boot device onto the internal flash storage.

3. The software prompts you with the following options:

```
Junos Snapshot Installer - (c) Juniper Networks 2013
Reboot
Install Junos Snapshot
[13.2-20131115_x132_x51_vjunos.0Boot to host shell [debug]
```

On some devices, including a QFX5100 or EX4600 switch, the **Junos Recovery** option might also appear. The **Junos Recovery** option allows you to install a recovery version of Junos OS that was automatically saved when the switch was previously running.

4. Select **Install Junos** to format the internal flash storage and install the Junos OS on the emergency boot device onto the internal flash storage.
5. The device copies the software from the emergency boot device, occasionally displaying status messages. Copying the software can take up to 12 minutes.

When the software is finished being copied from the emergency device to the device, the device reboots from the internal flash storage on which the software was just installed. When the reboot is complete, the device displays the Junos OS login prompt:

```
root@switch#
```

6. Create a new configuration as you did when the device was shipped from the factory, or restore the previously saved configuration file to the device.
7. Remove the emergency boot device.

Related Documentation

- [Creating an Emergency Boot Device on page 241](#)

Recovering from a Failed Software Installation

Problem	Description: If the Junos OS appears to have been installed but the CLI does not work, or if the switch has no software installed, you can use this recovery installation procedure to install the Junos OS.
Solution	If a Junos OS image already exists on the switch, you can either install the new Junos OS package in a separate partition, in which case both Junos OS images remain on the switch, or you can remove the existing Junos OS image before you start the new installation process.



NOTE: QFX5100, EX4600, and OCX Series switches do not have a separate partition to reinstall a Junos OS image.

A recovery image is created automatically on these switches. If a previously-running switch is powered on and unable to boot using a Junos OS image, you can boot the switch using the recovery Junos OS image by selecting an option in the “Select a recovery image” menu.

We suggest creating a system snapshot on your switch onto the external USB flash drive, and using the snapshot for recovery purposes. The system snapshot feature takes a “snapshot” of the files currently used to run the device—the complete contents of the /config directories, which include the running Juniper Networks Junos OS, the active configuration, and the rescue configuration, as well as the host OS—and copies all of these files into an external USB flash drive. See [“Creating a Snapshot and Using It to Boot a QFX3500 and QFX3600 Series Switch” on page 242](#) or [“Creating a Snapshot and Using It to Boot a Device” on page 244](#).

To perform a recovery installation:

1. Power on the switch. The loader script starts.
2. After the message **Loading /boot/defaults/loader.conf** appears, you are prompted with the following message:

Hit [Enter] to boot immediately, or space bar for command prompt.

Press the Spacebar to enter the manual loader. The **loader>** prompt appears.



NOTE: The loader prompt does not appear on QFX5100, EX4600, and OCX Series switches.

On QFX5100, EX4600, and OCX Series switches only, a recovery image is automatically saved if a previously-running switch is powered on and unable to boot using a Junos OS image.

The “Select a recovery image” menu appears on the console when one of these switches is booted and unable to load a version of Junos OS. Follow the instructions in the “Select a recovery image” menu to load the recovery version of Junos OS for one of these switches.

You can ignore the remainder of this procedure if you are using a QFX5100, EX4600, or OCX Series switch.

3. Enter the following command:

```
loader> install [--format] [--external] source
```


where:

- **format**—Enables you to erase the installation media before installing the installation package. If you do not include this option, the system installs the new Junos OS in a different partition from that of the most recently installed Junos OS.
- **external**—Installs the installation package onto external media (a USB stick, for example).
- **source**—Represents the name and location of the Junos OS package, either on a server on the network or as a file on an external media, as shown in the following two examples:
 - Network address of the server and the path on the server; for example, **tftp://192.171.28/junos/jinstall-qfx-11.1R1.5-domestic-signed.tgz**
 - Junos OS package on a USB device (commonly stored in the root drive as the only file), for example, **file:///jinstall-qfx-11.1R1.5-domestic-signed.tgz**.

The installation now proceeds normally and ends with a login prompt.

**Related
Documentation**

- [Creating a Snapshot and Using It to Boot a QFX3500 and QFX3600 Series Switch on page 242](#)
- [Creating a Snapshot and Using It to Boot a Device on page 244](#)

PART 15

Routine Monitoring

- [Understanding Routine Monitoring on page 253](#)

CHAPTER 16

Understanding Routine Monitoring

- [Monitoring System Process Information on page 253](#)
- [Monitoring System Properties on page 254](#)
- [Monitoring Interface Status and Traffic on page 255](#)

Monitoring System Process Information

Purpose View the processes running on the device.

Action To view the software processes running on the device:

[edit system]

user@switch> [show system processes](#)

Meaning [Table 29 on page 253](#) summarizes the output fields in the system process information display.

The display includes the total CPU load and total memory utilization.

Table 29: Summary of System Process Information Output Fields

Field	Values
PID	Identifier of the process.
Name	Owner of the process.
State	Current state of the process.
CPU Load	Percentage of the CPU that is being used by the process.
Memory Utilization	Amount of memory that is being used by the process.
Start Time	Time of day when the process started.

Related Documentation

- [Monitoring System Properties on page 254](#)
- [show system uptime on page 1206](#)

Monitoring System Properties

Purpose View system properties such as the name, IP address, and resource usage.

Action To monitor system properties in the CLI, enter the following commands:

- `show system uptime`
- `show system users`
- `show system storage`

Meaning [Table 30 on page 254](#) summarizes key output fields in the system properties display.

Table 30: Summary of Key System Properties Output Fields

Field	Values	Additional Information
General Information		
Serial Number	Serial number of device.	
Junos OS Version	Version of Junos OS active on the switch, including whether the software is for domestic or export use.	Export software is for use outside the USA and Canada.
Hostname	Name of the device.	
IP Address	IP address of the device.	
Loopback Address	Loopback address.	
Domain Name Server	Address of the domain name server.	
Time Zone	Time zone on the device.	
Time		
Current Time	Current system time, in Coordinated Universal Time (UTC).	
System Booted Time	Date and time when the device was last booted and how long it has been running.	
Protocol Started Time	Date and time when the protocols were last started and how long they have been running.	
Last Configured Time	Date and time when a configuration was last committed. This field also shows the name of the user who issued the last commit command.	
Load Average	CPU load average for 1, 5, and 15 minutes.	

Table 30: Summary of Key System Properties Output Fields (*continued*)

Field	Values	Additional Information
Storage Media		
Internal Flash Memory	Usage details of internal flash memory.	
External Flash Memory	Usage details of external USB flash memory.	
Logged in Users Details		
User	Username of any user logged in to the switch.	
Terminal	Terminal through which the user is logged in.	
From	System from which the user has logged in. A hyphen indicates that the user is logged in through the console.	
Login Time	Time when the user logged in.	This is the user@switch field in show system users command output.
Idle Time	How long the user has been idle.	

- Related Documentation**
- [Monitoring System Process Information on page 253](#)
 - [show system processes on page 1121](#)

Monitoring Interface Status and Traffic

Purpose View interface status to monitor interface bandwidth utilization and traffic statistics.

- Action**
- To view interface status for all the interfaces, enter **show interfaces xe**.
 - To view status and statistics for a specific interface, enter **show interfaces xe interface-name**.
 - To view status and traffic statistics for all interfaces, enter either **show interfaces xe detail** or **show interfaces xe extensive**.

Meaning For details about output from the CLI commands, see *show interfaces xe*.

PART 16

Standard Software Installation and Upgrade

- [Understanding Standard Software Installation and Upgrade on page 259](#)

Understanding Standard Software Installation and Upgrade

- [Junos OS Package Names on page 259](#)
- [Software Installation Overview on page 260](#)
- [Creating an Emergency Boot Device on page 260](#)
- [Upgrading Jloader Software on QFX Series Devices on page 262](#)
- [Upgrading Software on page 273](#)

Junos OS Package Names

You upgrade the Juniper Networks Junos OS on the switch by copying a software package to your switch or another system on your local network and then installing the new software package on the switch.

A software package name is in the following format:



NOTE: A signed domestic package is used as an example only. Other types of software packages might be available in future releases.

package-name-m.nZx.y-domestic-signed.tgz

where:

- **package-name** is the name of the package—for example, **jinstall-qfx**.
- **m.n** is the software release, with **m** representing the major release number and **n** representing the minor release number—for example, 11.1.
- **Z** indicates the type of software release, where **R** indicates released software and **B** indicates beta-level software.
- **x.y** represents the maintenance software release, with **x** representing the maintenance software release number and **y** representing the maintenance software spin number—for example, 1.5.

A sample switch software package name is:

`jinstall-qfx-11.1R1.5-domestic-signed.tgz`

**Related
Documentation**

- [Upgrading Software on page 273](#)
- *Installing and Recovering Software Using the Open Network Install Environment (ONIE)*
- *Upgrading Software on a QFabric System*
- [Software Installation Overview on page 260](#)

Software Installation Overview

A device is delivered with the Junos OS preinstalled. As new features and software fixes become available, you can upgrade your software to use them.

When you power on the switch, it starts (boots) using the installed software.

You upgrade the Junos OS on a switch by copying a software package to a switch or other system on your local network and then using the CLI to install the new software on the switch. You then reboot the switch, which boots from the upgraded software. After a successful upgrade, you should back up the new current configuration to a secondary device.

During a successful upgrade, the installation package removes all files from the `/var/tmp` directory of the switch and completely reinstalls the existing software. It retains configuration files, and similar information, such as secure shell and host keys, from the previous version. The previous software package is preserved in a separate disk partition, and you can manually revert to it if necessary. If the software installation fails for any reason, such as loss of power during the installation process, the system returns to the originally active installation when you reboot.

If you encounter any difficulties during software installation or an upgrade, you can use the recovery installation procedure to install the Junos OS on the switch.

**Related
Documentation**

- [Upgrading Software on page 273](#)
- *Upgrading Software on a QFabric System*
- [Recovering from a Failed Software Installation on page 247](#)
- *Performing a Nonstop Software Upgrade on the QFabric System*
- *Performing a QFabric System Recovery Installation on the Director Group*
- *Performing a Recovery Installation*

Creating an Emergency Boot Device

If Junos OS on the device is damaged in some way that prevents the software from loading properly, you can use an emergency boot device to repartition the primary disk

and load a fresh installation of Junos OS. Use the following procedure to create an emergency boot device.

Before you begin, you need to download the installation media image for your device and Junos OS release from <http://www.juniper.net/customers/support/>.



NOTE: You can create the emergency boot device on another Juniper Networks switch or router, or any PC or laptop that supports Linux. The steps you take to create the emergency boot device vary, depending on the device.

To create an emergency boot device:

1. Use FTP to copy the installation media image into the **/var/tmp** directory on the device.
2. Insert a USB device into the USB port.
3. From the Junos OS command-line interface (CLI), start the shell:

```
user@device> start shell
%
```

4. Switch to the root account using the **su** command:

```
% su
Password: password
```



NOTE: The password is the root password for the device. If you logged in to the device as root, you do not need to perform this step.

5. Enter the following command on the device:

```
root@device% dd if=/var/tmp/filename of=/dev/da1 bs=16k
```

The device writes the installation media image to the USB device:

```
root@device% dd if=/var/tmp/install-media-qfx3500.junos_11.1 of=/dev/da1 bs=16k
11006+1 records in
11006+1 records out
180332544 bytes transferred in 71.764266 secs (2512846 bytes/sec)
```

6. Enter the following command:

```
root@device% dd if=/var/tmp/filename of=/dev/da0 bs=1048576
```

The device writes the installation media image to the USB device:

```
root@device% dd if=/var/tmp/jinstall-vjunos-usb-13.2.img of=/dev/da0 bs=1048576
11006+1 records in
11006+1 records out
180332544 bytes transferred in 71.764266 secs (2512846 bytes/sec)
```



NOTE: The device automatically create a recovery Junos OS image.

The “Select a recovery image” menu appears on the console when one of these switches is booted and unable to load a version of Junos OS. You can follow the instructions in the “Select a recovery image” menu to load the Junos OS image for one of these switches.

7. Log out of the shell:

```
root@device% exit
% exit
user@device>
```

Related Documentation

- [USB Port Specifications for the QFX Series](#)
- [Performing a Recovery Installation](#)
- [Performing a QFabric System Recovery Installation on the Director Group](#)
- [Performing a Recovery Installation Using an Emergency Boot Device on page 246](#)

Upgrading Jloader Software on QFX Series Devices

Jloader software contains a boot loader (Uboot), which is used to bring up QFX Series devices and load the Junos OS from the flash memory of these devices. You can upgrade Jloader software on QFX3500 switches, QFX3500 and QFX3600 Node devices, and QFX3600-I and QFX3008-I Interconnect devices.



NOTE: Before you upgrade the Jloader software, see [Table 31 on page 262](#), [Table 32 on page 263](#), and [Table 33 on page 263](#) to make sure that you are upgrading to the right version of Jloader software for the Junos OS software release running on your QFX3500 switches, or Node devices and Interconnect devices in your QFabric system.

See [Table 34 on page 263](#) to see which Uboot software versions are available and the filenames of the Jloader software packages.

Table 31: Junos OS and Jloader Software Compatibility Matrix for the QFX3500 Switch and QFX3500 Node Device

Junos OS Software Version	1.1.2	1.1.4	1.1.5	1.1.8
11.3R1 and later (QFX3500 switch)	Supported	Supported	Not supported	Supported and recommended
11.3X30.6 and later (QFX3500 Node device)	Supported	Supported	Not supported	Supported and recommended

Table 31: Junos OS and Jloader Software Compatibility Matrix for the QFX3500 Switch and QFX3500 Node Device (continued)

Junos OS Software Version	1.1.2	1.1.4	1.1.5	1.1.8
12.1X49-D1 and later (QFX3500 switch)	Supported	Supported	Not supported	Supported and recommended
12.2X50-D1 and later (QFX3500 switch and QFX3500 Node device)	Supported	Supported	Not supported	Supported and recommended



NOTE: An en dash means that the item is not applicable.

Table 32: Junos OS and Jloader Software Compatibility Matrix for the QFX3008-I Interconnect Device

Junos OS Software Version	1.1.2	1.1.4	1.1.5	1.1.8
11.3X30.9 and later (QFX3008-I Interconnect device)	Supported	Supported	Not supported	Supported and recommended
11.3X30.6 and later (QFX3008-I Interconnect device)	Supported	Supported	Not supported	Supported and recommended
12.2X50-D10.3 and later (QFX3008-I Interconnect device)	Supported	Supported	Not supported	Supported and recommended



NOTE: An en dash means that the item is not applicable.

Table 33: Junos OS and Jloader Software Compatibility Matrix for the QFX3600-I Interconnect Device and QFX3600 Node Device

Junos OS Software Version	1.1.2	1.1.4	1.1.5	1.1.8
12.2X50-D10.3 and later (QFX3600-I Interconnect Device and QFX3600 Node Device)	-	-	Supported	Supported and recommended
12.2X50-D20 and later (QFX3600 switch)	-	-	Supported	Supported and recommended

Table 34: Uboot Software Release and Jloader Software Compatibility Matrix

Uboot Software Release Number	Jloader Software Package Name
1.1.2	jloader-qfx-11.3X30.9-signed.tgz

Table 34: Uboot Software Release and Jloader Software Compatibility Matrix (*continued*)

Uboot Software Release Number	Jloader Software Package Name
1.1.4 (11.3R3 and 11.3R2 releases only. Not supported on 11.3R1)	jloader-qfx-11.3I20120127_0733_dc-builder-signed.tgz
1.1.4 (12.1R1 release and later)	jloader-qfx-12.1-20120125_pr.0-signed.tgz
1.1.5 (12.2X50-D10.3 and later)	jloader-qfx-12.2X50.D10.3-signed.tgz
1.1.8 (13.1X50-D15.1 and later)	jloader-qfx-13.3-20130831_pr_branch_qfd.0.tgz

Jloader Software Version 1.1.4 Guidelines

Jloader Release 1.1.4 is compatible with Junos OS Release 11.3R3 and 11.3R2, and Junos OS Release 12.1R1 and later. Jloader Release 1.1.4 is not compatible with Junos OS Release 11.3R1. The Jloader software package names are different for versions 1.1.4 (Junos OS 11.3R3 and 11.3R2) and 1.1.4 (Junos OS 12.2R1 release and later), but the binaries are the same. Because the binaries are the same, you can upgrade or downgrade to any Junos OS release.

- If you have Junos OS Release 11.3 installed and want to upgrade the Jloader software from version 1.1.2 to version 1.1.4, you need to upgrade using the **jloader-qfx-11.3I20120127_0733_dc-builder-signed.tgz** software package.
- If you have Junos OS Release 11.3R2 installed and want to upgrade to Junos OS Release 12.1, you do not need to upgrade the Jloader Release and can continue to use Jloader Release 1.1.2.
- If you have Junos OS Release 12.1 installed and want to upgrade the Jloader software from version 1.1.2 to version 1.1.4, you need to upgrade using the **jloader-qfx-12.1-20120125_pr.0-signed.tgz** software package.
- If you upgrade to Junos OS Release 12.1, you can upgrade to Jloader Release 1.1.4 using the **jloader-qfx-12.1-20120125_pr.0-signed.tgz** software package.

Upgrading Jloader Software on a QFX3500 Switch

The Jloader software for a QFX3500 switch resides in two flash memory banks. At any time, one bank acts as the primary bank, and the QFX3500 switch boots from it. The other bank is the backup bank—if the QFX3500 switch cannot boot from the primary bank, it boots from the backup bank. When you upgrade the Jloader software, the upgraded software is installed in the backup bank, which then becomes the new primary bank. Thus the primary and backup banks alternate each time you upgrade the Jloader software, with the primary bank containing the most recently installed version of the software, and the backup bank containing the previous version. To upgrade the Jloader software on a QFX3500 switch, you must perform the upgrade twice: once for each bank. Each upgrade requires that you to reboot the QFX3500 switch.



NOTE: If you are running Junos OS Release 11.3R1 or Junos OS Release 11.3R2, you must use the `no-validate` option when you issue the `request system software add` command to upgrade the Jloader software. Otherwise, the installation will fail and you receive a configuration error. The `no-validate` option is not required for Junos OS Release 11.3R3 and later.



NOTE: After you upgrade the Jloader software on the first bank, the software package is deleted after you reboot. Make sure that you have either downloaded the Jloader software package to either a remote site or in a local directory on the switch, such as the `/var/tmp` directory on the QFX3500 device.

1. In a browser, go to <http://www.juniper.net/support/downloads/junos.html> .
The Junos Platforms Download Software page appears.
2. In the QFX Series section of the Junos Platforms Download Software download page, select the QFX Series platform software you want to download.
3. Select the number of the software version that you want to download in the Release: pull-down window to the right of the tabs on the Download Software page.
4. Select the Software tab and then select the install package you want to download in the Install Package section.
5. In the pop-up Alert box, click the link to the Product Support Notification (PSN) document.
6. Enter your name and password and press **Enter**.
7. Read the End User License Agreement, click the **I agree** radio button, and then click **Proceed**.
8. Open or save the `jloader-qfx-version-signed.tgz` file either to a local system or to a remote location. If you are saving the installation package to a remote system, make sure that you can access it using HTTP, TFTP, FTP, or scp.

9. Log in to the QFX3500 switch and enter the shell. We recommend using a console connection.

10. Determine the version of the Jloader software package installed on the switch.

For example:

```
root@switch% ls
gres-tp krt_gencfg_filter.txt
jloader-qfx-11.3-20110510.0-signed.tgz
```

11. Determine the version of the Uboot software that is running in the bank:

For example:

```
root@switch% kenv | grep boot.version
boot.version="1.0.7"
```

12. Enter the CLI and install the Jloader software package.

- To install a Jloader software package that is located in the `/var/tmp` directory, issue the **request system software add /var/tmp/jloader-qfx-version.tgz no-validate** command:

For example:

```
user@switch> request system software add
/var/tmp/jloader-qfx-11.3-20110510.0-signed.tgz no-validate
```

You see the following messages during the installation:

```
Verified jloader-qfx-11.3-20110510.0.tgz signed by PackageProduction_11_3_0
Adding jloader-qfx...
Installation in progress, please wait...
Mounted jloader-qfx package on /dev/md8...
Verified manifest signed by PackageProduction_11_3_0
Verified jloader-qfx-11.3-20110510.0 signed by PackageProduction_11_3_0
Registering jloader-qfx as unsupported
```

```
Installation finished successfully.
Please reboot to activate the package
Saving package file in /var/sw/pkg/jloader-qfx-11.3-20110510.0-signed.tgz
...
Saving state for rollback ...
```

```
juniper@qfx3500>
```

- To install a Jloader software package located on a remote server using FTP, issue the **request system software add /ftp://hostname/pathname/jloader-qfx-version-signed.tgz no-validate** command.

For example:

```
user@switch> request system software add
/ftp://hostname/pathname/jloader-qfx-11.3-20110510.0-signed.tgz no-validate
```

- To install a Jloader software package located on a remote server using HTTP, issue the **request system software add /http://hostname/pathname/jloader-qfx-version-signed.tgz no-validate** command.

For example:

```
user@switch> request system software add
/http://hostname/pathname/jloader-qfx-11.3-20110510.0-signed.tgz no-validate
```

13. When prompted, reboot the Control Board by issuing the **request system reboot** command.

For example:

```
user@switch> request system reboot
Reboot the system ? [yes,no] (no) yes
```

14. Enter the shell and verify that the version of the Uboot software in the primary bank is the version you just installed.

For example:

```
root@switch% kenv | grep boot.version
boot.version="1.1.1"
```

15. To install the Jloader software package on the current backup bank, repeat Step 10 through Step 14.

Upgrading Jloader Software on a QFabric System

This procedure explains how to upgrade the Jloader software on your Node devices and Interconnect devices. The example shows how to upgrade the Jloader Release 1.1.1 to 1.1.2 on a Node device with the serial number BBAK1186.



NOTE: Before you upgrade the Jloader software, make sure you have the serial numbers of the Node devices, Interconnect devices, and Control Boards in the Interconnect devices you want to upgrade.

1. Issue the **show chassis hardware node-device ?** command to view the serial numbers of the Node devices.

For example:

```
user@qfabric> show chassis hardware node-device ?
<node-device>      Node device identifier
BBAK1186           Node device
BBAK3149           Node device
BBAK3177           Node device
BBAK8063           Node device
BBAK8799           Node device
P2443-C            Node device
P2515-C            Node device
P3708-C            Node device
P3885-C            Node device
P3916-C            Node device
node0              Node device
node1              Node device
node2              Node device
node3              Node device
node4              Node device
node5              Node device
node6              Node device
node7              Node device
node8              Node device
```

An example of a Node device serial number is BBAK1186.

2. Issue the **show chassis hardware interconnect-device ?** command to view the serial numbers of the Interconnect devices.

For example:

```
user@qfabric> show chassis hardware interconnect-device ?
Possible completions:
interconnect-device  Interconnect device identifier
IC-F1052             Interconnect device
IC-F3947             Interconnect device
```

The Interconnect device serial numbers are IC-F1052 and IC-F3947.

3. Issue the **show chassis hardware interconnect-device name** command to view the serial numbers of the Control Boards in the Interconnect device.

For example:

```
user@qfabric> show chassis hardware interconnect-device IC-F3947
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis	REV 10		F3947	QFXC08-3008
Midplane	REV 10	750-035835	F3947-C	QFX Midplane
CB 0 Board	REV 14	750-035855	ZJ9432	QFX Chassis Control
Routing Engine 0		BUILTIN	BUILTIN	QFX Routing Engine
CB 1 Board	REV 14	750-035855	ZJ9404	QFX Chassis Control

The Control Board serial numbers are ZJ9432 and ZJ9404.

4. Issue the **show chassis firmware node-device *name*** command to see which version of Uboot software you have installed on your Node device.

For example:

```
user@qfabric> show chassis firmware node-device BBAK1186
```

Part	Type	Version
node4	U-Boot	1.1.6 (May 10 2011 - 04:52:59) 1.1.1
	loader	FreeBSD/MIPS U-Boot bootstrap loader 0.1

The Uboot software version is 1.1.1. The loader software version appears after the timestamp for U-Boot 1.1.6.

5. Issue the **show chassis firmware interconnect-device *name*** command to see which version of Uboot software you have installed on the Routing Engines located on the Control Boards of the Interconnect device.

For example:

```
user@qfabric> show chassis firmware interconnect-device IC-F3947
```

Part	Type	Version
Routing Engine 0	U-Boot	U-Boot 1.1.6 (Jan 27 2012 - 03:24:34) 1.1.4
	loader	FreeBSD/MIPS U-Boot bootstrap loader 0.1
Routing Engine 1	U-Boot	U-Boot 1.1.6 (Jan 27 2012 - 03:24:34) 1.1.4
	loader	FreeBSD/MIPS U-Boot bootstrap loader 0.1

The Uboot software version is 1.1.4. The loader software version appears after the timestamp for U-Boot 1.1.6.

6. In a browser, go to <http://www.juniper.net/support/downloads/junos.html>.

The Junos Platforms Download Software page appears.

7. In the QFX Series section of the Junos Platforms Download Software download page, select the QFX Series platform software you want to download.
8. Select the number of the software version that you want to download in the Release: pull-down window to the right of the tabs on the Download Software page.
9. Select the **Software** tab and then select the install package you want to download in the Install Package section.

10. In the pop-up Alert box, click the link to the Product Support Notification (PSN) document.
11. Enter your username and password, and press **Enter**.
12. Read the End User License Agreement, click the **I agree** radio button, and then click **Proceed**.
13. Open or save the **jloader-qfx-version-signed.tgz** file either to a local system or to a remote location. If you are saving the installation package to a remote system, make sure that you can access it using HTTP, TFTP, FTP, or scp.
14. Retrieve the software from the location in which you downloaded it. To do this, issue the **request system software download /path/package-name** command.

For example:

```
user@qfabric> request system software download
ftp://server/files/jloader-qfx-11.3X30.9-signed.tgz
```

15. Log in to the Director device as root and enter the shell to verify that you have downloaded the Jloader software package. We recommend using a console connection. The software package is copied from where you downloaded it and is placed locally on the QFabric system in the **/pbdata/packages** directory.

For example:

```
[root@dg0] # pwd
/pbdata/packages

[root@dg0] # ls
jloader-qfx-11.3X30.9-signed.tgz
```

16. Before you copy over the Jloader software package to the Node device or Interconnect device, determine the directory that matches the serial number of the Node device or Interconnect device that you want to upgrade. View the remote logs and the Node device and Interconnect device serial numbers by issuing the **ls /pbdata/export/rlogs** command at the command line of the Director device before you copy the software package over to the device.



NOTE: The **/pbdata/export/rlogs/node-device-serial-ID** and **/pbdata/export/rlogs/interconnect-device-serial-ID** directories on the Director device are NFS mounted as the **/tftpboot/logfiles** directories on the Node device and Interconnect device. These directories are created for all Node devices and Interconnect devices in a QFabric system. The Jloader files are stored in the **/tftpboot/logfiles** directories for each Node device and Interconnect device.

For example:

```
[root@dg0 tmp] # ls /pbdata/export/rlogs
02de4930-828b-11e1-a319-00e081c57938 c9898afe-828b-11e1-956c-00e081c57938
04103b2a-29d5-e011-bf8a-0e6bdf3aa1e6 eeba4aac-828b-11e1-85e2-00e081c57938
1e2739e0-828b-11e1-bf74-00e081c57938 F1052
8d8a978c-828b-11e1-a833-00e081c57938 F3947
ad55b89e-828b-11e1-b70e-00e081c57938 P2443-C
BBAK1186 P2515-C
```

BBAK3149	P3708-C
BBAK3177	P3885-C
BBAK8063	P3916-C
BBAK8799	

BBAK1186 is the serial number of the Node device that needs to be upgraded.

17. Copy the Jloader software package from the `/var/tmp` directory to the `/pbdata/export/rlogs/BBAK1186` directory.

For example:

```
[root@dg0 tmp] # cp jloader-qfx-11.3X30.9-signed.tgz /pbdata/export/rlogs/BBAK1186
```

18. Confirm that the Jloader software package you copied over is in the `/pbdata/export/rlogs/BBAK1186` directory.

For example:

```
[root@dg0 tmp] # ls /pbdata/export/rlogs/BBAK1186
jloader-qfx-11.3X30.9-signed.tgz
```

19. Issue the `/root/dns.dump` command to find out the internal IP addresses of the Node device or Interconnect device.

```
[root@dg0 tmp] # /root/dns.dump
; <<>> DiG 9.3.6-P1-RedHat-9.3.6-4.P1.e15 <<>> -t axfr pkg.dcbg.juniper.net
@169.254.0.1
;; global options: printcmd
pkg.dcbg.juniper.net. 600 IN SOA ns.pkg.dcbg.juniper.net.
mail.pkg.dcbg.juniper.net. 152 3600 600 7200 3600
pkg.dcbg.juniper.net. 600 IN NS ns.pkg.dcbg.juniper.net.
pkg.dcbg.juniper.net. 600 IN A 169.254.0.1
pkg.dcbg.juniper.net. 600 IN MX 1 mail.pkg.dcbg.juniper.net.
dcfnnode---DCF-ROOT.pkg.dcbg.juniper.net. 45 IN A 169.254.192.17
dcfnnode---DRE-0.pkg.dcbg.juniper.net. 45 IN A 169.254.3.3
dcfnnode-8d8a978c-828b-11e1-a833-00e081c57938.pkg.dcbg.juniper.net. 45 IN A
169.254.128.19
dcfnnode-ad55b89e-828b-11e1-b70e-00e081c57938.pkg.dcbg.juniper.net. 45 IN A
169.254.128.20
dcfnnode-BBAK1186.pkg.dcbg.juniper.net. 45 IN A 169.254.128.14
```

The internal IP address for BBAK1186 is 169.254.128.14.

20. Upgrade the Jloader software on the Node device or Interconnect device.

Before you can upgrade the Jloader software, you need to use SSH to log in to the Node device or Interconnect device and verify that the software is in the `/tftpboot/logfiles` directory.

- a. Use SSH to log in to the Node device or Interconnect device.

For example:

```
[root@dg0 tmp] # ssh 160.254.128.14
root@169.254.128.14's password:
--- JUNOS 11.3X30.10 built 2012-03-11 22:55:43 UTC
At least one package installed on this device has limited support.
Run 'file show /etc/notices/unsupported.txt' for details.
root@sng3%
```

- b. Verify that the Jloader software package is in the `tftpboot/logfiles` directory of the Node device or Interconnect device.

For example:

```
root@sng3% ls /tftpboot/logfiles
.index                               jloader-qfx-11.3X30.9-signed.tgz
```

- c. Copy the Jloader software package from the **/tftpboot/logfiles** directory to the **/var/tmp** directory of the Node device or Interconnect device.

For example:

```
root@sng3% cp /tftpboot/logfiles/jloader-qfx-11.3X30.9-signed.tgz /var/tmp
```

- d. Verify that the Jloader software package is in the **/var/tmp** directory of the Node device or Interconnect device.

For example:

```
root@sng3% ls /var/tmp
.snap                               jloader-qfx-11.3X30.9-signed.tgz
    tmp
gres-tp                            krt_gencfg_filter.txt
    vc-autoupgrade
if-rtbdb                           rtsdb
```

- e. Enter CLI mode and issue the **request system software add /var/tmp/jloader-qfx-version-signed.tgz** command.

For example:

```
root@sng3% cli
root@sng3> request system software add /var/tmp/jloader-qfx-11.3X30.9-signed.tgz
Validating on fpc0
Checking compatibility with configuration
Initializing...
Using jbase-11.3X30.10
Verified manifest signed by PackageProduction_11_3_0
Verified jbase-11.3X30.10 signed by PackageProduction_11_3_0
Using /var/tmp/jloader-qfx-11.3X30.9-signed.tgz
Verified jloader-qfx-11.3X30.9.tgz signed by PackageProduction_11_3_0
Using jloader-qfx-11.3X30.9.tgz
Checking jloader-qfx requirements on /
Verified manifest signed by PackageProduction_11_3_0
Verified jloader-qfx-11.3X30.9 signed by PackageProduction_11_3_0
Using jkernel-qfx-11.3X30.10
Verified manifest signed by PackageProduction_11_3_0
Verified jkernel-qfx-11.3X30.10 signed by PackageProduction_11_3_0
Using jroute-qfx-11.3X30.10
Verified manifest signed by PackageProduction_11_3_0
Verified jroute-qfx-11.3X30.10 signed by PackageProduction_11_3_0
Using jcrypto-qfx-11.3X30.10
Verified manifest signed by PackageProduction_11_3_0
Verified jcrypto-qfx-11.3X30.10 signed by PackageProduction_11_3_0
Using jweb-qfx-11.3X30.10
Verified manifest signed by PackageProduction_11_3_0
Verified jweb-qfx-11.3X30.10 signed by PackageProduction_11_3_0
Using jswitch-qfx-11.3X30.10
Verified manifest signed by PackageProduction_11_3_0
Verified jswitch-qfx-11.3X30.10 signed by PackageProduction_11_3_0
Hardware Database regeneration succeeded
Validating against /config/juniper.conf.gz
mgd: commit complete
Validation succeeded
```


Done with validate on all chassis

```
fpc0:
Verified jloader-qfx-11.3X30.9.tgz signed by PackageProduction_11_3_0
Adding jloader-qfx...
Installation in progress, please wait...
Mounted jloader-qfx package on /dev/md10...
Verified manifest signed by PackageProduction_11_3_0
Verified jloader-qfx-11.3X30.9 signed by PackageProduction_11_3_0
#####
#####
Installation finished successfully.
Please reboot to activate the package
Saving package file in /var/sw/pkg/jloader-qfx-11.3X30.9-signed.tgz ...
Saving state for rollback ...
```

Upgrade has completed successfully.
Reboot is now required.

- f. Reboot both the Node device and Interconnect device twice, because they each contain two partitions.

For example:

```
root@sng3> request system reboot
Reboot the system ? [yes,no] (no) yes
Shutdown NOW!
[pid 37663]
```

```
root@sng3>
```

```
*** FINAL System shutdown message from root@sng3 ***
```

```
System going down IMMEDIATELY
```

- g. Verify that the Uboot software on the Node device or Interconnect device has been upgraded to the new Uboot software by logging in to the QFabric CLI and issuing either the **show chassis firmware node-device *name*** command or the **show chassis firmware interconnect-device *name*** command.

For example:

```
user@qfabric> show chassis firmware node-device BBAK1186
Part                Type      Version
node4               U-Boot   1.1.6 (Nov 19 2011 - 11:42:07) 1.1.2
0.1                 loader   FreeBSD/MIPS U-Boot bootstrap loader
```

The Uboot software version is now 1.1.2. The loader software version appears after the timestamp for U-Boot 1.1.6.

Upgrading Software

To upgrade Junos OS, you need to install the appropriate upgrade package on the device. Upgrading involves these tasks:



NOTE: If you want to use the Open Network Install Environment (ONIE) to install software, see *Installing and Recovering Software Using the Open Network Install Environment (ONIE)*.

1. [Downloading Software Files with a Browser on page 274](#)
2. [Accessing Software Downloaded to a Remote Location on page 275](#)
3. [Connecting to the Console Port on page 275](#)
4. [Backing Up the Current Configuration Files on page 275](#)
5. [Installing a Standard Software Package on page 275](#)
6. [Upgrading to an ELS-Based Software Package on page 277](#)

Downloading Software Files with a Browser

To download the software package from the Juniper Networks Support website, go to <http://www.juniper.net/support/>.



NOTE: To access the download site, you must have a service contract with Juniper Networks and an access account. If you need help obtaining an account, complete the registration form at the Juniper Networks website <https://www.juniper.net/registration/Register.jsp>.

This procedure shows you how to upgrade software on a QFX Series device, but you can follow the same procedure for any device unless otherwise specified.

1. Using a Web browser, navigate to the <http://www.juniper.net/support>.
2. Click **Download Software**.
3. In the **Switching** box, click **Junos OS Platforms**.
4. In the **QFX Series** section, click the name of the platform for which you want to download software.
5. Click the **Software** tab and select the release number from the **Release** drop-down list.
6. In the **Install Package** section of the **Software** tab, select the **Install Package** for the release.
A login screen appears.
7. Enter your name and password and press **Enter**.
8. Read the End User License Agreement, click the **I agree** radio button, and then click **Proceed**.

9. Save the `jinstall-qfx-<version>-domestic-signed.tgz` file on your computer.
10. Open or save the installation package either to the local system in the `var/tmp` directory or to a remote location. If you are saving the installation package to a remote system, make sure that you can access it using HTTP, TFTP, FTP, or scp.

Accessing Software Downloaded to a Remote Location

To access the installation package if you downloaded it to a remote location (for example, any system other than the switch), you can access the package using the CLI. You can specify a filename or URL in one of the following ways:

1. Copy a file from an FTP server, TFTP, or scp session.

In this example, a file is copied from an FTP server using the `file copy` command.

2. Enter the file name on the prompt of a file on an FTP server. You can also specify `hostname` as `username@hostname` or `username:password@hostname`. The default path is the user's home directory. To specify an absolute path, the path must start with `%2F`; for example, `ftp://hostname/%2Fpath/filename`. To have the system prompt you for the password, specify `prompt` in place of the password. If a password is required and you do not specify the password or `prompt`, an error message is displayed:

```
user@host> file copy ftp://username@ftp.hostname.net/package-name-m.mZx-distribution
.tgz
file copy ftp.hostname.net: Not logged in.

user@host> file copy
ftp://username:prompt@ftp.hostname.net/package-name-m.mZx-distribution
Password for username@ftp.hostname.net:
```

Connecting to the Console Port

We recommend that you connect to the console port while installing the installation package so you can respond to any required user input and detect any errors that may occur.

Backing Up the Current Configuration Files

Before you install the new installation package, we strongly recommend that you back up your current configuration files because the upgrade process removes all of the stored files on the switch.

To back up your current configuration files, enter the `save` command:

```
user@switch# save filename
```

Executing this command saves a copy of your configuration files to a remote location such as an external USB device.

Installing a Standard Software Package



NOTE: On Junos Release 14.1X53-D35.3, autonegotiation is disabled by default.



.....

NOTE: Before you install the software, back up any critical files in `/var/home`. For more information regarding how to back up critical files, contact Customer Support at <http://www.juniper.net/support>.

.....



.....

NOTE: If you are upgrading from a standard software package to an ELS-based package, see the *Upgrading to an ELS-Based Software Package* section.

.....

Install the software in one of three ways:

If the installation package resides locally on the switch, execute the **request system software add <pathname><source> reboot** command.

For example:

```
user@switch> request system software add /var/tmp/jinstall-qfx-11.1R1.5-domestic.tgz reboot
```

If the Install Package resides remotely, execute the **request system software add <pathname><source> reboot** command.

For example:

```
user@switch> request system software add
ftp://ftpsrvr/directory/jinstall-qfx-11.1R1.5-domestic.tgz reboot
```

If the installation package resides locally on the switch, execute the **request system software add <pathname><source> reboot** command.

For example:

```
user@switch> request system software add /var/tmp/jinstall-qfx-5.13.2X51-D10.6-domestic.tgz
reboot
```

If the install Package resides remotely from the switch, execute the **request system software add <pathname><source> reboot** command.

For example:

```
user@switch> request system software add
ftp://ftpsrvr/directory/jinstall-qfx-5.13.2X51-D10.6-domestic.tgz reboot
```

After the reboot has finished, verify that the new version of software has been properly installed by executing the **show version** command.

```
user@switch> show version
```

Upgrading to an ELS-Based Software Package

To upgrade your switch from a version of Junos OS that does not support Enhanced Layer 2 Software (ELS) to a version of Junos OS that supports ELS, we recommend performing the following procedure.



NOTE: Because this procedure can cause service outages, we recommend that you avoid performing this procedure on switches carrying traffic in a production network.

1. Log in to your device using the console port.



NOTE: Only perform this procedure from the console port. You can lose connectivity to your device if you perform this procedure from a management port or any other interface.

2. Set your device to standalone mode by issuing the **request chassis device-mode standalone** command. Do not reboot your system at this time.



NOTE: This step is only required for new devices shipped from the factory or QFabric system Node devices that you plan to redeploy in a QFX Series Virtual Chassis.

3. Choose whether you wish to reuse your previous configuration or not.
 - To reuse your previous configuration as part of the software upgrade, you must convert the configuration from the original style Junos OS CLI to the ELS CLI format using the following steps:



NOTE: We recommend this procedure for customers currently using a QFX3500 or QFX3600 switch as a standalone device.

- a. Copy your entire existing configuration into a text file. Save the file to a remote location or USB drive.
- b. Retain the portion of your existing configuration related to management network connectivity (such as **[edit system]** and management interfaces). Delete all other configuration elements (such as the **[edit protocols]** and **[edit vlans]** hierarchy levels, non-management interfaces, and so on). Issue a **commit** operation to remove the deleted configuration.
- c. Perform the software upgrade with the **validate** option and reboot your device to complete the upgrade by issuing the **request system software add validate reboot** command. Maintain your console port connection during the reboot.
- d. Using a web browser, navigate to the [ELS Translator Tool](#). Follow the instructions on the page to convert your saved configuration file to the new ELS CLI format.
- e. Return to your console port connection. When the switch has rebooted to complete the software upgrade, copy the configuration from the ELS Translator Tool and load it in to your switch.
- f. Issue a **commit** operation to activate the translated configuration.
- To delete your current configuration and upgrade the software, follow these steps:



NOTE: We recommend this procedure for customers with new QFX3500 or QFX3600 devices shipped from the factory or QFabric system Node devices that will be redeployed in a QFX Series Virtual Chassis.

- a. Perform a software upgrade with the **no-validate** option by issuing the **request system software add no-validate** command.
- b. Delete the configuration and set the device to factory defaults by issuing the **request system zeroize** command. The device automatically reboots and reverts to a factory default configuration.
- c. Configure your device using the ELS CLI format.

- Related Documentation**
- *Installing and Recovering Software Using the Open Network Install Environment (ONIE)*
 - *Overview of CoS Upgrade Requirements (Junos OS Release 11.1 or 11.2 to a Later Release)*
 - [Software Installation Overview on page 260](#)
 - [Recovering from a Failed Software Installation on page 247](#)
 - [Upgrading Jloader Software on QFX Series Devices on page 262](#)
 - [request system software add on page 1298](#)
 - *Installation and Upgrade Guide*

PART 17

System Snapshot

- [Understanding System Snapshot on page 283](#)

Understanding System Snapshot

- [Understanding System Snapshot on page 283](#)
- [Creating a Snapshot and Using It to Boot a QFX3500 and QFX3600 Series Switch on page 284](#)
- [Creating a Snapshot and Using It to Boot a Device on page 286](#)
- [Verifying That a System Snapshot Was Created on a QFX Series Switch on page 287](#)

Understanding System Snapshot



NOTE: On QFX3500 and QFX3600 switches running Enhanced Layer 2 Software, all of the directories that reside in the “/” partition are read only.

You can create copies of the software running on a switch using the system snapshot feature. The system snapshot feature takes a “snapshot” of the files currently used to run the switch—the complete contents of the `/config` and `/var` directories, which include the running Junos OS, the active configuration, and the rescue configuration—and copies all of these files into an alternate (internal, meaning internal flash, or an external, meaning USB flash) memory source. You can then use this snapshot to boot the switch at the next boot up or as a backup boot option.

You can only use snapshots to move files to external memory if the switch was booted from internal memory, or to move files to internal memory if the switch was booted from external memory. You cannot create a snapshot in the memory source that booted the switch even if the snapshot is being created on a different partition in the same memory source.

Snapshots are particularly useful for moving files onto USB flash drives. You cannot use the `copy` command or any other file-moving technique to move files from an internal memory source to USB memory on the switch.

System snapshots on the switch have the following limitations:

- You cannot use snapshots to move files to any destination outside of the switch other than an installed external USB flash drive.
- Snapshot commands are always executed on a local switch.

- Related Documentation**
- [Creating a Snapshot and Using It to Boot a QFX3500 and QFX3600 Series Switch on page 242](#)

Creating a Snapshot and Using It to Boot a QFX3500 and QFX3600 Series Switch

The system snapshot feature takes a “snapshot” of the files currently used to run the QFX Series switch—the complete contents of the `/config` and `/var` directories, which include the running Juniper Networks Junos OS, the active configuration, and the rescue configuration—and copies all of these files into an alternate (internal, meaning internal flash, or an external, meaning USB flash) memory source. You can then use these snapshots to boot the switch at the next bootup or as a backup boot option.

The system snapshot feature is especially effective as a bootup option after a partition corruption, as it is the only recovery option that allows you to completely restore the Junos OS and configuration in the event of a corrupted partition.

This topic includes the following tasks:

- [Creating a Snapshot on a USB Flash Drive and Using It to Boot the Switch on page 284](#)
- [Creating a Snapshot on an Internal Flash Drive and Using it to Boot the Switch on page 285](#)
- [Creating a Snapshot on the Alternate Slice of the Boot Media on page 285](#)

Creating a Snapshot on a USB Flash Drive and Using It to Boot the Switch

A snapshot can be created on USB flash memory after a switch is booted using files stored in internal memory.

Ensure that you have the following tools and parts available before creating a snapshot on a USB Flash drive:

- A USB flash drive that meets the QFX Series switch USB port specifications. See *USB Port Specifications for the QFX Series*.

To create a snapshot on USB flash memory and use it to boot the switch:

1. Place the snapshot into USB flash memory:

```
user@switch> request system snapshot partition
```



NOTE: This example uses the `partition` option. If you have already created a partition for the snapshot, you don't need to use the `partition` option.

2. (Optional) Perform this step if you want to boot the switch now using the snapshot stored on the external USB flash drive. If you created the snapshot as a backup, do not perform this step.

- To reboot the switch using the most recently created snapshot:

```
user@switch> request system reboot
```

- To reboot the switch using a snapshot in a specific partition on the USB flash drive:

```
user@switch> request system reboot slice 1
```

Creating a Snapshot on an Internal Flash Drive and Using it to Boot the Switch

A snapshot can be created on internal memory after a switch is booted using files stored in external memory.

To create a snapshot in internal memory and use it to boot the switch:

1. Place the snapshot files in internal memory:

```
user@switch> request system snapshot partition
```



NOTE: This example uses the `partition` option. If you have already created a partition for the snapshot, you don't need to use the `partition` option.

2. (Optional) Perform this step if you want to boot the switch now using the newly created snapshot. If you created the snapshot as a backup, do not perform this step.

- To reboot the switch using the most recently created snapshot:

```
user@switch> request system reboot
```

- To reboot the switch using a snapshot in a specific partition in internal memory:

```
user@switch> request system reboot slice 1
```

Creating a Snapshot on the Alternate Slice of the Boot Media

The alternate slice of the boot media contains a backup software image that the switch can boot from if it is unable to boot from the primary slice. When you upgrade software, the new software image gets copied only to the primary slice of the boot media.

To create a snapshot of the currently booted software image on the backup slice of the boot media:

```
user@switch> request system snapshot slice alternate
```

After the system boots up, you will see the following message before the login prompt:

WARNING: THIS DEVICE HAS BOOTED FROM THE BACKUP JUNOS IMAGE

It is possible that the primary copy of JUNOS failed to boot up properly, and so this device has booted up from the backup copy.

Please re-install JUNOS to recover the primary copy in case it has been corrupted.

The system will generate an alarm indicating that the switch has booted from the backup slice.

Related Documentation

- [Verifying That a System Snapshot Was Created on a QFX Series Switch on page 287](#)
- [Understanding System Snapshot on page 283](#)

Creating a Snapshot and Using It to Boot a Device

The system snapshot feature takes a “snapshot” of the files currently used to run the device—the complete contents of the **/config** directories, which include the running Juniper Networks Junos OS, the active configuration, and the rescue configuration, as well as the host OS—and copies all of these files into an external USB flash drive.

You can use the snapshot to boot the device at the next bootup or as a backup boot option.

The system snapshot feature is especially effective as a bootup option after a partition corruption, as it is the only recovery option that allows you to completely restore the Junos OS and configuration in the event of a corrupted partition on a switch.

This topic includes the following tasks:

- [Creating a Snapshot on an External USB Flash Drive and Using It to Boot the Device on page 286](#)

Creating a Snapshot on an External USB Flash Drive and Using It to Boot the Device

A snapshot can be created on an external USB flash drive after a device is booted using files stored in internal memory.

Ensure that you have the following tools and parts available before creating a snapshot on an external USB flash drive:

- An external USB flash drive that meets the device USB port specifications. See *USB Port Specifications for the QFX Series*.

To create a snapshot on the external USB flash drive and use it to boot the device:

1. Insert the external USB flash drive.
2. Issue the **request system snapshot** command.

```
user@device> request system snapshot
fpc0:
```

```
-----
Starting snapshot to usb (/dev/da0)
Creating snapshot on the host ..
Copying bootable disk image from host ..
Writing to usb (/dev/da0) ..
Copying 'Host OS' to '/dev/da0s1' .. (this may take a few minutes)
Copying 'JUNOS' to '/dev/da0s1' .. (this may take a few minutes)
The following filesystems were archived: / /config Host-OS
```

3. (Optional) Perform this step if you want to boot the device now using the snapshot stored on the external USB flash drive. If you created the snapshot as a backup, do not perform this step.

- Insert the external USB flash drive.
- Power cycle the device.

The external USB flash drive is detected.

- The software prompts you with the following options:

```
Junos Snapshot Installer - (c) Juniper Networks 2013
Reboot
Install Junos Snapshot [13.2-20131115_x_132_x51_vjunos.0
Boot to host shell [debug]
```

- Select **Install Junos Snapshot** to install the snapshot located on the external USB flash drive to the device.

The device copies the software from the external USB flash drive, occasionally displaying status messages. When the software is finished being copied from the external USB flash drive to the device, the device then reboots from the internal flash storage on which the software was just installed. When the reboot is complete, the device displays the Junos OS login prompt:

```
root@device#
```

Related Documentation

- [Verifying That a System Snapshot Was Created on a QFX Series Switch on page 287](#)
- [Understanding System Snapshot on page 283](#)

Verifying That a System Snapshot Was Created on a QFX Series Switch

Purpose Verify that a system snapshot was created with the proper files on a QFX Series switch.

Action View the snapshot on a QFX3500 or QFX3600 switch:

`show system snapshot slice 1`

```
user@switch> show system snapshot slice 1
Information for snapshot on external (da1s1)
Creation date: Sep 28 15:39:47 2011
JUNOS version on snapshot:
  jbase   : qfx-11.3-20110922.0
  jcrypto: qfx-11.3-20110922.0
  jdocs   : qfx-11.3-20110922.0
  jkernel: qfx-11.3-20110922.0
  jroute  : qfx-11.3-20110922.0
  jswitch: qfx-11.3-20110922.0
  jpfe    : qfx-e9xxx-11.3-20110922.0
```

View the snapshot on a QFX5100 switch:

`show system snapshot`

```
user@switch show system snapshot
fpc0:
-----
Valid Junos snapshot found
Information for snapshot on      usb (/dev/da0s1)
Creation date: Oct 31 16:02:35 2013
JUNOS version on snapshot:
  JUNOS   : 13.2-20131030_x_132_x51_exdc.0
```

Meaning The output shows the date and time when the snapshot was created and the packages that are part of the snapshot. The date and time match the time when you created the snapshot.

You can compare the output of this command to the output of the **show system software** command to ensure that the snapshot contains the same packages as the software currently running the switch.

**Related
Documentation**

- [Creating a Snapshot and Using It to Boot a QFX3500 and QFX3600 Series Switch on page 242](#)

PART 18

Zero Touch Provisioning (ZTP)

- [Understanding ZTP on page 291](#)

CHAPTER 19

Understanding ZTP

- [Understanding Zero Touch Provisioning on page 291](#)
- [Configuring Zero Touch Provisioning on page 298](#)
- [Monitoring Zero Touch Provisioning on page 303](#)

Understanding Zero Touch Provisioning

- [Understanding Zero Touch Provisioning on page 291](#)
- [Zero Touch Provisioning Process on page 293](#)
- [Zero Touch Provisioning Restart Process Triggers on page 296](#)

Understanding Zero Touch Provisioning



NOTE: To see which platforms support Zero Touch Provisioning, in a browser, go to [Feature Explorer](#). In the Explore Features section of the Feature Explorer page, select All Features. In the Features Grouped by Feature Family box, select Zero Touch Provisioning. You can also type the name of the feature in the Search for Features edit box. In previous Junos OS releases on EX Series switches, Zero Touch Provisioning was called EZ Touchless Provisioning.

Zero Touch Provisioning allows you to provision new Juniper Networks switches in your network automatically, without manual intervention. When you physically connect a switch to the network and boot it with a default factory configuration, it attempts to upgrade the Junos OS software automatically and autoinstall a configuration file from the network.

The switch uses information that you configure on a Dynamic Host Configuration Protocol (DHCP) server to locate the necessary software image and configuration files on the network. If the DHCP server does not respond or provide the software image and configuration files, the switch boots with the preinstalled software and default factory configuration. On switches running Enhanced Layer 2 Software, Junos Extended Dynamic Host Configuration Protocol (JDHCP) is used instead of legacy DHCP. JDHCP supports the same functionality as DHCP, and all configuration options remain the same. JDHCP is an enhanced version of legacy DHCP software.



.....

NOTE: For detailed information regarding the DHCP and DHCP options, refer to RFC2131 (<http://www.ietf.org/rfc/rfc2131.txt>) and RFC2132 (www.ietf.org/rfc/rfc2132.txt). Also, this document refers to Internet Systems Consortium (ISC) DHCP version 4.2. For more information regarding this version, refer to <http://www.isc.org/software/dhcp/documentation>.

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The Zero Touch Provisioning process will either upgrade or downgrade the Junos OS version. During a downgrade:

- On an EX Series switch, If you downgrade to a software version earlier than Junos OS Release 12.2, in which Zero Touch Provisioning is not supported, the configuration file autoinstall phase of the Zero Touch Provisioning process does not happen.
- On an EX Series switch, to downgrade to a software version that does not support resilient dual-root partitions (Junos OS Release 10.4R2 or earlier), you must perform some manual work on the switch. For more information, see *Understanding Resilient Dual-Root Partitions on Switches*.



.....

NOTE: On QFX3500 and QFX3600 switches running the original CLI, you cannot use ZTP to upgrade from Junos OS Release 12.2 or later to Junos OS Release 13.2X51-D15 or later.

.....

Zero Touch Provisioning Process

When you boot a switch with the default factory configuration, the following process happens:



NOTE: If you are performing Zero Touch Provisioning with a Junos OS image that contains enhanced automation for the QFX5100 switch, configure root authentication, and the provider name, license type, and deployment scope for Chef and Puppet at the [edit system] hierarchy in the configuration file that is fetched from the server:

```
{master:0}
root# set root-authentication (encrypted-password password | plain-text-password
password | ssh-dsa public-key | ssh-rsa public-key)
root# set extensions providers juniper license-type customer deployment-scope
commercial
root# set extensions providers chef license-type customer deployment-scope
commercial
```

1. If DHCP option 43, suboption 00 (the name of the software image file on the FTP, HTTP, or TFTP server) is configured, the switch compares the version of the provided software image to the version of the software installed on the switch.



NOTE: When the DHCP server cannot use suboption 00, configure the image file using suboption 04. If both suboption 00 and suboption 4 are defined, suboption 04 is ignored.

2. If DHCP option 43, suboption 02 (a symbolic link to the software image file on the FTP, HTTP, or TFTP server), the switch compares the version of the provided software image to the version of the software installed on the switch.
 - If the Junos OS versions are different, the switch downloads the software image from the FTP, HTTP, or TFTP server, installs the Junos OS, and reboots using the default factory configuration.
 - If the software versions are the same, the switch does not upgrade the software.
3. If DHCP option 43, suboption 01 (the name of the configuration file on the FTP, TFTP, or HTTP server) is configured:

If DHCP option 43 suboption 01 is not specified, the switch uses the default factory configuration.

If both DHCP option 43 suboption 01 and suboption 2 are specified, suboption 01 is processed before suboption 02. The Junos OS is upgraded, and then the configuration file is applied.



NOTE: On EX4300 and QFX5100 switches running Enhanced Layer 2 Software, and QFX5100 switches running a Junos OS image that contains enhanced automation, you can specify the name of a script file or a configuration file in suboption 01. ZTP determines if the file is a script file based on the first line that is included in the file. If the first line contains

`#!` characters followed by an interpreter path—for example, `#!/usr/libexec/ui/cscript`—ZTP determines that the file is a script file, and executes the script file with the specified interpreter path. If the script returns an error, ZTP will fetch the script file and execute the script file until the script executes successfully. If the file does not contain special characters or an interpreter path, ZTP determines that the file is a configuration file.

4. If DHCP option 43, suboption 03 (the transfer mode setting) is configured, the switch accesses the FTP, HTTP, or TFTP server using the specified transfer mode setting—for example, FTP.

If DHCP option 43, suboption 03, is not configured, TFTP becomes the transfer mode automatically.

5. If DHCP option 43, suboption 04 (the name of the software image file on the FTP, HTTP, or TFTP server) is configured, the switch compares the version of the provided software image to the version of the software installed on the switch.



NOTE: When the DHCP server cannot use suboption 00, configure the image file using suboption 04. If both suboption 00 and suboption 4 are defined, suboption 04 is ignored.



NOTE: DHCP option 43 suboptions 05 through 255 are reserved.

6. If DHCP option 150 or option 66 is specified, the IP address of the FTP, HTTP, or TFTP server is configured.



NOTE: You must configure either option 150 or option 66. If you configure both option 150 and option 66, option 150 takes precedence, and option 66 is ignored. Also, make sure you specify an IP address, not a hostname, because name resolution is not supported.

7. (Optional) If DHCP option 7 is specified, you can configure one or more system log (syslog) servers.

8. (Optional) If DHCP option 42 is specified, you can configure one or more NTP servers.
9. (Optional) If DHCP option 12 is specified, you can configure the hostname of the switch.

Zero Touch Provisioning Restart Process Triggers

ZTP restarts when any of the following events occur:

- Request for configuration file, script file, or image file fails.
- Configuration file is incorrect, and commit fails.
- No configuration file and no image file is available.
- Image file is corrupted, and installation fails.
- No file server information is available.
- DHCP client does not have valid ZTP parameters configured.
- When none of the DHCP client interfaces goes to a bound state.
- ZTP transaction fails after six attempts to fetch configuration file or image file.

When any of these events occur, ZTP resets the DHCP client state machine on all of the DHCP client-configured interfaces (management and network) and then restarts the state machine. Restarting the state machine enables the DHCP client to get the latest DHCP server-configured parameters.

Before ZTP restarts, approximately 15 to 30 seconds must elapse to allow enough time to build a list of bound and unbound DHCP client interfaces.

The list of bound and unbound DHCP client interfaces can contain:

- No entries.
- Multiple DHCP client interfaces.

Priority is given to the DHCP client interfaces that have received all ZTP parameters (software image file, configuration file, and file server information) from the DHCP server.

After the lists of bound and unbound client interfaces are created, and a DHCP client gets selected for ZTP activity, then any existing default route is deleted, and the DHCP client interface that was selected adds a new default route. In order to add a new default route, only one ZTP instance can be active.

After ZTP restarts, the DHCP client attempts fetching files from the DHCP server for up to six times, with ten to fifteen seconds elapsing between attempts. Every attempt, whether successful or not, is logged and can be seen on the console.

If there is a failure, or the number of attempts exceeds the limit, ZTP stops. ZTP then clears the DHCP client bindings and restarts state machine on the DHCP-configured interfaces.

The ZTP restart process continues until there is either a successful software upgrade, or an operator manually commits a user configuration and deletes the ZTP configuration.

**Related
Documentation**

- [Configuring Zero Touch Provisioning on page 298](#)
- [Monitoring Zero Touch Provisioning on page 303](#)

Configuring Zero Touch Provisioning



NOTE: To see which platforms support Zero Touch Provisioning (ZTP), in a browser, go to [Feature Explorer](#). In the Explore Features section of the Feature Explorer page, select All Features. In the Features Grouped by Feature Family box, select Zero Touch Provisioning. You can also type the name of the feature in the Search for Features edit box. In previous Junos OS releases on EX Series switches, Zero Touch Provisioning was called EZ Touchless Provisioning.

Zero Touch Provisioning allows you to provision new devices in your network automatically, without manual intervention. When you physically connect a device to the network and boot it with a default configuration, it attempts to upgrade the Junos OS software automatically and autoinstall a configuration file from the network.

The device uses information that you configure on a Dynamic Host Configuration Protocol (DHCP) server to locate the necessary software image and configuration files on the network. If the DHCP server does not respond or provide the software image and configuration files, the device continues using the preinstalled Junos OS software and default factory configuration. On switches running Enhanced Layer 2 Software, Junos Extended Dynamic Host Configuration Protocol (JDHCP) is used instead of legacy DHCP. JDHCP supports the same functionality as DHCP, and all configuration options remain the same. JDHCP is an enhanced version of legacy DHCP software. If you are performing Zero Touch Provisioning with a Junos OS image that contains enhanced automation for the QFX5100 switch, you can use DHCP option 43 suboption 01 to run script files, not just load configuration files. Using scripts, you can create device-specific configuration files, and perform HTTP request operations to web servers to download specific configuration files or Junos OS software.



NOTE: If the ZTP configuration is enabled, the switch broadcasts DHCP DISCOVER packets on its interfaces. If the DHCP server on the network responds with DHCP vendor options set with the necessary values to initiate ZTP, then ZTP proceeds. To disable broadcasting the DHCP DISCOVER packets without performing the ZTP process, manually delete the `auto-image-upgrade` statement located at the `[edit chassis]` hierarchy. If ZTP completes without errors, the `auto-image-upgrade` statement is automatically deleted.

Before you begin, ensure that the switch has access to the following network resources:

- A DHCP server to lease IP addresses and information on software images and configuration files on the network.

Refer to your DHCP server documentation for configuration instructions.

- The File Transfer Protocol (anonymous FTP), Hypertext Transfer Protocol (HTTP), Trivial File Transfer Protocol (TFTP) server on which the software image and configuration files are stored



NOTE: Although TFTP is supported, we recommend that you use FTP or HTTP instead, because these transport protocols are more reliable.

- A Domain Name System (DNS) server to perform reverse DNS lookup
- (Optional) An NTP server to perform time synchronization on the network
- (Optional) A system log (syslog) server to manage system log messages and alerts



CAUTION: We recommend that you do not commit a user configuration while the device is performing ZTP activity—for example, updating the software image or applying a configuration file.

Perform the following steps to configure ZTP:

1. Boot the device.

The device continues to use the preinstalled Junos OS software and default factory configuration.

2. Issue the **request system zeroize** command on the device.
3. Download the software image file and the configuration file to the FTP, HTTP, TFTP server that the device will download these files from.

You can download either one or both of these files.



NOTE: If you are performing Zero Touch Provisioning with a Junos OS image that contains enhanced automation for the QFX5100 device, configure root authentication, and the provider name, license type, and deployment scope for Chef and Puppet at the [edit system] hierarchy in the configuration file that is fetched from the server:

```
{master:0}
root# set root-authentication (encrypted-password password |
plain-text-password password | ssh-dsa public-key | ssh-rsa public-key)
root# set extensions providers juniper license-type customer deployment-scope
commercial
root# set extensions providers chef license-type customer deployment-scope
commercial
```

4. Configure the DHCP server to provide the necessary information to the device.

Configure IP address assignment.

You can configure dynamic or static IP address assignment for the device's management address. To determine the device's management MAC address for static IP address mapping, add 1 to the last byte of the device's MAC address, which you noted before you began this procedure.

5. Define the format of the vendor-specific information for DHCP option 43 in the dhcpd.conf file.

Here is an example of an ISC DHCP 4.2 server `dhcpd.conf` file:

```
option space NEW_OP; option;
option NEW_OP.image-file-name code 0 = text;
option NEW_OP.config-file-name code 1 = text;
option NEW_OP.image-file-type code 2 = text;
option NEW_OP.transfer-mode code 3 = text;
option NEW_OP.alt-image-file-name code 4 = text;
option NEW_OP-encapsulation code 43 = encapsulate NEW_OP;
```

6. Configure the following DHCP option 43 suboptions:

- Suboption 00: The name of the software image file to install



NOTE: When the DHCP server cannot use suboption 00, configure the image file using suboption 04. If both suboption 00 and suboption 4 are defined, suboption 04 is ignored.

```
option NEW_OP.image-file-name
"/dist/images/jinstall-ex-4300-13.2R1.1-domestic-signed.tgz";
```

- Suboption 01: The name of the configuration file to install



NOTE: On EX4300 and QFX5100 devices running Enhanced Layer 2 Software, and QFX5100 devices running a Junos OS image that contains enhanced automation, you can specify the name of a script file or a configuration file. ZTP determines if the file is a script file based on the first line that is included in the file. If the first line contains `#!` characters followed by an interpreter path, ZTP determines that the file is a script file, and executes the script file with the specified interpreter path. In order for a script to execute, the script file must provide the ability to fetch and load a valid configuration file on the device during the ZTP process.

The following list provides the types of scripts and their associated interpreter paths:

- Shell script interpreter path: `#!/bin/sh`
- SLAX script interpreter path: `#!/usr/libexec/ui/cscript`
- Python script interpreter path: `#!/usr/bin/python`

Unsigned Python scripts are only supported on limited platforms, such as the QFX5100 device. If you try to execute unsigned Python scripts on devices that do not provide support, error messages will be issued.

If the file does not contain special characters (`#!`), ZTP determines that the file is a configuration file and loads the configuration file.

```
option NEW_OP.config-file-name "/dist/config/jn-switch35.config";
```

- Suboption 02: The symbolic link to the software image file to install

```
option NEW_OP.image-file-type "symlink";
```



NOTE: If you do not specify suboption 2, the Zero Touch Provisioning process handles the software image as a filename, not a symbolic link.

- Suboption 03: The transfer mode that the device uses to access the TFTP/FTP/HTTP server

```
option NEW_OP.transfer-mode "ftp";
```



NOTE: If suboption 03 is not configured, TFTP becomes the transfer mode by default.

- Suboption 04: The name of the software image file to install



NOTE: When the DHCP server cannot use suboption 00, configure the image file using suboption 04. If both suboption 00 and suboption 4 are defined, suboption 04 is ignored.



NOTE: DHCP option 43 suboptions 05 through 255 are reserved.

```
option NEW_OP.alt-image-file-name
"/dist/images/jinstall-ex-4300-13.2R1.1-domestic-signed.tgz";
```

7.



NOTE: You must configure either option 150 or option 66. If you configure both option 150 and option 66, option 150 takes precedence, and option 66 is ignored. Also, make sure you specify an IP address, not a hostname, because name resolution is not supported.

Configure DHCP option 150 to specify the IP address of the FTP, HTTP, or TFTP server.

```
option option-150 code 150 "10.100.31.71";
```

8. Configure DHCP option 66 to specify the IP address of the FTP, HTTP, or TFTP server.

```
option tftp-server-name "10.100.31.71";
```

9. (Optional) Configure DHCP option 7 to specify one or more system log (syslog) servers.

```
option log-servers 10.100.31.72;
```

10. (Optional) Configure DHCP option 42 to specify one or more NTP servers.

```
option ntp-servers 10.100.31.73;
```

11. (Optional) Configure DHCP option 12 to specify the hostname of the device.

```
option hostname "jn-switch35";
```

The following sample configuration shows the DHCP options you just configured:

```
host jn-switch35 {
  hardware ethernet ac:4b:c8:29:5d:02;
  fixed-address 10.100.31.36;
  option tftp-server-name "10.100.31.71";
  option host-name "jn-switch35";
  option log-servers 10.100.31.72;
  option ntp-servers 10.100.31.73;
  option NEW_OP.image-file-name
    "/dist/images/jinstall-ex-4300-13.2R1.1-domestic-signed.tgz";
  option NEW_OP.transfer-mode "ftp";
  option NEW_OP.config-file-name "/dist/config/jn-switch35.config";
}
```

Based on the DHCP options you just configured, the following statements are appended to the Junos OS configuration file (for example, `jn-switch35.config`):

```
system {
  host-name jn-switch35;
  syslog {
    host 10.100.31.72 {
      any any;
    }
  }
  ntp {
    server 10.100.31.73;
  }
}
```

12. Connect the device to the network that includes the DHCP server and the FTP, HTTP, or TFTP server.
13. Boot the device with the default configuration.
14. Monitor the ZTP process by looking at the following log files.



NOTE: When SLAX (live operating system based on Linux) scripts are issued, the `op-script.log` and `event-script.log` files are produced.

- `/var/log/dhcp_logfile`
- `/var/log/event-script.log`
- `/var/log/image_load_log`
- `/var/log/messages`
- `/var/log/op-script.log`
- `/var/log/script_output`

You can also monitor the ZTP process by looking at error messages and issuing operational commands. See [“Monitoring Zero Touch Provisioning” on page 303](#) for more information.

- Related Documentation**
- [Understanding Zero Touch Provisioning on page 291](#)
 - [Understanding NTP Time Servers on page 175](#)
 - [Op Script Overview](#)
 - [Monitoring Zero Touch Provisioning on page 303](#)
 - [Understanding DHCP Services for Switches on page 71](#)
 - [Reverting to the Default Factory Configuration by Using the request system zeroize Command on page 27](#)

Monitoring Zero Touch Provisioning

You can use the console and operational commands to monitor Zero Touch Provisioning.

1. [Using the Console to Monitor Zero Touch Provisioning on page 303](#)
2. [Using System Log Alerts to Monitor Zero Touch Provisioning on page 304](#)
3. [Using Error Messages to Monitor Zero Touch Provisioning on page 304](#)
4. [Using System Log Files to Monitor Zero Touch Provisioning on page 304](#)
5. [Using the show dhcp client binding Command on page 305](#)
6. [Using the show dhcp client statistics Command on page 305](#)

Using the Console to Monitor Zero Touch Provisioning

The following Zero Touch Provisioning (ZTP) activities are displayed on the console during the ZTP process:

- Starting and ending times of ZTP process.
- Lists of bound and unbound DHCP client interfaces.
- DHCP options that DHCP servers send to DHCP clients.
- Logs indicating which interfaces are used for ZTP.
- ZTP parameters that DHCP clients obtain from DHCP servers.
- File names of configuration and image files, names of file servers, protocols used to fetch files, and times when DHCP servers fetch configuration and image files.
- Failure states caused by files not being on servers, or unreachable servers, and time outs.
- Number of attempts made, and number of attempts remaining, for retry in current ZTP cycle.
- Completion of file transfers.
- Installation, reboot, and state of ZTP process.
- Internal state errors and termination of ZTP process.
- Logs for when default routes were added or deleted.

Using System Log Alerts to Monitor Zero Touch Provisioning

- Purpose** In this example, the system log alert alerts you that the auto-image upgrade will start.
- Action** Use the following system log alert to monitor the auto-image upgrade process.
- ```

"ALERT:Auto-image upgrade will start. This can terminate config CLI session(s).
Modified configuration will be lost. To stop Auto-image, in CLI do the
following: 'edit; delete chassis auto-image-upgrade; commit'."

"Checking whether image upgrade is already invoked"

```
- Meaning** This system log alert indicates that the auto-image upgrade will start, and provides information on how to stop the auto-image upgrade process.

## Using Error Messages to Monitor Zero Touch Provisioning

- Purpose** Error messages provide information on which DHCP options are not configured.
- Action** Use the information in the following error message to find out which DHCP options are not configured.
- ```

"DHCP Log Server Option"
"DHCP Host Name Option"
"DHCP NTP Server Option"
    
```
- Meaning** The error message indicates that the DHCP log server, hostname, and NTP server options are not configured.

Using System Log Files to Monitor Zero Touch Provisioning

- Purpose** System log files provide information on the state of the auto-upgrade process, lists of bound and unbound DHCP client interfaces, IP addresses of file servers, names and locations of image and configuration files, and successful and failed attempts at fetching configuration and image files.
- Action** Use the information in the following system log files to monitor the auto-upgrade process.
- ```

Auto Image Upgrade: Start fetching config-file file from server 1.1.1.1 through
irb using ftp

Auto Image Upgrade: Tried [2] attempts to fetch config-file file from server
1.1.1.1 through irb. Summary: "Retrieving /config-file
:: Failed to open file.". To retry [4] times.

Auto Image Upgrade: Tried [4] attempts to fetch config-file file from server
1.1.1.1 through irb. Summary: "Retrieving /config-fileconfig-file
:: Failed to open file.". To retry [2] times.

Auto Image Upgrade: Tried [6] attempts to fetch config-file file from server
1.1.1.1 through irb. Summary: "Retrieving /config-file
:: Failed to open file.". To retry [0] times.

```



Auto Image Upgrade: All [6] attempts to fetch config-file file from server 1.1.1.1 through irb FAILED. Start retry again in few minutes.

**Meaning** These system log files indicate that there were six failed attempts to fetch the configuration file from the file server, the IP address of the file server, the DHCP client interface name, and the number of times the retry process occurred.

## Using the show dhcp client binding Command

**Purpose** Issue the **show dhcp client binding** command to display DHCP client binding information

**Action** Issue the **show dhcp client binding** command to display the IP address of the DHCP client, the hardware address of the DHCP client, number of seconds in which the DHCP client's IP address lease expires, state of the DHCP client IP address in the binding table, and the name of the interface that has active client bindings.

### show dhcp client binding

```
user@switch# show dhcp client binding
IP address Hardware address Expires State Interface
0.0.0.0 00:22:83:2a:db:dc 0 SELECTING irb.0
6.6.6.13 00:22:83:2a:db:dd 49201 BOUND vme.0
0.0.0.0 00:22:83:2a:db:df 0 SELECTING xe-0/0/0.0
0.0.0.0 00:22:83:2a:db:e0 0 SELECTING xe-0/0/1.0
```

**Meaning** The output of this command shows that there is one client interface that is bound, and that there are three interfaces that are receiving DHCP offers from the DHCP server.

## Using the show dhcp client statistics Command

**Purpose** Issue the **show dhcp client statistics** command to display DHCP client statistics.

**Action** Issue the **show dhcp client statistics** command to display DHCP client statistics, such as the number of packets dropped, and the number DHCP and BOOTP messages sent and received.

### show dhcp client statistics

```
user@switch# show dhcp client statistics
Packets dropped:
 Total 14
 Send error 14
Messages received:
 BOOTREPLY 5
 DHCPOFFER 1
 DHCPACK 4
 DHCPNAK 0
 DHCPFORCERENEW 0
Messages sent:
 BOOTREQUEST 6751
 DHCPDECLINE 0
 DHCPDISCOVER 6747
 DHCPREQUEST 4
 DHCPINFORM 0
 DHCPRELEASE 0
```

|            |   |
|------------|---|
| DHCPRENEW  | 0 |
| DHCPREBIND | 0 |

**Meaning** The output of this command displays how many packets were dropped with errors, the number of BOOTREPLY and DHCPOFFER messages that were received, and the number of BOOTREQUEST and DHCPREQUEST messages that were sent.

**Related Documentation**

- [Understanding Zero Touch Provisioning on page 291](#)
- [Configuring Zero Touch Provisioning on page 298](#)

## PART 19

# Configuration Statements and Operational Commands

- [Basic System Management Configuration Statements on page 309](#)
- [DHCP Configuration Statements on page 345](#)
- [ICMP Configuration Statements on page 353](#)
- [NSSU Configuration Statements on page 355](#)
- [Login Classes Configuration Statements on page 363](#)
- [NTP Configuration Statements on page 377](#)
- [Password Configuration Statements on page 387](#)
- [PTP Configuration Statement on page 405](#)
- [Autoinstallation Operational Commands on page 407](#)
- [Basic System Management Operational Commands on page 411](#)
- [CLI Operational Commands on page 513](#)
- [ISSU Operational Commands on page 523](#)
- [NSSU Operational Commands on page 541](#)
- [Licensing Operational Commands on page 555](#)
- [NTP Operational Commands on page 567](#)
- [Routine Monitoring Operational Commands on page 573](#)
- [Standard Software Installation and Upgrade Operational Commands on page 1297](#)
- [System Snapshot Operational Commands on page 1325](#)



## CHAPTER 20

# Basic System Management Configuration Statements

- [arp \(System\) on page 311](#)
- [auxiliary on page 312](#)
- [checksum on page 313](#)
- [compress-configuration-files \(System\) on page 314](#)
- [console \(Physical Port\) on page 315](#)
- [default-address-selection on page 316](#)
- [domain-name on page 317](#)
- [domain-search on page 317](#)
- [ethernet \(Alarm\) on page 318](#)
- [host-name on page 318](#)
- [icmpv4-rate-limit on page 319](#)
- [internet-options on page 320](#)
- [link-down on page 321](#)
- [location on page 322](#)
- [login-alarms on page 323](#)
- [management-ethernet \(Alarm\) on page 324](#)
- [max-configurations-on-flash on page 325](#)
- [name-server on page 325](#)
- [no-ping-record-route on page 326](#)
- [no-ping-time-stamp on page 326](#)
- [no-redirects \(IPv4 Traffic\) on page 327](#)
- [optional on page 328](#)
- [ports on page 328](#)
- [retry on page 329](#)
- [saved-core-context on page 330](#)
- [saved-core-files on page 330](#)

- [source-port \(Port Addresses\) on page 331](#)
- [static-host-mapping on page 332](#)
- [system on page 333](#)
- [time-format on page 338](#)
- [time-zone on page 339](#)
- [traceoptions \(Layer 2 Learning\) on page 341](#)
- [uid on page 343](#)
- [use-imported-time-zones on page 343](#)

## arp (System)

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <pre>arp {     aging-timer <i>minutes</i>;     gratuitous-arp-delayseconds;     gratuitous-arp-on-ifup;     interfaces {         <i>interface-name</i> {             aging-timer <i>minutes</i>;         }     }     passive-learning;     purging; }</pre> <p>For EX-Series switches:</p> <pre>arp {     aging-timer <i>minutes</i>; }</pre>                                                                                                                                                                                                                  |
| <b>Hierarchy Level</b>          | [edit system]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Release Information</b>      | <p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>                                                                                                                                                                                                                                                                  |
| <b>Description</b>              | <p>Specify ARP options. You can enable backup VRRP routers to learn ARP requests for VRRP-IP to VRRP-MAC address translation. You can also set the time interval between ARP updates.</p> <p>For EX-Series switches, set only the time interval between ARP updates.</p>                                                                                                                                                                                                                                                                                       |
| <b>Options</b>                  | <p><b>aging-timer</b>—Time interval in minutes between ARP updates. In environments where the number of ARP entries to update is high (for example, on routers only, metro Ethernet environments), increasing the time between updates can improve system performance.</p> <p><b>passive-learning</b> (QFX-Series only)—Configure switches to learn the ARP mappings (IP-to-MAC address) for hosts sending the requests.</p> <p><b>Default:</b> 20 minutes</p> <p><b>Range:</b> 1 to 240 minutes</p> <p>The remaining statements are explained separately.</p> |
| <b>Required Privilege Level</b> | <p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <i>Configuring Junos OS ARP Learning and Aging Options for Mapping IPv4 Network Addresses to MAC Addresses</i></li> <li>• <i>Junos OS Network Interfaces Library for Routing Devices</i></li> </ul>                                                                                                                                                                                                                                                                                                                   |

- [Junos OS System Basics Configuration Guide](#) .

## auxiliary

---

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <pre>auxiliary {<br/>  disable;<br/>  insecure;<br/>  type <i>terminal-type</i>;<br/>}</pre>                                                                                                                                                                                                                                                                                                                                                     |
| <b>Hierarchy Level</b>          | [edit system ports]                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                                                    |
| <b>Description</b>              | Configure the characteristics of the auxiliary port.                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Default</b>                  | The auxiliary port is disabled.                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Options</b>                  | <p><b>disable</b>—Disable the port.</p> <p><b>insecure</b>—Disable superuser access or root logins to establish a terminal connection.</p> <p><b>type <i>terminal-type</i></b>—Type of terminal that is connected to the port.</p> <p><b>Range:</b> <code>ansi</code>, <code>vt100</code>, <code>small-xterm</code>, <code>xterm</code></p> <p><b>Default:</b> The terminal type is unknown, and the user is prompted for the terminal type.</p> |
| <b>Required Privilege Level</b> | <p><code>system</code>—To view this statement in the configuration.</p> <p><code>system-control</code>—To add this statement to the configuration.</p>                                                                                                                                                                                                                                                                                           |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Configuring Console and Auxiliary Port Properties on page 15</a></li></ul>                                                                                                                                                                                                                                                                                                                   |




## checksum

---

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>checksum (md5   sha-256   sha1) <i>hash</i>;</code>                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Hierarchy Level</b>          | [edit event-options event-script file <i>filename</i> ],<br>[edit system scripts commit file <i>filename</i> ],                                                                                                                                                                                                                                                                                                             |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                               |
| <b>Description</b>              | For Junos commit scripts and op scripts, specify the MD5, SHA-1, or SHA-256 checksum hash. When it executes a local event or commit script, the Junos OS verifies the authenticity of the script by using the configured checksum hash.                                                                                                                                                                                     |
| <b>Options</b>                  | <p><b>md5 <i>hash</i></b>—MD5 checksum of this script.</p> <p><b>sha-256 <i>hash</i></b>—SHA-256 checksum of this script.</p> <p><b>sha1 <i>hash</i></b>—SHA-1 checksum of this script.</p>                                                                                                                                                                                                                                 |
| <b>Required Privilege Level</b> | <p><b>maintenance</b>—To view this statement in the configuration.</p> <p><b>maintenance-control</b>—To add this statement to the configuration.</p>                                                                                                                                                                                                                                                                        |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <i>Configuring Checksum Hashes for a Commit Script</i></li> <li>• <i>Configuring Checksum Hashes for an Event Script</i></li> <li>• <i>Configuring Checksum Hashes for an Op Script</i></li> <li>• <a href="#">file checksum md5 on page 431</a></li> <li>• <a href="#">file checksum sha-256 on page 433</a></li> <li>• <a href="#">file checksum sha1 on page 432</a></li> </ul> |

## compress-configuration-files (System)

---

|                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                                                                                                                                                                                                                         | (compress-configuration-files   no-compress-configuration-files);                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Hierarchy Level</b>                                                                                                                                                                                                                | [edit system]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Release Information</b>                                                                                                                                                                                                            | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Description</b>                                                                                                                                                                                                                    | Compress the current operational configuration file. The file is stored in the file <b>juniper.conf</b> , in the <b>/config</b> file system, along with the last three committed versions of the configuration. However, with large networks, the current configuration file might exceed the available space in the <b>/config</b> file system. Compressing the current configuration file allows the file to fit in the file system, typically reducing the size of the file by 90 percent. The current configuration file is compressed on the second commit of the configuration after the first commit is made to include the <b>compress-configuration-files</b> statement. |
| <div> <b>NOTE:</b> We recommend that you enable compression of the configuration files to minimize the amount of disk space that they require.</div> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Default</b>                                                                                                                                                                                                                        | The current operational configuration file is uncompressed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Required Privilege Level</b>                                                                                                                                                                                                       | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Related Documentation</b>                                                                                                                                                                                                          | <ul style="list-style-type: none"><li>• <a href="#">Compressing the Current Configuration File on page 14</a></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

## console (Physical Port)

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <pre>console {   disable;   insecure;   log-out-on-disconnect;   type <i>terminal-type</i>; }</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Hierarchy Level</b>          | [edit system ports]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Release Information</b>      | <p>Statement introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Description</b>              | Configure the characteristics of the console port.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Default</b>                  | The console port is enabled and its speed is 9600 baud.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Options</b>                  | <p><b>disable</b>—Disable console login connections.</p> <p><b>insecure</b>—Disable root login connections to the console and auxiliary ports. Configuring the console port as insecure also prevents superusers and anyone with a user identifier (UID) of 0 from establishing terminal connections in multiuser mode. This option can prevent a user from attempting password recovery by booting into single-user mode if the user does not know the root password.</p> <p><b>log-out-on-disconnect</b>—Log out the session when the data carrier on the console port is lost.</p> <p><b>type <i>terminal-type</i></b>—Type of terminal that is connected to the port: <b>ansi</b>, <b>vt100</b>, <b>small-xterm</b>, or <b>xterm</b>.</p> |
| <b>Required Privilege Level</b> | <p><b>system</b>—To view this statement in the configuration.</p> <p><b>system-control</b>—To add this statement to the configuration.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">Configuring Console and Auxiliary Port Properties on page 15</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

## default-address-selection

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | default-address-selection;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Hierarchy Level</b>          | [edit system]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Description</b>              | Use the loopback interface, <b>lo0</b> , as the source address for all locally generated IP packets when the packet is sent through a routed interface, but not when the packet is sent through a local interface such as <b>fxp0</b> . The <b>lo0</b> interface is the interface to the switch's Routing Engine.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Default</b>                  | <p>The default address is used as the source address for all locally generated IP packets on outgoing interfaces that are unnumbered. If an outgoing interface is numbered, the default address is chosen using the following sequence:</p> <ul style="list-style-type: none"> <li>• The primary address on the loopback interface <b>lo0</b> that is <i>not</i> 127.0.0.1 is used.</li> <li>• The primary address for the primary interface or the preferred address (if configured) for the primary interface is used.</li> </ul> <p>By default, the primary address on an interface is selected as the numerically lowest local address configured on the interface.</p> <p>An interface's <i>primary address</i> is used by default as the local address for broadcast and multicast packets sourced locally and sent out through the interface. An interface's <i>preferred address</i> is the default local address used for packets sourced by the local switch to destinations on the subnet. By default, the numerically lowest local address configured for the interface is chosen as the preferred address on the subnet.</p> <p>To configure a different primary address or preferred address, include the <b>primary</b> or <b>preferred</b> statement at the [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i> address <i>address</i>] or [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i> address <i>address</i>] hierarchy levels.</p> |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">Configuring the Junos OS to Select a Fixed Source Address for Locally Generated TCP/IP Packets on page 19</a></li> <li>• <i>Junos OS Network Interfaces Library for Routing Devices</i></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

## domain-name

---

|                                 |                                                                                                                                                              |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>domain-name <i>domain-name</i>;</code>                                                                                                                 |
| <b>Hierarchy Level</b>          | [edit system]                                                                                                                                                |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                |
| <b>Description</b>              | Configure the name of the domain in which the switch is located. This is the default domain name that is appended to hostnames that are not fully qualified. |
| <b>Options</b>                  | <i>domain-name</i> —Name of the domain.                                                                                                                      |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                            |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Reaching a Domain Name System Server on page 25</a></li></ul>                                            |

## domain-search

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|                                 |                                                                                                                                               |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>domain-search <i>domain-list</i>;</code>                                                                                                |
| <b>Hierarchy Level</b>          | [edit system]                                                                                                                                 |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>              | Configure a list of domains to be searched.                                                                                                   |
| <b>Options</b>                  | <i>domain-list</i> —List of domain names to search. The list can contain up to 6 domain names, with a total of up to 256 characters.          |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                             |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Reaching a Domain Name System Server on page 25</a></li></ul>                             |

## ethernet (Alarm)

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|                                 |                                                                                                                                               |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | ethernet {<br><a href="#">link-down</a> (red   yellow   ignore);<br>}                                                                         |
| <b>Hierarchy Level</b>          | [edit chassis alarm],<br>[edit chassis interconnect-device <i>name</i> alarm],<br>[edit chassis node-group <i>name</i> alarm]                 |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>              | Configure alarms for an Ethernet interface.                                                                                                   |
| <b>Options</b>                  | The remaining statement is explained separately.—                                                                                             |
| <b>Required Privilege Level</b> | interface—To view this statement in the configuration.<br>interface-control—To add this statement to the configuration.                       |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Understanding Alarms</a></li><li>• <a href="#">Interface Alarm Messages</a></li></ul>     |

## host-name

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|                                 |                                                                                                                                               |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | host-name <i>hostname</i> ;                                                                                                                   |
| <b>Hierarchy Level</b>          | [edit system]                                                                                                                                 |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>              | Set the hostname of the switch.                                                                                                               |
| <b>Options</b>                  | <i>hostname</i> —Name of the switch.                                                                                                          |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                             |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Configuring the Hostname of the Router or Switch on page 16</a></li></ul>                 |

## icmpv4-rate-limit

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|                                 |                                                                                                                                                                                                                                                                                                                            |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <pre>icmpv4-rate-limit {     bucket-size <i>seconds</i>;     packet-rate <i>pps</i>; }</pre>                                                                                                                                                                                                                               |
| <b>Hierarchy Level</b>          | [edit system internet-options]                                                                                                                                                                                                                                                                                             |
| <b>Release Information</b>      | <p>Statement introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>                                                                                                                                                                   |
| <b>Description</b>              | Configure rate-limiting parameters for ICMPv4 messages sent.                                                                                                                                                                                                                                                               |
| <b>Options</b>                  | <p><b>bucket-size <i>seconds</i></b>—Number of seconds in the rate-limiting bucket.</p> <p><b>Range:</b> 0 through 4294967295 seconds</p> <p><b>Default:</b> 5</p> <p><b>packet-rate <i>pps</i></b>—Rate-limiting packets earned per second.</p> <p><b>Range:</b> 0 through 4294967295 pps</p> <p><b>Default:</b> 1000</p> |
| <b>Required Privilege Level</b> | <p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>                                                                                                                                                                                                 |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <i>ping</i></li> <li>• <i>Configuring Junos OS ICMPv4 Rate Limit for ICMPv4 Routing Engine Messages</i></li> <li>• <i>Configuring Junos OS ICMPv6 Rate Limit for ICMPv6 Routing Engine Messages</i></li> </ul>                                                                    |

## internet-options

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|                                 |                                                                                                                                                                                                                                                               |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <pre>internet-options {<br/>    icmpv4-rate-limit bucket-size <i>bucket-size</i> packet-rate <i>packet-rate</i>;<br/>    source-port upper-limit <i>upper-limit</i>;<br/>}</pre>                                                                              |
| <b>Hierarchy Level</b>          | [edit system]                                                                                                                                                                                                                                                 |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                 |
| <b>Description</b>              | <p>Configure system IP options to protect against certain types of denial-of-service (DoS) attacks.</p> <p>The remaining statements are explained separately.</p>                                                                                             |
| <b>Required Privilege Level</b> | admin—To view this statement in the configuration.<br>admin-control—To add this statement to the configuration.                                                                                                                                               |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Configuring the Junos OS ICMPv4 Rate Limit for ICMPv4 Routing Engine Messages on page 84</a></li><li>• <a href="#">Configuring Junos OS to Extend the Default Port Address Range on page 18</a></li></ul> |



## link-down

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|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | link-down (red   yellow   ignore);                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Hierarchy Level</b>          | [edit chassis alarm <b>ethernet</b> ],<br>[edit chassis alarm fibre-channel],<br>[edit chassis interconnect-device <i>name</i> alarm <b>ethernet</b> ],<br>[edit chassis node-group <i>name</i> alarm fibre-channel]                                                                                                                                                                                                                                                                       |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.3 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                                                                                              |
| <b>Description</b>              | Specify either red, yellow, or ignore to display when the link is down.                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Options</b>                  | <p><b>red</b>—Indicates that one or more hardware components have failed or exceeded temperature thresholds, or an alarm condition configured on an interface has triggered a critical warning.</p> <p><b>yellow</b>—Indicates a noncritical condition on the device that, if left unchecked, might cause an interruption in service or degradation in performance. A yellow alarm condition requires monitoring or maintenance.</p> <p><b>ignore</b>—Suppresses or ignores the alarm.</p> |
| <b>Required Privilege Level</b> | <p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>                                                                                                                                                                                                                                                                                                                                                             |

## location

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|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <pre>location {<br/>  altitude <i>feet</i>;<br/>  building <i>name</i>;<br/>  country-code <i>code</i>;<br/>  floor <i>number</i>;<br/>  hcoord <i>horizontal-coordinate</i>;<br/>  lata <i>service-area</i>;<br/>  latitude <i>degrees</i>;<br/>  longitude <i>degrees</i>;<br/>  npa-nxx <i>number</i>;<br/>  postal-code <i>postal-code</i>;<br/>  rack <i>number</i>;<br/>  vcoord <i>vertical-coordinate</i>;<br/>}</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Hierarchy Level</b>          | [edit system]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Description</b>              | Configure the system location.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Options</b>                  | <p><b>altitude <i>feet</i></b>—Number of feet above sea level.</p> <p><b>building <i>name</i></b>—Name of the building. The name of the building can be 1 to 28 characters in length. If the string contains spaces, enclose it in quotation marks (" ").</p> <p><b>country-code <i>code</i></b>—Two-letter country code.</p> <p><b>floor <i>number</i></b>—Floor in the building.</p> <p><b>hcoord <i>horizontal-coordinate</i></b>—Bellcore Horizontal Coordinate.</p> <p><b>lata <i>service-area</i></b>—Long-distance service area.</p> <p><b>latitude <i>degrees</i></b>—Latitude in degree format.</p> <p><b>longitude <i>degrees</i></b>—Longitude in degree format.</p> <p><b>npa-nxx <i>number</i></b>—First six digits of the phone number (area code and exchange).</p> <p><b>postal-code <i>postal-code</i></b>—Postal code.</p> <p><b>rack <i>number</i></b>—Rack number.</p> <p><b>vcoord <i>vertical-coordinate</i></b>—Bellcore Vertical Coordinate.</p> |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

- Related Documentation**
- [Specifying the Physical Location of the Switch on page 29](#)

## login-alarms

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|                                 |                                                                                                                                                                                                                                                                            |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | login-alarms;                                                                                                                                                                                                                                                              |
| <b>Hierarchy Level</b>          | [edit system login class <i>class-name</i> ]                                                                                                                                                                                                                               |
| <b>Release Information</b>      | Statement introduced before Junos OS Release 7.4.<br>Statement introduced in Junos OS Release 9.0 for EX Series switches.<br>Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>              | Show system alarms automatically when an <b>admin</b> user logs in to the router or switch.                                                                                                                                                                                |
| <b>Options</b>                  | <i>class-name</i> —Login class name.                                                                                                                                                                                                                                       |
| <b>Required Privilege Level</b> | admin—To view this statement in the configuration.<br>admin-control—To add this statement to the configuration.                                                                                                                                                            |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Configuring System Alarms to Appear Automatically Upon Login on page 19</a></li></ul>                                                                                                                                  |

## management-ethernet (Alarm)

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|                            |                                                                                                                                               |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>              | management-ethernet {<br>link-down (red   yellow   ignore);<br>}                                                                              |
| <b>Hierarchy Level</b>     | [edit chassis alarm],<br>[edit chassis interconnect-device <i>name</i> alarm],<br>[edit chassis node-group <i>name</i> alarm]                 |
| <b>Release Information</b> | Statement introduced in Junos OS Release 12.2 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>         | Configure alarms for a management Ethernet interface.                                                                                         |



**NOTE:** If you configure a yellow alarm on the Interconnect device, it will be handled as a red alarm.

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|                                 |                                                                                                                         |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| <b>Options</b>                  | The remaining statement is explained separately.—                                                                       |
| <b>Required Privilege Level</b> | interface—To view this statement in the configuration.<br>interface-control—To add this statement to the configuration. |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <i>Understanding Alarms</i></li><li>• <i>Interface Alarm Messages</i></li></ul> |

## max-configurations-on-flash

|                                 |                                                                                                                                                                                                                                                              |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>max-configurations-on-flash <i>number</i>;</code>                                                                                                                                                                                                      |
| <b>Hierarchy Level</b>          | [edit system]                                                                                                                                                                                                                                                |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                |
| <b>Description</b>              | Specify the number of configurations stored on the internal fixed media storage (for example, USB device).                                                                                                                                                   |
| <b>Options</b>                  | <i>number</i> —The number of configurations stored on the CompactFlash card.<br><b>Range:</b> 0 through 49. The most recently saved configuration is number 0, and the oldest saved configuration is number 49.                                              |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                                                                                            |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <i>Saving a Configuration to a File</i></li> <li>• <i>Setting or Deleting the Rescue Configuration</i></li> <li>• <i>Uploading a Configuration File</i></li> <li>• <i>Uploading a Configuration File</i></li> </ul> |

## name-server

|                                 |                                                                                                                                                      |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>name-server {<br/>    <i>address</i>;<br/>}</code>                                                                                             |
| <b>Hierarchy Level</b>          | [edit system]                                                                                                                                        |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.        |
| <b>Description</b>              | Configure one or more Domain Name System (DNS) name servers.                                                                                         |
| <b>Options</b>                  | <i>address</i> —Address of the name server. To configure multiple name servers, include multiple <i>address</i> options.                             |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                    |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">Configuring a DNS Name Server for Resolving a Hostname into Addresses on page 15</a></li> </ul> |

## no-ping-record-route

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|                                 |                                                                                                                                                                                                                                                                        |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | no-ping-record-route;                                                                                                                                                                                                                                                  |
| <b>Hierarchy Level</b>          | [edit system]                                                                                                                                                                                                                                                          |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 9.4.<br>Statement introduced in Junos OS Release 9.4 for EX Series switches.<br>Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>              | Configure the Junos OS to disable the reporting of the IP address in ping responses.                                                                                                                                                                                   |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                                                                                                      |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Configuring Junos OS to Disable the Reporting of IP Address and Timestamps in Ping Responses on page 18</a></li></ul>                                                                                              |

## no-ping-time-stamp

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|                                 |                                                                                                                                                                                                                                                                        |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | no-ping-time-stamp;                                                                                                                                                                                                                                                    |
| <b>Hierarchy Level</b>          | [edit system]                                                                                                                                                                                                                                                          |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 9.4.<br>Statement introduced in Junos OS Release 9.4 for EX Series switches.<br>Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>              | Configure the Junos OS to disable the recording of timestamps in ping responses.                                                                                                                                                                                       |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                                                                                                      |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Configuring Junos OS to Disable the Reporting of IP Address and Timestamps in Ping Responses on page 18</a></li></ul>                                                                                              |

## no-redirects (IPv4 Traffic)

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | no-redirects;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Hierarchy Level</b>          | [edit system],<br>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i> ]                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Release Information</b>      | Statement introduced before Junos OS Release 7.4.<br>Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 12.3 for EX Series switches.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                                               |
| <b>Description</b>              | <p>Stop protocol redirect messages for IPv4 traffic from being sent on the entire switch or on an interface on the router or switch.</p> <p>To disable the sending of protocol redirect messages for the entire router or switch, include the <b>no-redirects</b> statement at the [edit system] hierarchy level.</p> <p>To disable the sending of protocol redirect messages on a specific interface, include the <b>no-redirects</b> statement at the [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i>] hierarchy level.</p> |
| <b>Default</b>                  | The router or switch sends redirect messages.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">Configuring Junos OS to Disable Protocol Redirect Messages on the Router or Switch on page 17</a></li> <li>• <a href="#">Understanding the Protocol Redirect Mechanism on EX Series Switches</a></li> <li>• <a href="#">Configuring Junos OS to Disable Sending Protocol Redirect Messages on EX Series Switches (CLI Procedure) on page 84</a></li> <li>• <a href="#">Junos OS Network Interfaces Library for Routing Devices</a></li> </ul>                                                                        |

## optional

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|                                 |                                                                                                                                                                                                       |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | optional;                                                                                                                                                                                             |
| <b>Hierarchy Level</b>          | [edit system scripts commit file <i>filename</i> ]                                                                                                                                                    |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                         |
| <b>Description</b>              | For Junos OS commit scripts, allow a commit operation to succeed even if the script specified in the <b>file</b> statement is missing from the <b>/var/db/scripts/commit</b> directory on the router. |
| <b>Required Privilege Level</b> | maintenance—To view this statement in the configuration.<br>maintenance-control—To add this statement to the configuration.                                                                           |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <i>Controlling Execution of Commit Scripts During Commit Operations</i></li></ul>                                                                             |

## ports

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|                                 |                                                                                                                                                                                                                                                       |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <pre>ports {<br/>  auxiliary {<br/>    disable;<br/>    insecure;<br/>    type <i>terminal-type</i>;<br/>  }<br/>  console {<br/>    disable;<br/>    insecure;<br/>    log-out-on-disconnect;<br/>    type <i>terminal-type</i>;<br/>  }<br/>}</pre> |
| <b>Hierarchy Level</b>          | [edit system]                                                                                                                                                                                                                                         |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                         |
| <b>Description</b>              | Configure the properties of the console and auxiliary ports. The ports are located on the craft interface.<br><br>See the switch hardware documentation for port locations.<br><br>The remaining statements are explained separately.                 |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                                                                                     |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Configuring Console and Auxiliary Port Properties on page 15</a></li></ul>                                                                                                                        |



## retry

|                            |                                                                                                                                               |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>              | <code>retry number;</code>                                                                                                                    |
| <b>Hierarchy Level</b>     | [edit system radius server <i>server-address</i> ],<br>[edit system accounting destination radius server <i>server-address</i> ]              |
| <b>Release Information</b> | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>         | Number of times the router or switch is allowed to try to contact a RADIUS authentication or accounting server.                               |
| <b>Options</b>             | <i>number</i> —Number of retries allowed for contacting a RADIUS server.<br><b>Range:</b> 1 through 10<br><b>Default:</b> 3                   |



**NOTE:** The [edit system accounting] hierarchy is not available on QFabric systems.

|                                 |                                                                                                                                                                                                   |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                                 |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <i>Configuring RADIUS Authentication (QFX Series or OCX Series)</i></li> <li>• <i>Configuring RADIUS Accounting</i></li> <li>• <i>timeout</i></li> </ul> |

## saved-core-context

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|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | (saved-core-context   no-saved-core-context);                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Hierarchy Level</b>          | [edit system]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Description</b>              | <p>Configure whether the switch saves core files generated by internal Junos OS processes, along with contextual information (system log files and a copy of the current configuration):</p> <ul style="list-style-type: none"><li>• <b>saved-core-context</b>—The switch saves each core file and its associated context in a compressed tar file named <code>/var/tmp/process-name.core.core-number.tgz</code>.</li><li>• <b>no-saved-core-context</b>—The switch does not save core files and their associated context.</li></ul> |
| <b>Default</b>                  | The switch saves core files.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Required Privilege Level</b> | admin—To view this statement in the configuration.<br>admin-control—To add this statement to the configuration.                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <i>Saving Core Files from Junos OS Processes</i></li><li>• <a href="#">saved-core-files on page 330</a></li></ul>                                                                                                                                                                                                                                                                                                                                                                            |

## saved-core-files

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|                                 |                                                                                                                                                             |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | saved-core-files <i>number</i> ;                                                                                                                            |
| <b>Hierarchy Level</b>          | [edit system]                                                                                                                                               |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.               |
| <b>Description</b>              | Save core files generated by internal Junos OS processes, but not the associated contextual information (configuration and system log files).               |
| <b>Options</b>                  | <i>number</i> —Maximum number of core files to save.<br><b>Range:</b> 1 through 10                                                                          |
| <b>Required Privilege Level</b> | admin—To view this statement in the configuration.<br>admin-control—To add this statement to the configuration.                                             |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <i>Saving Core Files from Junos OS Processes</i></li><li>• <a href="#">saved-core-context on page 330</a></li></ul> |

## source-port (Port Addresses)

---

|                                 |                                                                                                                                                                                                    |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | source-port upper-limit < <i>upper-limit</i> >;                                                                                                                                                    |
| <b>Hierarchy Level</b>          | [edit system internet-options]                                                                                                                                                                     |
| <b>Release Information</b>      | Statement introduced before Junos OS Release 7.4.<br>Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>              | Configure the range of port addresses.                                                                                                                                                             |
| <b>Options</b>                  | <b>upper-limit <i>upper-limit</i></b> —(Optional) The range of port addresses and can be a value from 5000 through 65,355.                                                                         |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                                  |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Configuring Junos OS to Extend the Default Port Address Range on page 18</a></li></ul>                                                         |

## static-host-mapping

---

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <pre>static-host-mapping {<br/>    hostname {<br/>        alias [ <i>alias</i> ];<br/>        inet [ <i>address</i> ];<br/>        sysid <i>system-identifier</i>;<br/>    }<br/>}</pre>                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Hierarchy Level</b>          | [edit system]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Description</b>              | Map a hostname to one or more IP addresses and aliases, and configure an International Organization for Standardization (ISO) system identifier (system ID).                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Options</b>                  | <p><b>alias <i>alias</i></b>—Alias for the hostname.</p> <p><b>hostname</b>—Fully qualified hostname.</p> <p><b>inet <i>address</i></b>—IP address. You can specify one or more IP addresses for the host.</p> <p><b>sysid <i>system-identifier</i></b>—ISO system identifier (system ID). This is the 6-byte portion of the Intermediate System-to-Intermediate System (IS-IS) network service access point (NSAP). We recommend that you use the host's IP address represented in binary-coded decimal (BCD) format. For example, the IP address <b>208.197.169.18</b> is <b>2081.9716.9018</b> in BCD.</p> |
| <b>Required Privilege Level</b> | <p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Configuring the Hostname of the Router or Switch on page 16</a></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

## system

```
Syntax system {
 accounting {
 events [login change-log interactive-commands];
 destination {
 radius {
 server {
 server-address {
 accounting-port port-number;
 retry number;
 secret password;
 source-address address;
 timeout seconds;
 }
 }
 }
 }
 tacplus {
 server {
 server-address {
 port port-number;
 secret password;
 single-connection;
 timeout seconds;
 }
 }
 }
 }
 archival {
 configuration {
 archive-sites {
 ftp://<username>:<password>@<host>:<port>/<url-path>;
 ftp://<username>:<password>@<host>:<port>/<url-path>;
 }
 transfer-interval interval;
 transfer-on-commit;
 }
 }
 arp {
 aging-timer minutes;
 interfaces;
 }
 authentication-order [authentication-methods];
 (compress-configuration-files | no-compress-configuration-files);
 default-address-selection;
 domain-name domain-name;
 domain-search [domain-list];
 host-name hostname;
 internet-options {
 icmpv4-rate-limit bucket-size packet-rate packet-rate;
 source-port upper-limit <upper-limit>;
 }
 location {
```

```

altitude feet;
building name;
country-code code;
floor number;
hcoord horizontal-coordinate;
lata service-area;
latitude degrees;
longitude degrees;
npa-nxx number;
postal-code postal-code;
rack number;
vcoord vertical-coordinate;
}
login {
 announcement text;
 class class-name {
 access-end;
 access-start;
 allow-configuration "regular-expression";
 allowed-days "regular-expression";
 deny-commands "regular-expression";
 deny-configuration "regular-expression";
 idle-timeout minutes;
 login-tip;
 permissions [permissions];
 }
 message text;
 password {
 change-type (set-transitions | character-set);
 format (md5 | sha1 | des);
 maximum-length length;
 minimum-changes number;
 minimum-length length;
 }
 retry-options {
 backoff-factor seconds;
 backoff-threshold number;
 minimum-time seconds;
 tries-before-disconnect number;
 }
 user username {
 authentication {
 (encrypted-password "password" | plain-text-password);
 load-key-file URL;
 remote-debug-permission (qfabric-admin | qfabric-operator | qfabric-user);
 ssh-rsa "public-key";
 ssh-dsa "public-key";
 }
 uid uid-value;
 class class-name;
 full-name complete-name;
 }
}
name-server {
 address;
}

```

```

no-multicast-echo;
no-redirects;
no-ping-record-route;
no-ping-time-stamp;
ntp {
 authentication-key number type type value password;
 serveraddress <key key-number> <version value> <prefer>;
}
ports {
 auxiliary {
 disable;
 insecure;
 type terminal-type;
 }
 console {
 disable;
 insecure;
 log-out-on-disconnect;
 type terminal-type;
 }
}
radius-server server-address {
 accounting-port port-number;
 port number;
 retry number;
 secret password;
 source-address source-address;
 timeout seconds;
}
radius-options {
 password-protocol mschap-v2;
}
attributes {
 nas-ip-address ip-address;
}
root-authentication {
 (encrypted-password "password" | plain-text-password);
 ssh-rsa "public-key";
 ssh-dsa "public-key";
}
(saved-core-context | no-saved-core-context);
saved-core-files saved-core-files;
services {
 finger {
 connection-limit limit;
 rate-limit limit;
 }
 flow-tap-dtcp {
 ssh {
 connection-limit limit;
 rate-limit limit;
 }
 }
}
ftp {
 connection-limit limit;
 rate-limit limit;
}

```

```

}
service-deployment {
 servers server-address {
 port port-number;
 }
 source-address source-address;
}
ssh {
 root-login (allow | deny | deny-password);
 protocol-version [v1 v2];
 connection-limit limit;
 rate-limit limit;
}
telnet {
 connection-limit limit;
 rate-limit limit;
}
web-management {
 http {
 interfaces [interface-names];
 port port;
 }
 https {
 interfaces [interface-names];
 local-certificate name;
 port port;
 }
 session {
 idle-timeout [minutes];
 session-limit [session-limit];
 }
}
xnm-clear-text {
 connection-limit limit;
 rate-limit limit;
}
xnm-ssl {
 connection-limit limit;
 local-certificate name;
 rate-limit limit;
}
}
static-host-mapping {
 hostname {
 alias [alias];
 inet [address];
 sysid system-identifier;
 }
}
syslog {
 archive {
 files number;
 size maximum-file-size;
 start-time "YYYY-MM-DD.hh:mm";
 transfer-interval minutes;
 (world-readable | no-world-readable);
 }
}

```



```

}
console {
 facility severity;
}
file filename {
 archive {
 files number;
 size maximum-file-size;
 start-time "YYYY-MM-DD.hh:mm";
 transfer-interval minutes;
 (world-readable | no-world-readable);
 }
 explicit-priority;
 facility severity;
 match "regular-expression";
 structured-data {
 brief;
 }
}
host (hostname | other-routing-engine | scc-master) {
 explicit-priority;
 facility-override facility;
 facility severity;
 log-prefix string;
 match "regular-expression";
}
source-address source-address;
time-format (millisecond | year | year millisecond);
user (username | *) {
 facility severity;
 match "regular-expression";
}
}
tacplus-options {
 service-name service-name;
 (no-cmd-attribute-value | exclude-cmd-attribute);
}
tacplus-server server-address {
 port
 secret password;
 single-connection;
 source-address source-address;
 timeout seconds;
}
time-zone (GMThour-offset | time-zone);
}
tracing {
 destination-override {
 syslog host;
 }
}
use-imported-time-zones;
}

```

Hierarchy Level [edit]

**Release Information** Statement introduced in Junos OS Release 11.1 for the QFX Series.  
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

**Description** Configure system management properties.



**NOTE:** The `radius-server source-address` and `radius-options` statements are not available on the QFabric system.

**Required Privilege Level** system—To view this statement in the configuration.  
system-control—To add this statement to the configuration.

## time-format

**Syntax** `time-format (year | millisecond | year millisecond);`

**Hierarchy Level** [edit system syslog]

**Release Information** Statement introduced in Junos OS Release 11.1 for the QFX Series.  
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

**Description** Include the year, the millisecond, or both, in the timestamp on every standard-format system log message. The additional information is included for messages directed to each destination configured by a `file`, `console`, or `user` statement at the [edit system syslog] hierarchy level, but not to destinations configured by a `host` statement.

**Default** The timestamp specifies the month, date, hour, minute, and second when the message was logged—for example, **Aug 21 12:36:30**.



**NOTE:** When the `structured-data` statement is included at the [edit system syslog file *filename*] hierarchy level, this statement is ignored for the file.

**Options** `millisecond`—Include the millisecond in the timestamp.

`year`—Include the year in the timestamp.

**Required Privilege Level** system—To view this statement in the configuration.  
system-control—To add this statement to the configuration.

**Related Documentation**

- [Including the Year or Millisecond in Timestamps on page 22](#)
- `structured-data`

## time-zone

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>              | <code>time-zone (GMT <i>hour-offset</i>   <i>time-zone</i>);</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Hierarchy Level</b>     | [edit system]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Release Information</b> | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Description</b>         | Set the local time zone. To have the time zone change take effect for all processes running on the switch, you must reboot the switch.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Default</b>             | UTC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Options</b>             | <p><b>GMT <i>hour-offset</i></b>—Set the time zone relative to UTC time.</p> <p><b>Range:</b> -14 through +12</p> <p><b>Default:</b> 0</p> <p><b><i>time-zone</i></b>—Specify the time zone as <b>UTC</b>, which is the default time zone, or as a string such as <b>PDT</b> (Pacific Daylight Time), or use one of the following continents and major cities:</p> <p>Africa/Abidjan, Africa/Accra, Africa/Addis_Ababa, Africa/Algiers, Africa/Asmera, Africa/Bamako, Africa/Bangui, Africa/Banjul, Africa/Bissau, Africa/Blantyre, Africa/Brazzaville, Africa/Bujumbura, Africa/Cairo, Africa/Casablanca, Africa/Ceuta, Africa/Conakry, Africa/Dakar, Africa/Dar_es_Salaam, Africa/Djibouti, Africa/Douala, Africa/El_Aaiun, Africa/Freetown, Africa/Gaborone, Africa/Harare, Africa/Johannesburg, Africa/Kampala, Africa/Khartoum, Africa/Kigali, Africa/Kinshasa, Africa/Lagos, Africa/Libreville, Africa/Lome, Africa/Luanda, Africa/Lubumbashi, Africa/Lusaka, Africa/Malabo, Africa/Maputo, Africa/Maseru, Africa/Mbabane, Africa/Mogadishu, Africa/Monrovia, Africa/Nairobi, Africa/Ndjamena, Africa/Niamey, Africa/Nouakchott, Africa/Ouagadougou, Africa/Porto-Novo, Africa/Sao_Tome, Africa/Timbuktu, Africa/Tripoli, Africa/Tunis, Africa/Windhoek</p> <p>America/Adak, America/Anchorage, America/Anguilla, America/Antigua, America/Aruba, America/Asuncion, America/Barbados, America/Belize, America/Bogota, America/Boise, America/Buenos_Aires, America/Caracas, America/Catamarca, America/Cayenne, America/Cayman, America/Chicago, America/Cordoba, America/Costa_Rica, America/Cuiaba, America/Curacao, America/Dawson, America/Dawson_Creek, America/Denver, America/Detroit, America/Dominica, America/Edmonton, America/El_Salvador, America/Ensenada, America/Fortaleza, America/Glace_Bay, America/Godthab, America/Goose_Bay, America/Grand_Turk, America/Grenada, America/Guadeloupe, America/Guatemala, America/Guayaquil, America/Guyana, America/Halifax, America/Havana, America/Indiana/Knox, America/Indiana/Marengo, America/Indiana/Vevay, America/Indianapolis, America/Inuvik, America/Iqaluit, America/Jamaica, America/Jujuy, America/Juneau, America/La_Paz, America/Lima, America/Los_Angeles, America/Louisville, America/Maceio, America/Managua, America/Manaus, America/Martinique, America/Mazatlan, America/Mendoza, America/Menominee, America/Mexico_City, America/Miquelon, America/Montevideo, America/Montreal, America/Montserrat, America/Nassau, America/New_York, America/Nipigon, America/Nome, America/Noronha, America/Panama, America/Pangnirtung, America/Paramaribo, America/Phoenix, America/Port-au-Prince, America/Port_of_Spain, America/Porto_Acre, America/Puerto_Rico, America/Rainy_River,</p> |

America/Rankin\_Inlet, America/Regina, America/Rosario, America/Santiago, America/Santo\_Domingo, America/Sao\_Paulo, America/Scoresbysund, America/Shiprock, America/St\_Johns, America/St\_Kitts, America/St\_Lucia, America/St\_Thomas, America/St\_Vincent, America/Swift\_Current, America/Tegucigalpa, America/Thule, America/Thunder\_Bay, America/Tijuana, America/Tortola, America/Vancouver, America/Whitehorse, America/Winnipeg, America/Yakutat, America/Yellowknife

Antarctica/Casey, Antarctica/DumontDURville, Antarctica/Mawson, Antarctica/McMurdo, Antarctica/Palmer, Antarctica/South\_Pole

Arctic/Longyearbyen

Asia/Aden, Asia/Alma-Ata, Asia/Amman, Asia/Anadyr, Asia/Aqtau, Asia/Aqtobe, Asia/Ashkhabad, Asia/Baghdad, Asia/Bahrain, Asia/Baku, Asia/Bangkok, Asia/Beirut, Asia/Bishkek, Asia/Brunei, Asia/Calcutta, Asia/Chungking, Asia/Colombo, Asia/Dacca, Asia/Damascus, Asia/Dubai, Asia/Dushanbe, Asia/Gaza, Asia/Harbin, Asia/Hong\_Kong, Asia/Irkutsk, Asia/Ishigaki, Asia/Jakarta, Asia/Jayapura, Asia/Jerusalem, Asia/Kabul, Asia/Kamchatka, Asia/Karachi, Asia/Kashgar, Asia/Katmandu, Asia/Krasnoyarsk, Asia/Kuala\_Lumpur, Asia/Kuching, Asia/Kuwait, Asia/Macao, Asia/Magadan, Asia/Manila, Asia/Muscat, Asia/Nicosia, Asia/Novosibirsk, Asia/Omsk, Asia/Phnom\_Penh, Asia/Pyongyang, Asia/Qatar, Asia/Rangoon, Asia/Riyadh, Asia/Saigon, Asia/Seoul, Asia/Shanghai, Asia/Singapore, Asia/Taipei, Asia/Tashkent, Asia/Tbilisi, Asia/Tehran, Asia/Thimbu, Asia/Tokyo, Asia/Ujung\_Pandang, Asia/Ulan\_Bator, Asia/Urumqi, Asia/Vientiane, Asia/Vladivostok, Asia/Yakutsk, Asia/Yekaterinburg, Asia/Yerevan

Atlantic/Azores, Atlantic/Bermuda, Atlantic/Canary, Atlantic/Cape\_Verde, Atlantic/Faeroe, Atlantic/Jan\_Mayen, Atlantic/Madeira, Atlantic/Reykjavik, Atlantic/South\_Georgia, Atlantic/St\_Helena, Atlantic/Stanley

Australia/Adelaide, Australia/Brisbane, Australia/Broken\_Hill, Australia/Darwin, Australia/Hobart, Australia/Lindeman, Australia/Lord\_Howe, Australia/Melbourne, Australia/Perth, Australia/Sydney

Europe/Amsterdam, Europe/Andorra, Europe/Athens, Europe/Belfast, Europe/Belgrade, Europe/Berlin, Europe/Bratislava, Europe/Brussels, Europe/Bucharest, Europe/Budapest, Europe/Chisinau, Europe/Copenhagen, Europe/Dublin, Europe/Gibraltar, Europe/Helsinki, Europe/Istanbul, Europe/Kaliningrad, Europe/Kiev, Europe/Lisbon, Europe/Ljubljana, Europe/London, Europe/Luxembourg, Europe/Madrid, Europe/Malta, Europe/Minsk, Europe/Monaco, Europe/Moscow, Europe/Oslo, Europe/Paris, Europe/Prague, Europe/Riga, Europe/Rome, Europe/Samara, Europe/San\_Marino, Europe/Sarajevo, Europe/Simferopol, Europe/Skopje, Europe/Sofia, Europe/Stockholm, Europe/Tallinn, Europe/Tirane, Europe/Vaduz, Europe/Vatican, Europe/Vienna, Europe/Vilnius, Europe/Warsaw, Europe/Zagreb, Europe/Zurich

Indian/Antananarivo, Indian/Chagos, Indian/Christmas, Indian/Cocos, Indian/Comoro, Indian/Kerguelen, Indian/Mahe, Indian/Maldives, Indian/Mauritius, Indian/Mayotte, Indian/Reunion

Pacific/Apia, Pacific/Auckland, Pacific/Chatham, Pacific/Easter, Pacific/Efate, Pacific/Enderbury, Pacific/Fakaofu, Pacific/Fiji, Pacific/Funafuti, Pacific/Galapagos, Pacific/Gambier, Pacific/Guadalcanal, Pacific/Guam, Pacific/Honolulu, Pacific/Johnston, Pacific/Kiritimati, Pacific/Kosrae, Pacific/Kwajalein, Pacific/Majuro, Pacific/Marquesas, Pacific/Midway, Pacific/Nauru, Pacific/Niue, Pacific/Norfolk, Pacific/Noumea, Pacific/Pago\_Pago, Pacific/Palau, Pacific/Pitcairn, Pacific/Ponape, Pacific/Port\_Moresby, Pacific/Rarotonga, Pacific/Saipan, Pacific/Tahiti, Pacific/Tarawa, Pacific/Tongatapu, Pacific/Truk, Pacific/Wake, Pacific/Wallis, Pacific/Yap

**Required Privilege Level** system—To view this statement in the configuration.  
system-control—To add this statement to the configuration.

**Related Documentation** • [Modifying the Default Time Zone for a Router or Switch Running Junos OS on page 23](#)

## traceoptions (Layer 2 Learning)

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>              | <pre> traceoptions {     file <i>filename</i> &lt;files <i>number</i>&gt; &lt;size <i>size</i>&gt; &lt;world-readable   no-world-readable&gt;;     flag <i>flag</i> (detail   disable   receive   send);     in-memory-debug;     level;     no-remote-trace; } </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Hierarchy Level</b>     | [edit protocols l2-learning]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Release Information</b> | Statement introduced in Junos OS Release 13.2 for the QFX Series.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Description</b>         | Define tracing operations for Layer 2 learning.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Default</b>             | The <b>traceoptions</b> feature is disabled by default.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Options</b>             | <p><b>file <i>filename</i></b>—Name of the file to receive the output of the tracing operation. Enclose the name within quotation marks. All files are placed in the directory <b>/var/log</b>.</p> <p>You can specify the following options:</p> <ul style="list-style-type: none"> <li>• <b>no-world-readable</b>—(Optional) Restrict file access to the user who created the file.</li> <li>• <b>size <i>size</i></b> —(Optional) Maximum size of each trace file, in kilobytes (KB), megabytes (MB), or gigabytes (GB). When a trace file named <b>trace-file</b> reaches its maximum size, it is renamed <b>trace-file.0</b>, then <b>trace-file.1</b>, and so on, until the maximum number of trace files is reached. Then the oldest trace file is overwritten. If you specify a maximum number of files, you also must specify a maximum file size with the <b>files</b> option. Use <b>xk</b> to specify KB, <b>xm</b> to specify MB, or <b>xg</b> to specify gigabytes.</li> <li>• <b>world-readable</b>—(Optional) Enable unrestricted file access.</li> </ul> <p><b>flag <i>flag</i></b> —Tracing operation to perform. To specify more than one tracing operation, include multiple flag statements. You can include the following flags:</p> <ul style="list-style-type: none"> <li>• <b>all</b>—All tracing operations.</li> <li>• <b>bmac-next-hop</b>—Trace backbone MAC next hop operations.</li> <li>• <b>bridge-bmac-next-hop</b>—Trace backbone MAC next hop bridge operations.</li> <li>• <b>bridging-interface</b>—Trace interface bridge operations.</li> <li>• <b>bridging-domain</b>—Trace bridging domain operations.</li> <li>• <b>configuration</b>—Trace configuration operations.</li> <li>• <b>flood-next-hop</b>—Trace flood next hop operations.</li> <li>• <b>initialization</b>—Trace initialization operations.</li> <li>• <b>interface-device</b>—Trace interface device operations.</li> <li>• <b>interface-family</b>—Trace interface family operations.</li> </ul> |

- **interface-logical**—Trace logical interface operations.
- **ipc**—Trace inter-process communications operations.
- **irb**—Trace integrated routing and bridging operations.
- **isid**—Trace i-tagged service ID operations.
- **kack**—Trace kernel-acknowledgment.
- **learning-domain**—Trace learning domain operations.
- **logical-system**—Trace logical system operations.
- **mac-learning**—Trace MAC address learning.
- **mc-ae**—Trace multichassis aggregated Ethernet interface operations.
- **redundant-trunk-group**—Trace redundant trunk group operations.
- **routing-instance**—Trace routing instance operations.
- **routing-socket**—Trace routing socket operations.
- **storm-control**—Trace storm control operations.
- **unknown-unicast-forwarding**—Trace unknown unicast forwarding events.
- **vpls-ping**—Trace Virtual Private VLAN Service (VPLS) ping operations.

**in-memory-debug**—Enable trace parameters in the memory.

**level**—Specify level of debugging output.

**no-remote-trace**—Disable remote tracing.

|                                 |                                                                                                                                              |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Required Privilege Level</b> | <p><b>routing</b>—To view this statement in the configuration.</p> <p><b>routing-control</b>—To add this statement to the configuration.</p> |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|

## uid

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|                                 |                                                                                                                                                          |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>uid <i>uid-value</i>;</code>                                                                                                                       |
| <b>Hierarchy Level</b>          | [edit system login user]                                                                                                                                 |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.            |
| <b>Description</b>              | Configure a user identifier for a login account.                                                                                                         |
| <b>Options</b>                  | <b><i>uid-value</i></b> —Number associated with the login account. This value must be unique on the router or switch.<br><b>Range:</b> 100 through 64000 |
| <b>Required Privilege Level</b> | admin—To view this statement in the configuration.<br>admin-control—To add this statement to the configuration.                                          |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">Configuring Junos OS User Accounts on page 169</a></li> </ul>                                       |

## use-imported-time-zones

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|                                 |                                                                                                                                               |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>use-imported-time-zones;</code>                                                                                                         |
| <b>Hierarchy Level</b>          | [edit system]                                                                                                                                 |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>              | Configure a custom time zone from a locally generated time zone database.                                                                     |
| <b>Required Privilege Level</b> | admin—To view this statement in the configuration.<br>admin-control—To add this statement to the configuration.                               |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">Updating the IANA Time Zone Database on Junos OS Devices on page 31</a></li> </ul>       |





## CHAPTER 21

# DHCP Configuration Statements

- [client-identifier \(DHCP Client\) on page 345](#)
- [lease-time on page 346](#)
- [retransmission-attempt on page 347](#)
- [retransmission-interval on page 348](#)
- [server-address on page 349](#)
- [update-server on page 350](#)
- [vendor-option on page 351](#)

### client-identifier (DHCP Client)

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|                                 |                                                                                                                                                                                                                                             |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | client-identifier (ascii <i>ascii</i>   hexadecimal <i>hexadecimal</i> );                                                                                                                                                                   |
| <b>Hierarchy Level</b>          | [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family inet dhcp]                                                                                                                                                    |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 9.0 for EX Series switches.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                            |
| <b>Description</b>              | Specify an ASCII or hexadecimal identifier for the Dynamic Host Configuration Protocol (DHCP) client. The DHCP server identifies a client by a client-identifier value, which must be unique for each client.                               |
| <b>Default</b>                  | If you do not include client-identifier in the configuration, the DHCP server uses the client hardware type and MAC address to identify the client.                                                                                         |
| <b>Options</b>                  | <b>ascii <i>ascii</i></b> —Identifier consisting of ASCII characters, such as a fully qualified domain name.<br><br><b>hexadecimal <i>hexadecimal</i></b> —Identifier consisting of hexadecimal numbers (0-9, a-f, A-F). Do not use colons. |
| <b>Required Privilege Level</b> | interface—To view this statement in the configuration.<br>interface-control—To add this statement to the configuration.                                                                                                                     |
| <b>Related Documentation</b>    | • <a href="#">Configuring a DHCP Client (CLI Procedure) on page 75</a>                                                                                                                                                                      |

## lease-time

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|                                 |                                                                                                                                                                                                                                                                                                |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | lease-time ( <i>seconds</i>   infinite);                                                                                                                                                                                                                                                       |
| <b>Hierarchy Level</b>          | [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family inet dhcp]                                                                                                                                                                                                       |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 8.5 for J Series devices.<br>Statement introduced in Junos OS Release 9.0 for EX Series switches.<br>Statement introduced in Junos OS Release 9.2 for SRX Series devices.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>              | Request a specific lease time for the IP address. The lease time is the length of time in seconds that a client holds the lease for an IP address assigned by a DHCP server.                                                                                                                   |
| <b>Default</b>                  | If no lease time is requested by client, then the server sends the lease time. The default lease time on a JUNOS OS DHCP server is one day.                                                                                                                                                    |
| <b>Options</b>                  | <b>seconds</b> —Request a lease time of a specific duration.<br><b>Range:</b> 60 through 2147483647 seconds<br><br><b>infinite</b> —Request that the lease never expire.                                                                                                                       |
| <b>Required Privilege Level</b> | interface—To view this statement in the configuration.<br>interface-control—To add this statement to the configuration.                                                                                                                                                                        |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Configuring a DHCP Client (CLI Procedure) on page 75</a></li><li>• <i>Example: Configuring the Device as a DHCP Client</i></li><li>• <i>interfaces</i></li><li>• <i>unit</i></li><li>• <i>family</i></li></ul>                             |

## retransmission-attempt

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|                                 |                                                                                                                                                                                                                                                                                                |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>retransmission-attempt <i>number</i>;</code>                                                                                                                                                                                                                                             |
| <b>Hierarchy Level</b>          | [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family inet dhcp]                                                                                                                                                                                                       |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 8.5 for J Series devices.<br>Statement introduced in Junos OS Release 9.0 for EX Series switches.<br>Statement introduced in Junos OS Release 9.2 for SRX Series devices.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>              | Specify the number of times the device retransmits a Dynamic Host Control Protocol (DHCP) packet if a DHCP server fails to respond. After the specified number of attempts, no further attempts at reaching a server are made.                                                                 |
| <b>Options</b>                  | <b><i>number</i></b> —Number of retransmit attempts..<br><b>Range:</b> 0 through 6<br><b>Default:</b> 4                                                                                                                                                                                        |
| <b>Required Privilege Level</b> | interface—To view this statement in the configuration.<br>interface-control—To add this statement to the configuration.                                                                                                                                                                        |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">Configuring a DHCP Client (CLI Procedure) on page 75</a></li> <li>• <i>Example: Configuring the Device as a DHCP Client</i></li> <li>• <i>interfaces</i></li> <li>• <i>unit</i></li> <li>• <i>family</i></li> </ul>                       |

## retransmission-interval

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|                                 |                                                                                                                                                  |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | retransmission-interval <i>seconds</i> ;                                                                                                         |
| <b>Hierarchy Level</b>          | [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family inet dhcp]                                                         |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 9.0 for EX Series switches.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>              | Specify the time between successive retransmissions of the client DHCP request if a DHCP server fails to respond.                                |
| <b>Options</b>                  | <b><i>seconds</i></b> —Number of seconds between successive retransmissions.<br><b>Range:</b> 4 through 64 seconds<br><b>Default:</b> 4 seconds  |
| <b>Required Privilege Level</b> | interface—To view this statement in the configuration.<br>interface-control—To add this statement to the configuration.                          |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Configuring a DHCP Client (CLI Procedure) on page 75</a></li></ul>                           |

## server-address

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|                                 |                                                                                                                                                                                                                                                                                                |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>server-address <i>ip-address</i>;</code>                                                                                                                                                                                                                                                 |
| <b>Hierarchy Level</b>          | [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family inet dhcp]                                                                                                                                                                                                       |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 8.5 for J Series devices.<br>Statement introduced in Junos OS Release 9.0 for EX Series switches.<br>Statement introduced in Junos OS Release 9.2 for SRX Series devices.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>              | Specify the address of the DHCP server that the client should accept DHCP offers from. If this option is included in the DHCP configuration, the client accepts offers only from this server and ignores all other offers.                                                                     |
| <b>Default</b>                  | The client accepts the first offer it receives from any DHCP server.                                                                                                                                                                                                                           |
| <b>Options</b>                  | <i>ip-address</i> —DHCP server address.                                                                                                                                                                                                                                                        |
| <b>Required Privilege Level</b> | interface—To view this statement in the configuration.<br>interface-control—To add this statement to the configuration.                                                                                                                                                                        |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">Configuring a DHCP Client (CLI Procedure) on page 75</a></li> <li>• <i>Example: Configuring the Device as a DHCP Client</i></li> <li>• <i>interfaces</i></li> <li>• <i>unit</i></li> <li>• <i>family</i></li> </ul>                       |

## update-server

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|                                 |                                                                                                                                                                                                                                                                                                |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | update-server;                                                                                                                                                                                                                                                                                 |
| <b>Hierarchy Level</b>          | [edit Interfaces <i>interface-name</i> unit <i>logical-unit-number</i> inet dhcp]                                                                                                                                                                                                              |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 8.5 for J Series devices.<br>Statement introduced in Junos OS Release 9.0 for EX Series switches.<br>Statement introduced in Junos OS Release 9.2 for SRX Series devices.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>              | Propagate TCP/IP settings learned from an external DHCP server to the DHCP server running on the switch, router, or device.                                                                                                                                                                    |
| <b>Required Privilege Level</b> | interface—To view this statement in the configuration.<br>interface-control—To add this statement to the configuration.                                                                                                                                                                        |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Configuring a DHCP Client (CLI Procedure) on page 75</a></li><li>• <i>Example: Configuring the Device as a DHCP Client</i></li><li>• <i>interfaces</i></li><li>• <i>unit</i></li><li>• <i>family</i></li></ul>                             |

## vendor-option

|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                                                                                                                                                                                                                                                                                                                                                                               | <pre> vendor-option {     default-local-server-group <i>local-server-group-name</i>       default-relay-server-group <i>server-group-name</i>     drop;     equals     starts-with } </pre>                                                                                                                                                                                                                                    |
| <b>Hierarchy Level</b>                                                                                                                                                                                                                                                                                                                                                                      | [edit forwarding-options dhcp-relay relay-option-60]                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Release Information</b>                                                                                                                                                                                                                                                                                                                                                                  | Statement introduced before Junos OS Release 12.1 for EX Series switches.<br>Statement deprecated in Junos OS Release 12.3 for EX Series switches.                                                                                                                                                                                                                                                                             |
| <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                          | Configure the match criteria when you use the DHCP vendor class identifier option (option 60) in DHCP client packets to forward client traffic to specific DHCP servers. The extended DHCP relay agent compares the option 60 vendor-specific strings received in DHCP client packets against the match criteria that you specify. If there is a match, you can define certain actions for the associated DHCP client packets. |
| <div style="display: flex; align-items: center;">  <div> <p><b>NOTE:</b> The <code>vendor-option</code> statement has been deprecated and might be removed from future product releases. We recommend that you phase out its use. See <i>option-number</i>.</p> </div> </div> |                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Required Privilege Level</b>                                                                                                                                                                                                                                                                                                                                                             | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                                                                                                                                                                                                                                                              |
| <b>Related Documentation</b>                                                                                                                                                                                                                                                                                                                                                                | <ul style="list-style-type: none"> <li>• <i>Configuring an Extended DHCP Relay Server on EX Series Switches (CLI Procedure)</i></li> <li>• <i>Understanding the Extended DHCP Relay Agent for EX Series Switches</i></li> </ul>                                                                                                                                                                                                |





## CHAPTER 22

# ICMP Configuration Statements

- [no-multicast-echo on page 353](#)

### no-multicast-echo

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|                                 |                                                                                                                                                                                                                                                                        |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | no-multicast-echo {                                                                                                                                                                                                                                                    |
| <b>Hierarchy Level</b>          | [edit system]                                                                                                                                                                                                                                                          |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 8.1.<br>Statement introduced in Junos OS Release 9.0 for EX Series switches.<br>Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>              | Disable the Routing Engine from responding to ICMP echo requests sent to multicast group addresses.                                                                                                                                                                    |
| <b>Default</b>                  | The Routing Engine responds to ICMP echo requests sent to multicast group addresses.                                                                                                                                                                                   |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                                                                                                      |
| <b>Related Documentation</b>    | • <a href="#">Configuring Junos OS to Disable the Routing Engine Response to Multicast Ping Packets on page 84</a>                                                                                                                                                     |




## CHAPTER 23

# NSSU Configuration Statements


- [fpcs \(NSSU Upgrade Groups\) on page 356](#)
- [member \(NSSU Upgrade Groups\) on page 357](#)
- [nssu on page 358](#)
- [rcp-count on page 360](#)
- [upgrade-group on page 361](#)

## fpcs (NSSU Upgrade Groups)


|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>fpcs (slot-number   [list-of-slot-numbers]);</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Hierarchy Level</b>          | [edit chassis <code>nssu upgrade-group group-name</code> ],<br>[edit chassis <code>nssu upgrade-group group-name member member-id</code> ]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 10.4 for EX Series switches.<br>Statement introduced in Junos OS Release 13.2X51-D20 for QFX Series switches.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Description</b>              | <p>Configure switch line cards, Virtual Chassis member switches, or Virtual Chassis Fabric (VCF) member switches as part of an NSSU upgrade group.</p> <p>To reduce the time an NSSU takes, you can configure line-card upgrade groups for an EX6200 or EX8200 switch with redundant Routing Engines; an EX8200 Virtual Chassis; QFX3500, QFX3600, and QFX5100 Virtual Chassis; or a Virtual Chassis Fabric (VCF).</p> <p>For switches that have separate line cards, use this statement to assign one or more line cards to an NSSU upgrade group by specifying their slot numbers with this statement.</p> <p>For Virtual Chassis or VCF member switches that do not have separate line cards, use this statement to assign one or more Virtual Chassis or VCF members to an NSSU upgrade group by specifying their member IDs.</p> |
|                                 | <p> <b>NOTE:</b> You do not use this statement with the <code>member</code> keyword in this case. When to use the <code>member</code> statement hierarchy is explained next.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                 | <p>To configure an upgrade group that includes line cards on different switches that support multiple line cards and comprise a Virtual Chassis, use this statement with the <code>member</code> statement hierarchy to specify the Virtual Chassis member ID and the desired line card slot number or numbers on that member switch to include in the upgrade group. Use multiple statements to add line cards from different Virtual Chassis members to the upgrade group.</p>                                                                                                                                                                                                                                                                                                                                                      |
| <b>Options</b>                  | <p><b><i>list-of-slot-numbers</i></b>—A list of slot numbers of multiple line cards or member IDs of Virtual Chassis or VCF members to be included in the upgrade group. Separate multiple slot numbers or member IDs with spaces and enclose the list in square brackets—for example: [3 4 7].</p> <p><b><i>slot-number</i></b>—The slot number of a single line card or member ID of a Virtual Chassis or VCF member to be included in the upgrade group.</p>                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Required Privilege Level</b> | <p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <i>Example: Configuring Line-Card Upgrade Groups for Nonstop Software Upgrade on EX Series Switches</i></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

- [Configuring Line-Card Upgrade Groups for Nonstop Software Upgrade \(CLI Procedure\) on page 136](#)

## member (NSSU Upgrade Groups)


|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <code>member member-id {<br/>    <b>fpcs</b> (slot-number   [list-of-slot-numbers]);<br/>}</code>                                                                                                                                                                                             |
| <b>Hierarchy Level</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | [edit chassis <b>nssu upgrade-group</b> group-name]                                                                                                                                                                                                                                           |
| <b>Release Information</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Statement introduced in Junos OS Release 11.1 for EX Series switches.<br>Statement introduced in Junos OS Release 13.2X51-D20 for QFX Series switches.                                                                                                                                        |
| <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Specify the Virtual Chassis member whose line-card slot numbers you are assigning to an NSSU upgrade group.                                                                                                                                                                                   |
| <div style="display: flex; align-items: flex-start;"> <div style="flex: 1; text-align: center; margin-right: 10px;">  </div> <div> <p><b>NOTE:</b> This statement is not applicable to Virtual Chassis or VCF member switches that do not support separate line cards. To configure Virtual Chassis or VCF member switches that do not have separate line cards into an NSSU upgrade group, use the <b>fpcs</b> statement alone, and specify the Virtual Chassis or VCF member IDs to include in the upgrade group in place of line card slot numbers.</p> </div> </div>                                                                                    |                                                                                                                                                                                                                                                                                               |
| <p>To reduce the time an NSSU takes, you can configure NSSU line-card upgrade groups on an EX6200 or EX8200 switch with redundant Routing Engines; EX8200 Virtual Chassis; QFX3500, QFX3600, and QFX5100 Virtual Chassis; and Virtual Chassis Fabric (VCF).</p> <p>To configure an upgrade group that includes line cards on different switches that support multiple line cards and comprise a Virtual Chassis, use this statement hierarchy with the <b>fpcs</b> option to first specify the Virtual Chassis member ID and then desired line card slot number or numbers on that member switch to include in the upgrade group. Use multiple statements to add line cards from different Virtual Chassis members to the upgrade group.</p> |                                                                                                                                                                                                                                                                                               |
| <b>Options</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <p><b>member-id</b>—The ID of the Virtual Chassis or VCF member switch containing one or more line cards to include in an NSSU upgrade group.</p> <p>The remaining statement is explained separately.</p>                                                                                     |
| <b>Required Privilege Level</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>                                                                                                                                                            |
| <b>Related Documentation</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <ul style="list-style-type: none"> <li>• <a href="#">Example: Configuring Line-Card Upgrade Groups for Nonstop Software Upgrade on EX Series Switches</a></li> <li>• <a href="#">Configuring Line-Card Upgrade Groups for Nonstop Software Upgrade (CLI Procedure) on page 136</a></li> </ul> |

## nssu

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <pre> nssu {   rcp-count number;   upgrade-group group-name {     fpcs (slot-number   [list-of-slot-numbers]);     member member-id {       fpcs (slot-number   [list-of-slot-numbers]);     }   } } </pre>                                                                                                                                                                             |
| <b>Hierarchy Level</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | [edit chassis]                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Release Information</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <p>Statement introduced in Junos OS Release 10.4 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 13.2X51-D20 for QFX Series switches.</p> <p><b>rcp-count</b> statement introduced in Junos OS Release 14.1X53-D40 for QFX5100 switches.</p>                                                                                                                    |
| <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Configure optional parameters used in the nonstop software upgrade (NSSU) process.                                                                                                                                                                                                                                                                                                      |
| <p> <b>NOTE:</b> The <b>request system software nonstop-upgrade</b> command is used to initiate NSSU.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                         |
| <p>For the <b>rcp-count</b> statement: (QFX5100 Virtual Chassis and Virtual Chassis Fabric (VCF) only) Configure the number of parallel <b>rcp</b> sessions NSSU uses to copy the new software to multiple Virtual Chassis or VCF member switches at a time. See <b>rcp-count</b> for details.</p> <p>For <b>upgrade-group</b> statements: Define a line-card upgrade group for NSSU, for switch configurations that support upgrade groups. All line cards or Virtual Chassis or VCF members in an upgrade group are upgraded to the new software version at the same time when an NSSU is initiated and at least one upgrade group is configured. Line-card upgrade groups are not required to initiate an NSSU, and are not supported on some EX Series switches or EX Virtual Chassis that support NSSU. See <b>upgrade-group</b> for details.</p> <p>The remaining statements are explained separately.</p> |                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Default</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <p>If <b>rcp-count</b> is not configured, NSSU uses a default algorithm to determine the number of parallel <b>rcp</b> sessions to use based on the number of members in the Virtual Chassis or VCF.</p> <p>If no line-card upgrade groups are defined, NSSU upgrades line cards and members of a Virtual Chassis or VCF one at a time in ascending order by slot or member number.</p> |
| <b>Required Privilege Level</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>                                                                                                                                                                                                                                                      |
| <b>Related Documentation</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <ul style="list-style-type: none"> <li><i>Example: Configuring Line-Card Upgrade Groups for Nonstop Software Upgrade on EX Series Switches</i></li> </ul>                                                                                                                                                                                                                               |

- [Configuring Line-Card Upgrade Groups for Nonstop Software Upgrade \(CLI Procedure\)](#) on page 136

## rcp-count

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>              | <code>rcp-count <i>number</i>;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Hierarchy Level</b>     | <code>[edit chassis <i>nssu</i>]</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Release Information</b> | Statement introduced in Junos OS Release 14.1X53-D40 for QFX5100 switches.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Description</b>         | <p>(QFX5100 Virtual Chassis or Virtual Chassis Fabric [VCF] only) Optionally override the default algorithm that defines the number of parallel <b>rcp</b> sessions used for copying the new software image to member switches in a Virtual Chassis or VCF for nonstop software upgrade (NSSU).</p> <p>You can upgrade the software running on all members of a Virtual Chassis or VCF using NSSU. At the beginning of the upgrade process, NSSU uses <b>rcp</b> to copy the new software from the master switch to each of the member switches. Starting in Junos OS Release 14.1X53-D40, to minimize the time to copy the files to all members, NSSU uses parallel <b>rcp</b> sessions to copy the software to multiple members at the same time, rather than copying sequentially to each member in turn.</p> <p>By default, the number of parallel <b>rcp</b> sessions that NSSU launches at a time follows an algorithm that optimizes the transfer time based on the total number of members in the Virtual Chassis or VCF, so that the new software is transferred to about half the members in parallel up to a maximum of 8 members at one time. After the first set of parallel copy operations are complete, NSSU launches the next set of parallel copy operations, and so on as needed until all members are updated.</p> <p>Although the default value is usually optimal, you can configure the <b>rcp-count</b> statement to set a specific value for the number of parallel copy sessions instead. For example, you might want to use a lower number of parallel sessions to avoid potential impact on Virtual Chassis or VCF forwarding activity during NSSU.</p> <p>After copying the new software to all members using as many parallel <b>rcp</b> sessions as needed, the NSSU process continues by rebooting each member with the new software in sequence, starting with the member in the backup Routing Engine role.</p> |
|                            | <p> <b>NOTE:</b> If copying the new software to any member fails, NSSU aborts the upgrade process for the entire Virtual Chassis or VCF, logs the error condition, and initiates an error recovery measure to remove the new software from the members to which it was already transferred.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Options</b>             | <p><b><i>number</i></b>—Number of parallel <b>rcp</b> sessions for NSSU to launch at a time, which overrides the default algorithm.</p> <p>Allowable values are 0 through 8. Specifying a value of 0 suppresses parallel copy sessions; the new software is copied to each member sequentially.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |



|                                 |                                                                                                                                                                                                                                                                                 |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Required Privilege Level</b> | interface—To view this statement in the configuration.<br>interface-control—To add this statement to the configuration.                                                                                                                                                         |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">Understanding Nonstop Software Upgrade on a Virtual Chassis and Mixed Virtual Chassis on page 127</a></li> <li>• <a href="#">Understanding Nonstop Software Upgrade on a Virtual Chassis Fabric on page 131</a></li> </ul> |

## upgrade-group

|                                 |                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <pre> upgrade-group <i>group-name</i> {     <b>fpcs</b> (<i>slot-number</i>   [<i>list-of-slot-numbers</i>]);     <b>member</b> <i>member-id</i> {         <b>fpcs</b> (<i>slot-number</i>   [<i>list-of-slot-numbers</i>]);     } } </pre>                                                                                                                     |
| <b>Hierarchy Level</b>          | [edit chassis <b>nssu</b> ]                                                                                                                                                                                                                                                                                                                                     |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 10.4 for EX Series switches.<br>Statement introduced in Junos OS Release 13.2X51-D20 for QFX Series switches.                                                                                                                                                                                                          |
| <b>Description</b>              | <p>Assign a name to a line-card upgrade group being created for nonstop software upgrade (NSSU).</p> <p>To reduce the time an NSSU takes, you can configure line-card upgrade groups on an EX6200 or EX8200 switch with redundant Routing Engines; EX8200 Virtual Chassis; QFX3500, QFX3600, and QFX5100 Virtual Chassis; and Virtual Chassis Fabric (VCF).</p> |
| <b>Options</b>                  | <p><b>group-name</b>—Name of the upgrade group.</p> <p>The remaining statements are explained separately.</p>                                                                                                                                                                                                                                                   |
| <b>Required Privilege Level</b> | interface—To view this statement in the configuration.<br>interface-control—To add this statement to the configuration.                                                                                                                                                                                                                                         |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">Example: Configuring Line-Card Upgrade Groups for Nonstop Software Upgrade on EX Series Switches</a></li> <li>• <a href="#">Configuring Line-Card Upgrade Groups for Nonstop Software Upgrade (CLI Procedure) on page 136</a></li> </ul>                                                                   |



## CHAPTER 24

# Login Classes Configuration Statements

- [access-end on page 364](#)
- [access-start on page 364](#)
- [allow-commands on page 365](#)
- [allow-configuration on page 366](#)
- [allowed-days on page 366](#)
- [announcement on page 367](#)
- [authentication \(Login\) on page 368](#)
- [class \(Defining Login Classes\) on page 369](#)
- [class \(Assigning a Class to an Individual User\) on page 370](#)
- [deny-commands on page 370](#)
- [deny-configuration on page 371](#)
- [idle-timeout on page 372](#)
- [load-key-file on page 373](#)
- [login on page 374](#)
- [login-tip on page 375](#)
- [message on page 375](#)
- [user \(Access\) on page 376](#)

## access-end

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|                                 |                                                                                                                                               |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | access-end <i>HH:MM</i> ;                                                                                                                     |
| <b>Hierarchy Level</b>          | [edit system <a href="#">login</a> class]                                                                                                     |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>              | Configure the end time for login access.                                                                                                      |
| <b>Required Privilege Level</b> | admin—To view this statement in the configuration.<br>admin-control—To add this statement to the configuration.                               |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Configuring Time-Based User Access on page 20</a></li></ul>                               |

## access-start

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|                                 |                                                                                                                                               |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | access-start <i>HH:MM</i> ;                                                                                                                   |
| <b>Hierarchy Level</b>          | [edit system <a href="#">login</a> class]                                                                                                     |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>              | Configure the start time for login access.                                                                                                    |
| <b>Required Privilege Level</b> | admin—To view this statement in the configuration.<br>admin-control—To add this statement to the configuration.                               |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Configuring Time-Based User Access on page 20</a></li></ul>                               |

## allow-commands

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|                                 |                                                                                                                                                                                                                                                     |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>allow-commands "regular-expression";</code>                                                                                                                                                                                                   |
| <b>Hierarchy Level</b>          | [edit system login class <i>class-name</i> ]                                                                                                                                                                                                        |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                       |
| <b>Description</b>              | Specify the operational mode commands that members of a login class can use.                                                                                                                                                                        |
| <b>Default</b>                  | If you omit this statement and the <b>deny-commands</b> statement, users can issue only those commands for which they have access privileges through the <b>permissions</b> statement.                                                              |
| <b>Options</b>                  | <b>regular-expression</b> —Extended (modern) regular expression as defined in POSIX 1003.2.<br>If the regular expression contains any spaces, operators, or wildcard characters, enclose it in quotation marks.                                     |
| <b>Required Privilege Level</b> | admin—To view this statement in the configuration.<br>admin-control—To add this statement to the configuration.                                                                                                                                     |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">Specifying Access Privileges for Junos OS Operational Mode Commands on page 29</a></li> <li>• <a href="#">deny-commands on page 370</a></li> <li>• <a href="#">user on page 376</a></li> </ul> |

## allow-configuration

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|                                 |                                                                                                                                                                                                                                                                                                                                             |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>allow-configuration "regular-expression";</code>                                                                                                                                                                                                                                                                                      |
| <b>Hierarchy Level</b>          | [edit system login class <i>class-name</i> ]                                                                                                                                                                                                                                                                                                |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                               |
| <b>Description</b>              | Explicitly allow configuration access to the specified levels in the hierarchy even if the permissions set with the <b>permissions</b> statement do not grant such access by default.                                                                                                                                                       |
| <b>Default</b>                  | If you omit this statement and the <b>deny-configuration</b> statement, users can edit only those commands for which they have access privileges through the <b>permissions</b> statement.                                                                                                                                                  |
| <b>Options</b>                  | <b>regular-expression</b> —Extended (modern) regular expression as defined in POSIX 1003.2.<br>If the regular expression contains any spaces, operators, or wildcard characters, enclose it in quotation marks.                                                                                                                             |
| <b>Required Privilege Level</b> | admin—To view this statement in the configuration.<br>admin-control—To add this statement to the configuration.                                                                                                                                                                                                                             |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <i>Specifying Access Privileges for Junos OS Configuration Mode Hierarchies</i></li><li>• <i>Regular Expressions for Allowing and Denying Junos OS Configuration Mode Hierarchies</i></li><li>• <a href="#">deny-configuration on page 371</a></li><li>• <a href="#">user on page 376</a></li></ul> |

## allowed-days

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|                                 |                                                                                                                                               |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>allowed-days [ <i>days-of-the-week</i> ];</code>                                                                                        |
| <b>Hierarchy Level</b>          | [edit system <a href="#">login</a> class <i>class-name</i> ]                                                                                  |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>              | Specify the days of the week when users can log in.                                                                                           |
| <b>Required Privilege Level</b> | admin—To view this statement in the configuration.<br>admin-control—To add this statement to the configuration.                               |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Configuring Time-Based User Access on page 20</a></li></ul>                               |

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## announcement

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|                                 |                                                                                                                                                                                                                                                                     |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | announcement <i>text</i> ;                                                                                                                                                                                                                                          |
| <b>Hierarchy Level</b>          | [edit system login]                                                                                                                                                                                                                                                 |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                       |
| <b>Description</b>              | Configure a system login announcement. This announcement appears after a user logs in.                                                                                                                                                                              |
| <b>Options</b>                  | <i>text</i> —Text of the announcement. If the text contains any spaces, enclose it in quotation marks.                                                                                                                                                              |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration                                                                                                                                                    |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <i>Configuring the Junos OS to Display a System Login Announcement</i></li><li>• <a href="#">Configuring Junos OS to Display a System Login Message on page 170</a></li><li>• <a href="#">message on page 375</a></li></ul> |

## authentication (Login)

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|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <pre>authentication {<br/>  encrypted-password <i>password</i>;<br/>  load-key-file <i>URL</i>;<br/>  plain-text-password <i>password</i>;<br/>  remote-debug-permission (qfabric-admin   qfabric-operator   qfabric-user);<br/>  ssh-dsa "<i>public-key</i>";<br/>  ssh-rsa "<i>public-key</i>";<br/>}</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Hierarchy Level</b>          | [edit system login user <i>username</i> ]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Description</b>              | Authentication methods that a user can use to log in to the switch. You can assign multiple authentication methods to a single user.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Options</b>                  | <p><b>encrypted-password "<i>password</i>"</b>—Message Digest 5 (MD5) or other encrypted authentication. Specify the MD5 or other password. You can specify only one encrypted password for each user.</p> <p>You cannot configure a blank password for <b>encrypted-password</b> using blank quotation marks (" "). You must configure a password of 1 through 128 characters and enclose the password in quotation marks.</p> <p><b>load-key-file</b>—Load RSA (SSH version 1 and SSH version 2) and DSA (SSH version 2) public keys from a file. The file is a URL containing one or more SSH keys.</p> <p><b>plain-text-password</b>—Plain-text password. The command-line interface (CLI) prompts you for the password and then encrypts it.</p> <p><b>remote-debug-permission</b> (QFabric systems only)—QFabric component authentication. Specifies permission levels for users to access individual components in a QFabric system.</p> <p><b>ssh-dsa "<i>public-key</i>"</b>—SSH version 2 authentication. Specify the SSH public key. You can specify one or more public keys for each user.</p> <p><b>ssh-rsa "<i>public-key</i>"</b>—SSH version 1 and SSH version 2 authentication. Specify the SSH public key. You can specify one or more public keys for each user.</p> |
| <b>Required Privilege Level</b> | admin—To view this statement in the configuration.<br>admin-control—To add this statement to the configuration.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Configuring Junos OS User Accounts on page 169</a></li><li>• <a href="#">root-authentication on page 401</a></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |



## class (Defining Login Classes)

|                                 |                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <pre> class <i>class-name</i> {     access-end;     access-start;     allow-commands "<i>regular-expression</i>";     allow-configuration "<i>regular-expression</i>";     deny-commands "<i>regular-expression</i>";     deny-configuration "<i>regular-expression</i>";     idle-timeout <i>minutes</i>;     login-tip;     permissions [ <i>permissions</i> ]; } </pre> |
| <b>Hierarchy Level</b>          | [edit system login]                                                                                                                                                                                                                                                                                                                                                        |
| <b>Release Information</b>      | <p>Statement introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>                                                                                                                                                                                                                   |
| <b>Description</b>              | Define a login class.                                                                                                                                                                                                                                                                                                                                                      |
| <b>Options</b>                  | <p><b><i>class-name</i></b>—A name you choose for the login class.</p> <p>The remaining statements are explained separately.</p>                                                                                                                                                                                                                                           |
| <b>Required Privilege Level</b> | <p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>                                                                                                                                                                                                                                                 |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>Defining Junos OS Login Classes</li> <li><a href="#">user on page 376</a></li> </ul>                                                                                                                                                                                                                                                |

## class (Assigning a Class to an Individual User)

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|                                 |                                                                                                                                               |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <pre>class <i>class-name</i> {<br/>    operator;<br/>    read-only;<br/>    super-user;<br/>    unauthorized;<br/>}</pre>                     |
| <b>Hierarchy Level</b>          | [edit system login user <i>username</i> ]                                                                                                     |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>              | Configure a user's login class. You must configure one class for each user.                                                                   |
| <b>Options</b>                  | <i>class-name</i> —One of the classes defined at the [edit system login class] hierarchy level.                                               |
| <b>Required Privilege Level</b> | admin—To view this statement in the configuration.<br>admin-control—To add this statement to the configuration.                               |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Configuring Junos OS User Accounts on page 169</a></li></ul>                              |

## deny-commands

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|                                 |                                                                                                                                                                                                                                                  |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | deny-commands " <i>regular-expression</i> ";                                                                                                                                                                                                     |
| <b>Hierarchy Level</b>          | [edit system login class]                                                                                                                                                                                                                        |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                    |
| <b>Description</b>              | Specify the operational mode commands that the user is denied permission to issue even though the permissions set with the <b>permissions</b> statement would allow their use.                                                                   |
| <b>Default</b>                  | If you omit this statement and the <b>allow-commands</b> statement, users can issue only those commands for which they have access privileges through the <b>permissions</b> statement.                                                          |
| <b>Options</b>                  | <i>regular-expression</i> —Extended (modern) regular expression as defined in POSIX 1003.2.<br>If the regular expression contains any spaces, operators, or wildcard characters, enclose it in quotation marks.                                  |
| <b>Required Privilege Level</b> | admin—To view this statement in the configuration.<br>admin-control—To add this statement to the configuration.                                                                                                                                  |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Specifying Access Privileges for Junos OS Operational Mode Commands on page 29</a></li><li>• <a href="#">allow-commands on page 365</a></li><li>• <a href="#">user on page 376</a></li></ul> |

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## deny-configuration

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|                                 |                                                                                                                                                                                                                                      |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>deny-configuration "regular-expression";</code>                                                                                                                                                                                |
| <b>Hierarchy Level</b>          | [edit system login class]                                                                                                                                                                                                            |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                        |
| <b>Description</b>              | Explicitly deny configuration access to the specified levels in the hierarchy even if the permissions set with the <b>permissions</b> statement grant such access by default.                                                        |
| <b>Default</b>                  | If you omit this statement and the <b>allow-configuration</b> statement, users can edit those levels in the configuration hierarchy for which they have access privileges through the <b>permissions</b> statement.                  |
| <b>Options</b>                  | <b>regular-expression</b> —Extended (modern) regular expression as defined in POSIX 1003.2.<br>If the regular expression contains any spaces, operators, or wildcard characters, enclose it in quotation marks.                      |
| <b>Required Privilege Level</b> | admin—To view this statement in the configuration.<br>admin-control—To add this statement to the configuration.                                                                                                                      |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <i>Specifying Access Privileges Using allow/deny-configuration Statements</i></li><li>• <a href="#">allow-configuration on page 366</a></li><li>• <a href="#">user on page 376</a></li></ul> |

## idle-timeout

---

|                                 |                                                                                                                                                                                                                     |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>idle-timeout <i>minutes</i>;</code>                                                                                                                                                                           |
| <b>Hierarchy Level</b>          | <code>[edit system login class <i>class-name</i>]</code>                                                                                                                                                            |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                       |
| <b>Description</b>              | For a login class, configure the maximum time that a session can be idle before the user is logged off the switch. The session times out after remaining at the CLI operational mode prompt for the specified time. |
| <b>Default</b>                  | If you omit this statement, a user is never forced off the system after extended idle times.                                                                                                                        |
| <b>Options</b>                  | <b><i>minutes</i></b> —Maximum idle time.<br><b>Range:</b> 0 through 4294967295 minutes                                                                                                                             |
| <b>Required Privilege Level</b> | <b>admin</b> —To view this statement in the configuration.<br><b>admin-control</b> —To add this statement to the configuration.                                                                                     |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Configuring the Timeout Value for Idle Login Sessions on page 21</a></li></ul>                                                                                  |

## load-key-file

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>load-key-file URL filename;</code>                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Hierarchy Level</b>          | [edit system root-authentication],<br>[edit system login user <i>username</i> authentication]                                                                                                                                                                                                                                                                                                                                                        |
| <b>Release Information</b>      | Statement introduced before Junos OS Release 7.4.<br>Statement introduced in Junos OS Release 9.0 for EX Series switches.<br>Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                           |
| <b>Description</b>              | <div>  <b>NOTE:</b> ECDSA is not supported on the QFabric system. </div> <p>Load RSA (SSH version 1 and SSH version 2) and DSA or ECDSA (SSH version 2) public keys from a previously-generated named file at a specified URL location or local path. The file contains one or more SSH keys that are copied into the configuration when the command is issued.</p> |
| <b>Required Privilege Level</b> | admin—To view this statement in the configuration.<br>admin-control—To add this statement to the configuration.                                                                                                                                                                                                                                                                                                                                      |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">Configuring the Root Password on page 229</a></li> <li>• <a href="#">Configuring the Root Password</a></li> <li>• <a href="#">Configuring Junos OS User Accounts</a></li> <li>• <a href="#">Configuring Junos OS User Accounts on page 169</a></li> </ul>                                                                                                                                       |

## login

```
Syntax login {
 announcement text;
 class class-name {
 access-end "regular-expression";
 access-start "regular-expression";
 allow-commands "regular-expression";
 allow-configuration "regular-expression";
 deny-commands "regular-expression";
 deny-configuration "regular-expression";
 idle-timeout minutes;
 login-tip;
 permissions [permissions];
 }
 message text;
 password {
 change-type (set-transitions | character-set);
 format (md5 | sha1 | des);
 maximum-length length;
 minimum-changes number;
 minimum-length length;
 }
 retry-options {
 backoff-factor seconds;
 backoff-threshold number;
 minimum-time seconds;
 tries-before-disconnect number;
 }
 user username {
 authentication authentication;
 (encrypted-password "password" | plain-text-password);
 load-key-file URL;
 remote-debug-permission (qfabric-admin | qfabric-operator | qfabric-user);
 ssh-dsa "public-key";
 ssh-rsa "public-key";
 }
 class class-name;
 full-name complete-name;
 uid uid-value;
}
}
```

**Hierarchy Level** [edit system]

**Release Information** Statement introduced in Junos OS Release 11.1 for the QFX Series.  
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

**Description** Configure user access to the switch.

**Options** The remaining statements are explained separately.

**Required Privilege Level** admin—To view this statement in the configuration.  
admin-control—To add this statement to the configuration.

**Related Documentation**

- [Defining Junos OS Login Classes](#)

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## login-tip

**Syntax** login-tip;

**Hierarchy Level** [edit system login class *class-name*]

**Release Information** Statement introduced in Junos OS Release 11.1 for the QFX Series.  
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

**Description** Enable CLI tips at login.

**Default** Disabled.

**Required Privilege Level** system—To view this statement in the configuration.  
system-control—To add this statement to the configuration.

**Related Documentation**

- [Configuring Login Tips on page 40](#)

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## message

**Syntax** message *text*;

**Hierarchy Level** [edit system login]

**Release Information** Statement introduced in Junos OS Release 11.1 for the QFX Series.  
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

**Description** Configure a system login message. This message appears before a user logs in.

**Options** *text*—Text of the message.

**Required Privilege Level** system—To view this statement in the configuration.  
system-control—To add this statement to the configuration

**Related Documentation**

- [Configuring Junos OS to Display a System Login Message on page 170](#)
- [announcement on page 367](#)

## user (Access)

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|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <pre>user username {<br/>  authentication {<br/>    (encrypted-password "password"   plain-text-password);<br/>    load-key-file URL;<br/>    remote-debug-permission (qfabric-admin   qfabric-operator   qfabric-user);<br/>    ssh-dsa "public-key" &lt;from hostname&gt;;<br/>    ssh-rsa "public-key" &lt;from hostname&gt;;<br/>  }<br/>  class class-name;<br/>  full-name "complete-name";<br/>  uid uid-value;<br/>}</pre> |
| <b>Hierarchy Level</b>          | [edit system login]                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                                      |
| <b>Description</b>              | Configure access permission for individual users.                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Options</b>                  | The remaining statements are explained separately.                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Required Privilege Level</b> | admin—To view this statement in the configuration.<br>admin-control—To add this statement to the configuration.                                                                                                                                                                                                                                                                                                                    |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Configuring Junos OS User Accounts on page 169</a></li><li>• <a href="#">class on page 369</a></li></ul>                                                                                                                                                                                                                                                                       |



## CHAPTER 25

# NTP Configuration Statements

- [authentication-key on page 378](#)
- [boot-server \(NTP\) on page 379](#)
- [broadcast on page 380](#)
- [broadcast-client on page 381](#)
- [multicast-client on page 381](#)
- [ntp on page 382](#)
- [peer on page 383](#)
- [server \(NTP\) on page 384](#)
- [source-address \(NTP, RADIUS, System Logging, or TACACS+\) on page 385](#)
- [trusted-key on page 386](#)

## authentication-key

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|                                 |                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>authentication-key <i>key-number</i> type <i>type</i> value <i>password</i>;</code>                                                                                                                                                                                                                                                                      |
| <b>Hierarchy Level</b>          | [edit system ntp]                                                                                                                                                                                                                                                                                                                                              |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                  |
| <b>Description</b>              | <p>Configure Network Time Protocol (NTP) authentication keys so that the router or switch can send authenticated packets. If you configure the router or switch to operate in authenticated mode, you must configure a key.</p> <p>Both the keys and the authentication scheme (MD5) must be identical between a set of peers sharing the same key number.</p> |
| <b>Options</b>                  | <p><b><i>key-number</i></b>—An integer in the range of 1 to 65533.</p> <p><b><i>type type</i></b>—Authentication type. It can only be <b>md5</b>.</p> <p><b><i>value password</i></b>—Key itself, consisting of 1 through 8 ASCII characters. If the key contains spaces, enclose it in quotation marks.</p>                                                   |
| <b>Required Privilege Level</b> | <p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>                                                                                                                                                                                                                                   |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <i>Configuring NTP Authentication Keys (QFabric System)</i></li><li>• <a href="#">Understanding NTP Time Servers on page 175</a></li><li>• <a href="#">Configuring NTP Authentication Keys on page 176</a></li><li>• <i>NTP Time Server and Time Services Overview (QFabric System)</i></li></ul>                      |

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## boot-server (NTP)

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|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>boot-server (address   hostname);</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Hierarchy Level</b>          | [edit system <a href="#">ntp</a> ]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Description</b>              | <p>Configure the server that NTP queries when the router or switch boots to determine the local date and time.</p> <p>When you boot the router or switch, it issues an <b>ntpdate</b> request, which polls a network server to determine the local date and time. You need to configure a server that the router or switch uses to determine the time when the router or switch boots. Otherwise, NTP cannot synchronize to a time server if the server time significantly differs from the local router's or switch's time. You can configure either an IP address or a hostname for the boot server. If you configure a hostname instead of an IP address, the <b>ntpdate</b> request resolves the hostname to an IP address when the router or switch boots up.</p> |
| <b>Options</b>                  | <ul style="list-style-type: none"><li>• <b>address</b>—IP address of an NTP boot server.</li><li>• <b>hostname</b>—Hostname of an NTP boot server.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Understanding NTP Time Servers on page 175</a></li><li>• <a href="#">Configuring NTP Authentication Keys on page 176</a></li><li>• <a href="#">Synchronizing and Coordinating Time Distribution Using NTP on page 181</a></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

## broadcast

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|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>broadcast address &lt;key key-number&gt; &lt;version value&gt; &lt;tll value&gt;;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Hierarchy Level</b>          | [edit system <a href="#">ntp</a> ]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Description</b>              | Configure the local router or switch to operate in broadcast mode with the remote system at the specified address to send periodic broadcast messages to a client population. Normally, you include this statement only when the local router or switch is operating as a transmitter.                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Options</b>                  | <p><b>address</b>—Broadcast address on one of the local networks or a multicast address assigned to NTP. You must specify an address, not a hostname. If the multicast address is used, it must be <b>224.0.1.1</b>.</p> <p><b>key key-number</b>—(Optional) All packets sent to the address include authentication fields that are encrypted using the specified key number (any unsigned 32-bit integer).</p> <p><b>tll value</b>—(Optional) Time-to-live (TTL) value to use.<br/><b>Range:</b> 1 through 255<br/><b>Default:</b> 1</p> <p><b>version value</b>—(Optional) Specify the version number to be used in outgoing NTP packets.<br/><b>Range:</b> 1 through 4<br/><b>Default:</b> 4</p> |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Understanding NTP Time Servers on page 175</a></li><li>• <a href="#">Configuring NTP Authentication Keys on page 176</a></li><li>• <a href="#">Configuring the NTP Time Server and Time Services on page 177</a></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                      |

## broadcast-client

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|                                 |                                                                                                                                                                                                                                                                                                    |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>broadcast-client;</code>                                                                                                                                                                                                                                                                     |
| <b>Hierarchy Level</b>          | [edit system <a href="#">ntp</a> ]                                                                                                                                                                                                                                                                 |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                      |
| <b>Description</b>              | Configure the local switch to listen for broadcast messages on the local network to discover other servers on the same subnet.                                                                                                                                                                     |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                                                                                                                                  |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">Understanding NTP Time Servers on page 175</a></li> <li>• <a href="#">Configuring NTP Authentication Keys on page 176</a></li> <li>• <a href="#">Configuring the Switch to Listen for Broadcast Messages Using NTP on page 179</a></li> </ul> |

## multicast-client

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|                                 |                                                                                                                                                                                                                                                                                                    |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>multicast-client &lt;address&gt;;</code>                                                                                                                                                                                                                                                     |
| <b>Hierarchy Level</b>          | [edit system <a href="#">ntp</a> ]                                                                                                                                                                                                                                                                 |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                      |
| <b>Description</b>              | For Network Time Protocol (NTP), configure the local router or switch to listen for multicast messages on the local network to discover other servers on the same subnet.                                                                                                                          |
| <b>Options</b>                  | <b>address</b> —(Optional) One or more IP addresses. If you specify addresses, the router or switch joins those multicast groups.<br><b>Default:</b> 224.0.1.1.                                                                                                                                    |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                                                                                                                                  |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">Understanding NTP Time Servers on page 175</a></li> <li>• <a href="#">Configuring NTP Authentication Keys on page 176</a></li> <li>• <a href="#">Configuring the Switch to Listen for Multicast Messages Using NTP on page 180</a></li> </ul> |

## ntp

---

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <pre>ntp {<br/>  authentication-key <i>number</i> type <i>type</i> value <i>password</i>;<br/>  boot-server <i>address</i>;<br/>  broadcast &lt;<i>address</i>&gt; &lt;<i>key key-number</i>&gt; &lt;<i>version value</i>&gt; &lt;<i>ttl value</i>&gt;;<br/>  broadcast-client;<br/>  multicast-client &lt;<i>address</i>&gt;;<br/>  peer <i>address</i> &lt;<i>key key-number</i>&gt; &lt;<i>version value</i>&gt; &lt;<i>prefer</i>&gt;;<br/>  server <i>address</i> &lt;<i>key key-number</i>&gt; &lt;<i>version value</i>&gt; &lt;<i>prefer</i>&gt;;<br/>  source-address <i>source-address</i>;<br/>  trusted-key [ <i>key-numbers</i> ];<br/>}</pre> |
| <b>Hierarchy Level</b>          | [edit system]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Description</b>              | Configure Network Time Protocol (NTP) on the switch.<br><br>The remaining statements are explained separately.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Understanding NTP Time Servers on page 175</a></li><li>• <a href="#">Configuring NTP Authentication Keys on page 176</a></li><li>• <a href="#">Synchronizing and Coordinating Time Distribution Using NTP on page 181</a></li></ul>                                                                                                                                                                                                                                                                                                                                                                    |

## peer

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>peer address &lt;key key-number&gt; &lt;version value&gt; &lt;prefer&gt;;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Hierarchy Level</b>          | [edit system <a href="#">ntp</a> ]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Description</b>              | For NTP, configure the local router or switch to operate in symmetric active mode with the remote system at the specified address. In this mode, the local router or switch and the remote system can synchronize with each other. This configuration is useful in a network in which either the local router or switch or the remote system might be a better source of time.                                                                                                                                                                                                                                                                                                                             |
| <b>Options</b>                  | <p><b>address</b>—Address of the remote system. You must specify an address, not a hostname.</p> <p><b>key key-number</b>—(Optional) All packets sent to the address include authentication fields that are encrypted using the specified key number.</p> <p><b>Range:</b> Any unsigned 32-bit integer</p> <p><b>prefer</b>—(Optional) Mark the remote system as the preferred host, which means that if all other factors are equal, this remote system is chosen for synchronization among a set of correctly operating systems.</p> <p><b>version value</b>—(Optional) Specify the NTP version number to be used in outgoing NTP packets.</p> <p><b>Range:</b> 1 through 4</p> <p><b>Default:</b> 4</p> |
| <b>Required Privilege Level</b> | <p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">Understanding NTP Time Servers on page 175</a></li> <li>• <a href="#">Configuring NTP Authentication Keys on page 176</a></li> <li>• <a href="#">Configuring the NTP Time Server and Time Services on page 177</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                         |

## server (NTP)

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|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>server address &lt;key key-number&gt; &lt;version value&gt; &lt;prefer&gt;;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Hierarchy Level</b>          | [edit system ntp]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Description</b>              | For NTP, configure the switch to operate in client mode with the remote system at the specified server address. In this mode, the local switch can be synchronized with the remote system, but the remote system can never be synchronized with the local switch.                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Options</b>                  | <p><b>address</b>—Address of the remote system. You must specify an address, not a hostname.</p> <p><b>key key-number</b>—(Optional) Use the specified key number to encrypt authentication fields in all packets sent to the specified address.</p> <p><b>Range:</b> Any unsigned 32-bit integer</p> <p><b>prefer</b>—(Optional) Mark the remote system as preferred host, which means that if all other things are equal, this remote system is chosen for synchronization among a set of correctly operating systems.</p> <p><b>version value</b>—(Optional) Specify the version number to be used in outgoing NTP packets.</p> <p><b>Range:</b> 1 through 4</p> <p><b>Default:</b> 4</p> |
| <b>Required Privilege Level</b> | <p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Understanding NTP Time Servers on page 175</a></li><li>• <a href="#">Configuring NTP Authentication Keys on page 176</a></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |



## source-address (NTP, RADIUS, System Logging, or TACACS+)

|                                 |                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>source-address <i>source-address</i>;</code>                                                                                                                                                                                                                                                                                            |
| <b>Hierarchy Level</b>          | [edit system accounting destination radius server <i>server-address</i> ],<br>[edit system accounting destination tacplus server <i>server-address</i> ],<br>[edit system ntp],<br>[edit system radius-server <i>server-address</i> ],<br>[edit system syslog],<br>[edit system tacplus-server <i>server-address</i> ]                        |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                 |
| <b>Description</b>              | Specify a source address for each configured TACACS+ server, RADIUS server, NTP server, or the source address to record in system log messages that are directed to a remote machine.                                                                                                                                                         |
| <b>Options</b>                  | <b><i>source-address</i></b> —Valid IP address configured on one of the switch interfaces. For system logging, the address is recorded as the message source in messages sent to the remote machines specified in all <b>host <i>hostname</i></b> statements at the [edit system syslog] hierarchy level.                                     |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                                                                                                                                                                             |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <i>Configuring RADIUS Authentication (QFX Series or OCX Series)</i></li> <li>• <a href="#">Synchronizing and Coordinating Time Distribution Using NTP on page 181</a></li> <li>• <i>Specifying an Alternative Source Address for System Log Messages Directed to a Remote Destination</i></li> </ul> |

## trusted-key

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|                                 |                                                                                                                                                                                                             |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>trusted-key [ <i>key-numbers</i> ];</code>                                                                                                                                                            |
| <b>Hierarchy Level</b>          | [edit system <a href="#">ntp</a> ]                                                                                                                                                                          |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                               |
| <b>Description</b>              | For NTP, configure the keys to use when you configure the switch to synchronize its time with other systems on the network.                                                                                 |
| <b>Options</b>                  | <i>key-numbers</i> —One or more key numbers. Each key can be any 32-bit unsigned integer except 0.                                                                                                          |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                                           |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Configuring NTP Authentication Keys on page 176</a></li><li>• <a href="#">authentication-key</a></li><li>• <a href="#">server on page 384</a></li></ul> |

## CHAPTER 26

# Password Configuration Statements

- [authentication \(Login\) on page 388](#)
- [change-type on page 389](#)
- [format on page 390](#)
- [maximum-length on page 391](#)
- [minimum-changes on page 392](#)
- [minimum-length on page 393](#)
- [minimum-lower-cases on page 394](#)
- [minimum-numeric on page 395](#)
- [minimum-punctuations on page 396](#)
- [minimum-upper-cases on page 397](#)
- [password \(Login\) on page 398](#)
- [permissions on page 398](#)
- [retry-options on page 399](#)
- [root-authentication on page 401](#)
- [ssh-dsa on page 402](#)
- [ssh-rsa on page 402](#)
- [user \(Access\) on page 403](#)

## authentication (Login)

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <pre>authentication {   encrypted-password <i>password</i>;   load-key-file <i>URL</i>;   plain-text-password <i>password</i>;   remote-debug-permission (qfabric-admin   qfabric-operator   qfabric-user);   ssh-dsa "<i>public-key</i>";   ssh-rsa "<i>public-key</i>"; }</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Hierarchy Level</b>          | [edit system login user <i>username</i> ]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Release Information</b>      | <p>Statement introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Description</b>              | Authentication methods that a user can use to log in to the switch. You can assign multiple authentication methods to a single user.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Options</b>                  | <p><b>encrypted-password "<i>password</i>"</b>—Message Digest 5 (MD5) or other encrypted authentication. Specify the MD5 or other password. You can specify only one encrypted password for each user.</p> <p>You cannot configure a blank password for <b>encrypted-password</b> using blank quotation marks (" "). You must configure a password of 1 through 128 characters and enclose the password in quotation marks.</p> <p><b>load-key-file</b>—Load RSA (SSH version 1 and SSH version 2) and DSA (SSH version 2) public keys from a file. The file is a URL containing one or more SSH keys.</p> <p><b>plain-text-password</b>—Plain-text password. The command-line interface (CLI) prompts you for the password and then encrypts it.</p> <p><b>remote-debug-permission</b> (QFabric systems only)—QFabric component authentication. Specifies permission levels for users to access individual components in a QFabric system.</p> <p><b>ssh-dsa "<i>public-key</i>"</b>—SSH version 2 authentication. Specify the SSH public key. You can specify one or more public keys for each user.</p> <p><b>ssh-rsa "<i>public-key</i>"</b>—SSH version 1 and SSH version 2 authentication. Specify the SSH public key. You can specify one or more public keys for each user.</p> |
| <b>Required Privilege Level</b> | <p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">Configuring Junos OS User Accounts on page 169</a></li> <li>• <a href="#">root-authentication on page 401</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

## change-type

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|                                 |                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | change-type (character-sets   set-transitions);                                                                                                                                                                                                                                                                                                       |
| <b>Hierarchy Level</b>          | [edit system login password]                                                                                                                                                                                                                                                                                                                          |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                         |
| <b>Description</b>              | Set requirements for using character sets in plain-text passwords. When you combine this statement with the <b>minimum-changes</b> statement, you can check for the total number of character sets included in the password or for the total number of character-set changes in the password. Newly created passwords must meet these requirements.   |
| <b>Options</b>                  | Specify one of the following: <ul style="list-style-type: none"><li>• <b>character-sets</b>—Number of character sets in the password. Valid character sets include uppercase letters, lowercase letters, numbers, punctuation, and other special characters.</li><li>• <b>set-transitions</b>—Number of transitions between character sets.</li></ul> |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                                                                                                                                                                                     |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <i>Special Requirements for Junos OS Plain-Text Passwords</i></li><li>• <a href="#">minimum-changes on page 392</a></li></ul>                                                                                                                                                                                 |

## format

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|                                 |                                                                                                                                                                                                                                                                                                             |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | format (des   md5   sha1);                                                                                                                                                                                                                                                                                  |
| <b>Hierarchy Level</b>          | [edit system login password]                                                                                                                                                                                                                                                                                |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                               |
| <b>Description</b>              | Configure the authentication algorithm for plain-text passwords.                                                                                                                                                                                                                                            |
| <b>Default</b>                  | For Junos OS, the default encryption format is <b>md5</b> . For Junos OS-FIPS software, the default encryption format is <b>sha1</b> .                                                                                                                                                                      |
| <b>Options</b>                  | The hash algorithm that authenticates the password can be one of three algorithms: <ul style="list-style-type: none"><li>• <b>des</b>—Has a block size of 8 bytes; its key size is 48 bits long.</li><li>• <b>md5</b>—Produces a 128-bit digest.</li><li>• <b>sha1</b>—Produces a 160-bit digest.</li></ul> |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                                                                                                                                           |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <i>Special Requirements for Junos OS Plain-Text Passwords</i></li></ul>                                                                                                                                                                                             |

## maximum-length

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|                                 |                                                                                                                                                                      |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | maximum-length <i>length</i> ;                                                                                                                                       |
| <b>Hierarchy Level</b>          | [edit system login passwords]                                                                                                                                        |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                        |
| <b>Description</b>              | Specify the maximum number of characters allowed in plain-text passwords. Newly created passwords must meet this requirement.                                        |
| <b>Default</b>                  | For Junos OS-FIPS software, the maximum number of characters for plain-text passwords is <b>20</b> . For Junos OS, no maximum is set.                                |
| <b>Options</b>                  | <b>length</b> —Maximum number of characters the password can include.<br><b>Range:</b> 1 to 64 characters                                                            |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                    |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <i>Special Requirements for Junos OS Plain-Text Passwords</i></li><li>• <a href="#">minimum-length on page 393</a></li></ul> |

## minimum-changes

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|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>minimum-changes <i>number</i>;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Hierarchy Level</b>          | [edit system login passwords]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Description</b>              | <p>Specify the minimum number of character sets (or character set changes) required in plain-text passwords. Newly created passwords must meet this requirement.</p> <p>This statement is used in combination with the <b>change-type</b> statement. If the change type is <b>character-sets</b>, then the number of character sets included in the password is checked against the specified minimum. If the change type is <b>set-transitions</b>, then the number of character set changes in the password is checked against the specified minimum.</p> |
| <b>Default</b>                  | For Junos OS, the minimum number of changes is 1. For Junos-FIPS software, the minimum number of changes is 3.                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Options</b>                  | <i>number</i> —Minimum number of character sets (or character set changes) required for the password.                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li><i>Special Requirements for Junos OS Plain-Text Passwords</i></li><li><a href="#">change-type on page 389</a></li></ul>                                                                                                                                                                                                                                                                                                                                                                                               |



## minimum-length

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|                                 |                                                                                                                                                                           |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | minimum-length <i>length</i> ;                                                                                                                                            |
| <b>Hierarchy Level</b>          | [edit system login password]                                                                                                                                              |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                             |
| <b>Description</b>              | Specify the minimum number of characters required in plain-text passwords. Newly created passwords must meet this requirement.                                            |
| <b>Default</b>                  | For Junos OS, the minimum number of characters for plain-text passwords is six. For Junos-FIPS software, the minimum number of characters for plain-text passwords is 10. |
| <b>Options</b>                  | <b>length</b> —Minimum number of characters the password must include.<br><b>Range:</b> 6 to 20 characters                                                                |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                         |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <i>Special Requirements for Junos OS Plain-Text Passwords</i></li><li>• <a href="#">maximum-length on page 391</a></li></ul>      |

## minimum-lower-cases

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|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>minimum-lower-cases <i>number</i>;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Hierarchy Level</b>          | [edit system login password]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 12.1.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Description</b>              | <p>Specify the minimum number of lower-case letters required in plain-text passwords. Newly created passwords must meet this requirement.</p> <p>This statement can be used in combination with all of the other requirement options for plain-text passwords, such as <b>minimum-length</b>, <b>minimum-punctuations</b>, <b>minimum-upper-cases</b>, and so on.</p> <p>Using several password minimum requirement options will cause the <b>minimum-length</b> to be reset if the total sum of the required minimums exceeds the <b>minimum-length</b> setting.</p> |
| <b>Options</b>                  | <i>number</i> —The minimum number of lower-case letters required for the password.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <i>Special Requirements for Junos OS Plain-Text Passwords</i></li><li>• <a href="#">Example: Changing the Requirements for Junos OS Plain-Text Passwords on page 232</a></li><li>• <i>password (Login)</i></li></ul>                                                                                                                                                                                                                                                                                                          |

## minimum-numeric

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>minimum-numeric <i>number</i>;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Hierarchy Level</b>          | [edit system login password]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 12.1.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Description</b>              | <p>Specify the minimum number of numeric class characters required in plain-text passwords. Newly created passwords must meet this requirement.</p> <p>This statement can be used in combination with all of the other requirement options for plain-text passwords, such as <b>minimum-length</b>, <b>minimum-punctuations</b>, <b>minimum-lower-cases</b>, and so on.</p> <p>Using several password minimum requirement options will cause the <b>minimum-length</b> to be reset if the total sum of the required minimums exceeds the <b>minimum-length</b> setting.</p> |
| <b>Options</b>                  | <i>number</i> —The minimum number of numeric class characters required for the password.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <i>Special Requirements for Junos OS Plain-Text Passwords</i></li> <li>• <a href="#">Example: Changing the Requirements for Junos OS Plain-Text Passwords on page 232</a></li> <li>• <i>password (Login)</i></li> </ul>                                                                                                                                                                                                                                                                                                            |

## minimum-punctuations

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|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>minimum-punctuations <i>number</i>;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Hierarchy Level</b>          | [edit system login password]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 12.1.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Description</b>              | <p>Specify the minimum number of punctuation class characters required in plain-text passwords. Newly created passwords must meet this requirement.</p> <p>This statement can be used in combination with all of the other requirement options for plain-text passwords, such as <b>minimum-length</b>, <b>minimum-upper-cases</b>, <b>minimum-lower-cases</b>, and so on.</p> <p>Using several password minimum requirement options will cause the <b>minimum-length</b> to be reset if the total sum of the required minimums exceeds the <b>minimum-length</b> setting.</p> |
| <b>Options</b>                  | <i>number</i> —The minimum number of punctuation class characters required for the password.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <i>Special Requirements for Junos OS Plain-Text Passwords</i></li><li>• <a href="#">Example: Changing the Requirements for Junos OS Plain-Text Passwords on page 232</a></li><li>• <i>password (Login)</i></li></ul>                                                                                                                                                                                                                                                                                                                   |

## minimum-upper-cases

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|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>minimum-upper-cases <i>number</i>;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Hierarchy Level</b>          | [edit system login password]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 12.1.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Description</b>              | <p>Specify the minimum number of upper-case letters required in plain-text passwords. Newly created passwords must meet this requirement.</p> <p>This statement can be used in combination with all of the other requirement options for plain-text passwords, such as <b>minimum-length</b>, <b>minimum-punctuations</b>, <b>minimum-lower-cases</b>, and so on.</p> <p>Using several password minimum requirement options will cause the <b>minimum-length</b> to be reset if the total sum of the required minimums exceeds the <b>minimum-length</b> setting.</p> |
| <b>Options</b>                  | <i>number</i> —The minimum number of upper-case letters required for the password.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <i>Special Requirements for Junos OS Plain-Text Passwords</i></li> <li>• <a href="#">Example: Changing the Requirements for Junos OS Plain-Text Passwords on page 232</a></li> <li>• <i>password (Login)</i></li> </ul>                                                                                                                                                                                                                                                                                                      |

## password (Login)

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|                                 |                                                                                                                                                                                                                         |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <pre>password {<br/>  change-type (set-transitions   character-set);<br/>  format (md5   sha1   des);<br/>  maximum-length length;<br/>  minimum-changes number;<br/>  minimum-length length;<br/>}</pre>               |
| <b>Hierarchy Level</b>          | [edit system login]                                                                                                                                                                                                     |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                           |
| <b>Description</b>              | Configure special requirements such as character length and encryption format for plain-text passwords. Newly created passwords must meet these requirements.<br><br>The remaining statements are explained separately. |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                                                       |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <i>Special Requirements for Junos OS Plain-Text Passwords</i></li></ul>                                                                                                         |

## permissions

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|                                 |                                                                                                                                                                                                         |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <pre>permissions {<br/>  storage;<br/>  storage-control;<br/>}</pre>                                                                                                                                    |
| <b>Hierarchy Level</b>          | [edit system login class]                                                                                                                                                                               |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                           |
| <b>Description</b>              | Configure the login access privileges to be provided on the switch.                                                                                                                                     |
| <b>Options</b>                  | <i>permissions</i> —Privilege type.                                                                                                                                                                     |
| <b>Required Privilege Level</b> | admin—To view this statement in the configuration.<br>admin-control—To add this statement to the configuration.                                                                                         |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <i>Configuring Access Privilege Levels</i></li><li>• <i>Understanding Junos OS Access Privilege Levels</i></li><li>• <a href="#">user on page 376</a></li></ul> |


## retry-options

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>              | <pre> retry-options {   backoff-threshold <i>number</i>;   backoff-factor <i>seconds</i>;   maximum-time <i>seconds</i>;   minimum-time <i>seconds</i>;   tries-before-disconnect <i>number</i>; } </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Hierarchy Level</b>     | [edit system login]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Release Information</b> | <p>Statement introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Description</b>         | Maximum number of times a user can attempt to enter a password while logging in through SSH or Telnet before being disconnected.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Options</b>             | <p><b>backoff-threshold <i>number</i></b>—Threshold for the number of failed login attempts before the user experiences a delay when attempting to reenter a password. Use the <b>backoff-factor</b> option to specify the length of delay, in seconds.</p> <p><b>Range:</b> 1 through 3</p> <p><b>Default:</b> 2</p> <p><b>backoff-factor <i>seconds</i></b>—Length of delay after each failed login attempt. The length of delay increases by this value for each subsequent login attempt after the value specified in the <b>backoff-threshold</b> option.</p> <p><b>Range:</b> 5 through 10</p> <p><b>Default:</b> 5</p> <p><b>maximum-time <i>seconds</i></b>—Maximum length of time that the connection remains open for the user to enter a username and password to log in. If the user remains idle and does not enter a username and password within the configured <b>maximum-time</b>, the connection is closed.</p> <p><b>Range:</b> 20 through 300</p> <p><b>Default:</b> 120</p> <p><b>minimum-time <i>seconds</i></b>—Minimum length of time that the connection remains open while the user is attempting to enter a password to log in.</p> <p><b>Range:</b> 20 through 60</p> <p><b>Default:</b> 20</p> <p><b>tries-before-disconnect <i>number</i></b>—Maximum number of times a user is allowed to attempt to enter a password to log in through SSH or Telnet.</p> <p><b>Range:</b> 1 through 10</p> <p><b>Default:</b> 10</p> |

|                              |                                                                                                                                 |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <b>Required Privilege</b>    | admin—To view this statement in the configuration.                                                                              |
| <b>Level</b>                 | admin-control—To add this statement to the configuration.                                                                       |
| <b>Related Documentation</b> | <ul style="list-style-type: none"><li>• <i>Limiting the Number of User Login Attempts for SSH and Telnet Sessions</i></li></ul> |



## root-authentication

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <pre>root-authentication {   (encrypted-password "password"   load-key-password URL   plain-text-password);   ssh-dsa "public-key";   ssh-rsa "public-key"; }</pre>                                                                                                                                                                                                                                                                                                                                                   |
| <b>Hierarchy Level</b>          | [edit system]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Release Information</b>      | <p>Statement introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>                                                                                                                                                                                                                                                                                                                                                              |
| <b>Description</b>              | Configure the authentication methods for the root-level user, whose username is <b>root</b> .                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Options</b>                  | <p><b>encrypted-password "password"</b>— Specify the MD5 or other encrypted authentication password. You can specify only one encrypted password.</p> <p>You cannot configure a blank password for the <b>encrypted-password</b> option using blank quotation marks (" "). You must configure a password of 1 through 128 characters and enclose the password in quotation marks.</p>                                                                                                                                 |
|                                 | <div>  <p><b>CAUTION:</b> Do not use the <b>encrypted-password</b> option unless the password is <i>already</i> encrypted, and you are entering the encrypted version of the password. If you commit the <b>encrypted-password</b> option with a plain-text password or with blank quotation marks (" "), you will not be able to log in to the device as root, and you will need to use the password recovery process.</p> </div> |
|                                 | <p><b>plain-text-password</b>—Plain-text password. The CLI prompts you for the password and then encrypts it. The CLI displays the encrypted version, and the software places the encrypted version in its user database. You can specify only one plain-text password.</p>                                                                                                                                                                                                                                           |
|                                 | <p><b>ssh-dsa "public-key"</b>—SSH version 2 authentication. Specify the DSA (SSH version 2) public key. You can specify one or more public keys.</p>                                                                                                                                                                                                                                                                                                                                                                 |
|                                 | <p><b>ssh-rsa "public-key"</b>—SSH version 1 authentication. Specify the RSA (SSH version 1 and SSH version 2) public key. You can specify one or more public keys.</p>                                                                                                                                                                                                                                                                                                                                               |
| <b>Required Privilege Level</b> | <p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <i>Configuring the Root Password</i></li> <li>• <i>Recovering the Root Password</i></li> <li>• <a href="#">authentication on page 368</a></li> </ul>                                                                                                                                                                                                                                                                                                                         |

## ssh-dsa

---

|                                 |                                                                                                                                                                                                       |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>ssh-dsa "public-key";</code>                                                                                                                                                                    |
| <b>Hierarchy Level</b>          | [edit system root-authentication]<br>[edit system login user authentication]                                                                                                                          |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                         |
| <b>Description</b>              | Specify the DSA (SSH version 2) public key. You can specify one or more public keys.                                                                                                                  |
| <b>Options</b>                  | <code>ssh-dsa "public-key"</code> —SSH version 2 authentication.                                                                                                                                      |
| <b>Required Privilege Level</b> | admin—To view this statement in the configuration.<br>admin-control—To add this statement to the configuration.                                                                                       |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Configuring the Root Password on page 229</a></li><li>• <a href="#">authentication on page 368</a></li><li>• <i>root-authentication</i></li></ul> |

## ssh-rsa

---

|                                 |                                                                                                                                                                                  |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>ssh-dsa "public-key";</code>                                                                                                                                               |
| <b>Hierarchy Level</b>          | [edit system root-authentication]<br>[edit system login user authentication]                                                                                                     |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                    |
| <b>Description</b>              | Specify the RSA (SSH version 1) public key. You can specify one or more public keys.                                                                                             |
| <b>Options</b>                  | <code>ssh-rsa "public-key"</code> —SSH version 1 authentication. Specify the RSA (SSH version 1 and SSH version 2) public key. You can specify one or more public keys.          |
| <b>Required Privilege Level</b> | admin—To view this statement in the configuration.<br>admin-control—To add this statement to the configuration.                                                                  |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <i>Configuring the Root Password</i></li><li>• <a href="#">authentication on page 368</a></li><li>• <i>root-authentication</i></li></ul> |

## user (Access)

|                                 |                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <pre> user username {   authentication {     (encrypted-password "password"   plain-text-password);     load-key-file URL;     remote-debug-permission (qfabric-admin   qfabric-operator   qfabric-user);     ssh-dsa "public-key" &lt;from hostname&gt;;     ssh-rsa "public-key" &lt;from hostname&gt;;   }   class class-name;   full-name "complete-name";   uid uid-value; } </pre> |
| <b>Hierarchy Level</b>          | [edit system login]                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Release Information</b>      | <p>Statement introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>                                                                                                                                                                                                                                 |
| <b>Description</b>              | Configure access permission for individual users.                                                                                                                                                                                                                                                                                                                                        |
| <b>Options</b>                  | The remaining statements are explained separately.                                                                                                                                                                                                                                                                                                                                       |
| <b>Required Privilege Level</b> | <p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>                                                                                                                                                                                                                                                               |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">Configuring Junos OS User Accounts on page 169</a></li> <li>• <a href="#">class on page 369</a></li> </ul>                                                                                                                                                                                                                          |



# PTP Configuration Statement

- [e2e-transparent on page 405](#)

## e2e-transparent

---

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | e2e-transparent;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Hierarchy Level</b>          | [edit protocols ptp]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 14.1X53-D25 for the QFX Series.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Description</b>              | Configure the transparent clock for Precision Time Protocol (PTP). The end to end (E2E) transparent clock mode is supported. With an end-to-end transparent clock, only the residence time is included in the timestamp in the packet. Transparent clock functionality is supported on both PTP over IP and PTP over Ethernet. With PTP over Ethernet, one or two VLANs are supported. Transparent clock functionality is enabled globally and might be required in scenarios in which the interface on which packets are received and transmitted is unknown. |
| <b>Options</b>                  | There are no options.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Required Privilege Level</b> | routing—To view this statement in the configuration.<br>routing-control—To add this statement to the configuration.                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">[edit protocols ptp] Hierarchy Level</a></li> <li>• <a href="#">Configuring Transparent Clock Mode for Precision Time Protocol on page 236</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                 |



## CHAPTER 28

# Autoinstallation Operational Commands

- `show system autoinstallation status`

## show system autoinstallation status

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | show system autoinstallation status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Release Information</b>      | <p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command supported in Junos OS Release 12.2 for ACX Series Universal Access Routers.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>                                                                                                                                                                                                                                                                                          |
| <b>Description</b>              | (ACX Series routers, J Series routers, and EX Series switches, QFX Series, and OCX Series only) Display autoinstallation status information.                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Options</b>                  | This command has no options.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Required Privilege Level</b> | view                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <i>ACX Series Autoinstallation Overview</i></li> <li>• <i>Before You Begin Autoinstallation on an ACX Series Universal Access Router</i></li> <li>• <i>Autoinstallation Configuration of ACX Series Universal Access Routers</i></li> <li>• <i>USB Autoinstallation on ACX Series Routers</i></li> <li>• <i>Autoinstalling a Configuration File from a Disk-on-Key USB Memory Stick onto an EX2200 or EX3300 Switch</i></li> <li>• <i>Verifying Autoinstallation on ACX Series Universal Access Routers</i></li> <li>• <i>autoinstallation</i></li> </ul> |
| <b>List of Sample Output</b>    | <a href="#">show system autoinstallation status on page 409</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Output Fields</b>            | <a href="#">Table 35 on page 408</a> describes the output fields for the <b>show system autoinstallation status</b> command. Output fields are listed in the approximate order in which they appear.                                                                                                                                                                                                                                                                                                                                                                                               |

**Table 35: show system autoinstallation status Output Fields**

| Field Name                     | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Autoinstallation status</b> | <p>Display autoinstallation status information:</p> <ul style="list-style-type: none"> <li>• <b>Last committed file</b>—File last committed for autoinstallation configuration.</li> <li>• <b>Configuration server of last committed file</b>—IP address or URL of the server configured to retrieve configuration information for the last committed configuration file.</li> <li>• <b>Interface</b>—Interface configured for autoinstallation. <ul style="list-style-type: none"> <li>• <b>Name</b>—Name of the interface.</li> <li>• <b>State</b>—Interface state.</li> </ul> </li> <li>• <b>Address acquisition</b>—Display IP address acquired and protocol used for acquisition upon startup. <ul style="list-style-type: none"> <li>• <b>Protocol</b>—Protocol used for acquisition: BOOTP/DHCP or RARP.</li> <li>• <b>Acquired address</b>—IP address acquired from the DHCP server.</li> </ul> </li> </ul> |



## Sample Output

### show system autoinstallation status

```
user@host> show system autoinstallation status
Autoinstallation status:
Master state: Active
Last committed file: None
Configuration server of last committed file: 0.0.0.0
Interface:
 Name: ge-0/0/1
 State: None
 Address acquisition:
 Protocol: DHCP Client
 Acquired address: None
 Protocol: RARP Client
 Acquired address: None
```



## CHAPTER 29

# Basic System Management Operational Commands

- commit
- clear log
- clear chassis display message
- clear system commit
- clear system reboot
- file
- file archive
- file checksum md5
- file checksum sha1
- file checksum sha-256
- file compare
- file delete
- file list
- file rename
- file show
- load
- ping
- request chassis beacon
- request chassis fpc
- request chassis pic
- request chassis routing-engine master
- request message
- request system configuration rescue delete
- request system configuration rescue save
- request system halt
- request system logout

- `request system power-off`
- `request system reboot`
- `request system storage cleanup`
- `request system zeroize`
- `restart`
- `save`

## commit

**Syntax** `commit <at <"string">> <and-quit> <check> <comment <"comment-string">>  
<confirmed> <display detail> <fast-synchronize> <minutes>  
<synchronize <force> <scripts>>`

**Release Information** Command introduced before Junos OS Release 7.4.  
Command introduced in Junos OS Release 11.1 for the QFX Series.  
Option **fast-synchronize** added in Junos OS Release 12.2.  
Option **synchronize scripts** introduced in Junos OS Release 13.2.  
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

**Description** Commit the set of changes to the database and cause the changes to take operational effect.



**NOTE:** The **fast-synchronize** option is not supported in a QFX Series Virtual Chassis.



**NOTE:** Beginning in Junos OS 12.3, it is possible that FPCs brought offline using the `request chassis fpc slot fpc-slot offline` operational-mode CLI command can come online during a configuration commit or power-supply replacement procedure. As an alternative, use the `set fpc fpc-slot power off` configuration-mode command at the `[edit chassis]` hierarchy level to ensure that the FPCs remain offline.

**Options** `at <"string">`—(Optional) Save software configuration changes and activate the configuration at a future time, or upon reboot.

**string** is **reboot** or the future time to activate the configuration changes. Enclose the **string** value (including **reboot**) in quotation marks (" "). You can specify time in two formats:

- A time value in the form **hh:mm[:ss]** (hours, minutes, and optionally seconds)—Commit the configuration at the specified time, which must be in the future but before 11:59:59 PM on the day the **commit at** configuration command is issued. Use 24-hour time for the **hh** value; for example, **04:30:00** is 4:30:00 AM, and **20:00** is 8:00 PM. The time is interpreted with respect to the clock and time zone settings on the router.
- A date and time value in the form **yyyy-mm-dd hh:mm[:ss]** (year, month, date, hours, minutes, and, optionally, seconds)—Commit the configuration at the specified day and time, which must be after the **commit at** command is issued. Use 24-hour time for the **hh** value. For example, **2003-08-21 12:30:00** is 12:30 PM on August 21, 2003. The time is interpreted with respect to the clock and time zone settings on the router.

For example, **commit at "18:00:00"**. For date and time, include both values in the same set of quotation marks. For example, **commit at "2005-03-10 14:00:00"**.

A *commit check* is performed when you issue the **commit at** configuration mode command. If the result of the check is successful, then the current user is logged out of configuration mode, and the configuration data is left in a read-only state. No other commit can be performed until the scheduled commit is completed.



**NOTE:** If Junos OS fails before the configuration changes become active, all configuration changes are lost.

You cannot enter the **commit at** configuration command when there is a pending reboot.

You cannot enter the **request system reboot** command once you schedule a commit operation for a specific time in the future.

You cannot commit a configuration when a scheduled commit is pending. For information about how to use the **clear** command to cancel a scheduled configuration, see the [CLI Explorer](#).

**and-quit**—(Optional) Commit the configuration and, if the configuration contains no errors and the commit succeeds, exit from configuration mode.

**check**—(Optional) Verify the syntax of the configuration, but do not activate it.

**comment** <"*comment-string*">—(Optional) Add a comment that describes the committed configuration. The comment can be as long as 512 bytes and must be typed on a single line. You cannot include a comment with the **commit check** command. Enclose *comment-string* in quotation marks (" "). For example, **commit comment "Includes changes recommended by SW Lab"**.

**confirmed** <*minutes*>—(Optional) Require that the commit be confirmed within the specified amount of time. To confirm a commit, enter either a **commit** or **commit check** command. If the commit is not confirmed within the time limit, the configuration rolls back automatically to the precommit configuration and a broadcast message is sent to all logged-in users. To show when a rollback is scheduled, enter the **show system commit** command. The allowed range is 1 through 65,535 minutes, and the default is 10 minutes.

In Junos OS Release 11.4 and later, you can also use the **commit confirmed** command in the **[edit private]** configuration mode.

**display detail**—(Optional) Monitors the commit process.



**NOTE:** In Junos OS Release 10.4 and later, if the number of commit details or messages exceeds a page when used with the **| display detail** pipe option, the **more** pagination option on the screen is no longer available. Instead, the messages roll up on the screen by default, just like using the **commit** command with the **| no more** pipe option.

**fast-synchronize**—(Optional) Configure the commits to run in parallel on both the master and backup Routing Engines to reduce the time taken for commit synchronization.



**NOTE:** The **fast-synchronize** statement is not supported on QFX Series devices when used in a Virtual Chassis.

**synchronize <force> <scripts>**—(Optional) If your router has two Routing Engines, you can manually direct one Routing Engine to synchronize its configuration with the other by issuing the **commit synchronize** command. The Routing Engine on which you execute this command (request Routing Engine) copies and loads its candidate configuration to the other (responding Routing Engine). Both Routing Engines then perform a syntax check on the candidate configuration file being committed. If no errors are found, the configuration is activated and becomes the current operational configuration on both Routing Engines. The **commit synchronize** command does not work if the responding Routing Engine has uncommitted configuration changes. However, you can enforce commit synchronization on the Routing Engines by using the **force** option. When you issue the **commit synchronize** command with the **force** option from one Routing Engine, the configuration sessions on the other Routing Engine are terminated and its configuration synchronized with that on the Routing Engine from which you issued the command.

When you issue the **commit synchronize** command with the **scripts** option, the device synchronizes all commit, event, lib, and op scripts from the requesting Routing Engine to the responding Routing Engine and also commits and synchronizes the configuration. If the commit check operation fails for the requesting Routing Engine, the process stops, and the scripts are not copied to the responding Routing Engine. If the commit check or commit operation fails for the responding Routing Engine, the scripts are still synchronized, since the synchronization occurs prior to the commit check operation on the responding Routing Engine.

If the **load-scripts-from-flash** statement is configured for the requesting Routing Engine, the device synchronizes the scripts from flash memory on the requesting Routing Engine to flash memory on the responding Routing Engine. Otherwise, the device synchronizes the scripts from the hard disk on the requesting Routing Engine to the hard disk on the responding Routing Engine. The device synchronizes all scripts regardless of whether they are enabled in the configuration or have been updated since the last synchronization.



**NOTE:** When you issue the **commit synchronize** command, you must use the **apply-groups re0** and **re1** commands. For information about how to use groups, see *Disabling Inheritance of a Junos OS Configuration Group*.

The responding Routing Engine must use Junos OS Release 5.0 or later.

**Required Privilege Level**

**configure**—To enter configuration mode.



**NOTE:** If you are using Junos OS in a Common Criteria environment, system log messages are created whenever a secret attribute is changed (for example, password changes or changes to the RADIUS shared secret). These changes are logged during the following configuration load operations:

```
load merge
load replace
load override
load update
```

For more information, see the *Secure Configuration Guide for Common Criteria and Junos-FIPS*

#### Related Documentation

- *Verifying a Junos OS Configuration, Committing a Junos OS Configuration*
- *Scheduling a Junos OS Commit Operation*
- *Deactivating and Reactivating Statements and Identifiers in a Junos OS Configuration*
- *Monitoring the Junos OS Commit Process*
- *Adding a Comment to Describe the Committed Configuration*

## Sample Output

### commit | display detail

```
user@host> commit | display detail

2011-08-24 01:08:08.00691 PDT: begin creating snapshots
2011-08-24 01:08:09.00210 PDT: end creating snapshots
2011-08-24 01:08:09.00211 PDT: begin preparing metadata
2011-08-24 01:08:09.00228 PDT: end preparing metadata
2011-08-24 01:08:09.00229 PDT: begin computing dcf root changes
2011-08-24 01:08:09.00236 PDT: end computing dcf root changes
2011-08-24 01:08:09.00244 PDT: begin computing additions
2011-08-24 01:08:09.00251 PDT: end computing additions
2011-08-24 01:08:09.00251 PDT: begin local object validation
2011-08-24 01:08:09.00251 PDT: end local object validation
2011-08-24 01:08:09.00252 PDT: begin update instances
2011-08-24 01:08:09.00252 PDT: end update instances
2011-08-24 01:08:09.00252 PDT: begin adjust metadata
2011-08-24 01:08:09.00252 PDT: end adjust metadata
2011-08-24 01:08:09.00253 PDT: begin validate metadata
2011-08-24 01:08:09.00253 PDT: end validate metadata
2011-08-24 01:08:09.00253 PDT: begin adjust allocations
2011-08-24 01:08:09.00254 PDT: end adjust allocations
2011-08-24 01:08:09.00254 PDT: begin adjust dependencies
2011-08-24 01:08:09.00254 PDT: end adjust dependencies
2011-08-24 01:08:09.00255 PDT: begin instance validation
2011-08-24 01:08:09.00255 PDT: end instance validation
2011-08-24 01:08:09.00255 PDT: begin opening all sessions eagerly
2011-08-24 01:08:09.00277 PDT: begin request #1 [login]
2011-08-24 01:08:09.00278 PDT: end request #1 [login]
2011-08-24 01:08:09.00325 PDT: begin processing globals
2011-08-24 01:08:09.00330 PDT: begin waiting for stamp check
```



```
(qfabric-default---node0)
2011-08-24 01:08:09.00334 PDT: end reply #1 [login]
2011-08-24 01:08:09.00351 PDT: end reply #1 [login]
2011-08-24 01:08:09.00451 PDT: begin request #2 [open]
2011-08-24 01:08:09.00451 PDT: end request #2 [open]
2011-08-24 01:08:09.00451 PDT: begin request #3 [get commit history]
2011-08-24 01:08:09.00452 PDT: end request #3 [get commit history]
2011-08-24 01:08:09.00452 PDT: begin request #4 [load]
2011-08-24 01:08:09.00453 PDT: end request #4 [load]
2011-08-24 01:08:09.00453 PDT: begin request #5 [load]
2011-08-24 01:08:09.00454 PDT: begin reply #2 [open]
2011-08-24 01:08:09.00456 PDT: end reply #2 [open]
2011-08-24 01:08:09.00457 PDT: begin reply #3 [get commit history]
2011-08-24 01:08:09.00475 PDT: end reply #3 [get commit history]
2011-08-24 01:08:09.00476 PDT: begin reply #4 [load]
2011-08-24 01:08:09.00499 PDT: begin reply #5 [load]
2011-08-24 01:08:09.00501 PDT: end waiting for stamp check
(qfabric-default---node0)
2011-08-24 01:08:09.00501 PDT: begin waiting for open (qfabric-default---node0)
2011-08-24 01:08:09.00502 PDT: end waiting for open (qfabric-default---node0)
2011-08-24 01:08:09.00504 PDT: end processing globals
2011-08-24 01:08:09.00617 PDT: end request #5 [load]
2011-08-24 01:08:09.00617 PDT: begin request #6 [check]
2011-08-24 01:08:09.00617 PDT: end request #6 [check]
2011-08-24 01:08:09.00619 PDT: end reply #5 [load]
2011-08-24 01:08:09.00619 PDT: begin reply #6 [check]
2011-08-24 01:08:09.00730 PDT: end session
2011-08-24 01:08:09.00752 PDT: end request #5 [load]
2011-08-24 01:08:09.00754 PDT: begin request #6 [check]
2011-08-24 01:08:09.00755 PDT: end request #6 [check]
2011-08-24 01:08:09.00881 PDT: end request #5 [load]
2011-08-24 01:08:09.00961 PDT: begin commit to devices
2011-08-24 01:08:10.00668 PDT: begin request #8 [get commit history]
2011-08-24 01:08:10.00669 PDT: end request #8 [get commit history]
2011-08-24 01:08:10.00721 PDT: end session
2011-08-24 01:08:10.00727 PDT: end commit to devices
2011-08-24 01:08:10.00733 PDT: begin committing metadata
2011-08-24 01:08:10.00772 PDT: end committing metadata
2011-08-24 01:08:10.00772 PDT: begin calling commit callbacks
2011-08-24 01:08:10.00773 PDT: end calling commit callbacks
commit complete
```

## clear log

---

|                                 |                                                                                                                                                                                                                                                                    |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>clear log <i>filename</i></code><br><code>&lt;all&gt;</code>                                                                                                                                                                                                 |
| <b>Release Information</b>      | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>              | Remove contents of a log file.                                                                                                                                                                                                                                     |
| <b>Options</b>                  | <b><i>filename</i></b> —Name of the specific log file to delete.<br><br><b>all</b> —(Optional) Delete the specified log file and all archived versions of it.                                                                                                      |
| <b>Required Privilege Level</b> | clear                                                                                                                                                                                                                                                              |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">show log on page 1030</a></li></ul>                                                                                                                                                                            |
| <b>List of Sample Output</b>    | <a href="#">clear log on page 418</a>                                                                                                                                                                                                                              |
| <b>Output Fields</b>            | See <a href="#">file list</a> for an explanation of output fields.                                                                                                                                                                                                 |

## Sample Output

### clear log

The following sample commands list log file information, clear the contents of a log file, and then display the updated log file information:

```
user@host> file list lcc0-re0:/var/log/sampled detail
lcc0-re0:

-rw-r----- 1 root wheel 26450 Jun 23 18:47 /var/log/sampled
total 1

user@host> clear log lcc0-re0:sampled
lcc0-re0:

user@host> file list lcc0-re0:/var/log/sampled detail
lcc0-re0:

-rw-r----- 1 root wheel 57 Sep 15 03:44 /var/log/sampled
total 1
```

## clear chassis display message

|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                 | <a href="#">Syntax on page 419</a><br><a href="#">Syntax (TX Matrix Router) on page 419</a><br><a href="#">Syntax (TX Matrix Plus Router) on page 419</a><br><a href="#">Syntax (QFabric Systems) on page 419</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Syntax</b>                         | clear chassis display message                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Syntax (TX Matrix Router)</b>      | clear chassis display message<br><lcc <i>number</i>   scc>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Syntax (TX Matrix Plus Router)</b> | clear chassis display message<br><lcc <i>number</i>   sfc <i>number</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Syntax (QFabric Systems)</b>       | clear chassis display message<br><node-device <i>name</i>   interconnect-device <i>name</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Release Information</b>            | <p>Command introduced in Junos OS Release 7.5.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p><b>sfc</b> option for the TX Matrix Plus routers introduced in Junos OS Release 9.6.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Description</b>                    | <p>(M40e, M160, M320, T Series routers, EX Series, and QFabric systems only) Clear or stop a text message on the craft interface display, which is on the front of the router or switch or on the LCD panel display on the router or switch. The craft interface alternates the display of text messages with standard craft interface messages, switching between messages every 2 seconds. By default, on both the router and the switch, the text message is displayed for 5 minutes. The craft interface display has four 20-character lines. The LCD panel display has two 16-character lines, and text messages appear only on the second line.</p>                                                                                           |
| <b>Options</b>                        | <p><b>none</b>—Clear or stop a text message on the craft interface display.</p> <p><b>interconnect-device <i>name</i></b>—(QFabric systems only) (Optional) On a QFabric system, clear or stop a text message on the LCD panel display on the specified Interconnect device.</p> <p><b>lcc <i>number</i></b>—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.</p> <p>Replace <i>number</i> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none"> <li>0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.</li> <li>0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.</li> </ul> |

- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**node-device *name***—(QFabric systems only) (Optional) On a QFabric system, clear or stop a text message on the LCD panel display on the specified Node device in a Node group.

**scc**—(TX Matrix routers only) (Optional) Clear or stop a text message on the craft interface on the TX Matrix router (switch-card chassis).

**sfc *number***—(TX Matrix Plus routers only) (Optional) Clear or stop a text message on the craft interface on the TX Matrix Plus router (or switch-fabric chassis). Replace *number* with 0.

**Required Privilege Level**

clear

**Related Documentation**

- *Configuring the LCD Panel on EX Series Switches (CLI Procedure)*
- *set chassis display message*
- *show chassis craft-interface*

**List of Sample Output** [clear chassis display message on page 420](#)

**Output Fields** See *show chassis craft-interface* for an explanation of output fields.

## Sample Output

### clear chassis display message

The following example displays and then clears the text message on the craft interface display:

```
user@host> show chassis craft-interface
Red alarm: LED off, relay off
Yellow alarm: LED off, relay off
Host OK LED: On
Host fail LED: Off
FPCs 0 1 2 3 4 5 6 7

Green .. *.. * *.
Red
LCD screen:
 +-----+
 |NOC contact Dusty|
 |(888) 526-1234 |
 +-----+

user@host> clear chassis display message

user@host> show chassis craft-interface
Red alarm: LED off, relay off
Yellow alarm: LED off, relay off
```

```
Host OK LED: On
Host fail LED: Off
FPCs 0 1 2 3 4 5 6 7

Green .. *.. * *.
Red
LCD screen:
+-----+
|host |
|Up: 0+17:05:47|
| |
|Temperature OK|
+-----+
```

## clear system commit

---

|                                 |                                                                                                                                                                                                                                                                    |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | clear system commit                                                                                                                                                                                                                                                |
| <b>Release Information</b>      | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>              | Clear any pending commit operation.                                                                                                                                                                                                                                |
| <b>Options</b>                  | This command has no options.                                                                                                                                                                                                                                       |
| <b>Required Privilege Level</b> | maintenance (or the actual user who scheduled the commit)                                                                                                                                                                                                          |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">show system commit on page 1078</a></li></ul>                                                                                                                                                                  |
| <b>List of Sample Output</b>    | <a href="#">clear system commit on page 422</a><br><a href="#">clear system commit (None Pending) on page 422</a><br><a href="#">clear system commit (User Does Not Have Required Privilege Level) on page 422</a>                                                 |
| <b>Output Fields</b>            | When you enter this command, you are provided feedback on the status of your request.                                                                                                                                                                              |

### Sample Output

#### clear system commit

```
user@host> clear system commit
Pending commit cleared.
```

#### clear system commit (None Pending)

```
user@host> clear system commit
No commit scheduled.
```

#### clear system commit (User Does Not Have Required Privilege Level)

```
user@host> clear system commit
error: Permission denied
```

## clear system reboot

|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                 | <a href="#">Syntax on page 423</a><br><a href="#">Syntax (EX Series Switches) on page 423</a><br><a href="#">Syntax (TX Matrix Router) on page 423</a><br><a href="#">Syntax (TX Matrix Plus Router) on page 423</a><br><a href="#">Syntax (QFX Series) on page 423</a>                                                                                                                                                                                                                                                                                                          |
| <b>Syntax</b>                         | clear system reboot<br><both-routing-engines>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Syntax (EX Series Switches)</b>    | clear system reboot<br><all-members><br><both-routing-engines><br><local><br><member <i>member-id</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Syntax (TX Matrix Router)</b>      | clear system reboot<br><both-routing-engines><br><all-chassis   all-lcc   lcc <i>number</i>   scc>                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Syntax (TX Matrix Plus Router)</b> | clear system reboot<br><both-routing-engines><br><all-chassis   all-lcc   lcc <i>number</i>   sfc <i>number</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Syntax (QFX Series)</b>            | clear system reboot<br><infrastructure <i>name</i> ><br><interconnect-device <i>name</i> ><br><node-group <i>name</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Release Information</b>            | <p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p><b>sfc</b> option introduced for the TX Matrix Plus router in Junos OS Release 9.6.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>                                                                                                                                                                                                 |
| <b>Description</b>                    | Clear any pending system software reboots or halts. When issued on a TX Matrix router without any options, the default behavior clears all pending system software reboots or halts on all T640 routers connected to the TX Matrix router. When issued on a TX Matrix Plus router without any options, the default behavior clears all pending system software reboots or halts on all T1600 or T4000 routers connected to the TX Matrix Plus router.                                                                                                                            |
| <b>Options</b>                        | <p><b>none</b>—Clear all pending system software reboots or halts.</p> <p><b>all-chassis</b>—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Clear all halt or reboot requests for all the Routing Engines in the chassis.</p> <p><b>all-lcc</b>—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, clear all halt or reboot requests for all T640 routers (or line-card chassis) connected to the TX Matrix router. On a TX Matrix Plus router, clear all halt or reboot requests on the l connected T1600 or T4000 LCCs.</p> |

**all-members**—(EX4200 switches only) (Optional) Clear all halt or reboot requests on all members of the Virtual Chassis configuration.

**both-routing-engines**—(Systems with multiple Routing Engines) (Optional) Clear all halt or reboot requests on both Routing Engines. On a TX Matrix router, clear both Routing Engines on all chassis connected to the TX Matrix router. Likewise, on a TX Matrix Plus router, clear both Routing Engines on all chassis connected to the TX Matrix Plus router.

**infrastructure *name***—(QFabric systems) (Optional) Clear all halt or reboot requests on the fabric control Routing Engines or fabric manager Routing Engines.

**interconnect-device *name***—(QFabric systems) (Optional) Clear all halt or reboot requests on the Interconnect device.

**lcc *number***—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, clear all halt or reboot requests for a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, clear all halt or reboot requests for a specific router that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(EX4200 switches only) (Optional) Clear all halt or reboot requests on the local Virtual Chassis member.

**member *member-id***—(EX4200 switches only) (Optional) Clear all halt or reboot requests on the specified member of the Virtual Chassis configuration. Replace *member-id* with a value from 0 through 9.

**node-group *name***—(QFabric systems) (Optional) Clear all halt or reboot requests on the Node group.

**scc**—(TX Matrix routers only) (Optional) Clear all halt or reboot requests for the TX Matrix router (or switch-card chassis).

**sfc *number***—(TX Matrix Plus routers only) (Optional) Clear all halt or reboot requests for the TX Matrix Plus router. Replace *number* with 0.

**Required Privilege Level**      maintenance



|                              |                                                                                                                                                                                                                                                                                                     |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Related Documentation</b> | <ul style="list-style-type: none"><li>• <i>request system reboot</i></li><li>• <a href="#">request system reboot on page 481</a></li><li>• <a href="#">Rebooting and Halting a Device on page 24</a></li><li>• <a href="#">Routing Matrix with a TX Matrix Plus Router Solutions Page</a></li></ul> |
| <b>List of Sample Output</b> | <a href="#">clear system reboot on page 426</a><br><a href="#">clear system reboot (TX Matrix Router) on page 426</a><br><a href="#">clear system reboot (QFX Series) on page 426</a>                                                                                                               |
| <b>Output Fields</b>         | When you enter this command, you are provided feedback on the status of your request.                                                                                                                                                                                                               |

## Sample Output

### clear system reboot

```
user@host> clear system reboot
reboot requested by root at Sat Dec 12 19:37:34 1998
[process id 17855]
Terminating...
```

### clear system reboot (TX Matrix Router)

```
user@host> clear system reboot
scc-re0:

No shutdown/reboot scheduled.
lcc0-re0:

No shutdown/reboot scheduled.
lcc2-re0:

No shutdown/reboot scheduled.
```

### clear system reboot (QFX Series)

```
user@switch> clear system reboot node-group node1
No shutdown/reboot scheduled.
```

## file

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | file <archive  change-owner   change-permission   checksum  compare   compress   copy   delete   delete-directory   link   list   make-directory   rename   show   source address>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Release Information</b>      | <p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p><b>change-owner, change-permission, compress, delete-directory, link, and make-directory</b> options added in Junos OS Release 14.1.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Description</b>              | Archive files from the device, copy files to and from the router or switch, calculate the file checksum, compare files, delete a file from the device, list files on the device, rename a file, show file contents, show the local address to initiate a connection, change owner of a file, change permission of a file, compress a file, delete a directory, create a link between files, or create a new directory.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Options</b>                  | <p><b>archive (Optional)</b> —Archive, and optionally compress, one or multiple local system files as a single file, locally or at a remote location.</p> <p><b>change-owner (Optional)</b> —Change owner of a file.</p> <p><b>change-permission (Optional)</b> —Change permission of a file.</p> <p><b>checksum (Optional)</b> —Calculate the Message Digest 5 (MD5) checksum of a file.</p> <p><b>compare (Optional)</b> —Compare two local files and describe the differences between them in default, context, or unified output styles.</p> <p><b>compress (Optional)</b> —Compress a file.</p> <p><b>copy (Optional)</b> —Copy files from one place to another on the local switch or between the local switch and a remote system.</p> <p><b>delete (Optional)</b> —Delete a file on the local switch.</p> <p><b>delete-directory (Optional)</b> —Delete a directory.</p> <p><b>link (Optional)</b> —Create a link between files.</p> <p><b>list (Optional)</b> —Display a list of files on the local switch.</p> <p><b>make-directory (Optional)</b> —Create a new directory.</p> <p><b>rename (Optional)</b> —Rename a file on the local switch.</p> <p><b>show (Optional)</b> —Display the contents of a file.</p> <p><b>source address (Optional)</b> —Specify the source address of the local file.</p> |
| <b>Required Privilege Level</b> | maintenance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

- Related Documentation**
- *Viewing Files and Directories on a Device Running Junos OS*
  - [CLI Explorer](#)

## file archive

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>file archive destination <i>destination</i> source <i>source</i> &lt;compress&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Release Information</b>      | <p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Description</b>              | Archive, and optionally compress, one or multiple local system files as a single file, locally or at a remote location.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Options</b>                  | <p><b>destination <i>destination</i></b>—Destination of the archived file or files. Specify the destination as a URL or filename. The Junos OS adds one of the following suffixes if the destination filename does not already have it:</p> <ul style="list-style-type: none"> <li>• For archived files—The suffix <b>.tar</b></li> <li>• For archived and compressed files—The suffix <b>.tgz</b></li> </ul> <p><b>source <i>source</i></b>—Source of the original file or files. Specify the source as a URL or filename.</p> <p><b>compress</b>—(Optional) Compress the archived file with the GNU zip (gzip) compression utility. The compressed files have the suffix <b>.tgz</b>.</p> |
| <b>Required Privilege Level</b> | maintenance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">Format for Specifying Filenames and URLs in Junos OS CLI Commands on page 40</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>List of Sample Output</b>    | <p><a href="#">file archive (Multiple Files) on page 429</a></p> <p><a href="#">file archive (Single File) on page 429</a></p> <p><a href="#">file archive (with Compression) on page 430</a></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Output Fields</b>            | When you enter this command, you are provided feedback on the status of your request.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## Sample Output

### file archive (Multiple Files)

The following sample command archives all message files in the local directory `/var/log/messages` as the single file **messages-archive.tar**.

```
user@host> file archive source /var/log/messages* destination /var/log/messages-archive.tar
/usr/bin/tar: Removing leading / from absolute path names in the archive.
user@host>
```

### file archive (Single File)

The following sample command archives one message file in the local directory `/var/log/messages` as the single file **messages-archive.tar**.

```
user@host> file archive source /var/log/messages destination /var/log/messages-archive.tar
/usr/bin/tar: Removing leading / from absolute path names in the archive.
user@host
```

### file archive (with Compression)

The following sample command archives and compresses all message files in the local directory **/var/log/messages** as the single file **messages-archive.tgz**.

```
user@host> file archive compress source /var/log/messages* destination
/var/log/messages-archive.tgz
/usr/bin/tar: Removing leading / from absolute path names in the archive.
```

## file checksum md5

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>file checksum md5 &lt;pathname&gt; filename</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Release Information</b>      | <p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Description</b>              | Calculate the Message Digest 5 (MD5) checksum of a file.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Options</b>                  | <p><b>pathname</b>—(Optional) Path to a filename.</p> <p><b>filename</b>—Name of a local file for which to calculate the MD5 checksum.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Required Privilege Level</b> | maintenance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <i>Configuring Checksum Hashes for a Commit Script</i> in the <i>Junos OS Configuration and Operations Automation Guide</i></li> <li>• <i>Configuring Checksum Hashes for an Event Script</i> in the <i>Junos OS Configuration and Operations Automation Guide</i></li> <li>• <i>Configuring Checksum Hashes for an Op Script</i> in the <i>Junos OS Configuration and Operations Automation Guide</i></li> <li>• <i>Executing an Op Script from a Remote Site</i> in the <i>Junos OS Configuration and Operations Automation Guide</i></li> <li>• <a href="#">file checksum sha-256 on page 433</a></li> <li>• <a href="#">file checksum sha1 on page 432</a></li> <li>• <i>op</i></li> </ul> |
| <b>List of Sample Output</b>    | <a href="#">file checksum md5 on page 431</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Output Fields</b>            | When you enter this command, you are provided feedback on the status of your request.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

## Sample Output

### file checksum md5

```
user@host> file checksum md5 jbundle-5.3R2.4-export-signed.tgz
MD5 (jbundle-5.3R2.4-export-signed.tgz) = 2a3b69e43f9bd4893729cc16f505a0f5
```

## file checksum sha1

---

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>file checksum sha1 &lt;pathname&gt; filename</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Release Information</b>      | Command introduced in Junos OS Release 9.5.<br>Command introduced in Junos OS Release 9.5 for EX Series switches.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Description</b>              | Calculate the Secure Hash Algorithm (SHA-1) checksum of a file.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Options</b>                  | <b>pathname</b> —(Optional) Path to a filename.<br><br><b>filename</b> —Name of a local file for which to calculate the SHA-1 checksum.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Required Privilege Level</b> | maintenance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <i>Configuring Checksum Hashes for a Commit Script</i> in the <i>Junos OS Configuration and Operations Automation Guide</i></li><li>• <i>Configuring Checksum Hashes for an Event Script</i> in the <i>Junos OS Configuration and Operations Automation Guide</i></li><li>• <i>Configuring Checksum Hashes for an Op Script</i> in the <i>Junos OS Configuration and Operations Automation Guide</i></li><li>• <i>Executing an Op Script from a Remote Site</i> in the <i>Junos OS Configuration and Operations Automation Guide</i></li><li>• <a href="#">file checksum md5 on page 431</a></li><li>• <a href="#">file checksum sha-256 on page 433</a></li><li>• <i>op</i></li></ul> |
| <b>List of Sample Output</b>    | <a href="#">file checksum sha1 on page 432</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Output Fields</b>            | When you enter this command, you are provided feedback on the status of your request.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

## Sample Output

### file checksum sha1

```
user@host> file checksum sha1 /var/db/scripts/opscript.slax
```

```
SHA1 (/var/db/scripts/commitscript.slax) = ba9e47120c7ce55cff29afd73eacd370e162c676
```



## file checksum sha-256

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>file checksum sha-256 &lt;pathname&gt; filename</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Release Information</b>      | <p>Command introduced in Junos OS Release 9.5.</p> <p>Command introduced in Junos OS Release 9.5 for EX Series switches.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Description</b>              | Calculate the Secure Hash Algorithm 2 family (SHA-256) checksum of a file.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Options</b>                  | <p><b>pathname</b>—(Optional) Path to a filename.</p> <p><b>filename</b>—Name of a local file for which to calculate the SHA-256 checksum.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Required Privilege Level</b> | <p>maintenance</p> <p>view</p> <p>view-configuration</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <i>Configuring Checksum Hashes for a Commit Script</i> in the <i>Junos OS Configuration and Operations Automation Guide</i></li> <li>• <i>Configuring Checksum Hashes for an Event Script</i> in the <i>Junos OS Configuration and Operations Automation Guide</i></li> <li>• <i>Configuring Checksum Hashes for an Op Script</i> in the <i>Junos OS Configuration and Operations Automation Guide</i></li> <li>• <i>Executing an Op Script from a Remote Site</i> in the <i>Junos OS Configuration and Operations Automation Guide</i></li> <li>• <a href="#">file checksum md5 on page 431</a></li> <li>• <a href="#">file checksum sha1 on page 432</a></li> <li>• <i>op</i></li> </ul> |
| <b>List of Sample Output</b>    | <a href="#">file checksum sha-256 on page 433</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Output Fields</b>            | When you enter this command, you are provided feedback on the status of your request.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

## Sample Output

### file checksum sha-256

```

user@host> file checksum sha-256 /var/db/scripts/commitscript.slax

SHA256 (/var/db/scripts/commitscript.slax) =
94c2b061fb55399e15babd2529453815601a602b5c98e5c12ed929c9d343dd71

```

## file compare

---

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>file compare (files <i>filename filename</i>)</code><br><code>&lt;context   unified&gt;</code><br><code>&lt;ignore-white-space&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Release Information</b>      | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Description</b>              | <p>Compare two local files and describe the differences between them in default, context, or unified output styles:</p> <ul style="list-style-type: none"><li>• <b>Default</b>—In the first line of output, <b>c</b> means lines were changed between the two files, <b>d</b> means lines were deleted between the two files, and <b>a</b> means lines were added between the two files. The numbers preceding this alphabetical marker represent the first file, and the lines after the alphabetical marker represent the second file. A left angle bracket (&lt;) in front of output lines refers to the first file. A right angle bracket (&gt;) in front of output lines refers to the second file.</li><li>• <b>Context</b>—The display is divided into two parts. The first part is the first file; the second part is the second file. Output lines preceded by an exclamation point (!) have changed. Additions are marked with a plus sign (+), and deletions are marked with a minus sign (-).</li><li>• <b>Unified</b>—The display is preceded by the line number from the first and the second file (xx,xxx,x). Before the line number, additions to the file are marked with a plus sign (+), and deletions to the file are marked with a minus sign (-). The body of the output contains the affected lines. Changes are viewed as additions plus deletions.</li></ul> |
| <b>Options</b>                  | <p><b>files <i>filename</i></b>—Names of two local files to compare.</p> <p><b>context</b>—(Optional) Display output in context format.</p> <p><b>ignore-white-space</b>—(Optional) Ignore changes in the amount of white space.</p> <p><b>unified</b>—(Optional) Display output in unified format.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Required Privilege Level</b> | none                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Format for Specifying Filenames and URLs in Junos OS CLI Commands on page 40</a></li><li>• <a href="#">Viewing Core Files from Junos OS Processes on page 33</a></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>List of Sample Output</b>    | <a href="#">file compare files on page 436</a><br><a href="#">file compare files context on page 436</a><br><a href="#">file compare files unified on page 436</a><br><a href="#">file compare files unified ignore-white-space on page 436</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

**Output Fields** When you enter this command, you are provided feedback on the status of your request.

## Sample Output

### file compare files

```

user@host> file compare files /tmp/one /tmp/two
100c100
< full-name "File 1";

> full-name "File 2";
102c102
< class foo; # 'foo' is not defined

> class super-user;

```

### file compare files context

```

user@host> file compare files /tmp/one /tmp/two context
*** /tmp/one Wed Dec 3 17:12:50 2003
--- /tmp/two Wed Dec 3 09:13:14 2003

*** 97,104 ****
 }
 }
 user bill {
! full-name "Bill Smith";
! class foo; # 'foo' is not defined
 authentication {
 encrypted-password SECRET;
 }
--- 97,105 ----
 }
 user bill {
! full-name "Bill Smith";
! uid 1089;
! class super-user;
 authentication {
 encrypted-password SECRET;
 }

```

### file compare files unified

```

user@host> file compare files /tmp/one /tmp/two unified
--- /tmp/one Wed Dec 3 17:12:50 2003
+++ /tmp/two Wed Dec 3 09:13:14 2003
@@ -97,8 +97,9 @@
 }
}
user bill {
- full-name "Bill Smith";
- class foo; # 'foo' is not defined
+ full-name "Bill Smith";
+ uid 1089;
+ class super-user;
 authentication {
 encrypted-passwordSECRET;
 }

```

### file compare files unified ignore-white-space

```

user@host> file compare files /tmp/one /tmp/two unified ignore-white-space

```

```
--- /tmp/one Wed Dec 3 09:13:10 2003
+++ /tmp/two Wed Dec 3 09:13:14 2003
@@ -99,7 +99,7 @@
 user bill {
 full-name "Bill Smith";
 uid 1089;
- class foo; # 'foo' is not defined
+ class super-user;
 authentication {
 encrypted-password <SECRET>; # SECRET-DATA
 }
 }
```

## file delete

---

|                                 |                                                                                                                                                                                                                                                                                                           |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>file delete <i>filename</i></code><br><code>&lt;purge&gt;</code>                                                                                                                                                                                                                                    |
| <b>Release Information</b>      | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                        |
| <b>Description</b>              | Delete a file on the local router or switch.                                                                                                                                                                                                                                                              |
| <b>Options</b>                  | <b><i>filename</i></b> —Name of the file to delete. For a routing matrix, include chassis information in the filename if the file to be deleted is not local to the Routing Engine from which the command is issued.<br><br><b><i>purge</i></b> —(Optional) Overwrite regular files before deleting them. |
| <b>Required Privilege Level</b> | maintenance                                                                                                                                                                                                                                                                                               |
| <b>List of Sample Output</b>    | <a href="#">file delete on page 438</a><br><a href="#">file delete (Routing Matrix) on page 438</a>                                                                                                                                                                                                       |
| <b>Output Fields</b>            | When you enter this command, you are provided feedback on the status of your request.                                                                                                                                                                                                                     |

## Sample Output

### file delete

```
user@host> file list /var/tmp
dcd.core
rpd.core
snmpd.core

user@host> file delete /var/tmp/snmpd.core
user@host> file list /var/tmp
dcd.core
rpd.core
```

### file delete (Routing Matrix)

```
user@host> file list lcc0-re0:/var/tmp
dcd.core
rpd.core
snmpd.core

user@host> file delete lcc0-re0:/var/tmp/snmpd.core
user@host> file list /var/tmp
dcd.core
rpd.core
```

## file list

|                                 |                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | file list<br><detail   recursive><br><filename>                                                                                                                                                                                                                                                                                                                      |
| <b>Release Information</b>      | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                   |
| <b>Description</b>              | Display a list of files on the local router or switch.                                                                                                                                                                                                                                                                                                               |
| <b>Options</b>                  | <p><b>none</b>—Display a list of all files for the current directory.</p> <p><b>detail   recursive</b>—(Optional) Display detailed output or descend recursively through the directory hierarchy, respectively.</p> <p><b>filename</b>—(Optional) Display a list of files. For a routing matrix, the filename must include the chassis information.</p>              |
| <b>Additional Information</b>   | The default directory is the home directory of the user logged in to the router or switch. To view available directories, enter a space and then a backslash (/) after the <b>file list</b> command. To view files within a specific directory, include a backslash followed by the directory and, optionally, subdirectory name after the <b>file list</b> command. |
| <b>Required Privilege Level</b> | maintenance                                                                                                                                                                                                                                                                                                                                                          |
| <b>List of Sample Output</b>    | <a href="#">file list on page 439</a><br><a href="#">file list (Routing Matrix) on page 439</a>                                                                                                                                                                                                                                                                      |
| <b>Output Fields</b>            | When you enter this command, you are provided feedback on the status of your request.                                                                                                                                                                                                                                                                                |

## Sample Output

### file list

```
user@host> file list /var/tmp
dcd.core
rpd.core
snmpd.core
```

### file list (Routing Matrix)

```
user@host> file list lcc0-re0:var/tmp
lcc0-re0:

/var/tmp/:
.gdbinit
.pccardd
Test/
chassisd*
chassisd.nathan*
```

```
check_time*
cores/
diagTestPrep*
diagtest*
diagtest.user*
do_switchovers*
dump_test*
err.manoj.log
esw_clearstats*
esw_counter*
esw_debug*
esw_debug_ge*
esw_filt_test*
esw_filter_tnp_addr*
esw_getstats*
esw_phy*
esw_stats*
```



## file rename

|                                 |                                                                                                                                                                                                                                                                                       |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>file rename <i>source destination</i></code>                                                                                                                                                                                                                                    |
| <b>Release Information</b>      | <p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> |
| <b>Description</b>              | Rename a file on the local router or switch.                                                                                                                                                                                                                                          |
| <b>Options</b>                  | <p><i>destination</i>—New name for the file.</p> <p><i>source</i>—Original name of the file. For a routing matrix, the filename must include the chassis information.</p>                                                                                                             |
| <b>Required Privilege Level</b> | maintenance                                                                                                                                                                                                                                                                           |
| <b>List of Sample Output</b>    | <p><a href="#">file rename on page 441</a></p> <p><a href="#">file rename (Routing Matrix) on page 441</a></p>                                                                                                                                                                        |
| <b>Output Fields</b>            | When you enter this command, you are provided feedback on the status of your request.                                                                                                                                                                                                 |

## Sample Output

### file rename

The following example lists the files in `/var/tmp`, renames one of the files, and then displays the list of files again to reveal the newly named file.

```
user@host> file list /var/tmp
dcd.core
rpd.core
snmpd.core

user@host> file rename /var/tmp/dcd.core /var/tmp/dcd.core.990413
user@host> file list /var/tmp
dcd.core.990413
rpd.core
snmpd.core
```

### file rename (Routing Matrix)

The following example lists the files in `/var/tmp`, renames one of the files, and then displays the list of files again to reveal the newly named file.

```
user@host> file list lcc0-re1:/var/tmp
lcc0-re1:

/var/tmp:
.pccardd
sartre.conf
snmpd
syslogd.core-tarball.0.tgz
```

```
user@host> file rename lcc0-re0:/var/tmp/snmpd /var/tmp/snmpd.rr
user@host> file list lcc0-re1:/var/tmp
lcc0-re1:
```

```

/var/tmp:
.pccardd
sartre.conf
snmpd.rr
syslogd.core-tarball.0.tgz
```

## file show

|                                 |                                                                                                                                                                                                                                                                    |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>file show <i>filename</i></code><br><code>&lt;encoding (base64   raw)&gt;</code>                                                                                                                                                                             |
| <b>Release Information</b>      | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>              | Display the contents of a file.                                                                                                                                                                                                                                    |
| <b>Options</b>                  | <b><i>filename</i></b> —Name of a file. For a routing matrix, the filename must include the chassis information.<br><br><b><code>encoding (base64   raw)</code></b> —(Optional) Encode file contents with base64 encoding or show raw text.                        |
| <b>Required Privilege Level</b> | maintenance                                                                                                                                                                                                                                                        |
| <b>List of Sample Output</b>    | <a href="#">file show on page 443</a><br><a href="#">file show (Routing Matrix) on page 443</a>                                                                                                                                                                    |
| <b>Output Fields</b>            | When you enter this command, you are provided feedback on the status of your request.                                                                                                                                                                              |

## Sample Output

### file show

```
user@host> file show /var/log/messages
Apr 13 21:00:08 romney /kernel: so-1/1/2: loopback suspected; going to standby.
Apr 13 21:00:40 romney /kernel: so-1/1/2: loopback suspected; going to standby.
Apr 13 21:02:48 romney last message repeated 4 times
Apr 13 21:07:04 romney last message repeated 8 times
Apr 13 21:07:13 romney /kernel: so-1/1/0: Clearing SONET alarm(s) RDI-P
Apr 13 21:07:29 romney /kernel: so-1/1/0: Asserting SONET alarm(s) RDI-P
...
```

### file show (Routing Matrix)

```
user@host> file show lcc0-re0:/var/tmp/.gdbinit
lcc0-re0:

#####
Settings
#####

set print pretty

#####
Basic stuff
#####

define msgbuf
 printf "%s", msgbufp->msg_ptr
```


```

end
hex dump of a block of memory
usage: dump address length
define dump
 p $arg0, $arg1
 set $ch = $arg0
 set $j = 0
 set $n = $arg1
 while ($j < $n)
 #printf "%x %x ",&$ch[$j],$ch[$j]
 printf "%x ",$ch[$j]
 set $j = $j + 1
 if (!($j % 16))
 printf "\n"
 end
 end
end
end

```

## load

|                            |                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>              | load (factory-default   merge   override   patch   replace   set   update)<br>load ( <i>filename</i>   terminal) <relative>                                                                                                                                                                                                                                                              |
| <b>QFX Series</b>          | load (dhcp-snooping <i>filename</i> )                                                                                                                                                                                                                                                                                                                                                    |
| <b>Release Information</b> | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                             |
| <b>Description</b>         | Load a configuration from an ASCII configuration file, from terminal input, or from the factory default. Your current location in the configuration hierarchy is ignored when the load operation occurs.                                                                                                                                                                                 |
| <b>Options</b>             | <p><b>dhcp-snooping</b>—(QFX Series switches) Loads DHCP snooping entries.</p> <p><b>factory-default</b>—Loads the factory configuration. The factory configuration contains the manufacturer's suggested configuration settings. The factory configuration is the router or switch's first configuration and is loaded when the router or switch is first installed and powered on.</p> |

 **NOTE:** To load the factory default configuration, you must first *unprotect* any protected hierarchies in the configuration.

On J Series Services Routers, pressing and holding down the Config button on the router for 15 seconds causes the factory configuration to be loaded and committed. However, this operation deletes all other configurations on the router; using the **load factory-default** command does not.

**filename**—Name of the file to load. For information about specifying the filename, see *Viewing Files and Directories on a Device Running Junos OS*.

**merge**—Combine the configuration that is currently shown in the CLI with the configuration.

**override**—Discard the entire configuration that is currently shown in the CLI and load the entire configuration. Marks every object as changed.

**patch**—Change part of the configuration and mark only those parts as changed.

**replace**—Look for a **replace** tag in *filename*, delete the existing statement of the same name, and replace it with the configuration.

**set**—Merge a set of commands with an existing configuration. This option executes the configuration instructions line by line as they are stored in a file or from a terminal. The instructions can contain any configuration mode command, such as **set**, **edit**, **exit**, and **top**.

**relative**—(Optional) Use the **merge** or **replace** option without specifying the full hierarchy level.

**terminal**—Use the text you type at the terminal as input to the configuration. Type Ctrl+d to end terminal input.

**update**—Discard the entire configuration that is currently shown in the CLI, and load the entire configuration. Marks changed objects only.



**NOTE:** If you are using Junos OS in a Common Criteria environment, system log messages are created whenever a secret attribute is changed (for example, password changes or changes to the RADIUS shared secret). These changes are logged during the following configuration load operations:

```
load merge
load replace
load override
load update
```

For more information, see the *Secure Configuration Guide for Common Criteria and Junos-FIPS* .

---

|                                 |                                                                                                                                                     |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Required Privilege Level</b> | configure—To enter configuration mode, but other required privilege levels depend on where the statement is located in the configuration hierarchy. |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <i>Loading a Configuration from a File</i></li></ul>                                                        |


## ping

**List of Syntax**   [Syntax on page 447](#)  
                               [Syntax \(QFX Series\) on page 447](#)

**Syntax**   `ping host`  
                   <bypass-routing>  
                   <count *requests*>  
                   <detail>  
                   <do-not-fragment>  
                   <inet | inet6>  
                   <interface *source-interface*>  
                   <interval *seconds*>  
                   <logical-system *logical-system-name*>  
                   <loose-source *value*>  
                   <mac-address *mac-address*>  
                   <no-resolve>  
                   <pattern *string*>  
                   <rapid>  
                   <record-route>  
                   <routing-instance *routing-instance-name*>  
                   <size *bytes*>  
                   <source *source-address*>  
                   <strict>  
                   <strict-source *value*>  
                   <tos *type-of-service*>  
                   <ttl *value*>  
                   <verbose>  
                   <vpls *instance-name*>  
                   <wait *seconds*>

**Syntax (QFX Series)**   `ping host`  
                               <bypass-routing>  
                               <count *requests*>  
                               <detail>  
                               <do-not-fragment>  
                               <inet>  
                               <interface *source-interface*>  
                               <interval *seconds*>  
                               <logical-system *logical-system-name*>  
                               <loose-source *value*>  
                               <mac-address *mac-address*>  
                               <no-resolve>  
                               <pattern *string*>  
                               <rapid>  
                               <record-route>  
                               <routing-instance *routing-instance-name*>  
                               <size *bytes*>  
                               <source *source-address*>  
                               <strict>  
                               <strict-source *value*>  
                               <tos *type-of-service*>  
                               <ttl *value*>  
                               <verbose>

<wait *seconds*>

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Release Information</b> | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Description</b>         | Check host reachability and network connectivity. The <b>ping</b> command sends Internet Control Message Protocol (ICMP) ECHO_REQUEST messages to elicit ICMP ECHO_RESPONSE messages from the specified host. Press Ctrl+c to interrupt a ping command.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Options</b>             | <p><b>host</b>—IP address or hostname of the remote system to ping.</p> <p><b>bypass-routing</b>—(Optional) Bypass the normal routing tables and send ping requests directly to a system on an attached network. If the system is not on a directly attached network, an error is returned. Use this option to ping a local system through an interface that has no route through it.</p> <p><b>count requests</b>—(Optional) Number of ping requests to send. The range of values is 1 through 2,000,000,000. The default value is an unlimited number of requests.</p> <p><b>detail</b>—(Optional) Include in the output the interface on which the ping reply was received.</p> <p><b>do-not-fragment</b>—(Optional) Set the do-not-fragment (DF) flag in the IP header of the ping packets. For IPv6 packets, this option disables fragmentation.</p> <div><div></div><div><p><b>NOTE:</b> In Junos OS Release 11.1 and later, when issuing the <b>ping</b> command for an IPv6 route with the <b>do-not-fragment</b> option, the maximum ping packet size is calculated by subtracting 48 bytes (40 bytes for the IPV6 header and 8 bytes for the ICMP header) from the MTU. Therefore, if the ping packet size (including the 48-byte header) is greater than the MTU, the ping operation might fail.</p></div></div> |
|                            | <p><b>inet</b>—(Optional) Ping Packet Forwarding Engine IPv4 routes.</p> <p><b>inet6</b>—(Optional) Ping Packet Forwarding Engine IPv6 routes.</p> <p><b>interface source-interface</b>—(Optional) Interface to use to send the ping requests.</p> <p><b>interval seconds</b>—(Optional) How often to send ping requests. The range of values, in seconds, is 1 through infinity. The default value is 1.</p> <p><b>logical-system logical-system-name</b>—(Optional) Name of logical system from which to send the ping requests.</p> <p>Alternatively, enter the <b>set cli logical-system logical-system-name</b> command and then run the <b>ping</b> command. To return to the main router or switch, enter the <b>clear cli logical-system</b> command.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |



**loose-source *value***—(Optional) Intermediate loose source route entry (IPv4). Open a set of values.

**mac-address *mac-address***—(Optional) Ping the physical or hardware address of the remote system you are trying to reach.

**no-resolve**—(Optional) Do not attempt to determine the hostname that corresponds to the IP address.

**pattern *string***—(Optional) Specify a hexadecimal fill pattern to include in the ping packet.

**rapid**—(Optional) Send ping requests rapidly. The results are reported in a single message, not in individual messages for each ping request. By default, five ping requests are sent before the results are reported. To change the number of requests, include the **count** option.

**record-route**—(Optional) Record and report the packet's path (IPv4).

**routing-instance *routing-instance-name***—(Optional) Name of the routing instance for the ping attempt.

**size *bytes***—(Optional) Size of ping request packets. The range of values, in bytes, is **0** through **65,468**. The default value is **56**, which is effectively 64 bytes because 8 bytes of ICMP header data are added to the packet.

**source *source-address***—(Optional) IP address of the outgoing interface. This address is sent in the IP source address field of the ping request. If this option is not specified, the default address is usually the loopback interface (**lo.0**).

**strict**—(Optional) Use the strict source route option (IPv4).

**strict-source *value***—(Optional) Intermediate strict source route entry (IPv4). Open a set of values.

**tos *type-of-service***—(Optional) Set the type-of-service (ToS) field in the IP header of the ping packets. The range of values is **0** through **255**.

If the device configuration includes the **dscp-code-point *value*** statement at the **[edit class-of-service host-outbound-traffic]** hierarchy level, the configured DSCP value overrides the value specified in this command option. In this case, the ToS field of ICMP echo request packets sent on behalf of this command carries the DSCP value specified in the **dscp-code-point** configuration statement instead of the value you specify in this command option.

**ttl *value***—(Optional) Time-to-live (TTL) value to include in the ping request (IPv6). The range of values is **0** through **255**.

**verbose**—(Optional) Display detailed output.

**vpls *instance-name***—(Optional) Ping the instance to which this VPLS belongs.

**wait *seconds***—(Optional) Maximum wait time, in seconds, after the final packet is sent. If this option is not specified, the default delay is **10** seconds. If this option is used without the count option, a default count of **5** packets is used.

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Required Privilege Level | network                                                                                                                                                                                                                                                                                                                                                                                                            |
| Related Documentation    | <ul style="list-style-type: none"><li>• <i>Configuring Junos OS ICMPv4 Rate Limit for ICMPv4 Routing Engine Messages</i></li></ul>                                                                                                                                                                                                                                                                                 |
| List of Sample Output    | <a href="#">ping hostname on page 450</a><br><a href="#">ping hostname rapid on page 450</a><br><a href="#">ping hostname size count on page 450</a>                                                                                                                                                                                                                                                               |
| Output Fields            | When you enter this command, you are provided feedback on the status of your request. An exclamation point (!) indicates that an echo reply was received. A period (.) indicates that an echo reply was not received within the timeout period. An x indicates that an echo reply was received with an error code. These packets are not counted in the received packets count. They are accounted for separately. |

## Sample Output

### ping hostname

```
user@host> ping skye
PING skye.net (192.168.169.254): 56 data bytes
64 bytes from 192.168.169.254: icmp_seq=0 ttl=253 time=1.028 ms
64 bytes from 192.168.169.254: icmp_seq=1 ttl=253 time=1.053 ms
64 bytes from 192.168.169.254: icmp_seq=2 ttl=253 time=1.025 ms
64 bytes from 192.168.169.254: icmp_seq=3 ttl=253 time=1.098 ms
64 bytes from 192.168.169.254: icmp_seq=4 ttl=253 time=1.032 ms
64 bytes from 192.168.169.254: icmp_seq=5 ttl=253 time=1.044 ms
^C [abort]
```

### ping hostname rapid

```
user@host> ping skye rapid
PING skye.net (192.168.169.254): 56 data bytes
!!!!
--- skye.net ping statistics ---
5 packets transmitted, 5 packets received, 0% packet loss
round-trip min/avg/max/stddev = 0.956/0.974/1.025/0.026 ms
```

### ping hostname size count

```
user@host> ping skye size 200 count 5
PING skye.net (192.168.169.254): 200 data bytes
208 bytes from 192.168.169.254: icmp_seq=0 ttl=253 time=1.759 ms
208 bytes from 192.168.169.254: icmp_seq=1 ttl=253 time=2.075 ms
208 bytes from 192.168.169.254: icmp_seq=2 ttl=253 time=1.843 ms
208 bytes from 192.168.169.254: icmp_seq=3 ttl=253 time=1.803 ms
208 bytes from 192.168.169.254: icmp_seq=4 ttl=253 time=17.898 ms

--- skye.net ping statistics ---
5 packets transmitted, 5 packets received, 0% packet loss
round-trip min/avg/max = 1.759/5.075/17.898 ms
```

## request chassis beacon

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax (QFX Series)</b>      | <pre>request chassis beacon &lt;all (off   on)&gt; &lt;fpc slot-number (off   on)&gt; &lt;interconnect-device name (cb slot-number   fpc slot-number   (off   on)&gt; &lt;node-device name (off   on)&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Release Information</b>      | <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Description</b>              | (QFX Series only) Enable or disable the beacon LED on a QFX Series device.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Options</b>                  | <p><b>all</b>—Turn the beacon LED either <b>on</b> or <b>off</b> on all QFabric system Interconnect and Node devices.</p> <p><b>cb slot-number</b>—Turn the beacon LED either <b>on</b> or <b>off</b> on the Control Board of the QFX3008-I Interconnect device.</p> <p><b>fpc slot-number</b>—Turn the beacon LED either <b>on</b> or <b>off</b> on the Flexible PIC Concentrator on the standalone QFX3500 switch or the Interconnect device.</p> <p><b>interconnect-device name</b>—Turn the beacon LED either <b>on</b> or <b>off</b> on the Interconnect device.</p> <p><b>node-device name</b>—Turn the beacon LED either <b>on</b> or <b>off</b> on the Node device.</p> <p><b>off</b>—Turn the beacon LED <b>off</b>.</p> <p><b>on</b>—Turn the beacon LED <b>on</b>.</p> |
| <b>Required Privilege Level</b> | maintenance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">show chassis beacon on page 590</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>List of Sample Output</b>    | <a href="#">request chassis beacon fpc 0 on (QFX Series) on page 451</a><br><a href="#">request chassis beacon node-device (QFabric System) on page 451</a><br><a href="#">request chassis beacon on interconnect-device fpc (QFabric System) on page 452</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Output Fields</b>            | When you enter this command, you are provided feedback on the status of your request.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

## Sample Output

### request chassis beacon fpc 0 on (QFX Series)

```
user@switch> request chassis beacon fpc 0 on

Beacon set to ON
```

### request chassis beacon node-device (QFabric System)

```
user@switch> request chassis beacon node-device node1 on
```

node1 ON

**request chassis beacon on interconnect-device fpc (QFabric System)**

user@switch> request chassis beacon on interconnect-device fpc 2

FPC 2 ON

## request chassis fpc

|                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                                | <a href="#">Syntax on page 453</a><br><a href="#">Syntax (TX Matrix and TX Matrix Plus Routers) on page 453</a><br><a href="#">Syntax (MX Series Routers) on page 453</a><br><a href="#">Syntax (MX2020 3D Universal Edge Routers) on page 453</a><br><a href="#">Syntax (MX2010 3D Universal Edge Routers) on page 453</a><br><a href="#">Syntax (QFabric System) on page 453</a><br><a href="#">Syntax (PTX Series Packet Transport Routers) on page 453</a>                                                                                             |
| <b>Syntax</b>                                        | <code>request chassis fpc (offline   online   restart) slot <i>slot-number</i></code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Syntax (TX Matrix and TX Matrix Plus Routers)</b> | <code>request chassis fpc (offline   online   restart) slot <i>slot-number</i> &lt;lcc <i>number</i>&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Syntax (MX Series Routers)</b>                    | <code>request chassis fpc (offline   online   restart) slot <i>slot-number</i> &lt;all-members&gt; &lt;local&gt; &lt;member <i>member-id</i>&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Syntax (MX2020 3D Universal Edge Routers)</b>     | <code>request chassis fpc (offline   online   restart) slot <i>slot-number</i></code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Syntax (MX2010 3D Universal Edge Routers)</b>     | <code>request chassis fpc (offline   online   restart) slot <i>slot-number</i></code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Syntax (QFabric System)</b>                       | <code>request chassis fpc &lt;interconnect-device <i>name</i> slot <i>slot-number</i> (offline   online)&gt; &lt;(offline   online) interconnect-device <i>name</i> slot <i>slot-number</i>&gt; &lt;slot <i>slot-number</i> interconnect-device <i>name</i> (offline   online)&gt;</code>                                                                                                                                                                                                                                                                  |
| <b>Syntax (PTX Series Packet Transport Routers)</b>  | <code>request chassis fpc (offline   online   restart) slot <i>slot-number</i></code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Release Information</b>                           | <p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS 11.3 for QFX Series.</p> <p>Command introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> |
| <b>Description</b>                                   | (M20, M40, M40e, M120, M160, M320, MX Series, and T Series routers, QFabric systems, EX Series switches, and PTX Series Packet Transport Routers only) Control the operation of the Flexible PIC Concentrator (FPC). For information about the meaning of “FPCs” on the switches, see <i>EX Series Switches Hardware and CLI Terminology Mapping</i> .                                                                                                                                                                                                     |



**NOTE:** Beginning in Junos OS Release 12.3, it is possible that FPCs brought offline using the request chassis fpc slot *fpc-slot* offline operational-mode CLI command can come online during a configuration commit or power-supply replacement procedure. As an alternative, use the set fpc *fpc-slot* power off configuration-mode command at the [edit chassis] hierarchy level to ensure that the FPCs remain offline.

**Options**    **offline**—Take the FPC offline.

**online**—Bring the FPC online.

**interconnect-device *name***—(QFabric systems only) Bring the Flexible Port Concentrator (FPC) on the QFX3008-I Interconnect device either offline or online:

- (QFabric System) On a QFabric system, specify the name of the QFX3008-I Interconnect device containing the Flexible Port Concentrator (FPC) you want to bring either offline or online.

**restart**—Restart the FPC.

**slot *slot-number***—FPC slot number:

- M20 router—0 through 3.
- M120 router—0 through 5.
- MX240 router—0 through 2. On the MX240 router, slot-number corresponds to the Dense Port Concentrator (DPC) slot number. If an MPC is installed, slot-number corresponds to the MPC slot number.
- MX480 router—0 through 5. On the MX480 router, slot-number corresponds to the Dense Port Concentrator (DPC) slot number. If an MPC is installed, slot-number corresponds to the MPC slot number.
- MX960 router—0 through 11. On the MX960 router, slot-number corresponds to the Dense Port Concentrator (DPC) slot number. If an MPC is installed, slot-number corresponds to the MPC slot number.
- MX2020 router—0 through 19.
- MX2010 router—0 through 9.
- TX Matrix and TX Matrix Plus routers only—On the TX Matrix router, if you specify the number of the T640 router by using the **lcc *number*** option (the recommended method), replace **slot-number** with a value from 0 through 7. Otherwise, replace **slot-number** with a value from 0 through 31.

Likewise, on a TX Matrix Plus router, if you specify the number of the T1600 or T4000 router by using the **lcc *number*** option (the recommended method), replace **slot-number** with a value from 0 through 7. Otherwise, replace **slot-number** with a value from 0 through 31. In case of TX Matrix Plus router with 3D SIBs, replace

*slot-number* with a value from 0 through 63. For example, the following commands have the same result:

```
user@host> request chassis fpc lcc 1 slot 1 offline
user@host> request chassis fpc slot 9 offline
```

- Other routers—0 through 7.
- QFabric System—Replace *slot-number* with a value from 0 through 2.
- EX Series switches:
  - EX4200 switches in a Virtual Chassis configuration—Replace *slot-number* with a value from 0 through 9.
  - EX6210 switches—Replace *slot-number* with a value from 0 through 9.



**NOTE:** These commands are not supported for slots 4 and 5 when a Switch Fabric and Routing Engine (SRE) module is installed in those slots. These commands are supported for slots 4 and 5 only if a line card is installed in them.

- EX8208 switches—Replace *slot-number* with a value from 0 through 7.
- EX8216 switches—Replace *slot-number* with a value from 0 through 15.
- PTX5000 Packet Transport Router—Replace *slot-number* with a value from 0 through 7.

**all-members**—(MX Series routers only) (Optional) Change FPC status of all members of the Virtual Chassis configuration.

**local**—(MX Series routers only) (Optional) Change FPC status of the local Virtual Chassis member.

**member *member-id***—(MX Series routers only) (Optional) Change FPC status of the specified member of the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

**lcc *number***—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.

- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**Required Privilege Level** maintenance

**Related Documentation**

- [show chassis fpc on page 720](#)
- *show chassis fpc-feb-connectivity*
- *show chassis fabric fpcs*
- *Configuring the Junos OS to Make a Flexible PIC Concentrator Stay Offline*
- *Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online*
- *MX960 Flexible PIC Concentrator Description*

**List of Sample Output**

- [request chassis fpc on page 456](#)
- [request chassis fpc \(MX Series Routers with Media Services Blade \[MSB\]\) on page 456](#)
- [request chassis fpc \(MX2020 Router\) on page 456](#)
- [request chassis fpc \(MX2010 Router\) on page 456](#)

**Output Fields** When you enter this command, you are provided feedback on the status of your request.

## Sample Output

### [request chassis fpc](#)

```
user@host> request chassis fpc online slot 0
FPC 0 already online
```

### [request chassis fpc \(MX Series Routers with Media Services Blade \[MSB\]\)](#)

```
user@host> request chassis fpc slot 0
Possible completions:
offline Take FPC offline
online Bring FPC online
restart Restart FPC
```

### [request chassis fpc \(MX2020 Router\)](#)

```
user@host >request chassis fpc online slot 2
FPC 2 already online
```

### [request chassis fpc \(MX2010 Router\)](#)

```
user@host >request chassis fpc offline slot 5
Offline initiated, use "show chassis fpc" to verify
```



## request chassis pic

|                                                      |                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                                | <a href="#">Syntax on page 457</a><br><a href="#">Syntax (ACX4000 Series Routers) on page 457</a><br><a href="#">Syntax (TX Matrix and TX Matrix Plus Routers) on page 457</a>                                                                                                                                                         |
| <b>Syntax</b>                                        | <code>request chassis pic (offline   online) fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i></code>                                                                                                                                                                                                                            |
| <b>Syntax (ACX4000 Series Routers)</b>               | <code>request chassis pic (offline   online) fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i></code>                                                                                                                                                                                                                            |
| <b>Syntax (TX Matrix and TX Matrix Plus Routers)</b> | <code>request chassis pic (offline   online) fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i> &lt;lcc <i>number</i>&gt;</code>                                                                                                                                                                                                  |
| <b>Release Information</b>                           | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br>Command introduced in Junos OS Release 12.3 for ACX4000 Routers.<br>Command introduced in Junos OS Release 13.2 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>                                   | Control the operation of the PIC.                                                                                                                                                                                                                                                                                                      |



**NOTE:** The `request chassis pic (offline | online) fpc-slot slot number pic-slot slot-number` command is not supported for built-in PICs on MX Series routers.

To view a list of built-in PICs on the router or switch chassis, use the `show chassis hardware` command.



**NOTE:** This command is not supported on MX960 and MX2020 routers with MPC5EQ.



**NOTE:** T1600 routers and TX Matrix Plus routers with 100-Gigabit Ethernet PICs require two adjacent PIC slots, 0 and 1, for each PIC. Therefore, only online and offline command options to PIC slot 0 are allowed. Use of the online and offline command options for PIC slot 1 with the described router and PIC combination is not allowed.



**NOTE:** In T Series routers, when the PIC state is set from offline to online or vice-versa before the processing is complete for the previous command, you are provided feedback on the status of your request. The following sample messages are displayed if you try to set a PIC offline or online:

```
user@switch> request chassis pic fpc-slot 1 pic-slot 0 online
fpc 1 pic 0 online initiated, use "show chassis fpc pic-status" to verify
```

```
user@switch> request chassis pic fpc-slot 1 pic-slot 0 online
FPC 1 PIC 0 already transitioning to online
```

When the same PIC is set to a different state while the transition is in progress, you are provided feedback on the status of your request.

```
user@switch> request chassis pic fpc-slot 1 pic-slot 0 offline
FPC 1, PIC 0 already transitioning to online. Please retry later.
```

**Options**    **offline**—Take the PIC offline.

**online**—Bring the PIC online.

**fpc-slot *slot-number***—Flexible PIC Concentrator (FPC) slot number. Replace *slot-number* with a value appropriate for your router or switch:

- ACX4000 routers—1 or 2.
- EX Series switches:
  - EX3200 switches and EX4200 standalone switches—0.
  - EX4200 switches in a Virtual Chassis configuration—0 through 9 (switch's member ID).
  - EX8208 switches—0 through 7 (line card).
  - EX8216 switches—0 through 15 (line card).
- M5, M7i, M10, and M10i routers—0 or 1.
- M20 routers—0 through 3.
- M40 and M40e routers—0 through 7.
- M120 routers—0 through 5.
- M160 routers—0 through 7.
- M320 routers—0 through 7.
- MX 5, MX10, and MX40 routers—0 or 1.
- MX80 routers—0 or 1.
- MX240 routers—0 through 2
- MX480 routers—0 through 5
- MX2020 routers—0 through 19.

- MX2010 routers—0 through 9.
- MX960 routers—0 through 11.
- PTX5000 routers—0 or 1.
- T Series routers—0 through 7.
- TX Matrix and TX Matrix Plus routers only—On a TX Matrix router, if you specify the number of the T640 router by using the **lcc number** option (the recommended method), replace **slot-number** with a value from 0 through 7. Otherwise, replace **slot-number** with a value from 0 through 31.

Likewise, on a TX Matrix Plus router, if you specify the **number** of the T1600 or T4000 router by using the **lcc number** option (the recommended method), replace **slot-number** with a value from 0 through 7. Otherwise, for the FPC slot number, replace **slot-number** with a value from 0 through 31. On a TX Matrix Plus router with 3D SIBs to assign the FPC slot number, replace **slot-number** with a value from 0 through 63. For example, the following commands have the same result:

```
user@host> request chassis pic fpc-slot 1 lcc 1 pic-slot 0 offline
user@host> request chassis pic fpc-slot 9 pic-slot 0 offline
```

- QFX5100 standalone switches—0.

**pic-slot slot-number**—PIC slot number.

- EX3200 and EX4200 switches—0 for built-in network interfaces and 1 for interfaces on uplink modules.
- EX8208 and EX8216 switches—0.
- M Series routers—0, 1, 2, or 3
- MX960 router—**slot-number** corresponds to the slot number of the Packet Forwarding Engine.
- PTX5000 routers—0 or 1.
- T320 router—0 or 1.
- T640 router—0, 1, 2, or 3.
- T1600 router —0, 1, 2, or 3.
- T4000 router—0, 1, 2, or 3.
- QFX5100 standalone switches—0, 1, or 2. PIC 0 is used for all interfaces that are not configured on expansion modules, and PIC 1 and PIC 2 are used for interfaces configured on expansion modules.

**lcc number**—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**Required Privilege Level** maintenance

**Related Documentation**

- [show chassis hardware on page 758](#)
- [show chassis pic on page 966](#)
- *Configuring the PIC Type*

**List of Sample Output** [request chassis pic on page 460](#)

**Output Fields** When you enter this command, you are provided feedback on the status of your request.

## Sample Output

[request chassis pic](#)

```
user@host> request chassis pic pic-slot 0 online fpc-slot 0
FPC 0, PIC 0 is already online
```

## request chassis routing-engine master

|                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                                 | <a href="#">Syntax on page 461</a><br><a href="#">Syntax (M Series, MX Series, T Series Routers) on page 461</a><br><a href="#">Syntax (TX Matrix Routers) on page 461</a><br><a href="#">Syntax (TX Matrix Plus Routers) on page 461</a><br><a href="#">Syntax (MX Series Virtual Chassis) on page 461</a><br><a href="#">Syntax (QFX Series) on page 461</a>                                                                                                                                                                                                                                                                                                                                                         |
| <b>Syntax</b>                                         | request chassis routing-engine master (acquire   release   switch)<br><force><br><no-confirm>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Syntax (M Series, MX Series, T Series Routers)</b> | request chassis routing-engine master (acquire   release   switch <check>)<br><no-confirm>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Syntax (TX Matrix Routers)</b>                     | request chassis routing-engine master (acquire   release   switch) (lcc <i>number</i>   scc   all-chassis)<br><force><br><no-confirm>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Syntax (TX Matrix Plus Routers)</b>                | request chassis routing-engine master (acquire   release   switch) (lcc <i>number</i>   sfc   all-chassis   all-lcc)<br><force><br><no-confirm>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Syntax (MX Series Virtual Chassis)</b>             | request chassis routing-engine master (acquire   release   switch <check>)<br><all-members><br><local><br><member <i>member-id</i> ><br><no-confirm>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Syntax (QFX Series)</b>                            | request chassis routing-engine master (release   switch)<br><check><br><interconnect-device <i>name</i> ><br><node-group <i>name</i> ><br><no-confirm>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Release Information</b>                            | <p>Command introduced before Junos OS Release 7.4.</p> <p><b>all-chassis</b> option added in Junos OS Release 8.0.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p><b>sfc</b> option introduced for the TX Matrix Plus router in Junos OS Release 9.6.</p> <p>Command introduced in Junos OS Release 11.3 for QFX Series.</p> <p>Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> |
| <b>Description</b>                                    | For routers or switches with multiple Routing Engines, control which Routing Engine is the master.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |



**CAUTION:** (Routing matrix based on the TX Matrix or TX Matrix Plus routers only) Within the routing matrix, we recommend that all Routing Engines run the same Junos OS Release. If you run different releases on the Routing Engines and a change in mastership occurs on any backup Routing Engine in the routing matrix, one or all routers (in a routing matrix based on the TX Matrix router or in a routing matrix based on a TX Matrix Plus router) might become logically disconnected from the TX Matrix router and cause data loss. For more information, see the [TX Matrix Router Hardware Guide](#) or the *Junos OS High Availability Library for Routing Devices*.



**NOTE:** Successive graceful Routing Engine switchover events must be a minimum of 240 seconds (4 minutes) apart after both Routing Engines have come up.

If the router or switch displays a warning message similar to “Standby Routing Engine is not ready for graceful switchover. Packet Forwarding Engines that are not ready for graceful switchover might be reset,” do not attempt switchover. If you choose to proceed with switchover, only the Packet Forwarding Engines that were not ready for graceful switchover are reset. None of the Flexible PIC concentrators (FPCs) should spontaneously restart. We recommend that you wait until the warning no longer appears and then proceed with the switchover.

You will receive an error message stating “Command aborted. Not ready for mastership switch, try after n seconds” when this command is re-entered before 240 seconds have elapsed on EX Series switches.



**NOTE:** On a QFabric system, to avoid traffic loss on the network Node group, switch mastership of the routing engine to the backup routing engine, and then reboot.

**Options**    **acquire**—Attempt to become the master Routing Engine.

**release**—Request that the other Routing Engine become the master.

**switch**—Toggle mastership between Routing Engines.



**NOTE:** The **acquire** option should be used with caution because acquiring a Routing Engine may result in a corrupted database. If possible, use the **switch** option instead.

The **acquire**, **release**, and **switch** options have the following suboptions:

**all-chassis**—(TX Matrix and TX Matrix Plus routers only) On a routing matrix composed of a TX Matrix router and the attached T640 routers, switch mastership on all the Routing Engines in the routing matrix. Likewise, on a routing matrix composed of a TX Matrix Plus router and the attached T1600 or T4000 routers, switch mastership on all the Routing Engines in the routing matrix.

**all-lcc**—(TX Matrix Plus routers only) Request to acquire mastership for all line-card chassis (LCC).

**all-members**—(MX Series routers only) (Optional) Control Routing Engine mastership on the Routing Engines in all member routers of the Virtual Chassis configuration.

**check**—(QFabric systems, MX104, MX480, MX960, MX2010, and MX2020 routers, and PTX5000 routers only) (Optional) Available only with the **switch** option. Check graceful switchover status of the standby Routing Engine before toggling mastership between Routing Engines.

**interconnect-device *name***—(QFabric systems only) (Optional) Control Routing Engine mastership on the Routing Engines on an Interconnect device.

**lcc *number***—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(MX Series routers only) (Optional) Control Routing Engine mastership on the Routing Engines in the local Virtual Chassis member.

**member *member-id***—(MX Series routers only) (Optional) Control Routing Engine mastership on the Routing Engines of the specified member in the Virtual Chassis Configuration. Replace *member-id* with a value of 0 or 1.

**no-confirm**—(Optional) Do not request confirmation for the switch.

**node-group *name***—(QFabric systems only) (Optional) Control Routing Engine mastership on the Routing Engines on a Node group.

**scc**—(TX Matrix routers only) TX Matrix (switch-card chassis).

**sfc**—(TX Matrix Plus routers only) TX Matrix Plus router (or switch-fabric chassis).

**force**—(Optional) Available only with the **acquire** option. Force the change to a new master Routing Engine.



**NOTE:** The **force** option is not supported on the M Series, MX Series, or T Series routers.

#### Additional Information

Because both Routing Engines are always running, the transition from one to the other as the master Routing Engine is immediate. However, the changeover interrupts communication to the System and Switch Board (SSB). The SSB takes several seconds to reinitialize the Flexible PIC Concentrators (FPCs) and restart the PICs. Interior gateway protocol (IGP) and BGP convergence times depend on the specific network environment.

By default, the Routing Engine in slot 0 (**RE0**) is the master and the Routing Engine in slot 1 (**RE1**) is the backup. To change the default master Routing Engine, include the **routing-engine** statement at the **[edit chassis redundancy]** hierarchy level in the configuration. For more information, see the *Junos OS Administration Library for Routing Devices*

To have the backup Routing Engine become the master Routing Engine, use the **request chassis routing-engine master switch** command. If you use this command to change the master and then restart the chassis software for any reason, the master reverts to the default setting.



**NOTE:** Although the configurations on the two Routing Engines do not have to be the same and are not automatically synchronized, we recommend making both configurations the same.

#### Required Privilege Level

maintenance

#### Related Documentation

- [show chassis routing-engine on page 982](#)
- [Configuring Routing Engine Redundancy](#)
- [Switching the Global Master and Backup Roles in a Virtual Chassis Configuration](#)

#### List of Sample Output

[request chassis routing-engine master acquire on page 465](#)  
[request chassis routing-engine master switch on page 465](#)  
[request chassis routing-engine master switch check on page 465](#)

#### Output Fields

When you enter this command, you are provided feedback on the status of your request.



## Sample Output

### request chassis routing-engine master acquire

```
user@host> request chassis routing-engine master acquire

warning: Traffic will be interrupted while the PFE is re-initialized

warning: The other routing engine's file system could be corrupted

Reset other routing engine and become master ? [yes,no] (no)
```

### request chassis routing-engine master switch

```
user@host> request chassis routing-engine master switch

warning: Traffic will be interrupted while the PFE is re-initialized
Toggle mastership between Routing Engines ? [yes,no] (no) yes

Resolving mastership...
Complete. The other Routing Engine becomes the master.
```

Switch mastership back to the local Routing Engine:

```
user@host> request chassis routing-engine master switch

warning: Traffic will be interrupted while the PFE is re-initialized
Toggle mastership between routing engines ? [yes,no] (no) yes

Resolving mastership...
Complete. The local routing engine becomes the master.
```

### request chassis routing-engine master switch check

```
Usage shown for M Series, MX Series, and T Series routers.

{master}[edit]

user@host> request chassis routing-engine master switch check

warning: Standby Routing Engine is not ready for graceful switchover.

{master}[edit]

user@host> request chassis routing-engine master switch check
Switchover Ready

You can similarly check the backup Routing Engine.
```

## request message

---


|                                 |                                                                                                                                                                                                                                                                                                                                   |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>request message all message "text"</code><br><code>request message message "text" (terminal <i>terminal-name</i>   user <i>user-name</i>)</code>                                                                                                                                                                            |
| <b>Release Information</b>      | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                |
| <b>Description</b>              | Display a message on the screens of all users who are logged in to the router or switch or on specific screens.                                                                                                                                                                                                                   |
| <b>Options</b>                  | <b>all</b> —Display a message on the terminal of all users who are currently logged in.<br><br><b>message "text"</b> —Message to display.<br><br><b>terminal <i>terminal-name</i></b> —Name of the terminal on which to display the message.<br><br><b>user <i>user-name</i></b> —Name of the user to whom to direct the message. |
| <b>Required Privilege Level</b> | maintenance                                                                                                                                                                                                                                                                                                                       |
| <b>List of Sample Output</b>    | <a href="#">request message message on page 466</a>                                                                                                                                                                                                                                                                               |
| <b>Output Fields</b>            | When you enter this command, you are provided feedback on the status of your request.                                                                                                                                                                                                                                             |

## Sample Output

### request message message

```
user@host> request message message "Maintenance window in 10 minutes" user maria
Message from user@host on tty0 at 20:27 ...
Maintenance window in 10 minutes
EOF
```

## request system configuration rescue delete

|                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                                                                                                                                                                                     | request system configuration rescue delete                                                                                                                                                                                                                                            |
| <b>Release Information</b>                                                                                                                                                                        | <p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> |
| <b>Description</b>                                                                                                                                                                                | Delete an existing rescue configuration.                                                                                                                                                                                                                                              |
| <div>  <p><b>NOTE:</b> The [edit system configuration] hierarchy is not available on QFabric systems.</p> </div> |                                                                                                                                                                                                                                                                                       |
| <b>Options</b>                                                                                                                                                                                    | This command has no options.                                                                                                                                                                                                                                                          |
| <b>Required Privilege Level</b>                                                                                                                                                                   | maintenance                                                                                                                                                                                                                                                                           |
| <b>Related Documentation</b>                                                                                                                                                                      | <ul style="list-style-type: none"> <li>• <a href="#">request system configuration rescue save on page 468</a></li> <li>• <a href="#">request system software rollback on page 1313</a></li> <li>• <a href="#">show system commit on page 1078</a></li> </ul>                          |
| <b>List of Sample Output</b>                                                                                                                                                                      | <a href="#">request system configuration rescue delete on page 467</a>                                                                                                                                                                                                                |
| <b>Output Fields</b>                                                                                                                                                                              | This command produces no output.                                                                                                                                                                                                                                                      |


### Sample Output

#### request system configuration rescue delete

```
user@host> request system configuration rescue delete
```

## request system configuration rescue save

---

|                                                                                                                                                                                          |                                                                                                                                                                                                                                                                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                                                                                                                                                                            | request system configuration rescue save                                                                                                                                                                                                                           |
| <b>Release Information</b>                                                                                                                                                               | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>                                                                                                                                                                       | Save the most recently committed configuration as the rescue configuration so that you can return to it at any time by using the <b>rollback</b> command.                                                                                                          |
| <div> <b>NOTE:</b> The [edit system configuration] hierarchy is not available on QFabric systems.</div> |                                                                                                                                                                                                                                                                    |
| <b>Options</b>                                                                                                                                                                           | This command has no options.                                                                                                                                                                                                                                       |
| <b>Required Privilege Level</b>                                                                                                                                                          | maintenance                                                                                                                                                                                                                                                        |
| <b>Related Documentation</b>                                                                                                                                                             | <ul style="list-style-type: none"><li>• <a href="#">request system software delete on page 1307</a></li><li>• <a href="#">request system software rollback on page 1313</a></li><li>• <a href="#">show system commit on page 1078</a></li></ul>                    |
| <b>List of Sample Output</b>                                                                                                                                                             | <a href="#">request system configuration rescue save on page 468</a>                                                                                                                                                                                               |
| <b>Output Fields</b>                                                                                                                                                                     | This command produces no output.                                                                                                                                                                                                                                   |

### Sample Output

request system configuration rescue save

```
user@host> request system configuration rescue save
```

## request system halt

|                                       |                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                 | <a href="#">Syntax on page 469</a><br><a href="#">Syntax (EX Series Switches) on page 469</a><br><a href="#">Syntax (PTX Series) on page 469</a><br><a href="#">Syntax (TX Matrix Router) on page 469</a><br><a href="#">Syntax (TX Matrix Plus Router) on page 469</a><br><a href="#">Syntax (MX Series Router) on page 470</a><br><a href="#">Syntax (QFX Series) on page 470</a> |
| <b>Syntax</b>                         | <pre>request system halt &lt;at <i>time</i>&gt; &lt;backup-routing-engine&gt; &lt;both-routing-engines&gt; &lt;other-routing-engine&gt; &lt;in <i>minutes</i>&gt; &lt;media (compact-flash   disk   removable-compact-flash   usb)&gt; &lt;message "<i>text</i>"&gt;</pre>                                                                                                          |
| <b>Syntax (EX Series Switches)</b>    | <pre>request system halt &lt;all-members&gt; &lt;at <i>time</i>&gt; &lt;backup-routing-engine&gt; &lt;both-routing-engines&gt; &lt;in <i>minutes</i>&gt; &lt;local&gt; &lt;media (external   internal)&gt; &lt;member <i>member-id</i>&gt; &lt;message "<i>text</i>"&gt; &lt;other-routing-engine&gt; &lt;slice <i>slice</i>&gt;</pre>                                              |
| <b>Syntax (PTX Series)</b>            | <pre>request system halt &lt;at <i>time</i>&gt; &lt;backup-routing-engine&gt; &lt;both-routing-engines&gt; &lt;other-routing-engine&gt; &lt;in <i>minutes</i>&gt; &lt;media (compact-flash   disk)&gt; &lt;message "<i>text</i>"&gt;</pre>                                                                                                                                          |
| <b>Syntax (TX Matrix Router)</b>      | <pre>request system halt &lt;all-lcc   lcc <i>number</i>   scc&gt; &lt;at <i>time</i>&gt; &lt;backup-routing-engine&gt; &lt;both-routing-engines&gt; &lt;other-routing-engine&gt; &lt;in <i>minutes</i>&gt; &lt;media (compact-flash   disk)&gt; &lt;message "<i>text</i>"&gt;</pre>                                                                                                |
| <b>Syntax (TX Matrix Plus Router)</b> | <pre>request system halt &lt;all-chassis   all-lcc   lcc <i>number</i>   sfc <i>number</i>&gt;</pre>                                                                                                                                                                                                                                                                                |

|                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                  | <pre>&lt;at <i>time</i>&gt; &lt;backup-routing-engine&gt; &lt;both-routing-engines&gt; &lt;other-routing-engine&gt; &lt;in <i>minutes</i>&gt; &lt;media (compact-flash   disk)&gt; &lt;message "<i>text</i>"&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Syntax (MX Series Router)</b> | <pre>request system halt &lt;all-members&gt; &lt;at <i>time</i>&gt; &lt;backup-routing-engine&gt; &lt;both-routing-engines&gt; &lt;in <i>minutes</i>&gt; &lt;local&gt; &lt;media (external   internal)&gt; &lt;member <i>member-id</i>&gt; &lt;message "<i>text</i>"&gt; &lt;other-routing-engine&gt;</pre>                                                                                                                                                                                                                                                                                                                                  |
| <b>Syntax (QFX Series)</b>       | <pre>request system halt &lt;all-members&gt; &lt;at <i>time</i>&gt; &lt;both-routing-engines&gt; &lt;director-device <i>director-device-id</i>&gt; &lt;in <i>minutes</i>&gt; &lt;local&gt; &lt;media &gt; &lt;member <i>member-id</i>&gt; &lt;message "<i>text</i>"&gt; &lt;other-routing-engine&gt; &lt;slice <i>slice</i>&gt;</pre>                                                                                                                                                                                                                                                                                                        |
| <b>Release Information</b>       | <p>Command introduced before Junos OS Release 7.4.</p> <p><b>other-routing-engine</b> option introduced in Junos OS Release 8.0.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p><b>sfc</b> option introduced for the TX Matrix Plus router in Junos OS Release 9.6.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p><b>director-device</b> option introduced for QFabric systems in Junos OS Release 12.2.</p> <p><b>backup-routing-engine</b> option introduced in Junos OS Release 13.1.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> |
| <b>Description</b>               | Stop the router or switch software.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |



**NOTE:** When you issue this command on an individual component—for example, a Node device—in a QFabric system, you will receive a warning that says “Hardware-based members will halt, Virtual Junos Routing Engines will reboot.” If you want to halt only one member of a Node group, issue this command with the **member** option on the Node device CLI, because you cannot issue this command from the QFabric CLI. Also, issuing this command might cause traffic loss on an individual component.

When you issue this command on a QFX5100 switch, you are not prompted to reboot. You must power cycle the switch to reboot.

**Options** **none**—Stop the router or switch software immediately.

**all-chassis**—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Halt all chassis.

**all-lcc**—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, halt all T640 routers (or line-card chassis) connected to the TX Matrix router. On a TX Matrix Plus router, halt all T1600 or T4000 routers connected to the TX Matrix Plus router.

**all-members**—(EX4200 switches and MX Series routers only) (Optional) Halt all members of the Virtual Chassis configuration.

**at time** —(Optional) Time at which to stop the software, specified in one of the following ways:

- **now**—Stop the software immediately. This is the default.
- **+minutes**—Number of minutes from now to stop the software.
- **yymmddhhmm**—Absolute time at which to stop the software, specified as year, month, day, hour, and minute.
- **hh:mm**—Absolute time on the current day at which to stop the software.

**backup-routing-engine**—(Optional) Halt the backup Routing Engine. This command halts the backup Routing Engine, regardless from which Routing Engine the command is executed. For example, if you issue the command from the master Routing Engine, the backup Routing Engine is halted. If you issue the command from the backup Routing Engine, the backup Routing Engine is halted.

**both-routing-engines**—(Optional) Halt both Routing Engines at the same time.

**director-device** *director-device-id*—(QFabric systems only) Halt a specific Director device.

**lcc number**—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, halt a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, halt a specific router that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(EX4200 switches and MX Series routers only) (Optional) Halt the local Virtual Chassis member.

**in *minutes***—(Optional) Number of minutes from now to stop the software. This option is an alias for the at *+minutes* option.

**media (compact-flash | disk | removable-compact-flash | usb)**—(Optional) Boot medium for the next boot. (The options **removable-compact-flash** and **usb** pertain to J Series routers only.)

**media (external | internal)**—(EX Series and QFX Series switches and MX Series routers only) (Optional) Halt the boot media:

- **external**—Halt the external mass storage device.
- **internal**—Halt the internal flash device.

**member *member-id***—(EX4200 switches and MX Series routers only) (Optional) Halt the specified member of the Virtual Chassis configuration. For EX4200 switches, replace *member-id* with a value from 0 through 9. For an MX Series Virtual Chassis, replace *member-id* with a value of 0 or 1.

**message "*text*"**—(Optional) Message to display to all system users before stopping the software.

**other-routing-engine**—(Optional) Halt the other Routing Engine from which the command is issued. For example, if you issue the command from the master Routing Engine, the backup Routing Engine is halted. Similarly, if you issue the command from the backup Routing Engine, the master Routing Engine is halted.

**scc**—(TX Matrix routers only) (Optional) Halt the TX Matrix router (or switch-card chassis).

**sfc *number***—(TX Matrix Plus routers only) (Optional) Halt the TX Matrix Plus router (or switch-fabric chassis). Replace *number* with 0.

**slice *slice***—(EX Series and QFX Series switches only) (Optional) Halt a partition on the boot media. This option has the following suboptions:

- 1—Halt partition 1.
- 2—Halt partition 2.



- **alternate**—Reboot from the alternate partition.

**Additional Information** On the M7i router, the **request system halt** command does not immediately power down the Packet Forwarding Engine. The power-down process can take as long as 5 minutes.

On a TX Matrix router and TX Matrix Plus router if you issue the **request system halt** command on the master Routing Engine, all the master Routing Engines connected to the routing matrix are halted. If you issue this command on the backup Routing Engine, all the backup Routing Engines connected to the routing matrix are halted.



**NOTE:** If you have a router or switch with two Routing Engines and you want to shut the power off to the router or switch or remove a Routing Engine, you must first halt the backup Routing Engine (if it has been upgraded), and then halt the master Routing Engine. To halt a Routing Engine, issue the **request system halt** command. You can also halt both Routing Engines at the same time by issuing the **request system halt both-routing-engines** command.

**Required Privilege Level** maintenance

**Related Documentation**

- [clear system reboot on page 423](#)
- [request system power-off on page 476](#)
- [Rebooting and Halting a Device on page 24](#)
- [Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

**List of Sample Output**

- [request system halt on page 474](#)
- [request system halt \(In 2 Hours\) on page 474](#)
- [request system halt \(Immediately\) on page 474](#)
- [request system halt \(At 1:20 AM\) on page 474](#)

**Output Fields** When you enter this command, you are provided feedback on the status of your request.

## Sample Output

### request system halt

```
user@host> request system halt
Halt the system ? [yes,no] (no) yes

*** FINAL System shutdown message from root@section2 ***
System going down IMMEDIATELY
Terminated
...
syncing disks... 11 8 done
The operating system has halted.
Please press any key to reboot.
```

### request system halt (In 2 Hours)

The following example, which assumes that the time is 5 PM (1700), illustrates three different ways to request that the system stop 2 hours from now:

```
user@host> request system halt at +120
user@host> request system halt in 120
user@host> request system halt at 19:00
```

### request system halt (Immediately)

```
user@host> request system halt at now
```

### request system halt (At 1:20 AM)

To stop the system at 1:20 AM, enter the following command. Because 1:20 AM is the next day, you must specify the absolute time.

```
user@host> request system halt at yymdd120
request system halt at 120
Halt the system at 120? [yes,no] (no) yes
```

## request system logout

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>request system logout (pid <i>pid</i>   terminal <i>terminal</i>   user <i>username</i>) &lt;all&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Release Information</b>      | <p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>                                                                                                                                                                                                                           |
| <b>Description</b>              | Log out users from the router or switch and the configuration database. If a user held the <b>configure exclusive</b> lock, this command clears the exclusive lock.                                                                                                                                                                                                                                                                                                                                             |
| <b>Options</b>                  | <p><b>all</b>—(Optional) Log out all sessions owned by a particular PID, terminal session, or user. (On a TX Matrix or TX Matrix Plus router, this command is broadcast to all chassis.)</p> <p><b>pid <i>pid</i></b>—Log out the user session using the specified management process identifier (PID). The PID type must be management process.</p> <p><b>terminal <i>terminal</i></b>—Log out the user for the specified terminal session.</p> <p><b>user <i>username</i></b>—Log out the specified user.</p> |
| <b>Required Privilege Level</b> | configure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <i>Junos OS Administration Library for Routing Devices</i></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>List of Sample Output</b>    | <a href="#">request system logout on page 475</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Output Fields</b>            | When you enter this command, you are provided feedback on the status of your request.                                                                                                                                                                                                                                                                                                                                                                                                                           |

## Sample Output

### request system logout

```
user@host> request system logout user tammy all
Connection closed by foreign host.
```

## request system power-off

---

|                                       |                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                 | <a href="#">Syntax on page 476</a><br><a href="#">Syntax (EX Series Switches) on page 476</a><br><a href="#">Syntax (TX Matrix Router) on page 476</a><br><a href="#">Syntax (TX Matrix Plus Router) on page 476</a><br><a href="#">Syntax (MX Series Router) on page 476</a><br><a href="#">Syntax (QFX Series) on page 477</a> |
| <b>Syntax</b>                         | <pre>request system power-off &lt;both-routing-engines&gt; &lt;other-routing-engine&gt; &lt;at <i>time</i>&gt; &lt;in <i>minutes</i>&gt; &lt;media (compact-flash   disk   removable-compact-flash   usb)&gt; &lt;message "<i>text</i>"&gt;</pre>                                                                                |
| <b>Syntax (EX Series Switches)</b>    | <pre>request system power-off &lt;all-members&gt; &lt;at <i>time</i>&gt; &lt;both-routing-engines&gt; &lt;in <i>minutes</i>&gt; &lt;local&gt; &lt;media (external   internal)&gt; &lt;member <i>member-id</i>&gt; &lt;message "<i>text</i>"&gt; &lt;other-routing-engine&gt; &lt;slice <i>slice</i>&gt;</pre>                    |
| <b>Syntax (TX Matrix Router)</b>      | <pre>request system power-off &lt;all-chassis   all-lcc   lcc <i>number</i>   scc&gt; &lt;both-routing-engines&gt; &lt;other-routing-engine&gt; &lt;at <i>time</i>&gt; &lt;in <i>minutes</i>&gt; &lt;media (compact-flash   disk)&gt; &lt;message "<i>text</i>"&gt;</pre>                                                        |
| <b>Syntax (TX Matrix Plus Router)</b> | <pre>request system power-off &lt;all-chassis   all-lcc   lcc <i>number</i>   sfc <i>number</i>&gt; &lt;both-routing-engines&gt; &lt;other-routing-engine&gt; &lt;at <i>time</i>&gt; &lt;in <i>minutes</i>&gt; &lt;media (compact-flash   disk)&gt; &lt;message "<i>text</i>"&gt;</pre>                                          |
| <b>Syntax (MX Series Router)</b>      | <pre>request system power-off &lt;all-members&gt; &lt;at <i>time</i>&gt; &lt;both-routing-engines&gt; &lt;in <i>minutes</i>&gt; &lt;local&gt;</pre>                                                                                                                                                                              |

```

<media (external | internal)>
<member member-id>
<message "text">
<other-routing-engine>

```

**Syntax (QFX Series)** request system power-off  
 <at *time*>  
 <in *minutes*>  
 <media (external | internal)>  
 <message "*text*">  
 <slice *slice*>

**Release Information** Command introduced in Junos OS Release 8.0.  
 Command introduced in Junos OS Release 9.0 for EX Series switches.  
 Command introduced in Junos OS Release 11.1 for the QFX Series.  
 Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

**Description** Power off the software.



**NOTE:** When you issue this command on an individual component in a QFabric system, you will receive a warning that says “Hardware-based members will halt, Virtual Junos Routing Engines will reboot.” If you want to halt only one member, use the *member* option. You cannot issue this command from the QFabric CLI.



**NOTE:** For a standalone chassis (such as MX Series, PTX Series, and T Series routers), the request to power off the system is applicable only to the Routing Engines. When you request to power off both Routing Engines, all the FPCs in the chassis shut down after approximately 10 minutes and the chassis fans run at full speed. The FPCs shut down because they no longer have communication with the Routing Engines and an Inter-Integrated Circuit (I2C) timeout occurred.

**Options** none—Power off the router or switch software immediately.

**all-chassis**—(Optional) (TX Matrix and TX Matrix Plus router only) Power off all Routing Engines in the chassis.

**all-lcc**—(Optional) (TX Matrix and TX Matrix Plus router only) On a TX Matrix router, power off all T640 routers (or line-card chassis) connected to the TX Matrix router. On a TX Matrix Plus router, power off all T1600 routers (or line-card chassis) connected to the TX Matrix Plus router.

**all-members**—(EX4200 switches and MX Series routers only) (Optional) Power off all members of the Virtual Chassis configuration.

**at *time***—(Optional) Time at which to power off the software, specified in one of the following ways:

- **now**—Power off the software immediately. This is the default.
- **+*minutes***—Number of minutes from now to power off the software.
- ***yymmddhhmm***—Absolute time at which to power off the software, specified as year, month, day, hour, and minute.
- ***hh:mm***—Absolute time on the current day at which to power off the software.

**both-routing-engines**—(Optional) Power off both Routing Engines at the same time.

**in *minutes***—(Optional) Number of minutes from now to power off the software. This option is an alias for the **at +*minutes*** option.

**lcc *number***—(Optional) (TX Matrix and TX Matrix Plus router only) On a TX Matrix router, power off a T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, power off a specific router that is connected to the TX Matrix Plus router. Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(EX4200 switches and MX Series routers only) (Optional) Power off the local Virtual Chassis member.

**media (*compact-flash* | *disk* | *removable-compact-flash* | *usb*)**—(Optional) Boot medium for the next boot. (The options **removable-compact-flash** and **usb** pertain to the J Series routers only.)

**media (*external* | *internal*)**—(EX Series and QFX Series switches and MX Series routers only) (Optional) Power off the boot media:

- **external**—Power off the external mass storage device.
- **internal**—Power off the internal flash device.

**member *member-id***—(EX4200 switches and MX Series routers only) (Optional) Power off the specified member of the Virtual Chassis configuration. For EX4200 switches, replace *member-id* with a value from 0 through 9. For an MX Series Virtual Chassis, replace *member-id* with a value of 0 or 1.

**message "*text*"**—(Optional) Message to display to all system users before powering off the software.

**other-routing-engine**—(Optional) Power off the other Routing Engine from which the command is issued. For example, if you issue the command from the master Routing Engine, the backup Routing Engine is halted. Similarly, if you issue the command from the backup Routing Engine, the master Routing Engine is halted.

**scc**—(Optional) (TX Matrix router only) Power off only the master Routing Engine or the backup Routing Engine on the TX Matrix router (or switch-card chassis). If you issue the command from the master Routing Engine, the master SCC is powered off. If you issue the command from the backup Routing Engine, the backup SCC is powered off.

**sfc number**—(Optional) (TX Matrix Plus router only) Power off only the master Routing Engine or the backup Routing Engine on the TX Matrix Plus router (or switch-fabric chassis). If you issue the command from the master Routing Engine, the master SFC is powered off. If you issue the command from the backup Routing Engine, the backup SFC is powered off. Replace *number* with zero.

**slice slice**—(EX Series and QFX Series switches only) (Optional) Power off a partition on the boot media. This option has the following suboptions:

- **1**—Power off partition 1.
- **2**—Power off partition 2.
- **alternate**—Reboot from the alternate partition.

**Additional Information** On a routing matrix composed of a TX Matrix router and T640 routers, if you issue the **request system power-off** command on the TX Matrix master Routing Engine, all the master Routing Engines connected to the routing matrix are powered off. If you issue this command on the backup Routing Engine, all the backup Routing Engines connected to the routing matrix are powered off.

Likewise, on a routing matrix composed of a TX Matrix Plus router and T1600 routers, if you issue the **request system power-off** command on the TX Matrix Plus master Routing Engine, all the master Routing Engines connected to the routing matrix are powered off. If you issue this command on the backup Routing Engine, all the backup Routing Engines connected to the routing matrix are powered off.

If you issue the **request system power-off both-routing-engines** command on the TX Matrix or TX Matrix Plus router, all the Routing Engines on the routing matrix are powered off.

**Required Privilege Level** maintenance

**List of Sample Output** [request system power-off on page 480](#)

**Output Fields** When you enter this command, you are provided feedback on the status of your request.

## Sample Output

### request system power-off

```
user@host> request system power-off message "This router will be powered off in 30 minutes.
Please save your data and log out immediately."
warning: This command will not halt the other routing-engine.
If planning to switch off power, use the both-routing-engines option.
Power Off the system ? [yes,no] (no) yes

*** FINAL System shutdown message from remote@nutmeg ***
System going down IMMEDIATELY

This router will be powered off in 30 minutes. Please save your data and log out
immediately.

Shutdown NOW!
[pid 5177]
```



## request system reboot

**Syntax (QFX Series)** request system reboot  
 <all <graceful>>  
 <at time>  
 <director-device *name*>  
 <director-group <graceful>>  
 <fabric <graceful>>  
 <in minutes>  
 <hypervisor>  
 <media >  
 <message "text">  
 <node-group *name*>  
 <slice (1 | 2 | alternate)>

**Release Information** Command introduced in Junos OS Release 11.1 for the QFX Series.

**Description** Reboot the Junos OS.



**NOTE:** On a QFabric system, to avoid traffic loss on the network Node group, switch mastership of the Routing Engine to the backup Routing Engine, and then reboot.

Reboot requests are recorded in the system log files, which you can view with the **show log messages** command. You can view the process names with the **show system processes** command.

**Options** **none**—Reboots the software immediately.

**all**—(QFabric systems only) (Optional) Reboots the software on the Director group, fabric control Routing Engines, fabric manager Routing Engines, Interconnect devices, and network and server Node groups.

**at time**—(Optional) Time at which to reboot the software, specified in one of the following ways:

- **+minutes**—Number of minutes from now to reboot the software.
- **hh:mm**—Absolute time on the current day at which to reboot the software, specified in 24-hour time.
- **now**—Stop or reboot the software immediately. This is the default.
- **yymmddhhmm**—Absolute time at which to reboot the software, specified as year, month, day, hour, and minute.

**director-device *name***—(QFabric systems only) (Optional) Reboots the software on the Director device and the default partition (QFabric CLI).

**director-group**—(QFabric systems only) (Optional) Reboots the software on the Director group and the default partition (QFabric CLI).

**fabric**—(QFabric systems only) (Optional) Reboots the fabric control Routing Engines and the Interconnect devices.

**graceful**—(QFabric systems only) (Optional) Allows the QFabric component to reboot with minimal impact to network traffic. This option is only available for the **all**, **fabric**, and **director-group** options.

**in minutes**—(Optional) Number of minutes from now to reboot the software. This option is an alias for the **at +minutes** option.

**hypervisor**—(Optional) Reboot Junos OS, host OS, and any installed guest VMs.

**media (external | internal)**—(Optional) Boot medium for the next boot. The external option reboots the switch using a software package stored on an external boot source, such as a USB flash drive. The internal option reboots the switch using a software package stored in an internal memory source.

**message "text"**—(Optional) Message to display to all system users before rebooting the software.

**node-group name**—(QFabric systems only) (Optional) Reboots the software on a server Node group or a network Node group.

**routing-engine**—(Optional) Reboot the Routing Engine.

**slice (1 | 2 | alternate)**—(Optional) Reboot using the specified partition on the boot media. This option has the following suboptions:



**NOTE:** The slice option is not supported on the QFX5100 switch, because there is no alternate slice when Junos OS boots as a Virtual Machine (VM). To switch to previous version of Junos OS, issue the **request system software rollback** command.

---

- **1**—Reboot from partition 1.
- **2**—Reboot from partition 2.
- **alternate**—Reboot from the alternate partition, which is the partition that did not boot the switch at the last bootup.

**Required Privilege Level** maintenance

**Related Documentation**

- [clear system reboot on page 423](#)
- [Rebooting and Halting a Device on page 24](#)

**Output Fields** When you enter this command, you are provided feedback on the status of your request.

## Sample Output

### request system reboot

```
user@switch> request system reboot
Reboot the system ? [yes,no] (no)
```

### request system reboot (At 2300)

```
user@switch> request system reboot at 2300 message ?Maintenance time!?
Reboot the system ? [yes,no] (no) yes
```

```
shutdown: [pid 186]
*** System shutdown message from root@berry.network.net ***
System going down at 23:00
```

### request system reboot (In 2 Hours)

The following example, which assumes that the time is 5 PM (1700), illustrates three different ways to request the system to reboot in 2 hours:

```
user@switch> request system reboot at +120
user@switch> request system reboot in 120
user@switch> request system reboot at 19:00
```

### request system reboot (Immediately)

```
user@switch> request system reboot at now
```

### request system reboot (At 1:20 AM)

To reboot the system at 1:20 AM, enter the following command. Because 1:20 AM is the next day, you must specify the absolute time.

```
user@switch> request system reboot at 06060120
request system reboot at 120
Reboot the system at 120? [yes,no] (no) yes
```

### request system reboot director-device

```
user@switch> request system reboot director-device Node1
Issuing this command may interrupt traffic forwarding.
Continue? [yes,no] (no)
```

### request system reboot director-group

```
user@switch> request system reboot director-group
Issuing this command may interrupt traffic forwarding.
Continue? [yes,no] (no)
```

### request system reboot director-group graceful

```
user@switch> request system reboot director-group graceful
Issuing this command may interrupt traffic forwarding.
Continue? [yes,no] (no)
```

## request system storage cleanup

|                                    |                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>              | <a href="#">Syntax on page 484</a><br><a href="#">Syntax (EX Series Switches) on page 484</a><br><a href="#">Syntax (MX Series Router) on page 484</a><br><a href="#">Syntax (QFX Series) on page 484</a>                                                                                                                                                                                  |
| <b>Syntax</b>                      | request system storage cleanup <dry-run>                                                                                                                                                                                                                                                                                                                                                   |
| <b>Syntax (EX Series Switches)</b> | request system storage cleanup<br><all-members><br><dry-run><br><local><br><member <i>member-id</i> >                                                                                                                                                                                                                                                                                      |
| <b>Syntax (MX Series Router)</b>   | request system storage cleanup<br><all-members><br><dry-run><br><local><br><member <i>member-id</i> >                                                                                                                                                                                                                                                                                      |
| <b>Syntax (QFX Series)</b>         | request system storage cleanup<br><component ( <i>serial number</i>   <i>UUID</i>   all)><br><director-group <i>name</i> ><br><dry-run><br><infrastructure <i>name</i> ><br><interconnect-device <i>name</i> ><br><name-tag <i>name-tag</i> ><br><node-group <i>name</i> ><br><prune><br><qfabric (component <i>name</i> )   dry-run   name-tag   repository><br><repository (core   log)> |
| <b>Release Information</b>         | Command introduced in Junos OS Release 7.4.<br><b>dry-run</b> option introduced in Junos OS Release 7.6.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                |
| <b>Description</b>                 | Free storage space on the router or switch by rotating log files and proposing a list of files for deletion. User input is required for file deletion. On a QFabric system, you can delete debug files located on individual devices or on the entire QFabric system.                                                                                                                      |
| <b>Options</b>                     | <b>all-members</b> —(EX4200 switches and MX Series routers only) (Optional) Delete files on the Virtual Chassis master Routing Engine only.                                                                                                                                                                                                                                                |



**NOTE:** To delete files on the other members of the Virtual Chassis configuration, log in to each backup Routing Engine and delete the files using the `request system storage cleanup local` command.

**component** (*UUID | serial number | all*)—(QFabric systems only) (Optional) Delete files located on individual QFabric system devices or on the entire QFabric system.

**director-group** *name*—(QFabric systems only) (Optional) Delete files on the Director group.

**dry-run**—(Optional) List files proposed for deletion (without deleting them).

**infrastructure** *name*—(QFabric systems only) (Optional) Delete files on the fabric control Routing Engine and fabric manager Routing Engine.

**interconnect-device** *name*—(QFabric systems only) (Optional) Delete files on the Interconnect device.

**local**—(EX4200 switches and MX Series routers only) (Optional) Delete files on the local Virtual Chassis member.

**member** *member-id*—(EX4200 switches and MX Series routers only) (Optional) Delete files on the specified member of the Virtual Chassis configuration. For EX4200 switches, replace *member-id* with a value from 0 through 9. For an MX Series Virtual Chassis, replace *member-id* with a value of 0 or 1.

**name-tag** *name-tag*—(QFabric systems only) (Optional) Delete debug files that match a specific regular expression.

**node-group** *name*—(QFabric systems only) (Optional) Delete files on the Node group.

**prune**—(QFabric systems only) (Optional) Delete debug files located in either the core or log debug repositories of a QFabric system device.

**qfabric component** *name*—(QFabric systems only) (Optional) Delete debug files located in the debug repositories of a QFabric system device.

**repository** (*core | log*)—(QFabric systems only) (Optional) Specify the repository on the QFabric system device for which you want to delete debug files.

**Additional Information** If logging is configured and being used, the **dry-run** option rotates the log files. In that case, the output displays the message “Currently rotating log files, please wait.” If no logging is currently under way, the output displays only a list of files to delete.

**Required Privilege Level** maintenance

**List of Sample Output** [request system storage cleanup dry-run on page 486](#)  
[request system storage cleanup on page 487](#)  
[request system storage cleanup director-group \(QFabric Systems\) on page 487](#)  
[request system storage cleanup infrastructure device-name \(QFabric Systems\) on page 489](#)  
[request system storage cleanup interconnect-device device-name \(QFabric Systems\) on page 490](#)  
[request system storage cleanup node-group group-name \(QFabric Systems\) on page 491](#)

[request system storage cleanup qfabric component device-name \(QFabric Systems\) on page 492](#)  
[request system storage cleanup qfabric component device-name repository core \(QFabric Systems\) on page 492](#)  
[request system storage cleanup qfabric component all \(QFabric Systems\) on page 492](#)

**Output Fields** [Table 36 on page 486](#) describes the output fields for the **request system storage cleanup** command. Output fields are listed in the approximate order in which they appear.

**Table 36: request system storage cleanup Output Fields**

| Field Name                                            | Field Description                                                                                                                                                                                                                                                                                                                           |
|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| List of files to delete:                              | Shows list of files available for deletion.                                                                                                                                                                                                                                                                                                 |
| Size                                                  | Size of the core-dump file.                                                                                                                                                                                                                                                                                                                 |
| Date                                                  | Last core-dump file modification date and time.                                                                                                                                                                                                                                                                                             |
| Name                                                  | Name of the core-dump file.                                                                                                                                                                                                                                                                                                                 |
| Directory to delete:                                  | Shows list of directories available for deletion.                                                                                                                                                                                                                                                                                           |
| Repository scope:                                     | Repository where core-dump files and log files are stored. The core-dump files are located in the <b>core</b> repository, and the log files are located in the <b>log</b> repository. The default <b>Repository scope</b> is shared since both the <b>core</b> and <b>log</b> repositories are shared by all of the QFabric system devices. |
| Repository head:                                      | Name of the top-level repository location.                                                                                                                                                                                                                                                                                                  |
| Repository name:                                      | Name of the repository: <b>core</b> or <b>log</b> .                                                                                                                                                                                                                                                                                         |
| Creating list of debug artifacts to be removed under: | Shows location of files available for deletion.                                                                                                                                                                                                                                                                                             |
| List of debug artifacts to be removed under:          | Shows list of files available for deletion.                                                                                                                                                                                                                                                                                                 |

## Sample Output

### request system storage cleanup dry-run

```
user@host> request system storage cleanup dry-run
Currently rotating log files, please wait.
This operation can take up to a minute.
```

List of files to delete:

|  | Size  | Date         | Name                   |
|--|-------|--------------|------------------------|
|  | 11.4K | Mar 8 15:00  | /var/log/messages.1.gz |
|  | 7245B | Feb 5 15:00  | /var/log/messages.3.gz |
|  | 11.8K | Feb 22 13:00 | /var/log/messages.2.gz |

```

3926B Mar 16 13:57 /var/log/messages.0.gz
3962B Feb 22 12:47 /var/log/sampled.1.gz
4146B Mar 8 12:20 /var/log/sampled.0.gz
4708B Dec 21 11:39 /var/log/sampled.2.gz
7068B Jan 16 18:00 /var/log/messages.4.gz
13.7K Dec 27 22:00 /var/log/messages.5.gz
890B Feb 22 17:22 /var/tmp/sampled.pkts
65.8M Oct 26 09:10 /var/sw/pkg/jinstall-7.4R1.7-export-signed.tgz
63.1M Oct 26 09:13 /var/sw/pkg/jbundle-7.4R1.7.tgz

```

### request system storage cleanup

```

user@host> request system storage cleanup
Currently rotating log files, please wait.
This operation can take up to a minute.

```

List of files to delete:

|       | Size         | Date                                           | Name |
|-------|--------------|------------------------------------------------|------|
| 11.4K | Mar 8 15:00  | /var/log/messages.1.gz                         |      |
| 7245B | Feb 5 15:00  | /var/log/messages.3.gz                         |      |
| 11.8K | Feb 22 13:00 | /var/log/messages.2.gz                         |      |
| 3926B | Mar 16 13:57 | /var/log/messages.0.gz                         |      |
| 11.6K | Mar 8 15:00  | /var/log/messages.5.gz                         |      |
| 7254B | Feb 5 15:00  | /var/log/messages.6.gz                         |      |
| 12.9K | Feb 22 13:00 | /var/log/messages.8.gz                         |      |
| 3726B | Mar 16 13:57 | /var/log/messages.7.gz                         |      |
| 3962B | Feb 22 12:47 | /var/log/sampled.1.gz                          |      |
| 4146B | Mar 8 12:20  | /var/log/sampled.0.gz                          |      |
| 4708B | Dec 21 11:39 | /var/log/sampled.2.gz                          |      |
| 7068B | Jan 16 18:00 | /var/log/messages.4.gz                         |      |
| 13.7K | Dec 27 22:00 | /var/log/messages.5.gz                         |      |
| 890B  | Feb 22 17:22 | /var/tmp/sampled.pkts                          |      |
| 65.8M | Oct 26 09:10 | /var/sw/pkg/jinstall-7.4R1.7-export-signed.tgz |      |
| 63.1M | Oct 26 09:13 | /var/sw/pkg/jbundle-7.4R1.7.tgz                |      |

Delete these files ? [yes,no] (yes)

### request system storage cleanup director-group (QFabric Systems)

```

user@switch> request system storage cleanup director-group
List of files to delete:

```

|      | Size                | Date                                | Name |
|------|---------------------|-------------------------------------|------|
| 4.0K | 2011-11-07 05:16:29 | /tmp/2064.sfcauth                   |      |
| 4.0K | 2011-11-07 05:07:34 | /tmp/30804.sfcauth                  |      |
| 4.0K | 2011-11-07 04:13:41 | /tmp/26792.sfcauth                  |      |
| 4.0K | 2011-11-07 04:13:39 | /tmp/26432.sfcauth                  |      |
| 0    | 2011-11-07 07:45:40 | /tmp/cluster_cleanup.log            |      |
| 1.3M | 2011-11-07 07:39:11 | /tmp/cn_monitor.20111107-052401.log |      |
| 4.0K | 2011-11-07 07:36:29 | /tmp/clustat.28019.log              |      |
| 4.0K | 2011-11-07 07:36:29 | /tmp/clustat_x.28019.log            |      |
| 9.6M | 2011-11-07 05:30:24 | /tmp/sfc.2.log                      |      |
| 4.0K | 2011-11-07 05:28:11 | /tmp/mgd-init.1320672491.log        |      |
| 248K | 2011-11-07 05:19:24 | /tmp/cn_monitor.20111107-045111.log |      |
| 4.0K | 2011-11-07 05:17:18 | /tmp/clustat.3401.log               |      |
| 4.0K | 2011-11-07 05:17:18 | /tmp/clustat_x.3401.log             |      |
| 8.0K | 2011-11-07 04:58:25 | /tmp/mgd-init.1320670633.log        |      |
| 0    | 2011-11-07 04:54:01 | /tmp/mysql_db_install_5.1.37.log    |      |
| 4.0K | 2011-11-07 04:52:08 | /tmp/cn_send.log                    |      |
| 0    | 2011-11-07 04:52:00 | /tmp/init_eth0.log                  |      |

```

4.0K 2011-11-07 04:49:35 /tmp/install_interfaces.sh.log
4.0K 2011-11-07 04:48:15 /tmp/bootstrap.sh.log
160K 2011-11-07 04:47:43 /tmp/bootstrap_cleanup.log
38M 2011-11-07 04:42:42 /tmp/cn_monitor.20111104-110308.log
4.0K 2011-11-07 04:38:47 /tmp/clustat.30913.log
4.0K 2011-11-07 04:38:47 /tmp/clustat_x.30913.log
4.0K 2011-11-07 04:38:03 /tmp/dcf_upgrade.sh.remove.log
4.0K 2011-11-07 04:38:03 /tmp/peer_update.log
4.0K 2011-11-07 04:38:02 /tmp/dcf_upgrade.log
4.0K 2011-11-07 04:38:02 /tmp/perl_mark_upgrade.log
8.0K 2011-11-07 04:13:42 /tmp/install_dcf_rpm.log
4.0K 2011-11-07 04:13:06 /tmp/00_cleanup.sh.1320667986.log
0 2011-11-07 04:13:06 /tmp/ccif_patch_4410_4450.sh.1320667986.log
4.0K 2011-11-07 04:13:06 /tmp/dcf-tools.sh.1320667986.log
0 2011-11-07 04:13:06 /tmp/initial.sh.1320667986.log
0 2011-11-07 04:13:06 /tmp/inventory.sh.1320667986.log
4.0K 2011-11-07 04:13:06 /tmp/qf-db.sh.1320667986.log
4.0K 2011-11-07 04:13:06 /tmp/sfc.sh.1320667986.log
8.0K 2011-11-07 04:13:05 /tmp/jinstall-qfabric.log
8.0K 2011-11-04 11:10:24 /tmp/mgd-init.1320430192.log
4.0K 2011-11-04 11:07:03 /tmp/mysql_dcf_db_install.log
8.0K 2011-11-04 10:55:07 /tmp/ccif_patch_4410_4450.sh.1320429307.log
8.0K 2011-11-04 10:55:07 /tmp/initial.sh.1320429307.log
4.0K 2011-11-04 10:55:07 /tmp/inventory.sh.1320429307.log
8.0K 2011-11-04 10:55:07 /tmp/sfc.sh.1320429307.log
4.0K 2011-11-04 10:54:09 /tmp/ks-script-Ax0tz5.log
4.0K 2011-11-07 04:13:06 /tmp//sfc.sh.1320667986.log
8.0K 2011-11-04 10:55:07 /tmp//sfc.sh.1320429307.log

```

## Directory to delete:

```

45M 2011-11-08 10:57:43 /tmp/sfc-captures

```

## List of files to delete:

|      | Size       | Date     | Name                                |
|------|------------|----------|-------------------------------------|
| 4.0K | 2011-11-08 | 05:47:47 | /tmp/5713.sfcauth                   |
| 4.0K | 2011-11-08 | 05:14:32 | /tmp/14494.sfcauth                  |
| 4.0K | 2011-11-08 | 05:11:47 | /tmp/9978.sfcauth                   |
| 4.0K | 2011-11-08 | 05:09:37 | /tmp/6128.sfcauth                   |
| 4.0K | 2011-11-08 | 05:04:28 | /tmp/29703.sfcauth                  |
| 4.0K | 2011-11-07 | 11:59:10 | /tmp/7811.sfcauth                   |
| 4.0K | 2011-11-07 | 11:36:08 | /tmp/32415.sfcauth                  |
| 4.0K | 2011-11-07 | 11:30:30 | /tmp/22406.sfcauth                  |
| 4.0K | 2011-11-07 | 11:24:37 | /tmp/12131.sfcauth                  |
| 4.0K | 2011-11-07 | 10:48:42 | /tmp/12687.sfcauth                  |
| 4.0K | 2011-11-07 | 09:27:20 | /tmp/31082.sfcauth                  |
| 4.0K | 2011-11-07 | 07:33:58 | /tmp/14633.sfcauth                  |
| 4.0K | 2011-11-07 | 05:08:25 | /tmp/15447.sfcauth                  |
| 4.0K | 2011-11-07 | 04:12:29 | /tmp/26874.sfcauth                  |
| 4.0K | 2011-11-07 | 04:12:27 | /tmp/26713.sfcauth                  |
| 4.0K | 2011-11-07 | 03:49:17 | /tmp/17691.sfcauth                  |
| 4.0K | 2011-11-05 | 01:32:23 | /tmp/5716.sfcauth                   |
| 4.0K | 2011-11-07 | 08:00:17 | /tmp/sfcsnmpd.log                   |
| 4.0K | 2011-11-07 | 07:57:50 | /tmp/cluster_cleanup.log            |
| 824K | 2011-11-07 | 07:38:37 | /tmp/cn_monitor.20111107-053643.log |
| 4.0K | 2011-11-07 | 07:36:30 | /tmp/clustat.18399.log              |
| 4.0K | 2011-11-07 | 07:36:30 | /tmp/clustat_x.18399.log            |
| 4.0K | 2011-11-07 | 07:35:47 | /tmp/command_lock.log               |
| 4.0K | 2011-11-07 | 05:39:54 | /tmp/mgd-init.1320673194.log        |
| 92K  | 2011-11-07 | 05:19:25 | /tmp/cn_monitor.20111107-050412.log |
| 4.0K | 2011-11-07 | 05:17:20 | /tmp/clustat.30115.log              |



```

4.0K 2011-11-07 05:17:20 /tmp/clustat_x.30115.log
8.0K 2011-11-07 05:08:07 /tmp/mgd-init.1320671241.log
4.0K 2011-11-07 05:04:57 /tmp/cn_send.log
0 2011-11-07 05:04:52 /tmp/init_eth0.log
4.0K 2011-11-07 05:02:38 /tmp/install_interfaces.sh.log
4.0K 2011-11-07 05:01:19 /tmp/bootstrap.sh.log
160K 2011-11-07 05:00:47 /tmp/bootstrap_cleanup.log
28M 2011-11-07 04:42:27 /tmp/cn_monitor.20111104-112954.log
4.0K 2011-11-07 04:38:49 /tmp/clustat.6780.log
4.0K 2011-11-07 04:38:49 /tmp/clustat_x.6780.log
4.0K 2011-11-07 04:38:05 /tmp/issue_event.log
4.0K 2011-11-07 04:38:05 /tmp/peer_upgrade_reboot.log
12K 2011-11-07 04:38:05 /tmp/primary_update.log
4.0K 2011-11-07 04:38:04 /tmp/dcf_upgrade.sh.remove.log
4.0K 2011-11-07 04:38:04 /tmp/peer_rexec_upgrade.log
4.0K 2011-11-07 04:13:42 /tmp/peer_install_dcf_rpm.log
4.0K 2011-11-07 04:11:57 /tmp/dcf-tools.sh.1320667917.log
0 2011-11-07 04:11:57 /tmp/initial.sh.1320667917.log
0 2011-11-07 04:11:57 /tmp/inventory.sh.1320667917.log
4.0K 2011-11-07 04:11:57 /tmp/qf-db.sh.1320667917.log
4.0K 2011-11-07 04:11:57 /tmp/sfc.sh.1320667917.log
4.0K 2011-11-07 04:11:56 /tmp/00_cleanup.sh.1320667916.log
0 2011-11-07 04:11:56 /tmp/ccif_patch_4410_4450.sh.1320667916.log
8.0K 2011-11-07 04:11:56 /tmp/jinstall-qfabric.log
4.0K 2011-11-07 04:11:33 /tmp/dcf_upgrade.log
8.0K 2011-11-04 11:53:12 /tmp/mgd-init.1320432782.log
8.0K 2011-11-04 11:06:17 /tmp/ccif_patch_4410_4450.sh.1320429977.log
8.0K 2011-11-04 11:06:17 /tmp/initial.sh.1320429977.log
4.0K 2011-11-04 11:06:17 /tmp/inventory.sh.1320429977.log
8.0K 2011-11-04 11:06:17 /tmp/sfc.sh.1320429977.log
4.0K 2011-11-04 11:05:19 /tmp/ks-script-tnWeb.log
4.0K 2011-11-07 04:11:57 /tmp//sfc.sh.1320667917.log
8.0K 2011-11-04 11:06:17 /tmp//sfc.sh.1320429977.log

```

Directory to delete:

```
49M 2011-11-08 10:45:20 /tmp/sfc-captures
```

#### request system storage cleanup infrastructure device-name (QFabric Systems)

```
user@switch> request system storage cleanup infrastructure FC-0
re0:
```

-----

List of files to delete:

|  | Size   | Date        | Name                                                                         |
|--|--------|-------------|------------------------------------------------------------------------------|
|  | 139B   | Nov 8 19:03 | /var/log/default-log-messages.0.gz                                           |
|  | 5602B  | Nov 8 19:03 | /var/log/messages.0.gz                                                       |
|  | 28.4K  | Nov 8 10:15 | /var/log/messages.1.gz                                                       |
|  | 35.2K  | Nov 7 13:45 | /var/log/messages.2.gz                                                       |
|  | 207B   | Nov 7 16:02 | /var/log/wtmp.0.gz                                                           |
|  | 27B    | Nov 7 12:14 | /var/log/wtmp.1.gz                                                           |
|  | 184.4M | Nov 7 12:16 | /var/sw/pkg/jinstall-dc-re-11.3I20111104_1216_dc-builder-domestic-signed.tgz |
|  | 124.0K | Nov 7 15:59 | /var/tmp/gres-tp/env.dat                                                     |
|  | 0B     | Nov 7 12:57 | /var/tmp/gres-tp/lock                                                        |
|  | 155B   | Nov 7 16:02 | /var/tmp/krt_gencfg_filter.txt                                               |
|  | 0B     | Nov 7 12:35 | /var/tmp/last_ccif_update                                                    |
|  | 1217B  | Nov 7 12:15 | /var/tmp/loader.conf.preinstall                                              |
|  | 184.4M | Nov 6 07:11 | /var/tmp/mchassis-install.tgz                                                |
|  | 10.8M  | Nov 7 12:16 |                                                                              |

```

/var/tmp/preinstall/bootstrap-install-11.3I20111104_1216_dc-builder.tar
57.4K Nov 7 12:16 /var/tmp/preinstall/configs-11.3I20111104_1216_dc-builder.tgz

259B Nov 7 12:16 /var/tmp/preinstall/install.conf
734.3K Nov 4 13:46
/var/tmp/preinstall/jboot-dc-re-11.3I20111104_1216_dc-builder.tgz
177.8M Nov 7 12:16
/var/tmp/preinstall/jbundle-dc-re-11.3I20111104_1216_dc-builder-domestic.tgz
124B Nov 7 12:15 /var/tmp/preinstall/metatags
1217B Nov 7 12:16 /var/tmp/preinstall_boot_loader.conf
0B Nov 7 16:02 /var/tmp/rtssdb/if-rtssdb

```

### request system storage cleanup interconnect-device device-name (QFabric Systems)

```

user@switch> request system storage cleanup interconnect IC-WS001
re1:

```

List of files to delete:

|  | Size    | Date        | Name                               |
|--|---------|-------------|------------------------------------|
|  | 11B     | Nov 7 15:55 | /var/jail/tmp/alarmd.ts            |
|  | 128B    | Nov 8 19:06 | /var/log/default-log-messages.0.gz |
|  | 9965B   | Nov 8 19:06 | /var/log/messages.0.gz             |
|  | 15.8K   | Nov 8 12:30 | /var/log/messages.1.gz             |
|  | 15.8K   | Nov 8 11:00 | /var/log/messages.2.gz             |
|  | 15.7K   | Nov 8 07:30 | /var/log/messages.3.gz             |
|  | 15.8K   | Nov 8 04:00 | /var/log/messages.4.gz             |
|  | 15.7K   | Nov 8 00:30 | /var/log/messages.5.gz             |
|  | 18.7K   | Nov 7 21:00 | /var/log/messages.6.gz             |
|  | 17.6K   | Nov 7 19:00 | /var/log/messages.7.gz             |
|  | 58.3K   | Nov 7 16:00 | /var/log/messages.8.gz             |
|  | 20.3K   | Nov 7 15:15 | /var/log/messages.9.gz             |
|  | 90B     | Nov 7 15:41 | /var/log/wtmp.0.gz                 |
|  | 57B     | Nov 7 12:41 | /var/log/wtmp.1.gz                 |
|  | 124.0K  | Nov 7 15:42 | /var/tmp/gres-tp/env.dat           |
|  | 0B      | Nov 7 12:40 | /var/tmp/gres-tp/lock              |
|  | 0B      | Nov 7 12:41 | /var/tmp/if-rtssdb/env.lock        |
|  | 12.0K   | Nov 7 15:41 | /var/tmp/if-rtssdb/env.mem         |
|  | 132.0K  | Nov 7 15:55 | /var/tmp/if-rtssdb/shm_usr1.mem    |
|  | 2688.0K | Nov 7 15:41 | /var/tmp/if-rtssdb/shm_usr2.mem    |
|  | 2048.0K | Nov 7 15:41 | /var/tmp/if-rtssdb/trace.mem       |
|  | 730B    | Nov 7 19:57 | /var/tmp/juniper.conf+.gz          |
|  | 155B    | Nov 7 15:53 | /var/tmp/krt_gencfg_filter.txt     |
|  | 0B      | Nov 7 15:41 | /var/tmp/rtssdb/if-rtssdb          |

```

re0:

```

List of files to delete:

|  | Size  | Date        | Name                               |
|--|-------|-------------|------------------------------------|
|  | 11B   | Nov 7 15:55 | /var/jail/tmp/alarmd.ts            |
|  | 121B  | Nov 8 19:06 | /var/log/default-log-messages.0.gz |
|  | 16.7K | Nov 8 19:06 | /var/log/messages.0.gz             |
|  | 22.2K | Nov 8 17:45 | /var/log/messages.1.gz             |
|  | 18.4K | Nov 8 17:00 | /var/log/messages.2.gz             |
|  | 21.6K | Nov 8 16:00 | /var/log/messages.3.gz             |
|  | 17.9K | Nov 8 14:30 | /var/log/messages.4.gz             |
|  | 19.4K | Nov 8 13:30 | /var/log/messages.5.gz             |
|  | 18.2K | Nov 8 12:30 | /var/log/messages.6.gz             |

```

20.4K Nov 8 11:30 /var/log/messages.7.gz
21.4K Nov 8 10:15 /var/log/messages.8.gz
21.0K Nov 8 09:00 /var/log/messages.9.gz
19.9K Nov 8 08:13 /var/log/snmp-traps.0.gz
203B Nov 8 15:36 /var/log/wtmp.0.gz
57B Nov 7 12:41 /var/log/wtmp.1.gz
124.0K Nov 7 15:42 /var/tmp/gres-tp/env.dat
0B Nov 7 12:40 /var/tmp/gres-tp/lock
0B Nov 7 12:41 /var/tmp/if-rtssdb/env.lck
12.0K Nov 7 15:41 /var/tmp/if-rtssdb/env.mem
132.0K Nov 7 15:55 /var/tmp/if-rtssdb/shm_usr1.mem
2688.0K Nov 7 15:41 /var/tmp/if-rtssdb/shm_usr2.mem
2048.0K Nov 7 15:41 /var/tmp/if-rtssdb/trace.mem
727B Nov 7 15:54 /var/tmp/juniper.conf+.gz
155B Nov 7 15:55 /var/tmp/krt_gencfg_filter.txt
0B Nov 7 15:41 /var/tmp/rtssdb/if-rtssdb

```

#### request system storage cleanup node-group group-name (QFabric Systems)

```

user@switch> request system storage cleanup node-group NW-NG-0
BBAK0372:

```

-----

List of files to delete:

|  | Size    | Date        | Name                               |
|--|---------|-------------|------------------------------------|
|  | 126B    | Nov 8 19:07 | /var/log/default-log-messages.0.gz |
|  | 179B    | Nov 7 13:32 | /var/log/install.0.gz              |
|  | 22.9K   | Nov 8 19:07 | /var/log/messages.0.gz             |
|  | 26.5K   | Nov 8 17:30 | /var/log/messages.1.gz             |
|  | 20.5K   | Nov 8 13:15 | /var/log/messages.2.gz             |
|  | 33.2K   | Nov 7 17:45 | /var/log/messages.3.gz             |
|  | 35.5K   | Nov 7 15:45 | /var/log/messages.4.gz             |
|  | 339B    | Nov 8 17:10 | /var/log/wtmp.0.gz                 |
|  | 58B     | Nov 7 12:40 | /var/log/wtmp.1.gz                 |
|  | 124.0K  | Nov 8 17:08 | /var/tmp/gres-tp/env.dat           |
|  | 0B      | Nov 7 12:39 | /var/tmp/gres-tp/lock              |
|  | 0B      | Nov 7 12:59 | /var/tmp/if-rtssdb/env.lck         |
|  | 12.0K   | Nov 8 17:09 | /var/tmp/if-rtssdb/env.mem         |
|  | 2688.0K | Nov 8 17:09 | /var/tmp/if-rtssdb/shm_usr1.mem    |
|  | 132.0K  | Nov 8 17:09 | /var/tmp/if-rtssdb/shm_usr2.mem    |
|  | 2048.0K | Nov 8 17:09 | /var/tmp/if-rtssdb/trace.mem       |
|  | 1082B   | Nov 8 17:09 | /var/tmp/juniper.conf+.gz          |
|  | 155B    | Nov 7 17:39 | /var/tmp/krt_gencfg_filter.txt     |
|  | 0B      | Nov 8 17:09 | /var/tmp/rtssdb/if-rtssdb          |

EE3093:

-----

List of files to delete:

|  | Size  | Date        | Name                               |
|--|-------|-------------|------------------------------------|
|  | 11B   | Nov 8 17:33 | /var/jail/tmp/alarmd.ts            |
|  | 119B  | Nov 8 19:08 | /var/log/default-log-messages.0.gz |
|  | 180B  | Nov 7 17:41 | /var/log/install.0.gz              |
|  | 178B  | Nov 7 13:32 | /var/log/install.1.gz              |
|  | 2739B | Nov 8 19:08 | /var/log/messages.0.gz             |
|  | 29.8K | Nov 8 18:45 | /var/log/messages.1.gz             |
|  | 31.8K | Nov 8 17:15 | /var/log/messages.2.gz             |
|  | 20.6K | Nov 8 16:00 | /var/log/messages.3.gz             |
|  | 15.4K | Nov 8 10:15 | /var/log/messages.4.gz             |

```

15.4K Nov 8 02:15 /var/log/messages.5.gz
25.5K Nov 7 20:45 /var/log/messages.6.gz
48.0K Nov 7 17:45 /var/log/messages.7.gz
32.8K Nov 7 13:45 /var/log/messages.8.gz
684B Nov 8 17:02 /var/log/wtmp.0.gz
58B Nov 7 12:40 /var/log/wtmp.1.gz
124.0K Nov 7 17:34 /var/tmp/gres-tp/env.dat
 0B Nov 7 12:40 /var/tmp/gres-tp/lock
 0B Nov 7 12:59 /var/tmp/if-rtbdb/env.lck
12.0K Nov 7 17:39 /var/tmp/if-rtbdb/env.mem
2688.0K Nov 7 17:39 /var/tmp/if-rtbdb/shm_usr1.mem
132.0K Nov 7 17:40 /var/tmp/if-rtbdb/shm_usr2.mem
2048.0K Nov 7 17:39 /var/tmp/if-rtbdb/trace.mem
155B Nov 7 17:40 /var/tmp/krt_gencfg_filter.txt
 0B Nov 7 17:39 /var/tmp/rtbdb/if-rtbdb

```

### request system storage cleanup qfabric component device-name (QFabric Systems)

```

user@switch> request system storage cleanup qfabric component A0001/YA0197
Repository type: regular
Repository head: /pbstorage
Creating list of debug artifacts to be removed under:
/pbstorage/rdumps/A0001/YA0197
Removing debug artifacts ... (press control C to abort)
Removing /pbstorage/rdumps/A0001/YA0197/cosd.core.0.0.05162011123308.gz ... done
Removing /pbstorage/rdumps/A0001/YA0197/cosd.core.1.0.05162011123614.gz ... done
Removing /pbstorage/rdumps/A0001/YA0197/cosd.core.2.0.05162011123920.gz ... done
Removing /pbstorage/rdumps/A0001/YA0197/livekcore.05132011163930.gz ... done
Removing /pbstorage/rdumps/A0001/YA0197/tnetd.core.0.1057.05162011124500.gz ...
done
Removing /pbstorage/rdumps/A0001/YA0197/vmcore.05132011120528.gz ... done
Removing /pbstorage/rdumps/A0001/YA0197/vmcore.kz ... done
Creating list of debug artifacts to be removed under: /pbstorage/rlogs/A0001/YA0197
Removing debug artifacts ... (press control C to abort)
Removing /pbstorage/rlogs/A0001/YA0197/kdumpinfo.05132011120528 ... done
Removing /pbstorage/rlogs/A0001/YA0197/kernel.tarball.0.1039.051220111234415.tgz
... done
Removing /pbstorage/rlogs/A0001/YA0197/kernel.tarball.1.1039.05132011175544.tgz
... done
Removing /pbstorage/rlogs/A0001/YA0197/tnetd.tarball.0.1057.05162011175453.tgz
... done

```

### request system storage cleanup qfabric component device-name repository core (QFabric Systems)

```

user@switch> request system storage cleanup qfabric component EE3093 repository core
Repository scope: shared
Repository head: /pbdata/export
Repository name: core
Creating list of debug artifacts to be removed under: /pbdata/export/rdumps/EE3093
NOTE: core repository under /pbdata/export/rdumps/EE3093 empty

```

### request system storage cleanup qfabric component all (QFabric Systems)

```

user@switch> request system storage cleanup qfabric component all
Repository scope: shared
Repository head: /pbdata/export
Creating list of debug artifacts to be removed under: /pbdata/export/rdumps
NOTE: core repository under /pbdata/export/rdumps/all empty
Creating list of debug artifacts to be removed under: /pbdata/export/rlogs
List of debug artifacts to clean up ... (press control C to abort)
/pbdata/export/rlogs/73747cd8-0710-11e1-b6a4-00e081c5297e/install-11072011125819.log
/pbdata/export/rlogs/77116f18-0710-11e1-a2a0-00e081c5297e/install-11072011125819.log

```

```
/pbdata/export/rlogs/BBAK0372/install-11072011121538.log
/pbdata/export/rlogs/BBAK0394/install-11072011121532.log
/pbdata/export/rlogs/EE3093/install-11072011121536.log
/pbdata/export/rlogs/WS001/YN5999/install-11072011121644.log
/pbdata/export/rlogs/WS001/YW3803/install-11072011122429.log
/pbdata/export/rlogs/cd78871a-0710-11e1-878e-00e081c5297e/install-11072011125932.log
/pbdata/export/rlogs/d0afda1e-0710-11e1-a1d0-00e081c5297e/install-11072011125930.log
/pbdata/export/rlogs/d0afda1e-0710-11e1-a1d0-00e081c5297e/install-11072011133211.log
/pbdata/export/rlogs/d0afda1e-0710-11e1-a1d0-00e081c5297e/install-11072011155302.log
/pbdata/export/rlogs/d31ab7a6-0710-11e1-ad1b-00e081c5297e/install-11072011125931.log
/pbdata/export/rlogs/d4d0f254-0710-11e1-90c3-00e081c5297e/install-11072011125932.log
```

## request system zeroize

**Syntax**    request system zeroize  
                  <media>  
                  <local>

**Release Information**    Command introduced before Junos OS Release 9.0.  
                  Command introduced in Junos OS Release 11.2 for EX Series switches.  
                  Option **media** added in Junos OS Release 11.4 for EX Series switches.  
                  Command introduced in Junos OS Release 12.2 for MX Series routers.  
                  Command introduced in Junos OS Release 12.3 for the QFX Series.  
                  Option **local** added in Junos OS Release 14.1.  
                  Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

### Description



**NOTE:** The **media** option is not available on the QFX Series.

Remove all configuration information on the Routing Engines and reset all key values. If the device has dual Routing Engines, the command is broadcast to all Routing Engines on the device. The command removes all data files, including customized configuration and log files, by unlinking the files from their directories. The command removes all user-created files from the system including all plain-text passwords, secrets, and private keys for SSH, local encryption, local authentication, IPsec, RADIUS, TACACS+, and SNMP.

This command reboots the device and sets it to the factory default configuration. After the reboot, you cannot access the device through the management Ethernet interface. Log in through the console as **root** and start the Junos OS CLI by typing **cli** at the prompt.



**NOTE:** If you configure the **commit synchronize** statement at the **[edit system]** hierarchy level and issue a **commit** in the master Routing Engine, the master configuration is automatically synchronized with the backup. However, if the backup Routing Engine is down when you issue the **commit**, the Junos OS displays a warning and commits the candidate configuration in the master Routing Engine. When the backup Routing Engine comes up, its configuration will automatically be synchronized with the master. A newly inserted backup Routing Engine automatically synchronizes its configuration with the master Routing Engine configuration.

To completely erase user-created data so that it is unrecoverable, use the **media** option.

**Options**    **media**—(Optional) In addition to removing all configuration and log files, causes memory and the media to be scrubbed, removing all traces of any user-created files. Every storage device attached to the system is scrubbed, including disks, flash drives, removable USBs, and so on. The duration of the scrubbing process is dependent on the size of the media being erased. As a result, the **request system zeroize media**

operation can take considerably more time than the **request system zeroize** operation. However, the critical security parameters are all removed at the beginning of the process.

**local**—(Optional) Remove all the configuration information and restore all the key values on the active Routing Engine.

**Required Privilege Level** maintenance

**Related Documentation**

- *request system snapshot*
- [request system snapshot on page 1326](#)
- *Reverting to the Default Factory Configuration for the EX Series Switch*
- *Reverting to the Rescue Configuration for the EX Series Switch*
- *Reverting to the Default Factory Configuration*
- *Reverting to the Rescue Configuration*
- [Reverting to the Default Factory Configuration by Using the request system zeroize Command on page 27](#)

**List of Sample Output** [request system zeroize on page 495](#)  
[request system zeroize media on page 496](#)

## Sample Output

### request system zeroize

```
user@host> request system zeroize
warning: System will be rebooted and may not boot without configuration
Erase all data, including configuration and log files? [yes,no] (no) yes

0 1 1 0 0 0 done

syncing disks... All buffers synced.
Uptime: 5d19h20m26s
recorded reboot as normal shutdown
Rebooting...

U-Boot 1.1.6 (Mar 11 2011 - 04:39:06)

Board: EX4200-24T 2.11
EPLD: Version 6.0 (0x85)
DRAM: Initializing (1024 MB)
FLASH: 8 MB

Firmware Version: --- 01.00.00 ---
USB: scanning bus for devices... 2 USB Device(s) found
 scanning bus for storage devices... 1 Storage Device(s) found

ELF file is 32 bit
Consoles: U-Boot console

FreeBSD/PowerPC U-Boot bootstrap loader, Revision 2.4
(user@host, Fri Mar 11 03:03:36 UTC 2011)
```

```

Memory: 1024MB
bootsequencing is enabled
bootsuccess is set
new boot device = disk0s1:
Loading /boot/defaults/loader.conf
/kernel data=0x915c84+0xa1260 syms=[0x4+0x7cbd0+0x4+0xb1c19]

Hit [Enter] to boot immediately, or space bar for command prompt.
Booting [/kernel]...
Kernel entry at 0x800000e0 ...
GDB: no debug ports present
KDB: debugger backends: ddb
KDB: current backend: ddb
Copyright (c) 1996-2011, Juniper Networks, Inc.
All rights reserved.
Copyright (c) 1992-2006 The FreeBSD Project.
Copyright (c) 1979, 1980, 1983, 1986, 1988, 1989, 1991, 1992, 1993, 1994
 The Regents of the University of California. All rights reserved.
JUNOS 11.1R1.8 #0: 2011-03-09 20:14:25 UTC
 user@host:/volume/build/junos/11.1/release/11.1R1.8/obj-powerpc/bsd/kernels/
 JUNIPER-EX/kernel
Timecounter "decrementer" frequency 50000000 Hz quality 0
cpu0: Freescale e500v2 core revision 2.2
cpu0: HID0 80004080
...

```

#### request system zeroize media

```

user@host> request system zeroize media
warning: System will be rebooted and may not boot without configuration
Erase all data, including configuration and log files? [yes,no] (no) yes

warning: ipsec-key-management subsystem not running - not needed by configuration.
warning: zeroizing fpc0

{master:0}
root> Waiting (max 60 seconds) for system process `vnlr' to stop...done
. . .
Syncing disks, vnodes remaining...2 4 2 4 3 2 1 1 0 0 0 done

syncing disks... All buffers synced.
Uptime: 14m50s
recorded reboot as normal shutdown
Rebooting...

U-Boot 1.1.6 (Apr 21 2011 - 13:58:42)

Board: EX4200-48PX 1.1
EPLD: Version 8.0 (0x82)
DRAM: Initializing (512 MB)
FLASH: 8 MB
NAND: No NAND device found!!!
0 MiB

Firmware Version: --- 01.00.00 ---
USB: scanning bus for devices... 2 USB Device(s) found
 scanning bus for storage devices... 1 Storage Device(s) found

ELF file is 32 bit
Consoles: U-Boot console

```



```

FreeBSD/PowerPC U-Boot bootstrap loader, Revision 2.2
(device1.example.com, Fri Feb 26 17:48:51 PST 2010)
Memory: 512MB
Loading /boot/defaults/loader.conf
/kernel data=0x9abfdc+0xb06e4 syms=[0x4+0x83b30+0x4+0xbd7c6]

Hit [Enter] to boot immediately, or space bar for command prompt.
Booting [/kernel] in 1 second... Booting [/kernel]...
Kernel entry at 0x800000e0 ...
GDB: no debug ports present
KDB: debugger backends: ddb
KDB: current backend: ddb
Copyright (c) 1996-2011, Juniper Networks, Inc.
All rights reserved.
Copyright (c) 1992-2006 The FreeBSD Project.
Copyright (c) 1979, 1980, 1983, 1986, 1988, 1989, 1991, 1992, 1993, 1994
The Regents of the University of California. All rights reserved.
JUNOS 11.4R1.2 #0: 2011-10-27 18:05:39 UTC
user@host:/volume/build/junos/11.4/release/11.4R1.2/obj-powerpc/
bsd/kernels/JUNIPER-EX/kernel
can't re-use a leaf (all_slot_serialid)!
Timecounter "decrementer" frequency 50000000 Hz quality 0
cpu0: Freescale e500v2 core revision 2.2
cpu0: HIO 80004080<EMCP,TBEN,EN_MAS7_UPDATE>
real memory = 511705088 (488 MB)
avail memory = 500260864 (477 MB)
ETHERNET SOCKET BRIDGE initialising
Initializing EXSERIES platform properties ...
...
Automatic reboot in progress...
Media check on da0 on ex platforms
** /dev/da0s2a
FILE SYSTEM CLEAN; SKIPPING CHECKS
clean, 20055 free (31 frags, 2503 blocks, 0.0% fragmentation)
zeroizing /dev/da0s1a ...
...
zeroizing /dev/da0s3d ...
...
zeroizing /dev/da0s3e ...
...
zeroizing /dev/da0s4d ...
...
zeroizing /dev/da0s4e ...
...

syncing disks... All buffers synced.
Uptime: 3m40s
Rebooting...

U-Boot 1.1.6 (Apr 21 2011 - 13:58:42)

Board: EX4200-48PX 1.1
EPLD: Version 8.0 (0x82)
DRAM: Initializing (512 MB)
FLASH: 8 MB
NAND: No NAND device found!!!
0 MiB

Firmware Version: --- 01.00.00 ---
USB: scanning bus for devices... 2 USB Device(s) found

```

```

 scanning bus for storage devices... 1 Storage Device(s) found

ELF file is 32 bit
Consoles: U-Boot console

FreeBSD/PowerPC U-Boot bootstrap loader, Revision 2.2
(vtseng@svl-junos-pool27.host, Fri Feb 26 17:48:51 PST 2010)
Memory: 512MB
Loading /boot/defaults/loader.conf
/kernel data=0x9abfdc+0xb06e4 syms=[0x4+0x83b30+0x4+0xbd7c6]

Hit [Enter] to boot immediately, or space bar for command prompt.
Booting [/kernel] in 1 second... Booting [/kernel]...
Kernel entry at 0x800000e0 ...
GDB: no debug ports present
KDB: debugger backends: ddb
KDB: current backend: ddb
Copyright (c) 1996-2011, Juniper Networks, Inc.
All rights reserved.
Copyright (c) 1992-2006 The FreeBSD Project.
Copyright (c) 1979, 1980, 1983, 1986, 1988, 1989, 1991, 1992, 1993, 1994
The Regents of the University of California. All rights reserved.
JUNOS 11.4R1.2 #0: 2011-10-27 18:05:39 UTC
user@host:/volume/build/junos/11.4/release/11.4R1.2/obj-powerpc/
bsd/kernels/JUNIPER-EX/kernel
can't re-use a leaf (all_slot_serialid)!
Timecounter "decrementer" frequency 50000000 Hz quality 0
cpu0: Freescale e500v2 core revision 2.2
cpu0: HID0 80004080 <EMCP,TBEN,EN_MAS7_UPDATE>
real memory = 511705088 (488 MB)
avail memory = 500260864 (477 MB)
ETHERNET SOCKET BRIDGE initialising
Initializing EXSERIES platform properties ...
. . .
Automatic reboot in progress...
Media check on da0 on ex platforms
** /dev/da0s1a
FILE SYSTEM CLEAN; SKIPPING CHECKS
clean, 20064 free (48 frags, 2502 blocks, 0.1% fragmentation)
zeroizing /dev/da0s2a ...
. . .
Creating initial configuration...mgd: error: Cannot open configuration file:
/config/juniper.conf
mgd: warning: activating factory configuration
mgd: commit complete
mgd: -----
mgd: Please login as 'root'. No password is required.
mgd: To start Initial Setup, type 'ezsetup' at the JUNOS prompt.
mgd: To start JUNOS CLI, type 'cli' at the JUNOS prompt.
mgd: -----
Setting initial options: debugger_on_panic=NO debugger_on_break=NO.
Starting optional daemons: .
Doing initial network setup:
. . .

Amnesiac (ttyu0)

```

## restart

### List of Syntax [Syntax on page 499](#)

[Syntax \(ACX Series Routers\) on page 499](#)  
[Syntax \(EX Series Switches\) on page 499](#)  
[Syntax \(Routing Matrix\) on page 500](#)  
[Syntax \(J Series Routing Platform\) on page 500](#)  
[Syntax \(TX Matrix Routers\) on page 500](#)  
[Syntax \(TX Matrix Plus Routers\) on page 500](#)  
[Syntax \(MX Series Routers\) on page 500](#)  
[Syntax \(J Series Routers\) on page 501](#)  
[Syntax \(QFX Series\) on page 501](#)

### Syntax `restart`

```

<adaptive-services | ancpd-service | application-identification | audit-process |
 auto-configuration | captive-portal-content-delivery | ce-l2tp-service | chassis-control |
 class-of-service | clksyncd-service | database-replication | datapath-trace-service
 | dhcp-service | diameter-service | disk-monitoring | dynamic-flow-capture |
 ecc-error-logging | ethernet-connectivity-fault-management
 | ethernet-link-fault-management | event-processing | firewall
 | general-authentication-service | gracefully | iccp-service | idp-policy | immediately
 | interface-control | ipsec-key-management | kernel-replication | l2-learning | l2cpd-service
 | l2tp-service | l2tp-universal-edge | lacp | license-service | link-management
 | local-policy-decision-function | mac-validation | mib-process | mobile-ip | mountd-service
 | mpls-traceroute | mspd | multicast-snooping | named-service | nfsd-service |
 packet-triggered-subscribers | peer-selection-service | pgcp-service | pgm |
 pic-services-logging | pki-service | ppp | ppp-service | pppoe |
 protected-system-domain-service | redundancy-interface-process | remote-operations |
 root-system-domain-service | routing <logical-system logical-system-name> | sampling
 | sbc-configuration-process | sdk-service | service-deployment | services | services pgcp
 gateway gateway-name | snmp | soft | static-subscribers | statistics-service |
 subscriber-management | subscriber-management-helper | tunnel-oamd | usb-control |
 vrrp | web-management>
<gracefully | immediately | soft>

```

### Syntax (ACX Series Routers)

```

restart
<adaptive-services | audit-process | auto-configuration | autoinstallation | chassis-control |
 class-of-service | clksyncd-service | database-replication | dhcp-service | diameter-service
 | disk-monitoring | dynamic-flow-capture | ethernet-connectivity-fault-management
 | ethernet-link-fault-management | event-processing | firewall
 | general-authentication-service | gracefully | immediately | interface-control |
 ipsec-key-management | l2-learning | lacp | link-management | mib-process | mobile-ip |
 mountd-service | mpls-traceroute | mspd | named-service | nfsd-service | pgm | pki-service
 | ppp | pppoe | redundancy-interface-process | remote-operations | routing | sampling |
 sdk-service | secure-neighbor-discovery | service-deployment | services | snmp | soft
 | statistics-service | subscriber-management | subscriber-management-helper | tunnel-oamd
 | vrrp>

```

### Syntax (EX Series Switches)

```

restart
<autoinstallation | chassis-control | class-of-service | database-replication | dhcp |
 dhcp-service | diameter-service | dot1x-protocol | ethernet-link-fault-management |
 ethernet-switching | event-processing | firewall | general-authentication-service |
 interface-control | kernel-replication | l2-learning | lacp | license-service | link-management

```

|                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                           | lldpd-service   mib-process   mountd-service   multicast-snooping   pgm  <br>redundancy-interface-process   remote-operations   routing   secure-neighbor-discovery<br>  service-deployment   sflow-service   snmp   vrrp   web-management>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Syntax (Routing Matrix)</b>            | restart<br><adaptive-services   audit-process   chassis-control   class-of-service   disk-monitoring  <br>dynamic-flow-capture   ecc-error-logging   event-processing   firewall   interface-control<br>  ipsec-key-management   kernel-replication   l2-learning   l2tp-service   lacp  <br>link-management   mib-process   pgm   pic-services-logging   ppp   pppoe  <br>redundancy-interface-process   remote-operations   routing <logical-system<br><i>logical-system-name</i> >   sampling   service-deployment   snmp><br><all   all-lcc   lcc <i>number</i> ><br><gracefully   immediately   soft>                                                                                                                                                                                                                                                                                                                                                        |
| <b>Syntax (J Series Routing Platform)</b> | restart<br><adaptive-services   audit-process   chassis-control   class-of-service   dhcp   dialer-services<br>  dlsr   event-processing   firewall   interface-control   ipsec-key-management  <br>isdn-signaling   l2-learning   l2tp-service   mib-process   network-access-service   pgm  <br>ppp   pppoe   remote-operations   routing <logical-system <i>logical-system-name</i> >   sampling<br>  service-deployment   snmp   usb-control   web-management><br><gracefully   immediately   soft>                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Syntax (TX Matrix Routers)</b>         | restart<br><adaptive-services   audit-process   chassis-control   class-of-service   dhcp-service  <br>diameter-service   disk-monitoring   dynamic-flow-capture   ecc-error-logging  <br>event-processing   firewall   interface-control   ipsec-key-management   kernel-replication<br>  l2-learning   l2tp-service   lacp   link-management   mib-process   pgm   pic-services-logging<br>  ppp   pppoe   redundancy-interface-process   remote-operations   routing <logical-system<br><i>logical-system-name</i> >   sampling   service-deployment   snmp   statistics-service><br><all-chassis   all-lcc   lcc <i>number</i>   scc><br><gracefully   immediately   soft>                                                                                                                                                                                                                                                                                    |
| <b>Syntax (TX Matrix Plus Routers)</b>    | restart<br><adaptive-services   audit-process   chassis-control   class-of-service   dhcp-service  <br>diameter-service   disk-monitoring   dynamic-flow-capture   ecc-error-logging  <br>event-processing   firewall   interface-control   ipsec-key-management   kernel-replication<br>  l2-learning   l2tp-service   lacp   link-management   mib-process   pgm  <br>pic-services-logging   ppp   pppoe   redundancy-interface-process   remote-operations  <br>routing <logical-system <i>logical-system-name</i> >   sampling   service-deployment   snmp  <br>statistics-service><br><all-chassis   all-lcc   all-sfc   lcc <i>number</i>   sfc <i>number</i> ><br><gracefully   immediately   soft>                                                                                                                                                                                                                                                        |
| <b>Syntax (MX Series Routers)</b>         | restart<br><adaptive-services   ancpd-service   application-identification   audit-process  <br>auto-configuration   captive-portal-content-delivery   ce-l2tp-service   chassis-control  <br>class-of-service   clksyncd-service   database-replication   datapath-trace-service<br>  dhcp-service   diameter-service   disk-monitoring   dynamic-flow-capture  <br>ecc-error-logging   ethernet-connectivity-fault-management<br>  ethernet-link-fault-management   event-processing   firewall  <br>general-authentication-service   gracefully   iccp-service   idp-policy   immediately<br>  interface-control   ipsec-key-management   kernel-replication   l2-learning   l2cpd-service<br>  l2tp-service   l2tp-universal-edge   lacp   license-service   link-management<br>  local-policy-decision-function   mac-validation   mib-process   mobile-ip   mountd-service<br>  mpls-traceroute   mspdp   multicast-snooping   named-service   nfsd-service |

```

packet-triggered-subscribers |peer-selection-service | pgcp-service | pgm |
pic-services-logging | pki-service | ppp | ppp-service | pppoe |
protected-system-domain-service | redundancy-interface-process | remote-operations
|root-system-domain-service | routing |routing <logical-system logical-system-name> |
sampling | sbc-configuration-process | sdk-service |service-deployment |services | services
pgcp gateway gateway-name |snmp |soft |static-subscribers |statistics-service|
subscriber-management | subscriber-management-helper | tunnel-oamd | usb-control|
vrrp |web-management>
<all-members>
<gracefully | immediately | soft>
<local>
<member member-id>

```

**Syntax (J Series  
Routers)**

```

restart
<adaptive-services | audit-process | chassis-control | class-of-service | dhcp | dhcp-service
| dialer-services | diameter-service | dlsw | event-processing | firewall | interface-control |
ipsec-key-management | isdn-signaling | l2ald | l2-learning | l2tp-service | mib-process |
network-access-service | pgm | ppp | pppoe | remote-operations | routing <logical-system
logical-system-name> | sampling | service-deployment | snmp | usb-control |
web-management>
<gracefully | immediately | soft>

```

**Syntax (QFX Series)**

```

restart
<adaptive-services | audit-process | chassis-control | class-of-service | dialer-services |
diameter-service | dlsw | ethernet-connectivity | event-processing | fibre-channel | firewall
| general-authentication-service | igmp-host-services | interface-control |
ipsec-key-management | isdn-signaling | l2ald | l2-learning | l2tp-service | mib-process |
named-service | network-access-service | nstrace-process | pgm | ppp | pppoe |
redundancy-interface-process | remote-operations |logical-system-name> | routing |
sampling |secure-neighbor-discovery | service-deployment | snmp | usb-control |
web-management>
<gracefully | immediately | soft>

```

**Release Information**

Command introduced before Junos OS Release 7.4.  
 Command introduced in Junos OS Release 9.0 for EX Series switches.  
 Command introduced in Junos OS Release 11.1 for the QFX Series.  
 Command introduced in Junos OS Release 12.2 for ACX Series routers.  
 Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.  
 Options added:

- **dynamic-flow-capture** in Junos OS Release 7.4.
- **dlsw** in Junos OS Release 7.5.
- **event-processing** in Junos OS Release 7.5.
- **ppp** in Junos OS Release 7.5.
- **l2ald** in Junos OS Release 8.0.
- **link-management** in Release 8.0.
- **pgcp-service** in Junos OS Release 8.4.
- **sbc-configuration-process** in Junos OS Release 9.5.

- **services pgcp gateway** in Junos OS Release 9.6.
- **sfc** and **all-sfc** for the TX Matrix Router in Junos OS Release 9.6.

**Description** Restart a Junos OS process.



**CAUTION:** Never restart a software process unless instructed to do so by a customer support engineer. A restart might cause the router or switch to drop calls and interrupt transmission, resulting in possible loss of data.

**Options** **none**—Same as **gracefully**.

**adaptive-services**—(Optional) Restart the configuration management process that manages the configuration for stateful firewall, Network Address Translation (NAT), intrusion detection services (IDS), and IP Security (IPsec) services on the Adaptive Services PIC.

**all-chassis**—(TX Matrix and TX Matrix Plus routers only) (Optional) Restart the software process on all chassis.

**all-lcc**—(TX Matrix and TX Matrix Plus routers only) (Optional) For a TX Matrix router, restart the software process on all T640 routers connected to the TX Matrix router. For a TX Matrix Plus router, restart the software process on all T1600 routers connected to the TX Matrix Plus router.

**all-members**—(MX Series routers only) (Optional) Restart the software process for all members of the Virtual Chassis configuration.

**all-sfc**—(TX Matrix Plus routers only) (Optional) For a TX Matrix Plus router, restart the software processes for the TX Matrix Plus router (or switch-fabric chassis).

**ancpd-service**—(Optional) Restart the Access Node Control Protocol (ANCP) process, which works with a special Internet Group Management Protocol (IGMP) session to collect outgoing interface mapping events in a scalable manner.

**application-identification**—(Optional) Restart the process that identifies an application using intrusion detection and prevention (IDP) to allow or deny traffic based on applications running on standard or nonstandard ports.

**audit-process**—(Optional) Restart the RADIUS accounting process that gathers statistical data that can be used for general network monitoring, analyzing, and tracking usage patterns, for billing a user based on the amount of time or type of services accessed.

**auto-configuration**—(Optional) Restart the Interface Auto-Configuration process.

**autoinstallation**—(EX Series switches only) (Optional) Restart the autoinstallation process.

**captive-portal-content-delivery**—(Optional) Restart the HTTP redirect service by specifying the location to which a subscriber's initial Web browser session is redirected, enabling initial provisioning and service selection for the subscriber.

**ce-l2tp-service**—(M10, M10i, M7i, and MX Series routers only) (Optional) Restart the Universal Edge Layer 2 Tunneling Protocol (L2TP) process, which establishes L2TP tunnels and Point-to-Point Protocol (PPP) sessions through L2TP tunnels.

**chassis-control**—(Optional) Restart the chassis management process.

**class-of-service**—(Optional) Restart the class-of-service (CoS) process, which controls the router's or switch's CoS configuration.

**clksyncd-service**—(Optional) Restart the external clock synchronization process, which uses synchronous Ethernet (SyncE).

**database-replication**—(EX Series switches and MX Series routers only) (Optional) Restart the database replication process.

**d datapath-trace-service**—(Optional) Restart the packet path tracing process.

**dhcp**—(J Series routers and EX Series switches only) (Optional) Restart the software process for a Dynamic Host Configuration Protocol (DHCP) server. A DHCP server allocates network IP addresses and delivers configuration settings to client hosts without user intervention.

**dhcp-service**—(Optional) Restart the Dynamic Host Configuration Protocol process.

**dialer-services**—(J Series routers and EX Series switches only) (Optional) Restart the ISDN dial-out process.

**diameter-service**—(Optional) Restart the diameter process.

**disk-monitoring**—(Optional) Restart disk monitoring, which checks the health of the hard disk drive on the Routing Engine.

**dlsw**—(J Series routers and QFX Series only) (Optional) Restart the data link switching (DLSw) service.

**dot1x-protocol**—(EX Series switches only) (Optional) Restart the port-based network access control process.

**dynamic-flow-capture**—(Optional) Restart the dynamic flow capture (DFC) process, which controls DFC configurations on Monitoring Services III PICs.

**ecc-error-logging**—(Optional) Restart the error checking and correction (ECC) process, which logs ECC parity errors in memory on the Routing Engine.

**ethernet-connectivity-fault-management**—(Optional) Restart the process that provides IEEE 802.1ag Operation, Administration, and Management (OAM) connectivity fault management (CFM) database information for CFM maintenance association end points (MEPs) in a CFM session.

- ethernet-link-fault-management**—(EX Series switches and MX Series routers only) (Optional) Restart the process that provides the OAM link fault management (LFM) information for Ethernet interfaces.
- ethernet-switching**—(EX Series switches only) (Optional) Restart the Ethernet switching process.
- event-processing**—(Optional) Restart the event process (eventd).
- fibre-channel**—(QFX Series only) (Optional) Restart the Fibre Channel process.
- firewall**—(Optional) Restart the firewall management process, which manages the firewall configuration and enables accepting or rejecting packets that are transiting an interface on a router or switch.
- general-authentication-service**—(EX Series switches and MX Series routers only) (Optional) Restart the general authentication process.
- gracefully**—(Optional) Restart the software process.
- iccp-service**—(Optional) Restart the Inter-Chassis Communication Protocol (ICCP) process.
- idp-policy**—(Optional) Restart the intrusion detection and prevention (IDP) protocol process.
- immediately**—(Optional) Immediately restart the software process.
- interface-control**—(Optional) Restart the interface process, which controls the router's or switch's physical interface devices and logical interfaces.
- ipsec-key-management**—(Optional) Restart the IPsec key management process.
- isdn-signaling**—(J Series routers and QFX Series only) (Optional) Restart the ISDN signaling process, which initiates ISDN connections.
- kernel-replication**—(Optional) Restart the kernel replication process, which replicates the state of the backup Routing Engine when graceful Routing Engine switchover (GRES) is configured.
- l2-learning**—(Optional) Restart the Layer 2 address flooding and learning process.
- l2cpd-service**—(Optional) Restart the Layer 2 Control Protocol process, which enables features such as Layer 2 protocol tunneling and nonstop bridging.
- l2tp-service**—(M10, M10i, M7i, and MX Series routers only) (Optional) Restart the Layer 2 Tunneling Protocol (L2TP) process, which sets up client services for establishing Point-to-Point Protocol (PPP) tunnels across a network and negotiating Multilink PPP if it is implemented.
- l2tp-universal-edge**—(MX Series routers only) (Optional) Restart the L2TP process, which establishes L2TP tunnels and PPP sessions through L2TP tunnels.



**lACP**—(Optional) Restart the Link Aggregation Control Protocol (LACP) process. LACP provides a standardized means for exchanging information between partner systems on a link to allow their link aggregation control instances to reach agreement on the identity of the LAG to which the link belongs, and then to move the link to that LAG, and to enable the transmission and reception processes for the link to function in an orderly manner.

**lcc *number***—(TX Matrix and TX Matrix Plus routers only) (Optional) For a TX Matrix router, restart the software process for a specific T640 router that is connected to the TX Matrix router. For a TX Matrix Plus router, restart the software process for a specific router that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**license-service**—(EX Series switches only) (Optional) Restart the feature license management process.

**link-management**— (TX Matrix and TX Matrix Plus routers and EX Series switches only) (Optional) Restart the Link Management Protocol (LMP) process, which establishes and maintains LMP control channels.

**lldpd-service**—(EX Series switches only) (Optional) Restart the Link Layer Discovery Protocol (LLDP) process.

**local**—(MX Series routers only) (Optional) Restart the software process for the local Virtual Chassis member.

**local-policy-decision-function**— (Optional) Restart the process for the Local Policy Decision Function, which regulates collection of statistics related to applications and application groups and tracking of information about dynamic subscribers and static interfaces.

**mac-validation**— (Optional) Restart the Media Access Control (MAC) validation process, which configures MAC address validation for subscriber interfaces created on demux interfaces in dynamic profiles on MX Series routers.

**member *member-id***—(MX Series routers only) (Optional) Restart the software process for a specific member of the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

**mib-process**—(Optional) Restart the Management Information Base (MIB) version II process, which provides the router's MIB II agent.

**mobile-ip**—(Optional) Restart the Mobile IP process, which configures Junos OS Mobile IP features.

**moundd-service**—(EX Series switches and MX Series routers only) (Optional) Restart the service for NFS mount requests.

**mpls-traceroute**—(Optional) Restart the MPLS Periodic Traceroute process.

**mspd**—(Optional) Restart the Multiservice process.

**multicast-snooping**—(EX Series switches and MX Series routers only) (Optional) Restart the multicast snooping process, which makes Layer 2 devices, such as VLAN switches, aware of Layer 3 information, such as the media access control (MAC) addresses of members of a multicast group.

**named-service**—(Optional) Restart the DNS Server process, which is used by a router or a switch to resolve hostnames into addresses.

**network-access-service**—(J Series routers and QFX Series only) (Optional) Restart the network access process, which provides the router's Challenge Handshake Authentication Protocol (CHAP) authentication service.

**nfsd-service**—(Optional) Restart the Remote NFS Server process, which provides remote file access for applications that need NFS-based transport.

**packet-triggered-subscribers**—(Optional) Restart the packet-triggered subscribers and policy control (PTSP) process, which allows the application of policies to dynamic subscribers that are controlled by a subscriber termination device.

**peer-selection-service**—(Optional) Restart the Peer Selection Service process.

**pgcp-service**—(Optional) Restart the pgcpd service process running on the Routing Engine. This option does not restart pgcpd processes running on mobile station PICs. To restart pgcpd processes running on mobile station PICs, use the **services pgcp gateway** option.

**pgm**—(Optional) Restart the process that implements the Pragmatic General Multicast (PGM) protocol for assisting in the reliable delivery of multicast packets.

**pic-services-logging**—(Optional) Restart the logging process for some PICs. With this process, also known as fsad (the file system access daemon), PICs send special logging information to the Routing Engine for archiving on the hard disk.

**pki-service**—(Optional) Restart the PKI Service process.

**ppp**—(Optional) Restart the Point-to-Point Protocol (PPP) process, which is the encapsulation protocol process for transporting IP traffic across point-to-point links.

**ppp-service**—(Optional) Restart the Universal Edge PPP process, which is the encapsulation protocol process for transporting IP traffic across Universal Edge routers.

**pppoe**—(Optional) Restart the Point-to-Point Protocol over Ethernet (PPPoE) process, which combines PPP that typically runs over broadband connections with the Ethernet link-layer protocol that allows users to connect to a network of hosts over a bridge or access concentrator.

**protected-system-domain-service**—(Optional) Restart the Protected System Domain (PSD) process.

**redundancy-interface-process**—(Optional) Restart the ASP redundancy process.

**remote-operations**—(Optional) Restart the remote operations process, which provides the ping and traceroute MIBs.

**root-system-domain-service**—(Optional) Restart the Root System Domain (RSD) service.

**routing**—(ACX Series routers, QFX Series, EX Series switches, and MX Series routers only) (Optional) Restart the routing protocol process.

**routing <logical-system *logical-system-name*>**—(Optional) Restart the routing protocol process, which controls the routing protocols that run on the router or switch and maintains the routing tables. Optionally, restart the routing protocol process for the specified logical system only.

**sampling**—(Optional) Restart the sampling process, which performs packet sampling based on particular input interfaces and various fields in the packet header.

**sbc-configuration-process**—(Optional) Restart the session border controller (SBC) process of the border signaling gateway (BSG).

**scc**—(TX Matrix routers only) (Optional) Restart the software process on the TX Matrix router (or switch-card chassis).

**sdk-service**—(Optional) Restart the SDK Service process, which runs on the Routing Engine and is responsible for communications between the SDK application and Junos OS. Although the SDK Service process is present on the router, it is turned off by default.

**secure-neighbor-discovery**—(QFX Series, EX Series switches, and MX Series routers only) (Optional) Restart the secure Neighbor Discovery Protocol (NDP) process, which provides support for protecting NDP messages.

**sfc *number***—(TX Matrix Plus routers only) (Optional) Restart the software process on the TX Matrix Plus router (or switch-fabric chassis). Replace *number* with 0.

**service-deployment**—(Optional) Restart the service deployment process, which enables Junos OS to work with the Session and Resource Control (SRC) software.

**services**—(Optional) Restart a service.

**services pgcp gateway gateway-name**—(Optional) Restart the pgcpd process for a specific border gateway function (BGF) running on an MS-PIC. This option does not restart the pgcpd process running on the Routing Engine. To restart the pgcpd process on the Routing Engine, use the **pgcp-service** option.

**sflow-service**—(EX Series switches only) (Optional) Restart the flow sampling (sFlow technology) process.

**snmp**—(Optional) Restart the SNMP process, which enables the monitoring of network devices from a central location and provides the router's or switch's SNMP master agent.

**soft**—(Optional) Reread and reactivate the configuration without completely restarting the software processes. For example, BGP peers stay up and the routing table stays constant. Omitting this option results in a graceful restart of the software process.

**static-subscribers**—(Optional) Restart the static subscribers process, which associates subscribers with statically configured interfaces and provides dynamic service activation and activation for these subscribers.

**statistics-service**—(Optional) Restart the process that manages the Packet Forwarding Engine statistics.

**subscriber-management**—(Optional) Restart the Subscriber Management process.

**subscriber-management-helper**—(Optional) Restart the Subscriber Management Helper process.

**tunnel-oamd**—(Optional) Restart the Tunnel OAM process, which enables the Operations, Administration, and Maintenance of Layer 2 tunneled networks. Layer 2 protocol tunneling (L2PT) allows service providers to send Layer 2 PDUs across the provider's cloud and deliver them to Juniper Networks EX Series Ethernet Switches that are not part of the local broadcast domain.

**usb-control**—(J Series routers and MX Series routers only) (Optional) Restart the USB control process.

**vrrp**—(ACX Series routers, EX Series switches, and MX Series routers only) (Optional) Restart the Virtual Router Redundancy Protocol (VRRP) process, which enables hosts on a LAN to make use of redundant routing platforms on that LAN without requiring more than the static configuration of a single default route on the hosts.

**web-management**—(J Series routers, QFX Series, EX Series switches, and MX Series routers only) (Optional) Restart the Web management process.

**Required Privilege Level**    reset

**Related Documentation**    • [Overview of Junos OS CLI Operational Mode Commands on page 56](#)

**List of Sample Output**    [restart interfaces on page 509](#)

**Output Fields** When you enter this command, you are provided feedback on the status of your request.

## Sample Output

restart interfaces

```
user@host> restart interfaces
interfaces process terminated
interfaces process restarted
```

## save

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>              | <code>save <i>filename</i></code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>QFX Series</b>          | <code>save (dhcp-snooping <i>filename</i>)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Release Information</b> | <p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Description</b>         | <p>Save the configuration to an ASCII file. The contents of the current level of the statement hierarchy (and below) are saved, along with the statement hierarchy containing it. This allows a section of the configuration to be saved, while fully specifying the statement hierarchy.</p> <p>When saving a file to a remote system, the software uses the <b>scp/ssh</b> protocol.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Options</b>             | <p><b><i>filename</i></b>—Name of the saved file. You can specify a filename in one of the following ways:</p> <ul style="list-style-type: none"> <li>• <b><i>filename</i></b>—File in the user's home directory (the current directory) on the local flash drive.</li> <li>• <b><i>path/filename</i></b>—File on the local flash drive.</li> <li>• <b><i>/var/filename</i></b> or <b><i>/var/path/filename</i></b>—File on the local hard disk.</li> <li>• <b><i>a:filename</i></b> or <b><i>a:path/filename</i></b>—File on the local drive. The default path is <b>/</b> (the root-level directory). The removable media can be in MS-DOS or UNIX (UFS) format.</li> <li>• <b><i>hostname:/path/filename</i></b>, <b><i>hostname:filename</i></b>, <b><i>hostname:path/filename</i></b>, or <b><i>scp://hostname/path/filename</i></b>—File on an <b>scp/ssh</b> client. This form is not available in the worldwide version of Junos OS. The default path is the user's home directory on the remote system. You can also specify <b><i>hostname</i></b> as <b><i>username@hostname</i></b>.</li> <li>• <b><i>ftp://hostname/path/filename</i></b>—File on an FTP server. You can also specify <b><i>hostname</i></b> as <b><i>username @hostname</i></b> or <b><i>username:password @hostname</i></b>. The default path is the user's home directory. To specify an absolute path, the path must start with the string <b>%2F</b>; for example, <b><i>ftp://hostname/%2Fpath/filename</i></b>. To have the system prompt you for the password, specify <b><i>prompt</i></b> in place of the password. If a password is required, and you do not specify the password or <b><i>prompt</i></b>, an error message is displayed: <pre> user@host&gt; file copy ftp://username@ftp.hostname.net//filename file copy ftp.hostname.net: Not logged in. user@host&gt; file copy ftp://username:prompt@ftphostname.net//filename </pre> <p>Password for <b><i>username@ftp.hostname.net</i></b>:</p> </li> <li>• <b><i>http://hostname/path/filename</i></b>—File on a Hypertext Transfer Protocol (HTTP) server. You can also specify <b><i>hostname</i></b> as <b><i>username@hostname</i></b> or <b><i>username:password@hostname</i></b>. If a password is required and you omit it, you are prompted for it.</li> <li>• <b><i>re0:/path/filename</i></b> or <b><i>re1:/path/filename</i></b>—File on a local Routing Engine.</li> </ul> |

**Required Privilege Level**    configure—To enter configuration mode.

**Related Documentation**    • *Deactivating and Reactivating Statements and Identifiers in a Junos OS Configuration*





## CHAPTER 30

# CLI Operational Commands

- `show cli`
- `show cli authorization`
- `show cli directory`
- `show cli history`

## show cli

|                                           |                                                                                                                                                                                                                                                                    |
|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                     | <a href="#">Syntax on page 514</a><br><a href="#">Syntax (QFX Series and OCX Series) on page 514</a>                                                                                                                                                               |
| <b>Syntax</b>                             | show cli                                                                                                                                                                                                                                                           |
| <b>Syntax (QFX Series and OCX Series)</b> | show cli<br><authorization><br><directory><br><history <i>count</i> >                                                                                                                                                                                              |
| <b>Release Information</b>                | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>                        | Display configured CLI settings.                                                                                                                                                                                                                                   |
| <b>Options</b>                            | This command has no options.                                                                                                                                                                                                                                       |
| <b>Required Privilege Level</b>           | view                                                                                                                                                                                                                                                               |
| <b>List of Sample Output</b>              | <a href="#">show cli on page 515</a>                                                                                                                                                                                                                               |
| <b>Output Fields</b>                      | <a href="#">Table 37 on page 514</a> lists the output fields for the <b>show cli</b> command. Output fields are listed in the approximate order in which they appear.                                                                                              |

**Table 37: show cli Output Fields**

| Field Name             | Field Description                                                                                                                                                                                                        |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CLI complete-on-space  | Capability to complete a partial command entry when you type a space or a tab: <b>on</b> or <b>off</b> .                                                                                                                 |
| CLI idle-timeout       | Maximum time that an individual session can be idle before the user is logged out from the router or switch. When this feature is enabled, the number of minutes is displayed. Otherwise, the state is <b>disabled</b> . |
| CLI restart-on-upgrade | CLI is set to prompt you to restart the router or switch after upgrading the software: <b>on</b> or <b>off</b> .                                                                                                         |
| CLI screen-length      | Number of lines of text that the terminal screen displays.                                                                                                                                                               |
| CLI screen-width       | Number of characters in a line on the terminal screen.                                                                                                                                                                   |
| CLI terminal           | Terminal type.                                                                                                                                                                                                           |
| CLI is operating in    | Mode: <b>enhanced</b> .                                                                                                                                                                                                  |
| CLI timestamp          | Date and time format for the timestamp. If the timestamp is not set, the state is <b>disabled</b> .                                                                                                                      |
| CLI working directory  | Pathname of the working directory.                                                                                                                                                                                       |

## Sample Output

show cli

```
user@host> show cli
CLI complete-on-space set to on
CLI idle-timeout disabled
CLI restart-on-upgrade set to on
CLI screen-length set to 47
CLI screen-width set to 132
CLI terminal is 'vt100'
CLI is operating in enhanced mode
CLI timestamp disabled
CLI working directory is '/var/tmp'
```

## show cli authorization

|                                 |                                                                                                                                                                                                                                                                                       |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | show cli authorization                                                                                                                                                                                                                                                                |
| <b>Release Information</b>      | <p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> |
| <b>Description</b>              | Display the permissions for the current user.                                                                                                                                                                                                                                         |
| <b>Options</b>                  | This command has no options.                                                                                                                                                                                                                                                          |
| <b>Required Privilege Level</b> | view                                                                                                                                                                                                                                                                                  |
| <b>List of Sample Output</b>    | <a href="#">show cli authorization on page 518</a>                                                                                                                                                                                                                                    |
| <b>Output Fields</b>            | <p><a href="#">Table 38 on page 516</a> lists the output fields for the <b>show cli authorization</b> command. In the table, all possible permissions are displayed and output fields are listed in alphabetical order.</p>                                                           |

**Table 38: show cli authorization Output Fields**

| Field Name       | Field Description                              |
|------------------|------------------------------------------------|
| access           | Can view access configuration information.     |
| access-control   | Can modify access configuration.               |
| admin            | Can view user account information.             |
| admin-control    | Can modify user account information.           |
| clear            | Can clear learned network information.         |
| configure        | Can enter configuration mode.                  |
| control          | Can modify any configuration.                  |
| edit             | Can edit configuration files.                  |
| field            | Reserved for field (debugging) support.        |
| firewall         | Can view firewall configuration information.   |
| firewall-control | Can modify firewall configuration information. |
| floppy           | Can read from and write to removable media.    |
| flow-tap         | Can view flow-tap configuration information.   |

Table 38: show cli authorization Output Fields (*continued*)

| Field Name                            | Field Description                                                                                                 |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| <b>flow-tap-control</b>               | Can configure flow-tap configuration information.                                                                 |
| <b>idp-profiler-operation</b>         | Can configure Profiler data.                                                                                      |
| <b>interface</b>                      | Can view interface configuration information.                                                                     |
| <b>interface-control</b>              | Can modify interface configuration information.                                                                   |
| <b>maintenance</b>                    | Can perform system maintenance.                                                                                   |
| <b>network</b>                        | Can access the network by entering the <b>ping</b> , <b>ssh</b> , <b>telnet</b> , and <b>traceroute</b> commands. |
| <b>pgcp-session-mirroring</b>         | Can view Packet Gateway Control Protocol session mirroring configuration.                                         |
| <b>pgcp-session-mirroring-control</b> | Can modify Packet Gateway Control Protocol session mirroring configuration all-control.                           |
| <b>reset</b>                          | Can reset or restart interfaces and system processes.                                                             |
| <b>rollback</b>                       | Can roll back to previous configurations.                                                                         |
| <b>routing</b>                        | Can view routing configuration information.                                                                       |
| <b>routing-control</b>                | Can modify routing configuration information.                                                                     |
| <b>secret</b>                         | Can view passwords and authentication keys in the configuration.                                                  |
| <b>secret-control</b>                 | Can modify passwords and authentication keys in the configuration.                                                |
| <b>security</b>                       | Can view security configuration information.                                                                      |
| <b>security-control</b>               | Can modify security configuration information.                                                                    |
| <b>shell</b>                          | Can start a local shell.                                                                                          |
| <b>snmp</b>                           | Can view SNMP configuration information.                                                                          |
| <b>snmp-control</b>                   | Can modify SNMP configuration information.                                                                        |
| <b>system</b>                         | Can view system configuration information.                                                                        |
| <b>system-control</b>                 | Can modify system configuration information.                                                                      |
| <b>trace</b>                          | Can view trace file settings information.                                                                         |

Table 38: show cli authorization Output Fields (*continued*)

| Field Name                | Field Description                                               |
|---------------------------|-----------------------------------------------------------------|
| <b>trace-control</b>      | Can modify trace file settings information.                     |
| <b>view</b>               | Can view current values and statistics.                         |
| <b>view-configuration</b> | Can view all configuration information (not including secrets). |

## Sample Output

### show cli authorization

```

user@host> show cli authorization
Current user: 'remote' login: 'user' class ''
Permissions:
 admin -- Can view user accounts
 admin-control-- Can modify user accounts
 clear -- Can clear learned network information
 configure -- Can enter configuration mode
 control -- Can modify any configuration
 edit -- Can edit full files
 field -- Special for field (debug) support
 floppy -- Can read and write from the floppy
 interface -- Can view interface configuration
 interface-control-- Can modify interface configuration
 network -- Can access the network
 reset -- Can reset/restart interfaces and daemons
 routing -- Can view routing configuration
 routing-control-- Can modify routing configuration
 shell -- Can start a local shell
 snmp -- Can view SNMP configuration
 snmp-control-- Can modify SNMP configuration
 system -- Can view system configuration
 system-control-- Can modify system configuration
 trace -- Can view trace file settings
 trace-control-- Can modify trace file settings
 view -- Can view current values and statistics
 maintenance -- Can become the super-user
 firewall -- Can view firewall configuration
 firewall-control-- Can modify firewall configuration
 secret -- Can view secret configuration
 secret-control-- Can modify secret configuration
 rollback -- Can rollback to previous configurations
 security -- Can view security configuration
 security-control-- Can modify security configuration
 access -- Can view access configuration
 access-control-- Can modify access configuration
 view-configuration-- Can view all configuration (not including secrets)
 flow-tap -- Can view flow-tap configuration
 flow-tap-control-- Can configure flow-tap service
Individual command authorization:
 Allow regular expression: none
 Deny regular expression: none
 Allow configuration regular expression: none
 Deny configuration regular expression: none

```



## show cli directory

---

|                                 |                                                                                                                                                                                                                                                                    |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | show cli directory                                                                                                                                                                                                                                                 |
| <b>Release Information</b>      | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>              | Display the current working directory.                                                                                                                                                                                                                             |
| <b>Options</b>                  | This command has no options.                                                                                                                                                                                                                                       |
| <b>Required Privilege Level</b> | view                                                                                                                                                                                                                                                               |
| <b>List of Sample Output</b>    | <a href="#">show cli directory on page 520</a>                                                                                                                                                                                                                     |
| <b>Output Fields</b>            | <a href="#">Table 39 on page 520</a> lists the output fields for the <b>show cli directory</b> command. Output fields are listed in the approximate order in which they appear.                                                                                    |

**Table 39: show cli directory Output Fields**

| Field Name        | Field Description                          |
|-------------------|--------------------------------------------|
| Current directory | Pathname of the current working directory. |

---

## Sample Output

### show cli directory

```
user@host> show cli directory
Current directory: /var/tmp
```



## show cli history

|                                 |                                                                                                                                                                                                                                                                    |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>show cli history</code><br><code>&lt;count&gt;</code>                                                                                                                                                                                                        |
| <b>Release Information</b>      | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>              | Display a list of previous CLI commands.                                                                                                                                                                                                                           |
| <b>Options</b>                  | <b>none</b> —Display all previous CLI commands.<br><br><b>count</b> —(Optional) Maximum number of commands to display.                                                                                                                                             |
| <b>Required Privilege Level</b> | view                                                                                                                                                                                                                                                               |
| <b>List of Sample Output</b>    | <a href="#">show cli history on page 521</a>                                                                                                                                                                                                                       |
| <b>Output Fields</b>            | <a href="#">Table 40 on page 521</a> lists the output fields for the <b>show cli history</b> command. Output fields are listed in the approximate order in which they appear.                                                                                      |

**Table 40: show cli history Output Fields**

| Field Name            | Field Description                      |
|-----------------------|----------------------------------------|
| <i>timestamp</i>      | Time at which the command was entered. |
| <i>command-syntax</i> | Command that was entered.              |

## Sample Output

### show cli history

```
user@host> show cli history
11:14:14 -- show arp
11:22:10 -- show cli authorization
11:27:12 -- show cli history
```



## CHAPTER 31

# ISSU Operational Commands

- request system software in-service-upgrade
- show chassis in-service-upgrade

## request system software in-service-upgrade

|                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                    | <code>request system software in-service-upgrade <i>package-name</i></code><br><code>&lt;no-old-master-upgrade&gt;</code><br><code>&lt;reboot&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Syntax (QFX5100 Switches)</b> | <code>request system software in-service-upgrade <i>package-name</i></code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Release Information</b>       | <p>Command introduced in Junos OS Release 9.0.</p> <p>Command introduced in Junos OS Release 12.3R2, 13.1R2, and 13.2R1 for TX Matrix Plus routers.</p> <p>Command introduced in Junos OS Release 13.2 for PTX5000 routers.</p> <p>Command introduced in Junos OS Release 13.2 X51-D15 for the QFX Series.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Description</b>               | <p>Perform a unified in-service software upgrade (ISSU). A unified ISSU enables you to upgrade from one Junos OS Release to another with no disruption on the control plane and with minimal disruption of traffic. In addition, graceful Routing Engine switchover (GRES) and nonstop active routing (NSR) must be enabled. On QFX5100 switches, nonstop bridging (NSB) must be enabled if you are using the Layer 2 Control Protocol process (l2cpd) to transmit Layer 2 spanning tree protocols in a Layer 2 bridge environment.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Options</b>                   | <p><b><i>package-name</i></b>—Location from which the software package or bundle is to be installed. For example:</p> <ul style="list-style-type: none"> <li>• <b><i>/var/tmp/package-name</i></b>— For a software package or bundle that is being installed from a local directory on the router.</li> <li>• <b><i>protocol://hostname/pathname/package-name</i></b>—For a software package or bundle that is to be downloaded and installed from a remote location. Replace <b><i>protocol</i></b> with one of the following: <ul style="list-style-type: none"> <li>• <b>ftp</b>—File Transfer Protocol</li> <li>• <b>http</b>—Hypertext Transfer Protocol</li> <li>• <b>scp</b>—Secure copy (available only for Canada and U.S. version)</li> </ul> </li> </ul> <p><b>no-old-master-upgrade</b>—(Optional) When the <b>no-old-master-upgrade</b> option is included, after the backup Routing Engine is rebooted with the new software package and a switchover occurs to make it the new master Routing Engine, the former master (new backup) Routing Engine will not be upgraded to the new software. In this case, you must manually upgrade the former master (new backup) Routing Engine. If you do not include the <b>no-old-master-upgrade</b> option, the system will automatically upgrade the former master Routing Engine.</p> <p><b>reboot</b>—(Optional) When the <b>reboot</b> option is included, the former master (new backup) Routing Engine is automatically rebooted after being upgraded to the new software. When the <b>reboot</b> option is not included, you must manually reboot the former master (new backup) Routing Engine using the <b>request system reboot</b> command.</p> |



**NOTE:** The reboot option is not available on the QFX5100 switch.

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Additional Information</b>   | <p>The following conditions apply to unified ISSUs:</p> <ul style="list-style-type: none"> <li>Unified ISSU is not supported on every platform. For a list of supported platforms, see <i>Unified ISSU System Requirements</i>.</li> <li>Unsupported PICs are restarted during a unified ISSU on certain routing devices. For information about supported PICs, see the <i>Junos OS High Availability Library for Routing Devices</i>.</li> <li>Unsupported protocols will experience packet loss during a unified ISSU. For information about supported protocols, see the <i>Junos OS High Availability Library for Routing Devices</i>.</li> <li>During a unified ISSU, you cannot bring any PICs online or offline on certain routing devices.</li> </ul> <p>For more information, see the <i>Junos OS High Availability Library for Routing Devices</i>.</p> |
| <b>Required Privilege Level</b> | view                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li><i>request system software abort</i></li> <li><a href="#">show chassis in-service-upgrade on page 537</a></li> <li><i>Unified ISSU Concepts</i></li> <li><i>Performing a Unified ISSU</i></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>List of Sample Output</b>    | <a href="#">request system software-in-service upgrade reboot on page 525</a><br><a href="#">request system software-in-service upgrade reboot (TX Matrix Plus Router) on page 527</a><br><a href="#">request system software-in-service upgrade (QFX5100 Switch) on page 535</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Output Fields</b>            | When you enter this command, you are provided feedback on the status of your request.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

## Sample Output

### request system software-in-service upgrade reboot

```
{master}

user@host> request system software in-service-upgrade
/var/tmp/jinstall-9.0-20080114.2-domestic-signed.tgz reboot
ISSU: Validating Image
PIC 0/3 will be offlined (In-Service-Upgrade not supported)
Do you want to continue with these actions being taken ? [yes,no] (no) yes

ISSU: Preparing Backup RE
Pushing bundle to re1
Checking compatibility with configuration
Initializing...
Using jbase-9.0-20080114.2
```

```
Verified manifest signed by PackageProduction_9_0_0
Using /var/tmp/jinstall-9.0-20080114.2-domestic-signed.tgz
Verified jinstall-9.0-20080114.2-domestic.tgz signed by PackageProduction_9_0_0
Using jinstall-9.0-20080114.2-domestic.tgz
Using jbundle-9.0-20080114.2-domestic.tgz
Checking jbundle requirements on /
Using jbase-9.0-20080114.2.tgz
Verified manifest signed by PackageProduction_9_0_0
Using jkernel-9.0-20080114.2.tgz
Verified manifest signed by PackageProduction_9_0_0
Using jcrypto-9.0-20080114.2.tgz
Verified manifest signed by PackageProduction_9_0_0
Using jpfe-9.0-20080114.2.tgz
Using jdocs-9.0-20080114.2.tgz
Verified manifest signed by PackageProduction_9_0_0
Using jroute-9.0-20080114.2.tgz
Verified manifest signed by PackageProduction_9_0_0
Hardware Database regeneration succeeded
Validating against /config/juniper.conf.gz
mgd: commit complete
Validation succeeded
Installing package '/var/tmp/jinstall-9.0-20080114.2-domestic-signed.tgz' ...
Verified jinstall-9.0-20080114.2-domestic.tgz signed by PackageProduction_9_0_0
Adding jinstall...
Verified manifest signed by PackageProduction_9_0_0

WARNING: This package will load JUNOS 9.0-20080114.2 software.
WARNING: It will save JUNOS configuration files, and SSH keys
WARNING: (if configured), but erase all other files and information
WARNING: stored on this machine. It will attempt to preserve dumps
WARNING: and log files, but this can not be guaranteed. This is the
WARNING: pre-installation stage and all the software is loaded when
WARNING: you reboot the system.

Saving the config files ...
NOTICE: uncommitted changes have been saved in
/var/db/config/juniper.conf.pre-install
Installing the bootstrap installer ...

WARNING: A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the
WARNING: 'request system reboot' command when software installation is
WARNING: complete. To abort the installation, do not reboot your system,
WARNING: instead use the 'request system software delete jinstall'
WARNING: command as soon as this operation completes.

Saving package file in /var/sw/pkg/jinstall-9.0-20080114.2-domestic-signed.tgz
...
Saving state for rollback ...
Backup upgrade done
Rebooting Backup RE

Rebooting re1
ISSU: Backup RE Prepare Done
Waiting for Backup RE reboot
GRES operational
Initiating Chassis In-Service-Upgrade
Chassis ISSU started
ISSU: Backup RE Prepare Done
ISSU: Preparing Daemons
ISSU: Daemons Ready for ISSU
ISSU: Starting Upgrade for FRUs
```

```

ISSU: Preparing for Switchover
ISSU: Ready for Switchover
Checking In-Service-Upgrade status
 Item Status Reason
 FPC 0 Online (ISSU)
 FPC 1 Online (ISSU)
 FPC 2 Online (ISSU)
 FPC 6 Online (ISSU)
 FPC 7 Online (ISSU)
Resolving mastership...
Complete. The other routing engine becomes the master.
ISSU: RE switchover Done
ISSU: Upgrading Old Master RE
Installing package '/var/tmp/paKEuy' ...
Verified jinstall-9.0-20080114.2-domestic.tgz signed by PackageProduction_9_0_0
Adding jinstall...
Verified manifest signed by PackageProduction_9_0_0

WARNING: This package will load JUNOS 9.0-20080114.2 software.
WARNING: It will save JUNOS configuration files, and SSH keys
WARNING: (if configured), but erase all other files and information
WARNING: stored on this machine. It will attempt to preserve dumps
WARNING: and log files, but this can not be guaranteed. This is the
WARNING: pre-installation stage and all the software is loaded when
WARNING: you reboot the system.

Saving the config files ...
NOTICE: uncommitted changes have been saved in
/var/db/config/juniper.conf.pre-install
Installing the bootstrap installer ...

WARNING: A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the
WARNING: 'request system reboot' command when software installation is
WARNING: complete. To abort the installation, do not reboot your system,
WARNING: instead use the 'request system software delete jinstall'
WARNING: command as soon as this operation completes.

Saving package file in /var/sw/pkg/jinstall-9.0-20080114.2-domestic-signed.tgz
...
cp: /var/tmp/paKEuy is a directory (not copied).
Saving state for rollback ...
ISSU: Old Master Upgrade Done
ISSU: IDLE
Shutdown NOW!
Reboot consistency check bypassed - jinstall 9.0-20080114.2 will complete
installation upon reboot
[pid 30227]

*** FINAL System shutdown message from root@host ***

System going down IMMEDIATELY

Connection to host closed.

```

#### request system software-in-service upgrade reboot (TX Matrix Plus Router)

```

{master}

user@host> request system software in-service upgrade
/var/tmp/jinstall-12.3R2-domestic-signed.tgz
Chassis ISSU Check Done
ISSU: Validating Image

```

```
PIC 8/1 will be offlined (In-Service-Upgrade not supported)
PIC 19/2 will be offlined (In-Service-Upgrade not supported)
PIC 15/3 will be offlined (In-Service-Upgrade not supported)
Do you want to continue with these actions being taken ? [yes,no] (no) yes
```

```
Checking compatibility with configuration
Initializing...
Using jbase-12.3R2
Verified manifest signed by PackageProduction_12_3_0
Using /var/tmp/jinstall-12.3R2-domestic-signed.tgz
Verified jinstall-12.3R2-domestic.tgz signed by PackageProduction_12_3_0
Using jinstall-12.3R2-domestic.tgz
Using jbundle-12.3R2-domestic.tgz
Checking jbundle requirements on /
Using jbase-12.3R2.tgz
Verified manifest signed by PackageProduction_12_3_0
Verified jbase-12.3R2 signed by PackageProduction_12_3_0
Using /var/validate/chroot/tmp/jbundle/jboot-12.3R2.tgz
Using jcrypto-12.3R2.tgz
Verified manifest signed by PackageProduction_12_3_0
Verified jcrypto-12.3R2 signed by PackageProduction_12_3_0
Using jdocs-12.3R2.tgz
Verified manifest signed by PackageProduction_12_3_0
Verified jdocs-12.3R2 signed by PackageProduction_12_3_0
Using jkernel-12.3R2.tgz
Verified manifest signed by PackageProduction_12_3_0
Verified jkernel-12.3R2 signed by PackageProduction_12_3_0
Using jpfe-12.3R2.tgz
WARNING: jpfe-12.3R2.tgz: not a signed package
WARNING: jpfe-common-12.3R2.tgz: not a signed package
Verified jpfe-common-12.3R2 signed by PackageProduction_12_3_0
WARNING: jpfe-T-12.3R2.tgz: not a signed package
Verified jpfe-T-12.3R2 signed by PackageProduction_12_3_0
Using jplatform-12.3R2.tgz
Verified manifest signed by PackageProduction_12_3_0
Verified jplatform-12.3R2 signed by PackageProduction_12_3_0
Using jroute-12.3R2.tgz
Verified manifest signed by PackageProduction_12_3_0
Verified jroute-12.3R2 signed by PackageProduction_12_3_0
Using jruntime-12.3R2.tgz
Verified manifest signed by PackageProduction_12_3_0
Verified jruntime-12.3R2 signed by PackageProduction_12_3_0
Using jservices-12.3R2.tgz
Using jservices-crypto-12.3R2.tgz
Hardware Database regeneration succeeded
Validating against /config/juniper.conf.gz
mgd: commit complete
Validation succeeded
ISSU: Preparing LCC Backup REs
Pushing bundle to lcc0-re1
Pushing bundle to lcc1-re1
Pushing bundle to lcc2-re1
Pushing bundle to lcc3-re1
Pushing bundle to sfc0-re1
Installing package '/var/tmp/jinstall-12.3R2-domestic-signed.tgz' ...
Verified jinstall-12.3R2-domestic.tgz signed by PackageProduction_12_3_0
Adding jinstall...
Verified manifest signed by PackageProduction_12_3_0
```

```
WARNING: This package will load JUNOS 12.3R2 software.
WARNING: It will save JUNOS configuration files, and SSH keys
```



```
WARNING: (if configured), but erase all other files and information
WARNING: stored on this machine. It will attempt to preserve dumps
WARNING: and log files, but this can not be guaranteed. This is the
WARNING: pre-installation stage and all the software is loaded when
WARNING: you reboot the system.

Saving the config files ...
NOTICE: uncommitted changes have been saved in
/var/db/config/juniper.conf.pre-install
Installing the bootstrap installer ...

WARNING: A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the
WARNING: 'request system reboot' command when software installation is
WARNING: complete. To abort the installation, do not reboot your system,
WARNING: instead use the 'request system software delete jinstall'
WARNING: command as soon as this operation completes.

Saving package file in /var/sw/pkg/jinstall-12.3R2-domestic-signed.tgz ...
Saving state for rollback ...
Installing package '/var/tmp/jinstall-12.3R2-domestic-signed.tgz' ...
Verified jinstall-12.3R2-domestic.tgz signed by PackageProduction_12_3_0
Adding jinstall...
Verified manifest signed by PackageProduction_12_3_0

WARNING: This package will load JUNOS 12.3R2 software.
WARNING: It will save JUNOS configuration files, and SSH keys
WARNING: (if configured), but erase all other files and information
WARNING: stored on this machine. It will attempt to preserve dumps
WARNING: and log files, but this can not be guaranteed. This is the
WARNING: pre-installation stage and all the software is loaded when
WARNING: you reboot the system.

Saving the config files ...
NOTICE: uncommitted changes have been saved in
/var/db/config/juniper.conf.pre-install
Installing the bootstrap installer ...

WARNING: A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the
WARNING: 'request system reboot' command when software installation is
WARNING: complete. To abort the installation, do not reboot your system,
WARNING: instead use the 'request system software delete jinstall'
WARNING: command as soon as this operation completes.

Saving package file in /var/sw/pkg/jinstall-12.3R2-domestic-signed.tgz ...
Saving state for rollback ...
Installing package '/var/tmp/jinstall-12.3R2-domestic-signed.tgz' ...
Verified jinstall-12.3R2-domestic.tgz signed by PackageProduction_12_3_0
Adding jinstall...
Verified manifest signed by PackageProduction_12_3_0

WARNING: This package will load JUNOS 12.3R2 software.
WARNING: It will save JUNOS configuration files, and SSH keys
WARNING: (if configured), but erase all other files and information
WARNING: stored on this machine. It will attempt to preserve dumps
WARNING: and log files, but this can not be guaranteed. This is the
WARNING: pre-installation stage and all the software is loaded when
WARNING: you reboot the system.

Saving the config files ...
NOTICE: uncommitted changes have been saved in
/var/db/config/juniper.conf.pre-install
```

Installing the bootstrap installer ...

WARNING: A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the  
WARNING: 'request system reboot' command when software installation is  
WARNING: complete. To abort the installation, do not reboot your system,  
WARNING: instead use the 'request system software delete jinstall'  
WARNING: command as soon as this operation completes.

Saving package file in /var/sw/pkg/jinstall-12.3R2-domestic-signed.tgz ...

Saving state for rollback ...

Installing package '/var/tmp/jinstall-12.3R2-domestic-signed.tgz' ...

Verified jinstall-12.3R2-domestic.tgz signed by PackageProduction\_12\_3\_0

Adding jinstall...

Verified manifest signed by PackageProduction\_12\_3\_0

WARNING: This package will load JUNOS 12.3R2 software.

WARNING: It will save JUNOS configuration files, and SSH keys

WARNING: (if configured), but erase all other files and information

WARNING: stored on this machine. It will attempt to preserve dumps

WARNING: and log files, but this can not be guaranteed. This is the

WARNING: pre-installation stage and all the software is loaded when

WARNING: you reboot the system.

Saving the config files ...

NOTICE: uncommitted changes have been saved in

/var/db/config/juniper.conf.pre-install

Installing the bootstrap installer ...

WARNING: A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the

WARNING: 'request system reboot' command when software installation is

WARNING: complete. To abort the installation, do not reboot your system,

WARNING: instead use the 'request system software delete jinstall'

WARNING: command as soon as this operation completes.

Saving package file in /var/sw/pkg/jinstall-12.3R2-domestic-signed.tgz ...

Saving state for rollback ...

ISSU: Preparing SFC Backup RE

NOTICE: Validating configuration against jinstall-12.3R2-domestic-signed.tgz.

NOTICE: Use the 'no-validate' option to skip this if desired.

Checking compatibility with configuration

Initializing...

Using jbase-12.3R2

Verified manifest signed by PackageProduction\_12\_3\_0

Using /var/tmp/jinstall-12.3R2-domestic-signed.tgz

Verified jinstall-12.3R2-domestic.tgz signed by PackageProduction\_12\_3\_0

Using jinstall-12.3R2-domestic.tgz

Using jbundle-12.3R2-domestic.tgz

Checking jbundle requirements on /

Using jbase-12.3R2.tgz

Verified manifest signed by PackageProduction\_12\_3\_0

Verified jbase-12.3R2 signed by PackageProduction\_12\_3\_0

Using /var/validate/chroot/tmp/jbundle/jboot-12.3R2.tgz

Using jcrypto-12.3R2.tgz

Verified manifest signed by PackageProduction\_12\_3\_0

Verified jcrypto-12.3R2 signed by PackageProduction\_12\_3\_0

Using jdocs-12.3R2.tgz

Verified manifest signed by PackageProduction\_12\_3\_0

Verified jdocs-12.3R2 signed by PackageProduction\_12\_3\_0

Using jkernel-12.3R2.tgz

Verified manifest signed by PackageProduction\_12\_3\_0

Verified jkernel-12.3R2 signed by PackageProduction\_12\_3\_0

```

Using jpfe-12.3R2.tgz
WARNING: jpfe-12.3R2.tgz: not a signed package
WARNING: jpfe-common-12.3R2.tgz: not a signed package
Verified jpfe-common-12.3R2 signed by PackageProduction_12_3_0
WARNING: jpfe-T-12.3R2.tgz: not a signed package
Verified jpfe-T-12.3R2 signed by PackageProduction_12_3_0
Using jplatform-12.3R2.tgz
Verified manifest signed by PackageProduction_12_3_0
Verified jplatform-12.3R2 signed by PackageProduction_12_3_0
Using jroute-12.3R2.tgz
Verified manifest signed by PackageProduction_12_3_0
Verified jroute-12.3R2 signed by PackageProduction_12_3_0
Using jruntime-12.3R2.tgz
Verified manifest signed by PackageProduction_12_3_0
Verified jruntime-12.3R2 signed by PackageProduction_12_3_0
Using jservices-12.3R2.tgz
Using jservices-crypto-12.3R2.tgz
Hardware Database regeneration succeeded
Validating against /config/juniper.conf.gz
mgd: commit complete
Validation succeeded
Installing package '/var/tmp/jinstall-12.3R2-domestic-signed.tgz' ...
Verified jinstall-12.3R2-domestic.tgz signed by PackageProduction_12_3_0
Adding jinstall...
Verified manifest signed by PackageProduction_12_3_0

WARNING: This package will load JUNOS 12.3R2 software.
WARNING: It will save JUNOS configuration files, and SSH keys
WARNING: (if configured), but erase all other files and information
WARNING: stored on this machine. It will attempt to preserve dumps
WARNING: and log files, but this can not be guaranteed. This is the
WARNING: pre-installation stage and all the software is loaded when
WARNING: you reboot the system.

Saving the config files ...
NOTICE: uncommitted changes have been saved in
/var/db/config/juniper.conf.pre-install
Installing the bootstrap installer ...

WARNING: A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the
WARNING: 'request system reboot' command when software installation is
WARNING: complete. To abort the installation, do not reboot your system,
WARNING: instead use the 'request system software delete jinstall'
WARNING: command as soon as this operation completes.

Saving package file in /var/sw/pkg/jinstall-12.3R2-domestic-signed.tgz ...
Saving state for rollback ...
SFC Backup upgrade done
Rebooting SFC Backup RE

Rebooting sfc0-re1
ISSU: SFC Backup RE Prepare Done
Waiting for SFC Backup RE reboot

Rebooting lcc0-re1
Rebooting LCC [lcc0-re1]

Rebooting lcc1-re1
Rebooting LCC [lcc1-re1]

Rebooting lcc2-re1

```

Rebooting LCC [lcc2-re1]

Rebooting lcc3-re1

Rebooting LCC [lcc3-re1]

LCC Backup REs have rebooted

Waiting for LCC Backup REs come back online

ISSU: LCC Backup REs Prepare Done

GRES operational

Initiating Chassis In-Service-Upgrade

Chassis ISSU Started

ISSU: Preparing Daemons

ISSU: Daemons Ready for ISSU

ISSU: Starting Upgrade for FRUs

ISSU: Preparing for Switchover

ISSU: Ready for Switchover

Checking In-Service-Upgrade status

lcc0-re0:

| Item  | Status        | Reason |
|-------|---------------|--------|
| FPC 1 | Online (ISSU) |        |
| PIC 0 | Online (ISSU) |        |
| FPC 2 | Online (ISSU) |        |
| FPC 3 | Online (ISSU) |        |
| PIC 1 | Online (ISSU) |        |
| FPC 4 | Online (ISSU) |        |
| FPC 6 | Online (ISSU) |        |
| FPC 7 | Online (ISSU) |        |

lcc1-re0:

| Item  | Status        | Reason |
|-------|---------------|--------|
| FPC 0 | Online (ISSU) |        |
| PIC 3 | Online (ISSU) |        |
| FPC 1 | Online (ISSU) |        |
| FPC 2 | Online (ISSU) |        |
| FPC 4 | Online (ISSU) |        |
| FPC 6 | Online (ISSU) |        |
| FPC 7 | Online (ISSU) |        |

lcc2-re0:

| Item  | Status        | Reason |
|-------|---------------|--------|
| FPC 0 | Online (ISSU) |        |
| FPC 2 | Online (ISSU) |        |
| FPC 3 | Online (ISSU) |        |
| PIC 0 | Online (ISSU) |        |
| FPC 4 | Online (ISSU) |        |
| FPC 6 | Online (ISSU) |        |
| FPC 7 | Online (ISSU) |        |
| PIC 1 | Online (ISSU) |        |

lcc3-re0:

| Item  | Status        | Reason |
|-------|---------------|--------|
| FPC 0 | Online (ISSU) |        |
| PIC 0 | Online (ISSU) |        |
| FPC 1 | Online (ISSU) |        |
| FPC 2 | Online (ISSU) |        |
| FPC 3 | Online (ISSU) |        |
| PIC 2 | Online (ISSU) |        |
| FPC 4 | Online (ISSU) |        |

```

FPC 5 Online (ISSU)
FPC 6 Online (ISSU)
FPC 7 Online (ISSU)
PIC 1 Online (ISSU)

lcc0-re0:

Resolving mastership...
Complete. The other routing engine becomes the master.

lcc1-re0:

Resolving mastership...
Complete. The other routing engine becomes the master.

lcc2-re0:

Resolving mastership...
Complete. The other routing engine becomes the master.

lcc3-re0:

Resolving mastership...
Complete. The other routing engine becomes the master.
Resolving mastership...
Complete. The other routing engine becomes the master.
ISSU: RE switchover Done
ISSU: Upgrading SFC Old Master RE

lcc0-re0:
Installing package '/var/tmp/jinstall-12.3R2-domestic-signed.tgz' ...
Verified jinstall-12.3R2-domestic.tgz signed by PackageProduction_12_3_0
Adding jinstall...
Verified manifest signed by PackageProduction_12_3_0

WARNING: This package will load JUNOS 12.3R2 software.
WARNING: It will save JUNOS configuration files, and SSH keys
WARNING: (if configured), but erase all other files and information
WARNING: stored on this machine. It will attempt to preserve dumps
WARNING: and log files, but this can not be guaranteed. This is the
WARNING: pre-installation stage and all the software is loaded when
WARNING: you reboot the system.

Saving the config files ...
NOTICE: uncommitted changes have been saved in
/var/db/config/juniper.conf.pre-install
Installing the bootstrap installer ...

WARNING: A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the
WARNING: 'request system reboot' command when software installation is
WARNING: complete. To abort the installation, do not reboot your system,
WARNING: instead use the 'request system software delete jinstall'
WARNING: command as soon as this operation completes.

Saving package file in /var/sw/pkg/jinstall-12.3R2-domestic-signed.tgz ...
Saving state for rollback ...

lcc1-re0:
Installing package '/var/tmp/jinstall-12.3R2-domestic-signed.tgz' ...
Verified jinstall-12.3R2-domestic.tgz signed by PackageProduction_12_3_0
Adding jinstall...

```

Verified manifest signed by PackageProduction\_12\_3\_0

```
WARNING: This package will load JUNOS 12.3R2 software.
WARNING: It will save JUNOS configuration files, and SSH keys
WARNING: (if configured), but erase all other files and information
WARNING: stored on this machine. It will attempt to preserve dumps
WARNING: and log files, but this can not be guaranteed. This is the
WARNING: pre-installation stage and all the software is loaded when
WARNING: you reboot the system.
```

Saving the config files ...

NOTICE: uncommitted changes have been saved in

/var/db/config/juniper.conf.pre-install

Installing the bootstrap installer ...

```
WARNING: A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the
WARNING: 'request system reboot' command when software installation is
WARNING: complete. To abort the installation, do not reboot your system,
WARNING: instead use the 'request system software delete jinstall'
WARNING: command as soon as this operation completes.
```

Saving package file in /var/sw/pkg/jinstall-12.3R2-domestic-signed.tgz ...

Saving state for rollback ...

1cc2-re0:

Installing package '/var/tmp/jinstall-12.3R2-domestic-signed.tgz' ...

Verified jinstall-12.3R2-domestic.tgz signed by PackageProduction\_12\_3\_0

Adding jinstall...

Verified manifest signed by PackageProduction\_12\_3\_0

```
WARNING: This package will load JUNOS 12.3R2 software.
WARNING: It will save JUNOS configuration files, and SSH keys
WARNING: (if configured), but erase all other files and information
WARNING: stored on this machine. It will attempt to preserve dumps
WARNING: and log files, but this can not be guaranteed. This is the
WARNING: pre-installation stage and all the software is loaded when
WARNING: you reboot the system.
```

Saving the config files ...

NOTICE: uncommitted changes have been saved in

/var/db/config/juniper.conf.pre-install

Installing the bootstrap installer ...

```
WARNING: A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the
WARNING: 'request system reboot' command when software installation is
WARNING: complete. To abort the installation, do not reboot your system,
WARNING: instead use the 'request system software delete jinstall'
WARNING: command as soon as this operation completes.
```

Saving package file in /var/sw/pkg/jinstall-12.3R2-domestic-signed.tgz ...

Saving state for rollback ...

1cc3-re0:

Installing package '/var/tmp/jinstall-12.3R2-domestic-signed.tgz' ...

Verified jinstall-12.3R2-domestic.tgz signed by PackageProduction\_12\_3\_0

Adding jinstall...

Verified manifest signed by PackageProduction\_12\_3\_0

```
WARNING: This package will load JUNOS 12.3R2 software.
WARNING: It will save JUNOS configuration files, and SSH keys
WARNING: (if configured), but erase all other files and information
```

```

WARNING: stored on this machine. It will attempt to preserve dumps
WARNING: and log files, but this can not be guaranteed. This is the
WARNING: pre-installation stage and all the software is loaded when
WARNING: you reboot the system.

Saving the config files ...
NOTICE: uncommitted changes have been saved in
/var/db/config/juniper.conf.pre-install
Installing the bootstrap installer ...

WARNING: A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the
WARNING: 'request system reboot' command when software installation is
WARNING: complete. To abort the installation, do not reboot your system,
WARNING: instead use the 'request system software delete jinstall'
WARNING: command as soon as this operation completes.

Saving package file in /var/sw/pkg/jinstall-12.3R2-domestic-signed.tgz ...
Saving state for rollback ...
Installing package '/var/tmp/paBWTg' ...
Verified jinstall-12.3R2-domestic.tgz signed by PackageProduction_12_3_0
Adding jinstall...
Verified manifest signed by PackageProduction_12_3_0

WARNING: This package will load JUNOS 12.3R2 software.
WARNING: It will save JUNOS configuration files, and SSH keys
WARNING: (if configured), but erase all other files and information
WARNING: stored on this machine. It will attempt to preserve dumps
WARNING: and log files, but this can not be guaranteed. This is the
WARNING: pre-installation stage and all the software is loaded when
WARNING: you reboot the system.

Saving the config files ...
NOTICE: uncommitted changes have been saved in
/var/db/config/juniper.conf.pre-install
Installing the bootstrap installer ...

WARNING: A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the
WARNING: 'request system reboot' command when software installation is
WARNING: complete. To abort the installation, do not reboot your system,
WARNING: instead use the 'request system software delete jinstall'
WARNING: command as soon as this operation completes.

Saving package file in /var/sw/pkg/jinstall-12.3R2-domestic-signed ...
cp: /var/tmp/paBWTg is a directory (not copied).
Saving state for rollback ...
ISSU: SFC Old Master Upgrade Done
ISSU: IDLE

```

#### request system software-in-service upgrade (QFX5100 Switch)

```

{master}

user@switch> request system software in-service-upgrade
/var/tmp/jinstall-qfx-132_x51_vjunos.0-domestic.tgz
ISSU: Validating Image
Prepare for ISSU
spawn the backup VM
ISSU: Preparing Backup RE
Backup upgrade done
ISSU: Backup RE Prepare Done
waiting for backup RE switchover ready
GRES operational

```

```

Initiating Chassis In-Service-Upgrade
Chassis ISSU Started
ISSU: Preparing Daemons
ISSU: Daemons Ready for ISSU
ISSU: Starting Upgrade for FRUs
ISSU: FPC Warm Booting
ISSU: FPC Warm Booted
ISSU: Preparing for Switchover
ISSU: Ready for Switchover
Checking In-Service-Upgrade status
 Item Status Reason
 FPC 0 Online (ISSU)
send ISSU done to chassisd on backup VM
Chassis ISSU Completed
ISSU: IDLE
mgd_package_opus_issu: Initiate em0 device handoff

```



## show chassis in-service-upgrade

**Syntax** `show chassis in-service-upgrade`

**Release Information** Command introduced in Junos OS Release 9.0.  
 Command introduced in Junos OS Release 12.3R2, 13.1R2, and 13.2R1 for TX Matrix Plus routers.  
 Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.  
 Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.  
 Command introduced in Junos OS Release 13.2 for PTX5000 routers.  
 Command introduced in Junos OS Release 13.2X51-D15 for the QFX Series.

**Description** Display the status of Flexible PIC Concentrators (FPCs) and their corresponding PICs after the most recent unified in-service software upgrade (ISSU). This command must be issued on the master Routing Engine.



**NOTE:** Only Intelligent Queuing (IQ) PICs are displayed by this command output. Unified ISSU status for other PIC types is controlled internally by the FPC.

**Options** This command has no options.

**Required Privilege Level** view

**Related Documentation**

- *request system software abort*
- [request system software in-service-upgrade on page 524](#)
- *Unified ISSU Concepts*
- *Performing a Unified ISSU*

**List of Sample Output** [show chassis in-service-upgrade on page 538](#)  
[show chassis in-service-upgrade \(MX2010 Router\) on page 538](#)  
[show chassis in-service-upgrade \(MX2020 Router\) on page 538](#)  
[show chassis in-service-upgrade \(TX Matrix Plus Router\) on page 539](#)  
[show chassis in-service-upgrade \(QFX5100 Switch\) on page 540](#)

**Output Fields** [Table 41 on page 537](#) lists the output fields for the `show chassis in-service-upgrade` command. Output fields are listed in the approximate order in which they appear.

**Table 41: show chassis in-service-upgrade Output Fields**

| Field Name | Field Description                            |
|------------|----------------------------------------------|
| Item       | Flexible PIC Concentrator (FPC) slot number. |

Table 41: show chassis in-service-upgrade Output Fields (*continued*)

| Field Name    | Field Description                                                                                                                                                                                                  |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Status</b> | FPC and corresponding PIC state. State can be either of the following: <ul style="list-style-type: none"> <li>• <b>Online</b>—FPC is online and running.</li> <li>• <b>Offline</b>—FPC is powered down.</li> </ul> |
| <b>Reason</b> | Reason for the state (if offline).                                                                                                                                                                                 |

## Sample Output

### show chassis in-service-upgrade

```

user@host> show chassis in-service-upgrade
Item Status Reason
FPC 0 Online
FPC 1 Online
FPC 2 Online
 PIC 0 Online
 PIC 1 Online
FPC 3 Offline Offlined by CLI command
FPC 4 Online
 PIC 1 Online
FPC 5 Online
 PIC 0 Online
FPC 6 Online
 PIC 3 Online
FPC 7 Online

```

### show chassis in-service-upgrade (MX2010 Router)

```

user@host> show chassis in-service-upgrade
Item Status Reason
FPC 0 Online
FPC 1 Online
FPC 8 Online
FPC 9 Online

```

### show chassis in-service-upgrade (MX2020 Router)

```

user@host> show chassis in-service-upgrade
Item Status Reason
FPC 0 Online
FPC 1 Online
FPC 2 Online
FPC 3 Online
FPC 4 Online
FPC 5 Online
FPC 6 Online
FPC 7 Online
FPC 8 Online
FPC 9 Online
FPC 10 Online
FPC 11 Online
FPC 12 Online
FPC 13 Online

```

```

FPC 14 Online
FPC 15 Online
FPC 16 Online
FPC 17 Online
FPC 18 Online
FPC 19 Online

```

### show chassis in-service-upgrade (TX Matrix Plus Router)

```

user@host> show chassis in-service-upgrade
1cc0-re0:

```

| Item  | Status | Reason |
|-------|--------|--------|
| FPC 1 | Online |        |
| PIC 0 | Online |        |
| FPC 2 | Online |        |
| FPC 3 | Online |        |
| PIC 1 | Online |        |
| FPC 4 | Online |        |
| FPC 6 | Online |        |
| FPC 7 | Online |        |

```

1cc1-re0:

```

| Item  | Status | Reason |
|-------|--------|--------|
| FPC 0 | Online |        |
| PIC 3 | Online |        |
| FPC 1 | Online |        |
| FPC 2 | Online |        |
| FPC 4 | Online |        |
| FPC 6 | Online |        |
| FPC 7 | Online |        |

```

1cc2-re0:

```

| Item  | Status | Reason |
|-------|--------|--------|
| FPC 0 | Online |        |
| FPC 2 | Online |        |
| FPC 3 | Online |        |
| PIC 0 | Online |        |
| FPC 4 | Online |        |
| FPC 6 | Online |        |
| FPC 7 | Online |        |
| PIC 1 | Online |        |

```

1cc3-re0:

```

| Item  | Status | Reason |
|-------|--------|--------|
| FPC 0 | Online |        |
| PIC 0 | Online |        |
| FPC 1 | Online |        |
| FPC 2 | Online |        |
| FPC 3 | Online |        |
| PIC 2 | Online |        |
| FPC 4 | Online |        |
| FPC 5 | Online |        |
| FPC 6 | Online |        |
| FPC 7 | Online |        |
| PIC 1 | Online |        |

### show chassis in-service-upgrade (QFX5100 Switch)

```
user@switch> show chassis in-service-upgrade
```

| Item  | Status        | Reason |
|-------|---------------|--------|
| FPC 0 | Online (ISSU) |        |

## CHAPTER 32

# NSSU Operational Commands

- request system software nonstop-upgrade
- show chassis nonstop-upgrade

## request system software nonstop-upgrade

---

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>              | <code>request system software nonstop-upgrade (<i>package-name</i>   set [<i>package-name</i> <i>package-name</i>])</code><br><code>&lt;force-host&gt;</code><br><code>&lt;no-copy&gt;</code><br><code>&lt;no-old-master-upgrade&gt;</code><br><code>&lt;reboot&gt;</code><br><code>&lt;unlink&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Release Information</b> | Command introduced in Junos OS Release 10.4 for EX Series switches.<br>Option <code>set [<i>package-name</i> <i>package-name</i>]</code> added in Junos OS Release 12.1 for EX Series switches.<br>Command introduced in Junos OS Release 13.2X50-D20 for the QFX Series.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Description</b>         | <p>Perform a nonstop software upgrade (NSSU) on a switch with redundant Routing Engines or on a Virtual Chassis. The behavior of this command depends on which switch or Virtual Chassis it is executed on:</p> <ul style="list-style-type: none"><li>• When you execute this command on an EX3300, EX4200, EX4300, EX4500, EX4550, EX4600 Virtual Chassis or QFX3500, QFX3600, QFX5100, or EX4600 Virtual Chassis, a fixed configuration of switches in a Virtual Chassis Fabric (QFX3500/QFX3600 and QFX5100 switches) or for a mixed Virtual Chassis Fabric composed of any combination of QFX3500/QFX3600, QFX5100, and EX4300 switches, or a mixed Virtual Chassis composed of any combination of EX4200, EX4500, and EX4550 switches, all members are upgraded. The original Virtual Chassis backup becomes the master. The original master is automatically upgraded and rebooted and rejoins the Virtual Chassis as the backup after the upgrade completes.</li><li>• When you execute this command on an EX6200 or EX8200 switch, both the backup and master Routing Engines are upgraded, with the original backup Routing Engine becoming the new master at the end of the upgrade.<br/><br/>The original master Routing Engine is automatically rebooted on an EX6200 switch.<br/><br/>The original master Routing Engine is not automatically rebooted on an EX8200 switch unless you specify the <b>reboot</b> option.</li><li>• When you execute this command on an EX8200 Virtual Chassis, all master and backup Routing Engines are upgraded in the Virtual Chassis, including the external Routing Engines. The original backup Routing Engines become the new master Routing Engines. The original master Routing Engines are not automatically rebooted, unless you specify the <b>reboot</b> option.</li></ul> <p>This command has the following requirements:</p> <ul style="list-style-type: none"><li>• All Virtual Chassis members and all Routing Engines must be running the same Junos OS release.</li><li>• Graceful Routing Engine switchover (GRES) must be enabled.</li><li>• Nonstop active routing (NSR) must be enabled.</li></ul> |



**NOTE:** Although nonstop bridging (NSB) does not have to be enabled for you to use this command, we recommend that you enable NSB. Enabling NSB ensures that all NSB-supported Layer 2 protocols operate seamlessly during the Routing Engine switchover that is part of the NSSU. See *Configuring Nonstop Bridging on EX Series Switches (CLI Procedure)*.

- The command must be executed from the master Routing Engine on a standalone switch or from the master on a Virtual Chassis.
- For minimal traffic disruption, you must define link aggregation groups (LAGs) such that the member links reside on different Virtual Chassis members (for EX3300, EX4200, EX4300, EX4500, EX4550, QFX3500 and QFX3600 Virtual Chassis, and mixed Virtual Chassis, and Virtual Chassis Fabric) or on different line cards (for EX6200 and EX8200 switches, and for EX8200 Virtual Chassis).
- For EX3300, EX4200, EX4300, EX4500, EX4550, QFX3500 and QFX3600 Virtual Chassis, and mixed Virtual Chassis:
  - The Virtual Chassis members must be connected in a ring topology. A ring topology prevents the Virtual Chassis from splitting during an NSSU.
  - The Virtual Chassis master and backup must be adjacent to each other in the ring topology. Adjacency permits the master and backup to always be in sync, even when the switches in linecard roles are rebooting.
  - The Virtual Chassis must be preprovisioned so that the linecard role has been explicitly assigned to member switches acting in a linecard role. During an NSSU, the Virtual Chassis members must maintain their roles—the master and backup must maintain their Routing Engine roles (although mastership will change), and the remaining switches must maintain their linecard roles.
  - A two-member Virtual Chassis must have **no-split-detection** configured so that the Virtual Chassis does not split when an NSSU upgrades a member.
- For Virtual Chassis Fabric:
  - Only two pre-provisioned members in the routing engine role are supported. If more than two routing engines are configured, a warning will be issued, and NSSU will stop.
  - The Virtual Chassis Fabric members are connected in a spine and leaf topology. A spine and leaf topology prevents the Virtual Chassis Fabric from splitting during an NSSU. Each leaf device must be connected to both spine devices.
  - The Virtual Chassis Fabric must be preprovisioned so that the line card role has been explicitly assigned to member switches acting in a line card role, and that the routing engine role has been explicitly assigned to member switches acting in a routing engine role. During an NSSU, the Virtual Chassis Fabric members must maintain their roles—the master and backup must maintain their master and backup roles (although

mastership will change), the member switches must remain their routing engine roles, and the remaining switches must maintain their linecard roles.

- A two-member Virtual Chassis Fabric must have **no-split-detection** configured so that the Virtual Chassis Fabric does not split when an NSSU upgrades a member.

**Options** *package-name*—Location from which the software package or bundle is to be installed. For example:

- */var/tmp/package-name*—For a software package or bundle that is being installed from a local directory on the switch.
- *protocol://hostname/pathname/package-name*—For a software package or bundle that is to be downloaded and installed from a remote location. Replace **protocol** with one of the following:
  - **ftp**—File Transfer Protocol.  
Use *ftp://hostname/pathname/package-name*. To specify authentication credentials, use *ftp://<username>:<password>@hostname/pathname/package-name*. To have the system prompt you for the password, specify **prompt** in place of the password. If a password is required, and you do not specify the password or **prompt**, an error message is displayed.
  - **http**—Hypertext Transfer Protocol.  
Use *http://hostname/pathname/package-name*. To specify authentication credentials, use *http://<username>:<password>@hostname/pathname/package-name*. If a password is required and you omit it, you are prompted for it.
  - **scp**—Secure copy (available only for Canada and U.S. version).  
Use *scp://hostname/pathname/package-name*. To specify authentication credentials, use *scp://<username>:<password>@hostname/pathname/package-name*.



**NOTE:** The *pathname* in the protocol is the relative path to the user home directory on the remote system and not the root directory.

---

**set [package-name package-name]**—(Mixed Virtual Chassis only) Locations of the EX4200 and the EX4500 installation packages. These packages must be for the same Junos OS release. See the description of the *package-name* option for information about how to specify the location of the installation packages.

**force-host**—(Optional) Force the addition of host software package or bundle (ignore warnings) on the QFX5100 device.

**no-copy**—(Optional) Install a software package or bundle, but do not save copies of package or bundle files.



**no-old-master-upgrade**—(Optional) (EX8200 switches only) Upgrade the backup Routing Engine only. After the upgrade completes, the original master Routing Engine becomes the backup Routing Engine and continues running the previous software version.

**reboot**—(Optional) (EX8200 switches and EX8200 Virtual Chassis only) When the **reboot** option is included, the original master (new backup) Routing Engines are automatically rebooted after being upgraded to the new software. When the **reboot** option is not included, you must manually reboot the original master (new backup) Routing Engines using the **request system reboot** command.



**NOTE:** If you do not use the **reboot** option on an EX8200 Virtual Chassis, you must establish a connection to the console port on the Switch Fabric and Routing Engine (SRE) module or Routing Engine (RE) module to perform the manual reboot of the backup Routing Engines.

**unlink**—(Optional) Remove the software package after a successful upgrade is completed.

**Required Privilege Level** maintenance

**Related Documentation**

- [show chassis nonstop-upgrade on page 552](#)
- *Upgrading Software on an EX3300, EX4200, EX4300, EX4500 and EX4550 Virtual Chassis, and Mixed Virtual Chassis Using Nonstop Software Upgrade (CLI Procedure)*
- *Upgrading Software on an EX6200 or EX8200 Standalone Switch Using Nonstop Software Upgrade (CLI Procedure)*
- *Upgrading Software on an EX8200 Virtual Chassis Using Nonstop Software Upgrade (CLI Procedure)*
- [Upgrading Software on a Virtual Chassis and Mixed Virtual Chassis Using Nonstop Software Upgrade on page 138](#)
- [Upgrading Software on a Virtual Chassis Fabric Using Nonstop Software Upgrade on page 142](#)

**List of Sample Output**

[request system software nonstop-upgrade \(EX4200 Virtual Chassis\) on page 546](#)  
[request system software nonstop-upgrade \(EX6200 Switch\) on page 547](#)  
[request system software nonstop-upgrade reboot \(EX8200 Switch\) on page 548](#)  
[request system software nonstop-upgrade no-old-master-upgrade \(EX8200 Switch\) on page 549](#)  
[request system software nonstop-upgrade reboot \(EX8200 Virtual Chassis\) on page 549](#)

**Output Fields** When you enter this command, you are provided feedback on the status of your request.

## Sample Output

### request system software nonstop-upgrade (EX4200 Virtual Chassis)

```
user@switch> request system software nonstop-upgrade
/var/tmp/jinstall-ex-4200-12.1R5.5-domestic-signed.tgz
Chassis ISSU Check Done
ISSU: Validating Image
ISSU: Preparing Backup RE
Installing image on other FPC's along with the backup

Checking pending install on fpc1
Pushing bundle to fpc1
WARNING: A reboot is required to install the software
WARNING: Use the 'request system reboot' command immediately
Completed install on fpc1

Checking pending install on fpc2
Pushing bundle to fpc2
WARNING: A reboot is required to install the software
WARNING: Use the 'request system reboot' command immediately
Completed install on fpc2

Checking pending install on fpc3
Pushing bundle to fpc3
WARNING: A reboot is required to install the software
WARNING: Use the 'request system reboot' command immediately
Completed install on fpc3

Checking pending install on fpc4
Pushing bundle to fpc4
WARNING: A reboot is required to install the software
WARNING: Use the 'request system reboot' command immediately
Completed install on fpc4

Checking pending install on fpc5
Pushing bundle to fpc5
WARNING: A reboot is required to install the software
WARNING: Use the 'request system reboot' command immediately
Completed install on fpc5

Checking pending install on fpc6
Pushing bundle to fpc6
WARNING: A reboot is required to install the software
WARNING: Use the 'request system reboot' command immediately
Completed install on fpc6

Checking pending install on fpc7
Pushing bundle to fpc7
WARNING: A reboot is required to install the software
WARNING: Use the 'request system reboot' command immediately
Completed install on fpc7
Backup upgrade done
Rebooting Backup RE

Rebooting fpc1
ISSU: Backup RE Prepare Done
Waiting for Backup RE reboot
GRES operational
Initiating Chassis In-Service-Upgrade
Chassis ISSU Started
```

```

ISSU: Preparing Daemons
ISSU: Daemons Ready for ISSU
ISSU: Starting Upgrade for FRUs
ISSU: Preparing for Switchover
ISSU: Ready for Switchover
Checking In-Service-Upgrade status
 Item Status Reason
 FPC 0 Online
 FPC 1 Online
 FPC 2 Online (ISSU)
 FPC 3 Online (ISSU)
 FPC 4 Online (ISSU)
 FPC 5 Online (ISSU)
 FPC 6 Online (ISSU)
 FPC 7 Online (ISSU)
Going to install image on master
WARNING: A reboot is required to install the software
WARNING: Use the 'request system reboot' command immediately
relinquish mastership
ISSU: IDLE

*** FINAL System shutdown message from root@switch ***

System going down IMMEDIATELY

Shutdown NOW!
[pid 9336]

```

#### request system software nonstop-upgrade (EX6200 Switch)

```

{master}
user@switch> request system software nonstop-upgrade
/var/tmp/jinstall-ex-6200-12.2R5.5-domestic-signed.tgz
Chassis ISSU Check Done
ISSU: Validating Image
ISSU: Preparing Backup RE
Pushing bundle to re0
NOTICE: Validating configuration against
jinstall-ex-6200-12.2R5.5-domestic-signed.tgz.
NOTICE: Use the 'no-validate' option to skip this if desired.
WARNING: A reboot is required to install the software
WARNING: Use the 'request system reboot' command immediately
Backup upgrade done
Rebooting Backup RE

Rebooting re0
ISSU: Backup RE Prepare Done
Waiting for Backup RE reboot
GRES operational
Initiating Chassis In-Service-Upgrade
Chassis ISSU Started
ISSU: Preparing Daemons
ISSU: Daemons Ready for ISSU
ISSU: Starting Upgrade for FRUs
ISSU: Preparing for Switchover
ISSU: Ready for Switchover
Checking In-Service-Upgrade status
 Item Status Reason
 FPC 0 Online (ISSU)

```

```

FPC 1 Online (ISSU)
FPC 2 Online (ISSU)
FPC 3 Online (ISSU)
FPC 4 Online
FPC 5 Online
FPC 6 Online (ISSU)
FPC 7 Online (ISSU)
FPC 8 Online (ISSU)
FPC 9 Online (ISSU)
Going to install image on master
NOTICE: Validating configuration against
jinstall-ex-6200-12.2R5.5-domestic-signed.tgz.
NOTICE: Use the 'no-validate' option to skip this if desired.
WARNING: A reboot is required to install the software
WARNING: Use the 'request system reboot' command immediately
relinquish mastership
ISSU: IDLE
Trying to relinquish mastership before rebooting...
Resolving mastership...
Complete. The other routing engine becomes the master.

*** FINAL System shutdown message from user@switch ***

System going down IMMEDIATELY

```

#### request system software nonstop-upgrade reboot (EX8200 Switch)

```

{master}
user@switch> request system software nonstop-upgrade reboot
/var/tmp/jinstall-ex-8200-10.4R1.5-domestic-signed.tgz
Chassis ISSU Check Done
ISSU: Validating Image
ISSU: Preparing Backup RE
Pushing bundle to re1
WARNING: A reboot is required to install the software
WARNING: Use the 'request system reboot' command immediately
Backup upgrade done
Rebooting Backup RE

Rebooting re1
ISSU: Backup RE Prepare Done
Waiting for Backup RE reboot
GRES operational
Initiating Chassis In-Service-Upgrade
Chassis ISSU Started
ISSU: Preparing Daemons
ISSU: Daemons Ready for ISSU
ISSU: Starting Upgrade for FRUs
ISSU: Preparing for Switchover
ISSU: Ready for Switchover
Checking In-Service-Upgrade status
 Item Status Reason
 FPC 0 Online (ISSU)
 FPC 2 Offline
 FPC 3 Online (ISSU)
Resolving mastership...
Complete. The other routing engine becomes the master.
ISSU: RE switchover Done
ISSU: Upgrading Old Master RE
WARNING: A reboot is required to install the software
WARNING: Use the 'request system reboot' command immediately

```

```

ISSU: Old Master Upgrade Done
ISSU: IDLE
Shutdown NOW!
[pid 2635]

```

```

*** FINAL System shutdown message from user@switch ***
System going down IMMEDIATELY

```

### request system software nonstop-upgrade no-old-master-upgrade (EX8200 Switch)

```

{master}
user@switch> request system software nonstop-upgrade no-old-master-upgrade
/var/tmp/jinstall-ex-8200-10.4R1.5-domestic-signed.tgz
Chassis ISSU Check Done
ISSU: Validating Image
ISSU: Preparing Backup RE
Pushing bundle to re1
WARNING: A reboot is required to install the software
WARNING: Use the 'request system reboot' command immediately
Backup upgrade done
Rebooting Backup RE

Rebooting re1
ISSU: Backup RE Prepare Done
Waiting for Backup RE reboot
GRES operational
Initiating Chassis In-Service-Upgrade
Chassis ISSU Started
ISSU: Preparing Daemons
ISSU: Daemons Ready for ISSU
ISSU: Starting Upgrade for FRUs
ISSU: Preparing for Switchover
ISSU: Ready for Switchover
Checking In-Service-Upgrade status

```

| Item  | Status        | Reason                  |
|-------|---------------|-------------------------|
| FPC 0 | Online (ISSU) |                         |
| FPC 1 | Online (ISSU) |                         |
| FPC 2 | Online (ISSU) |                         |
| FPC 3 | Offline       | Offlined by CLI command |
| FPC 4 | Online (ISSU) |                         |
| FPC 5 | Online (ISSU) |                         |
| FPC 6 | Online (ISSU) |                         |
| FPC 7 | Online (ISSU) |                         |

```

Resolving mastership...
Complete. The other routing engine becomes the master.
ISSU: RE switchover Done
Skipping Old Master Upgrade
ISSU: IDLE

```

### request system software nonstop-upgrade reboot (EX8200 Virtual Chassis)

```

{master:9}
user@external-routing-engine> request system software nonstop-upgrade reboot
/var/tmp/jinstall-ex-xre200-11.1-20101130.0-domestic-signed.tgz
Chassis ISSU Check Done
ISSU: Validating Image
ISSU: Preparing LCC Backup REs
ISSU: Preparing Backup RE
Pushing bundle /var/tmp/jinstall-ex-xre200-11.1-20101130.0-domestic-signed.tgz
to member8

```

```

WARNING: A reboot is required to install the software
WARNING: Use the 'request system reboot' command immediately
VC Backup upgrade done
Rebooting VC Backup RE

```

```

Rebooting member8
ISSU: Backup RE Prepare Done
Waiting for VC Backup RE reboot
Pushing bundle to member0-backup
Pushing bundle to member1-backup
WARNING: A reboot is required to install the software
WARNING: Use the 'request system reboot' command immediately
WARNING: A reboot is required to install the software
WARNING: Use the 'request system reboot' command immediately

```

```

Rebooting member0-backup
Rebooting LCC [member0-backup]

```

```

Rebooting member1-backup
Rebooting LCC [member1-backup]
ISSU: LCC Backup REs Prepare Done
GRES operational
Initiating Chassis Nonstop-Software-Upgrade
Chassis ISSU Started
ISSU: Preparing Daemons
ISSU: Daemons Ready for ISSU
ISSU: Starting Upgrade for FRUs
ISSU: Preparing for Switchover
ISSU: Ready for Switchover
Checking Nonstop-Upgrade status
member0:

```

```

Item Status Reason
FPC 0 Online (ISSU)
FPC 1 Online (ISSU)
FPC 2 Online (ISSU)
FPC 5 Online (ISSU)

```

```
member1:
```

```

Item Status Reason
FPC 0 Online (ISSU)
FPC 1 Offline Offlined due to config
FPC 2 Online (ISSU)
FPC 3 Online (ISSU)
FPC 4 Online (ISSU)
FPC 5 Online (ISSU)
FPC 7 Online (ISSU)

```

```
member0:
```

```

Item Status Reason
FPC 0 Online (ISSU)
FPC 1 Online (ISSU)
FPC 2 Online (ISSU)
FPC 5 Online (ISSU)

```

```
member1:
```

```

Item Status Reason

```

```
FPC 0 Online (ISSU)
FPC 1 Offline Offlined due to config
FPC 2 Online (ISSU)
FPC 3 Online (ISSU)
FPC 4 Online (ISSU)
FPC 5 Online (ISSU)
FPC 7 Online (ISSU)
ISSU: Upgrading Old Master RE
Pushing bundle /var/tmp/incoming-package-8200.tgz to member0-master
Pushing bundle /var/tmp/incoming-package-8200.tgz to member1-master

ISSU: RE switchover Done
WARNING: A reboot is required to install the software
WARNING: Use the 'request system reboot' command immediately
Rebooting ...
shutdown: [pid 2188]
Shutdown NOW!
ISSU: Old Master Upgrade Done
ISSU: IDLE
Shutdown NOW!

*** FINAL System shutdown message from root@ ***
System going down IMMEDIATELY
```

## show chassis nonstop-upgrade

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <b>show chassis nonstop-upgrade</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Release Information</b>      | Command introduced in Junos OS Release 10.4 for EX Series switches.<br>Command introduced in Junos OS Release 13.2X50-D15 for the QFX Series.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Description</b>              | (EX6200 switches, EX8200 switches, EX8200 Virtual Chassis, QFX3500 and QFX3600 Virtual Chassis, and Virtual Chassis Fabric only) Display the status of the line cards or Virtual Chassis members in the linecard role after the most recent nonstop software upgrade (NSSU). This command must be issued on the master Routing Engine.                                                                                                                                                                                                                                                                                                               |
| <b>Required Privilege Level</b> | view                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">request system software nonstop-upgrade on page 542</a></li> <li>• <a href="#">Upgrading Software on an EX6200 or EX8200 Standalone Switch Using Nonstop Software Upgrade (CLI Procedure)</a></li> <li>• <a href="#">Upgrading Software on a Virtual Chassis and Mixed Virtual Chassis Using Nonstop Software Upgrade on page 138</a></li> <li>• <a href="#">Upgrading Software on a Virtual Chassis Fabric Using Nonstop Software Upgrade on page 142</a></li> <li>• <a href="#">Upgrading Software on an EX8200 Virtual Chassis Using Nonstop Software Upgrade (CLI Procedure)</a></li> </ul> |
| <b>List of Sample Output</b>    | <a href="#">show chassis nonstop-upgrade (EX8200 Switch) on page 553</a><br><a href="#">show chassis nonstop-upgrade (EX8200 Virtual Chassis) on page 553</a><br><a href="#">show chassis nonstop-upgrade (Virtual Chassis Fabric) on page 553</a>                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Output Fields</b>            | Table 42 on page 552 lists the output fields for the <b>show chassis nonstop-upgrade</b> command. Output fields are listed in the approximate order in which they appear.                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

**Table 42: show chassis nonstop-upgrade Output Fields**

| Field Name    | Field Description                                                                                                                                                                                                                   |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Item</b>   | Line card slot number.                                                                                                                                                                                                              |
| <b>Status</b> | State of line card: <ul style="list-style-type: none"> <li>• <b>Error</b>—Line card is in an error state.</li> <li>• <b>Offline</b>—Line card is powered down.</li> <li>• <b>Online</b>—Line card is online and running.</li> </ul> |
| <b>Reason</b> | Reason for the state (if the line card is offline).                                                                                                                                                                                 |



## Sample Output

### show chassis nonstop-upgrade (EX8200 Switch)

```
user@switch> show chassis nonstop-upgrade
```

| Item  | Status  | Reason                  |
|-------|---------|-------------------------|
| FPC 0 | Online  |                         |
| FPC 1 | Online  |                         |
| FPC 2 | Online  |                         |
| FPC 3 | Offline | Offlined by CLI command |
| FPC 4 | Online  |                         |
| FPC 5 | Online  |                         |
| FPC 6 | Online  |                         |
| FPC 7 | Online  |                         |

### show chassis nonstop-upgrade (EX8200 Virtual Chassis)

```
user@external-routing-engine> show chassis nonstop-upgrade
member0:
```

| Item  | Status | Reason |
|-------|--------|--------|
| FPC 0 | Online |        |
| FPC 1 | Online |        |
| FPC 2 | Online |        |
| FPC 5 | Online |        |

```
member1:
```

| Item  | Status  | Reason                 |
|-------|---------|------------------------|
| FPC 0 | Online  |                        |
| FPC 1 | Offline | Offlined due to config |
| FPC 2 | Online  |                        |
| FPC 3 | Online  |                        |
| FPC 4 | Online  |                        |
| FPC 5 | Online  |                        |
| FPC 7 | Online  |                        |

### show chassis nonstop-upgrade (Virtual Chassis Fabric)

| Item  | Status | Reason |
|-------|--------|--------|
| FPC 0 | Online |        |
| FPC 1 | Online |        |
| FPC 2 | Online |        |
| FPC 3 | Online |        |
| FPC 4 | Online |        |
| FPC 5 | Online |        |



## CHAPTER 33

# Licensing Operational Commands

- request system license add
- request system license delete
- request system license save
- show system license

## request system license add

---

|                                 |                                                                                                                                                                                                                                                                |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>request system license add (<i>filename</i>   terminal)</code>                                                                                                                                                                                           |
| <b>Release Information</b>      | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br>Command introduced in Junos OS Release 9.5 for SRX Series devices.<br>Command introduced in Junos OS Release 11.1 for the QFX Series. |
| <b>Description</b>              | Add a license key.                                                                                                                                                                                                                                             |
| <b>Options</b>                  | <b><i>filename</i></b> —License key from a file or URL. Specify the filename or the URL where the key is located.<br><br><b><i>terminal</i></b> —License key from the terminal.                                                                                |
| <b>Required Privilege Level</b> | maintenance                                                                                                                                                                                                                                                    |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Adding New Licenses (CLI Procedure) on page 161</a></li></ul>                                                                                                                                              |
| <b>List of Sample Output</b>    | <a href="#">request system license add on page 556</a>                                                                                                                                                                                                         |
| <b>Output Fields</b>            | When you enter this command, you are provided feedback on the status of your request.                                                                                                                                                                          |

## Sample Output

### request system license add

```
user@host> request system license add terminal
E408408918 aeaqib qcsbj a okbuqe rcmxnq vjocwf uxfsta
 z5ufjb kdrmt6 57bimv 2f3ddp qttcdn 627q4a
 jx4s5x hiri
E408408918: successfully added
add license complete (no errors)
```

## request system license delete

---

|                                 |                                                                                                                                                                                                                                                                                                                         |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>request system license delete ( <i>license-identifier</i>   license-identifier-list [ <i>licenseid001</i> <i>licenseid002</i> <i>licenseid003</i> ]   all )</code>                                                                                                                                                |
| <b>Release Information</b>      | <p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Option <b>license-identifier-list</b> introduced in Junos OS Release 13.1.</p>                               |
| <b>Description</b>              | Delete a license key. You can choose to delete one license at a time, all licenses at once, or a list of license identifiers enclosed in brackets.                                                                                                                                                                      |
| <b>Options</b>                  | <p><b>license-identifier</b>—Text string that uniquely identifies a license key.</p> <p><b>license-identifier-list [ <i>licenseid001</i> <i>licenseid002</i> <i>licenseid003</i>.... ]</b>—Delete multiple license identifiers as a list enclosed in brackets.</p> <p><b>all</b>—Delete all licenses on the device.</p> |
| <b>Required Privilege Level</b> | maintenance                                                                                                                                                                                                                                                                                                             |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">Deleting a License (CLI Procedure) on page 162</a></li> </ul>                                                                                                                                                                                                      |

## request system license save

---

|                                 |                                                                                                                                                                                                                                                                |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>request system license save (<i>filename</i>   terminal)</code>                                                                                                                                                                                          |
| <b>Release Information</b>      | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 9.5 for SRX Series devices. |
| <b>Description</b>              | Save installed license keys to a file or URL.                                                                                                                                                                                                                  |
| <b>Options</b>                  | <b><i>filename</i></b> —License key from a file or URL. Specify the filename or the URL where the key is located.<br><br><b><i>terminal</i></b> —License key from the terminal.                                                                                |
| <b>Required Privilege Level</b> | maintenance                                                                                                                                                                                                                                                    |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Saving License Keys on page 163</a></li></ul>                                                                                                                                                              |
| <b>List of Sample Output</b>    | <a href="#">request system license save on page 558</a>                                                                                                                                                                                                        |
| <b>Output Fields</b>            | When you enter this command, you are provided feedback on the status of your request.                                                                                                                                                                          |

## Sample Output

### request system license save

```
user@host> request system license save ftp://user@host/license.conf
```

## show system license

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | show system license<br><installed   keys   usage>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Release Information</b>      | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 13.3 for the MX104 3D Universal Edge Routers.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Description</b>              | Display licenses and information about how they are used.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Options</b>                  | <p><b>none</b>—Display all license information.</p> <p><b>installed</b>—(Optional) Display installed licenses only.</p> <p><b>keys</b>—(Optional) Display a list of license keys. Use this information to verify that each expected license key is present.</p> <p><b>usage</b>—(Optional) Display the state of licensed features.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Required Privilege Level</b> | maintenance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>List of Sample Output</b>    | <a href="#">show system license on page 560</a><br><a href="#">show system license installed on page 561</a><br><a href="#">show system license keys on page 561</a><br><a href="#">show system license usage on page 561</a><br><a href="#">show system license (MX104 Routers) on page 561</a><br><a href="#">show system license installed (MX104 Routers) on page 562</a><br><a href="#">show system license keys (MX104 Routers) on page 562</a><br><a href="#">show system license usage (MX104 Routers) on page 562</a><br><a href="#">show system license (MX104 Routers) on page 562</a><br><a href="#">show system license installed (MX104 Routers) on page 563</a><br><a href="#">show system license keys (MX104 Routers) on page 563</a><br><a href="#">show system license usage (MX104 Routers) on page 563</a><br><a href="#">show system license (MX104 Routers) on page 564</a><br><a href="#">show system license installed (MX104 Routers) on page 564</a><br><a href="#">show system license keys (MX104 Routers) on page 564</a><br><a href="#">show system license usage (MX104 Routers) on page 565</a><br><a href="#">show system license (QFX Series) on page 565</a> |
| <b>Output Fields</b>            | Table 43 on page 559 lists the output fields for the <b>show system license</b> command. Output fields are listed in the approximate order in which they appear.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

**Table 43: show system license Output Fields**

| Field Name          | Field Description                                                                                                                               |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Feature name</b> | Name assigned to the configured feature. You use this information to verify that all the features for which you installed licenses are present. |

Table 43: show system license Output Fields (*continued*)

| Field Name                | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Licenses used</b>      | <p>Number of licenses used by a router or switch. You use this information to verify that the number of licenses used matches the number configured. If a licensed feature is configured, the feature is considered used.</p> <p><b>NOTE:</b> In Junos OS Release 10.1 and later, the <b>Licenses used</b> column displays the actual usage count based on the number of active sessions or connections as reported by the corresponding feature daemons. This is applicable for scalable license-based features such as Subscriber Access (<b>scale-subscriber</b>), L2TP (<b>scale-l2tp</b>), Mobile IP (<b>scale-mobile-ip</b>), and so on.</p>                                                                                                                                        |
| <b>Licenses installed</b> | <p>Information about the installed license key:</p> <ul style="list-style-type: none"> <li>• <b>License identifier</b>—Identifier associated with a license key.</li> <li>• <b>State</b>—State of the license key: <b>valid</b> or <b>invalid</b>. An <b>invalid</b> state indicates that the key was entered incorrectly or is not valid for the specific device.</li> <li>• <b>License version</b>—Version of a license. The version indicates how the license is validated, the type of signature, and the signer of the license key.</li> <li>• <b>Valid for device</b>—Device that can use a license key.</li> <li>• <b>Group defined</b>—Group membership of a device.</li> <li>• <b>Features</b>—Feature associated with a license, such as data link switching (DLSw).</li> </ul> |
| <b>Licenses needed</b>    | Number of licenses required for features being used but not yet properly licensed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Expiry</b>             | Amount of time left within the grace period before a license is required for a feature being used.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

## Sample Output

### show system license

```
user@host> show system license
```

```
License usage:
```

| Feature name                  | Licenses used | Licenses installed | Licenses needed | Expiry    |
|-------------------------------|---------------|--------------------|-----------------|-----------|
| subscriber-accounting         | 2             | 2                  | 0               | permanent |
| subscriber-authentication     | 1             | 2                  | 0               | permanent |
| subscriber-address-assignment | 2             | 2                  | 0               | permanent |
| subscriber-vlan               | 2             | 2                  | 0               | permanent |
| subscriber-ip                 | 0             | 2                  | 0               | permanent |
| scale-subscriber              | 2             | 3                  | 0               | permanent |
| scale-l2tp                    | 4             | 5                  | 0               | permanent |
| scale-mobile-ip               | 1             | 2                  | 0               | permanent |

```
Licenses installed:
```

```
License identifier: XXXXXXXXXX
```

```
License version: 2
```

```
Features:
```

```
subscriber-accounting - Per Subscriber Radius Accounting
permanent
subscriber-authentication - Per Subscriber Radius Authentication
permanent
subscriber-address-assignment - Radius/SRC Address Pool Assignment
permanent
subscriber-vlan - Dynamic Auto-sensed Vlan
```



```

 permanent
subscriber-ip - Dynamic and Static IP
 permanent

```

### show system license installed

```

user@host> show system license installed
License identifier: XXXXXXXXXX
License version: 2
Features:
 subscriber-accounting - Per Subscriber Radius Accounting
 permanent
 subscriber-authentication - Per Subscriber Radius Authentication
 permanent
 subscriber-address-assignment - Radius/SRC Address Pool Assignment
 permanent
 subscriber-vlan - Dynamic Auto-sensed Vlan
 permanent
 subscriber-ip - Dynamic and Static IP
 permanent

```

### show system license keys

```

user@host> show system license keys
XXXXXXXXXX xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx
 xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx
 xxxxxx xxxxxx xxx

```

### show system license usage

```

user@host> show system license usage
License usage:

```

| Feature name                  | Licenses<br>used | Licenses<br>installed | Licenses<br>needed | Expiry    |
|-------------------------------|------------------|-----------------------|--------------------|-----------|
| subscriber-accounting         | 2                | 2                     | 0                  | permanent |
| subscriber-authentication     | 1                | 2                     | 0                  | permanent |
| subscriber-address-assignment | 2                | 2                     | 0                  | permanent |
| subscriber-vlan               | 2                | 2                     | 0                  | permanent |
| subscriber-ip                 | 0                | 2                     | 0                  | permanent |
| scale-subscriber              | 2                | 3                     | 0                  | permanent |
| scale-l2tp                    | 4                | 5                     | 0                  | permanent |
| scale-mobile-ip               | 1                | 2                     | 0                  | permanent |

### show system license (MX104 Routers)

In the following output, ports 0 and 1 are activated by installing the license to activate the first two built-in ports.

```

user@host> show system license
License usage:

```

| Feature name           | Licenses<br>used | Licenses<br>installed | Licenses<br>needed | Expiry    |
|------------------------|------------------|-----------------------|--------------------|-----------|
| scale-subscriber       | 0                | 1000                  | 0                  | permanent |
| scale-l2tp             | 0                | 1000                  | 0                  | permanent |
| scale-mobile-ip        | 0                | 1000                  | 0                  | permanent |
| MX104-2x10Gig-port-0-1 | 0                | 1                     | 0                  | permanent |

```

Licenses installed:
License identifier: XXXXXXXXXX
License version: 2
Features:

```

```

MX104-2x10Gig-port-0-1 - MX104 2X10Gig Builtin Port(xe-2/0/0 & xe-2/0/1)
upgrade
 permanent

```

### show system license installed (MX104 Routers)

In the following output, ports 0 and 1 are activated by installing the license to activate the first two built-in ports.

```

user@host > show system license installed
License identifier: XXXXXXXXXX
License version: 2
Features:
 MX104-2x10Gig-port-0-1 - MX104 2X10Gig Builtin Port(xe-2/0/0 & xe-2/0/1)
upgrade
 permanent

```

### show system license keys (MX104 Routers)

In the following output, ports 0 and 1 are activated by installing the license to activate the first two built-in ports.

```

user@host > show system license keys

XXXXXXXXXX xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx
 xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx
 xxxxxx xxxx

```

### show system license usage (MX104 Routers)

In the following output, ports 0 and 1 are activated by installing the license to activate the first two built-in ports.

```

user@host > show system license usage

```

| Feature name           | Licenses used | Licenses installed | Expiry needed |           |
|------------------------|---------------|--------------------|---------------|-----------|
| scale-subscriber       | 0             | 1000               | 0             | permanent |
| scale-l2tp             | 0             | 1000               | 0             | permanent |
| scale-mobile-ip        | 0             | 1000               | 0             | permanent |
| MX104-2x10Gig-port-0-1 | 0             | 1                  | 0             | permanent |

### show system license (MX104 Routers)

In the following output, ports 2 and 3 are activated by installing the license to activate the next two built-in ports after installing the license to activate the first two built-in ports.

```

user@host > show system license
License usage:

```

| Feature name           | Licenses used | Licenses installed | Licenses needed | Expiry    |
|------------------------|---------------|--------------------|-----------------|-----------|
| scale-subscriber       | 0             | 1000               | 0               | permanent |
| scale-l2tp             | 0             | 1000               | 0               | permanent |
| scale-mobile-ip        | 0             | 1000               | 0               | permanent |
| MX104-2x10Gig-port-0-1 | 0             | 1                  | 0               | permanent |
| MX104-2x10Gig-port-2-3 | 0             | 1                  | 0               | permanent |

```

Licenses installed:
License identifier: XXXXXXXXXX
License version: 2

```

```

Features:
MX104-2x10Gig-port-0-1 - MX104 2X10Gig Builtin Port(xe-2/0/0 & xe-2/0/1)
upgrade
 permanent

License identifier: XXXXXXXXXX
License version: 2
Features:
MX104-2x10Gig-port-2-3 - MX104 2X10Gig Builtin Port(xe-2/0/2 & xe-2/0/3)
upgrade
 permanent

```

### show system license installed (MX104 Routers)

In the following output, ports 2 and 3 are activated by installing the license to activate the next two built-in ports after installing the license to activate the first two built-in ports.

```

user@host > show system license installed
License identifier: XXXXXXXXXX
License version: 2
Features:
MX104-2x10Gig-port-0-1 - MX104 2X10Gig Builtin Port(xe-2/0/0 & xe-2/0/1)
upgrade
 permanent

License identifier: XXXXXXXXXX
License version: 2
Features:
MX104-2x10Gig-port-2-3 - MX104 2X10Gig Builtin Port(xe-2/0/2 & xe-2/0/3)
upgrade
 permanent

```

### show system license keys (MX104 Routers)

In the following output, ports 2 and 3 are activated by installing the license to activate the next two built-in ports after installing the license to activate the first two built-in ports.

```

user@host > show system license keys

XXXXXXXXXX xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx
 xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx
 xxxxxx xxxx

XXXXXXXXXX xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx
 xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx
 xxxxxx xxxx

```

### show system license usage (MX104 Routers)

In the following output, ports 2 and 3 are activated by installing the license to activate the next two built-in ports after installing the license to activate the first two built-in ports.

```

user@host > show system license usage

```

| Feature name     | Licenses used | Licenses installed | Expiry needed |           |
|------------------|---------------|--------------------|---------------|-----------|
| scale-subscriber | 0             | 1000               | 0             | permanent |
| scale-l2tp       | 0             | 1000               | 0             | permanent |

|                        |   |      |   |           |
|------------------------|---|------|---|-----------|
| scale-mobile-ip        | 0 | 1000 | 0 | permanent |
| MX104-2x10Gig-port-0-1 | 0 | 1    | 0 | permanent |
| MX104-2x10Gig-port-2-3 | 0 | 1    | 0 | permanent |

### show system license (MX104 Routers)

In the following output, ports 0,1,2, and 3 are activated by installing a single license key to activate all four built-in ports.

```
user@host > show system license
```

License usage:

| Feature name           | Licenses<br>used | Licenses<br>installed | Licenses<br>needed | Expiry    |
|------------------------|------------------|-----------------------|--------------------|-----------|
| scale-subscriber       | 0                | 1000                  | 0                  | permanent |
| scale-l2tp             | 0                | 1000                  | 0                  | permanent |
| scale-mobile-ip        | 0                | 1000                  | 0                  | permanent |
| MX104-2x10Gig-port-0-1 | 0                | 1                     | 0                  | permanent |
| MX104-2x10Gig-port-2-3 | 0                | 1                     | 0                  | permanent |

Licenses installed:

License identifier: XXXXXXXXXX

License version: 2

Features:

MX104-2x10Gig-port-0-1 - MX104 2X10Gig Builtin Port(xe-2/0/0 & xe-2/0/1)

upgrade

permanent

MX104-2x10Gig-port-2-3 - MX104 2X10Gig Builtin Port(xe-2/0/2 & xe-2/0/3)

upgrade

permanent

### show system license installed (MX104 Routers)

In the following output, ports 0,1,2, and 3 are activated by installing a single license key to activate all four built-in ports.

```
user@host > show system license installed
```

License identifier: XXXXXXXXXX

License version: 2

Features:

MX104-2x10Gig-port-0-1 - MX104 2X10Gig Builtin Port(xe-2/0/0 & xe-2/0/1)

upgrade

permanent

MX104-2x10Gig-port-2-3 - MX104 2X10Gig Builtin Port(xe-2/0/2 & xe-2/0/3)

upgrade

permanent

### show system license keys (MX104 Routers)

In the following output, ports 0,1,2, and 3 are activated by installing a single license key to activate all four built-in ports.

```
user@host > show system license keys
```

```
XXXXXXXX XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX
XXXXXXXX XXXXXX XXXXXX XXXXXX XXXXXX
XXXXXXXX XXXXXX X
```

**show system license usage (MX104 Routers)**

In the following output, ports 0,1,2, and 3 are activated by installing a single license key to activate all four built-in ports.

```
user@host > show system license usage
```

| Feature name           | Licenses used | Licenses installed | Licenses needed | Expiry    |
|------------------------|---------------|--------------------|-----------------|-----------|
| scale-subscriber       | 0             | 1000               | 0               | permanent |
| scale-l2tp             | 0             | 1000               | 0               | permanent |
| scale-mobile-ip        | 0             | 1000               | 0               | permanent |
| MX104-2x10Gig-port-0-1 | 0             | 1                  | 0               | permanent |
| MX104-2x10Gig-port-2-3 | 0             | 1                  | 0               | permanent |

**show system license (QFX Series)**

```
user@switch> show system license
```

License usage:

| Feature name | Licenses used | Licenses installed | Licenses needed | Expiry    |
|--------------|---------------|--------------------|-----------------|-----------|
| qfx-edge-fab | 1             | 1                  | 1               | permanent |

Licenses installed:  
 License identifier: JUNOS417988  
 License version: 1  
 Features:

|              |   |                                        |
|--------------|---|----------------------------------------|
| qfx-edge-fab | - | QFX3000 Series QF/Node feature license |
|              |   | permanent                              |



## CHAPTER 34

# NTP Operational Commands

- `show ntp associations`
- `show ntp status`

## show ntp associations

|                                 |                                                                                                                                                                                                                                                                    |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>show ntp associations</code><br><code>&lt;no-resolve&gt;</code>                                                                                                                                                                                              |
| <b>Release Information</b>      | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>              | Display Network Time Protocol (NTP) peers and their state.                                                                                                                                                                                                         |
| <b>Options</b>                  | <b>none</b> —Display NTP peers and their state.<br><br><b>no-resolve</b> —(Optional) Suppress symbolic addressing.                                                                                                                                                 |
| <b>Required Privilege Level</b> | view                                                                                                                                                                                                                                                               |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li><a href="#">show ntp status on page 570</a></li> </ul>                                                                                                                                                                      |
| <b>List of Sample Output</b>    | <a href="#">show ntp associations on page 569</a>                                                                                                                                                                                                                  |
| <b>Output Fields</b>            | <a href="#">Table 44 on page 568</a> describes the output fields for the <b>show ntp associations</b> command. Output fields are listed in the approximate order in which they appear.                                                                             |

**Table 44: show ntp associations Output Fields**

| Field Name    | Field Description                                                                                                               |
|---------------|---------------------------------------------------------------------------------------------------------------------------------|
| <b>remote</b> | Address or name of the remote NTP peer.                                                                                         |
| <b>refid</b>  | Reference identifier of the remote peer. If the reference identifier is not known, this field shows a value of <b>0.0.0.0</b> . |
| <b>st</b>     | Stratum of the remote peer.                                                                                                     |
| <b>t</b>      | Type of peer: <b>b</b> (broadcast), <b>l</b> (local), <b>m</b> (multicast), or <b>u</b> (unicast).                              |
| <b>when</b>   | When the last packet from the peer was received.                                                                                |
| <b>poll</b>   | Polling interval, in seconds.                                                                                                   |
| <b>reach</b>  | Reachability register, in octal.                                                                                                |
| <b>delay</b>  | Current estimated delay of the peer, in milliseconds.                                                                           |
| <b>offset</b> | Current estimated offset of the peer, in milliseconds.                                                                          |
| <b>disp</b>   | Current estimated dispersion of the peer, in milliseconds.                                                                      |



Table 44: show ntp associations Output Fields (*continued*)

| Field Name       | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>peer-name</i> | <p>Peer name and status of the peer in the clock selection process:</p> <ul style="list-style-type: none"> <li>• space—Discarded because of a high stratum value or failed sanity checks.</li> <li>• x—Designated "falseticker" by the intersection algorithm.</li> <li>• .—Culled from the end of the candidate list.</li> <li>• — —Discarded by the clustering algorithm.</li> <li>• +—Included in the final selection set.</li> <li>• #—Selected for synchronization, but the distance exceeds the maximum.</li> <li>• *—Selected for synchronization.</li> <li>• o—Selected for synchronization, but the packets-per-second (pps) signal is in use.</li> </ul> |

## Sample Output

### show ntp associations

```

user@host> show ntp associations
 remote refid st t when poll reach delay offset disp
=====
*wolfe-gw.junipe tick.ucla.edu 2 u 43 64 377 1.86 0.319 0.08

```

## show ntp status

|                                 |                                                                                                                                                                                                                                                                    |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>show ntp status</code><br><code>&lt;no-resolve&gt;</code>                                                                                                                                                                                                    |
| <b>Release Information</b>      | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>              | Display the values of internal variables returned by Network Time Protocol (NTP) peers.                                                                                                                                                                            |
| <b>Options</b>                  | <b>none</b> —Display the values of internal variables returned by NTP peers.<br><br><b>no-resolve</b> —(Optional) Suppress symbolic addressing.                                                                                                                    |
| <b>Required Privilege Level</b> | view                                                                                                                                                                                                                                                               |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li><a href="#">show ntp associations on page 568</a></li> </ul>                                                                                                                                                                |
| <b>List of Sample Output</b>    | <a href="#">show ntp status on page 571</a>                                                                                                                                                                                                                        |
| <b>Output Fields</b>            | <a href="#">Table 45 on page 570</a> describes the output fields for the <b>show ntp status</b> command. Output fields are listed in the approximate order in which they appear.                                                                                   |

**Table 45: show ntp status Output Fields**

| Field Name                  | Field Description                                                                                                                                                                                                                                         |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>status</b>               | System status word, a code representing the status items listed.                                                                                                                                                                                          |
| <b>leap_none</b>            | Indicates a normal synchronized state with no leap seconds imminent. Other options could be <b>leap_add_sec</b> , <b>leap_del_sec</b> , or <b>leap_alarm</b> , indicating a leap second will be added, deleted, or a leap second requirement is upcoming. |
| <b>sync_ntp</b>             | Indicates the current synchronization source, in this case, an NTP server. Other options include <b>sync_alarm</b> and <b>sync_unspec</b> , both indicating that the router has not been synched.                                                         |
| <b>x events</b>             | Indicates the number of events that have occurred since that last code change. An event is often the receipt of an NTP polling message.                                                                                                                   |
| <b>event_peer/strat_chg</b> | Describes the most recent event, in this case, the stratum of the peer server changed.                                                                                                                                                                    |
| <b>version</b>              | A detailed description of the version of NTP being used.                                                                                                                                                                                                  |
| <b>processor</b>            | Indicates the current hardware platform and version of the processor.                                                                                                                                                                                     |
| <b>system</b>               | Detailed description of the name and version of the operating system in use.                                                                                                                                                                              |
| <b>leap</b>                 | The number of leap seconds in use.                                                                                                                                                                                                                        |

Table 45: show ntp status Output Fields (*continued*)

| Field Name            | Field Description                                                                                                                                                                                                                         |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>stratum</b>        | The stratum of the peer server. Anything greater than 1 is a secondary reference source, and the number roughly represents the number of hops away from the stratum 1 server.. Stratum 1 is a primary reference, such as an atomic clock. |
| <b>precision</b>      | The precision of the peer clock, how precisely the frequency and time can be maintained with this particular timekeeping system.                                                                                                          |
| <b>rootdelay</b>      | The total roundtrip delay to the primary reference source, in seconds.                                                                                                                                                                    |
| <b>rootdispersion</b> | The maximum error relative to the primary reference source, in seconds.                                                                                                                                                                   |
| <b>peer</b>           | An identification number of the peer in use.                                                                                                                                                                                              |
| <b>refid</b>          | Reference identifier of the remote peer. If the reference identifier is not known, this field shows a value of 0.0.0.0.                                                                                                                   |
| <b>reftime</b>        | The local time, in timestamp format, when the local clock was last updated. If the local clock has never been synchronized, the value is zero.                                                                                            |
| <b>poll</b>           | The NTP broadcast message polling interval, in seconds.                                                                                                                                                                                   |
| <b>clock</b>          | The current time on the local router clock.                                                                                                                                                                                               |
| <b>state</b>          | The current mode of NTP operation, where 1 is symmetric active, 2 is symmetric passive, 3 is client, 4 is server, and 5 is broadcast.                                                                                                     |
| <b>offset</b>         | Current estimated offset of the peer, in milliseconds. Indicates the time difference between the reference clock and the local clock.                                                                                                     |
| <b>frequency</b>      | The frequency of the clock.                                                                                                                                                                                                               |
| <b>jitter</b>         | Indicates the magnitude of jitter, in milliseconds, between several time queries.                                                                                                                                                         |
| <b>stability</b>      | A measure of how well this clock can maintain a constant frequency.                                                                                                                                                                       |

## Sample Output

### show ntp status

```

user@host> show ntp status
assID=0 status=0544 leap_none, sync_local_proto, 4 events, event_peer/strat_chg,
version="ntpd 4.2.2p1@1.1570-o Tue May 19 13:57:55 UTC 2009 (1)",
processor="x86_64", system="Linux/2.6.18-164.el5", leap=00, stratum=4,
precision=-10, rootdelay=0.000, rootdispersion=11.974, peer=59475,
refid=LOCAL(0),
reftime=d495c32c.0e71eaf2 Mon, Jan 7 2013 13:57:00.056, poll=10,
clock=d495c32c.cebd43bd Mon, Jan 7 2013 13:57:00.807, state=4,
offset=0.000, frequency=0.000, jitter=0.977, noise=0.977,
stability=0.000, tai=0

```



## CHAPTER 35

# Routine Monitoring Operational Commands

- `show chassis alarms`
- `show chassis beacon`
- `show chassis environment`
- `show chassis environment fpc`
- `show chassis environment pem`
- `show chassis environment routing-engine`
- `show chassis fan`
- `show chassis firmware`
- `show chassis fpc`
- `show chassis hardware`
- `show chassis lcd`
- `show chassis led`
- `show chassis location`
- `show chassis mac-addresses`
- `show chassis pic`
- `show chassis routing-engine`
- `show chassis temperature-thresholds`
- `show chassis zones`
- `show host`
- `show log`
- `show subscribers`
- `show system alarms`
- `show system audit`
- `show system boot-messages`
- `show system buffers`
- `show system certificate`

- `show system commit`
- `show system configuration archival`
- `show system configuration rescue`
- `show system connections`
- `show system core-dumps`
- `show system directory-usage`
- `show system processes`
- `show system reboot`
- `show system resource-cleanup processes`
- `show system services service-deployment`
- `show system software`
- `show system statistics`
- `show system storage`
- `show system uptime`
- `show system users`
- `show system virtual-memory`
- `show version`
- `start shell`
- `test configuration`
- `traceroute`
- `traceroute monitor`

## show chassis alarms

|                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                                               | <a href="#">Syntax on page 575</a><br><a href="#">Syntax (TX Matrix Routers) on page 575</a><br><a href="#">Syntax (TX Matrix Plus Routers) on page 575</a><br><a href="#">Syntax (MX Series Routers) on page 575</a><br><a href="#">Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers) on page 575</a><br><a href="#">Syntax (QFX Series) on page 575</a><br><a href="#">Syntax (OCX Series) on page 575</a><br><a href="#">Syntax (PTX Series Packet Transport Routers) on page 575</a><br><a href="#">Syntax (ACX Series Universal Access Routers) on page 575</a> |
| <b>Syntax</b>                                                       | show chassis alarms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Syntax (TX Matrix Routers)</b>                                   | show chassis alarms<br><lcc <i>number</i>   scc>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Syntax (TX Matrix Plus Routers)</b>                              | show chassis alarms<br><lcc <i>number</i>   sfc <i>number</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Syntax (MX Series Routers)</b>                                   | show chassis alarms<br><all-members><br><local><br><member <i>member-id</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers)</b> | show chassis alarms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Syntax (QFX Series)</b>                                          | show chassis alarms<br><interconnect-device <i>name</i> ><br><node-device <i>name</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Syntax (OCX Series)</b>                                          | show chassis alarms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Syntax (PTX Series Packet Transport Routers)</b>                 | show chassis alarms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Syntax (ACX Series Universal Access Routers)</b>                 | show chassis alarms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Release Information</b>                                          | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br>sfc option for the TX Matrix Plus router introduced in Junos OS Release 9.6.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 12.1 for the PTX Series Packet Transport Routers.                                                                                                                                                                                                            |

Command introduced in Junos OS Release 12.2 for the ACX Series Universal Access Routers.

Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.

Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.

Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.

Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

**Description** Display information about the conditions that have been configured to trigger alarms.

**Options** **none**—Display information about the conditions that have been configured to trigger alarms.

**all-members**—(MX Series routers only) (Optional) Display information about alarm conditions for all the member routers of the Virtual Chassis configuration.

**interconnect-device *name***—(QFabric systems only) (Optional) Display information about alarm conditions for the Interconnect device.

**lcc *number***—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(MX Series routers only) (Optional) Display information about alarm conditions for the local Virtual Chassis member.

**member *member-id***—(MX Series routers only) (Optional) Display information about alarm conditions for the specified member of the Virtual Chassis configuration. Replace *member-id* variable with a value of 0 or 1.

**node-device *name***—(QFabric systems only) (Optional) Display information about alarm conditions for the Node device.

**scc**—(TX Matrix router only) (Optional) Show information about the TX Matrix router (switch-card chassis).

**sfc *number***—(TX Matrix Plus router only) (Optional) Show information about the respective TX Matrix Plus router, which is the switch-fabric chassis. Replace *number* variable with 0.



**Additional Information** You cannot clear the alarms for chassis components. Instead, you must remedy the cause of the alarm. When a chassis alarm LED is lit, it indicates that you are running the router or switch in a manner that we do not recommend.

On routers, you can manually silence external devices connected to the alarm relay contacts by pressing the alarm cutoff button, located on the craft interface. Silencing the device does not remove the alarm messages from the display (if present on the router) or extinguish the alarm LEDs. In addition, new alarms that occur after you silence an external device reactivate the external device.

In Junos OS release 11.1 and later, alarms for fans also show the slot number of the fans in the CLI output.

In Junos OS Release 11.2 and later, the command output on EX8200 switches shows the detailed location (**Plane/FPC/PFE**) for link errors in the chassis.

In Junos OS Release 10.2 and later, an alarm is shown on T Series routers for a standby sonic clock generator (SCG) that is offline or absent.

You may often see the following error messages, in which only the error code is shown and no other information is provided:

```
Apr 12 08:04:10 send: red alarm set, device FPC 6, reason FPC 6 Major Errors
- Error code: 257
Apr 12 08:04:19 send: red alarm set, device FPC 1, reason FPC 1 Major Errors
- Error code: 559
```

To understand what CM\_ALARM error codes mean, you need to first identify the structure of the CM Alarm codes. A CM\_ALARM code has the following structure:

| Bits: | Error type: |
|-------|-------------|
| 1-31  | Major (1)   |
| 0     | Minor (0)   |

According to the table above, the LSB (bit 0) identifies the **Error Type** (major alarm, if the bit is set and minor alarm if the bit is unset). The rest of the bits (1 - 31) identify the actual error code.

Take an example of the following error code, which was logged on a T1600:

```
Apr 12 08:04:10 send: red alarm set, device FPC 1, reason FPC 1 Major Errors
- Error code: 559
```

First, you have to convert 559 to binary; that is **100010111**. The LSB in this case is 1, which means that this is a major alarm. After removing the LSB, you are left with **10001011**, which is equal to 279 in decimal. This is the actual error code, its meaning can be found from the following list:

| Chip Type: L Chip                   | Code |
|-------------------------------------|------|
| CMALARM_LCHIP_LOUT_DESRD_PARITY_ERR | 1    |

|                                            |    |
|--------------------------------------------|----|
| CMALARM_LCHIP_LOUT_DESRD_UNINIT_ERR        | 2  |
| CMALARM_LCHIP_LOUT_DESRD_ILLEGALLINK_ERR   | 3  |
| CMALARM_LCHIP_LOUT_DESRD_ILLEGALSIZE_ERR   | 4  |
| CMALARM_LCHIP_LOUT_HDRF_TOERR_ERR          | 5  |
| CMALARM_LCHIP_LOUT_HDRF_PARITY_ERR         | 6  |
| CMALARM_LCHIP_LOUT_HDRF_UCERR_ERR          | 7  |
| CMALARM_LCHIP_LOUT_NLIF_CRCDROP_ERR        | 8  |
| CMALARM_LCHIP_LOUT_NLIF_CRCERR_ERR         | 9  |
| CMALARM_LCHIP_UCODE_TIMEOUT_ERR            | 10 |
| CMALARM_LCHIP_LIN_SRCTL_ACCT_DROP_ERR      | 11 |
| CMALARM_LCHIP_LIN_SRCTL_ACCT_ADDR_SIZE_ERR | 12 |
| CMALARM_LCHIP_SRAM_PARITY_ERR              | 13 |
| CMALARM_LCHIP_UCODE_OVFLW_ERR              | 14 |
| CMALARM_LCHIP_LOUT_HDRF_MTU_ERR            | 15 |

| Chip Type: M Chip               | Code |
|---------------------------------|------|
| CMALARM_MCHIP_ECC_UNCORRECT_ERR | 128  |

| Chip Type: N Chip                    | Code |
|--------------------------------------|------|
| CMALARM_NCHIP_RDDMA_JBUS_TIMEOUT_ERR | 256  |
| CMALARM_NCHIP_RDDMA_FIFO_OVFLW_ERR   | 257  |
| CMALARM_NCHIP_RDDMA_FIFO_UNFLW_ERR   | 258  |
| CMALARM_NCHIP_RDDMA_SIZE_ERR         | 259  |
| CMALARM_NCHIP_RDDMA_JBUS_CRC_ERR     | 260  |
| CMALARM_NCHIP_WRDMA_PKTR_ERR         | 261  |
| CMALARM_NCHIP_WRDMA_PKT_CRC_ERR      | 262  |
| CMALARM_NCHIP_WRDMA_JBUS_TIMEOUT_ERR | 263  |

|                                           |     |
|-------------------------------------------|-----|
| CMALARM_NCHIP_WRDMA_FIFO_OVFLW_ERR        | 264 |
| CMALARM_NCHIP_WRDMA_FIFO_UNFLW_ERR        | 265 |
| CMALARM_NCHIP_WRDMA_PKT_LEN_ERR           | 266 |
| CMALARM_NCHIP_WRDMA_JBUS_CRC_ERR          | 267 |
| CMALARM_NCHIP_PKTR_DMA_AGE_ERR            | 268 |
| CMALARM_NCHIP_PKTR_ICELLSIG_ERR           | 269 |
| CMALARM_NCHIP_PKTR_FTTL_ERR               | 270 |
| CMALARM_NCHIP_RODR_OFFSET_OVFLW_ERR       | 271 |
| CMALARM_NCHIP_PKTR_TMO_CELL_ERR           | 272 |
| CMALARM_NCHIP_PKTR_TMO_OUTRANGE_ERR       | 273 |
| CMALARM_NCHIP_PKTR_MD_REQUEST_Q_OVFLW_ERR | 274 |
| CMALARM_NCHIP_PKTR_DMA_BUFFER_OVFLW_ERR   | 275 |
| CMALARM_NCHIP_PKTR_GRT_OVFLW_ERR          | 276 |
| CMALARM_NCHIP_FRQ_ERR                     | 277 |
| CMALARM_NCHIP_RODR_IN_Q_OVFLW_ERR         | 278 |
| CMALARM_NCHIP_DBUF_CRC_ERR                | 279 |

| Chip Type: R Chip             | Code |
|-------------------------------|------|
| CMALARM_RCHIP_SRAM_PARITY_ERR | 512  |

| Chip Type: R Chip                | Code |
|----------------------------------|------|
| CMALARM_ICHIP_WO_DESRD_ID_ERR    | 601  |
| CMALARM_ICHIP_WO_DESRD_DATA_ERR  | 602  |
| CMALARM_ICHIP_WO_DESRD_OFLOW_ERR | 603  |
| CMALARM_ICHIP_WO_HDRF_UCERR_ERR  | 604  |
| CMALARM_ICHIP_WO_HDRF_MTUERR_ERR | 605  |
| CMALARM_ICHIP_WO_HDRF_PARITY_ERR | 606  |

|                                   |     |
|-----------------------------------|-----|
| CMALARM_ICHIP_WO_HDRF_TOERR_ERR   | 607 |
| CMALARM_ICHIP_WO_IP_CRC_ERR       | 608 |
| CMALARM_ICHIP_WO_IP_INTER_ERR     | 609 |
| CMALARM_ICHIP_WI_WAN_TIMEOUT_ERR  | 625 |
| CMALARM_ICHIP_WI_FAB_TIMEOUT_ERR  | 626 |
| CMALARM_ICHIP_RLDRAM_BIST_ERR     | 630 |
| CMALARM_ICHIP_SDRAM_BIST_ERR      | 631 |
| CMALARM_ICHIP_RLDRAM_PARITY_ERR   | 632 |
| CMALARM_ICHIP_SDRAM_UNCORRECT_ERR | 633 |
| CMALARM_ICHIP_SDRAM_CORRECT_ERR   | 634 |
| CMALARM_ICHIP_FUSE_DONE_ERR       | 635 |

According to the table above, the **279** error code corresponds to **CMALARM\_NCHIP\_DBUF\_CRC\_ERR**; this means that new CRC errors were seen on the NCHIP of this particular FPC, which is FPC as per the logs.

If you do not want to convert decimal to binary and vice versa, you may use the following shortcut:

For major alarms, the **Actual Error Code = (Error Code - 1)/2**, where **Error Code** is the code that you get in the log message. For example, if you get the following log:

```
Apr 12 08:04:10 send: red alarm set, device FPC 6, reason FPC 6 Major
Errors - Error code: 257
```

Actual Error Code =  $(257-1)/2 = 128$ . Similarly, for minor alarms, Actual Error Code =  $(\text{Error Code})/2$

**Required Privilege Level**

view

**Related Documentation**

- *Configuring an RMON Alarm Entry and Its Attributes*
- *Chassis Conditions That Trigger Alarms*

**List of Sample Output**

[show chassis alarms \(Alarms Active\) on page 582](#)  
[show chassis alarms \(No Alarms Active\) on page 582](#)  
[show chassis alarms \(Fan Tray\) on page 582](#)  
[show chassis alarms \(MX104 Router\) on page 582](#)  
[show chassis alarms \(MX2010 Router\) on page 582](#)

[show chassis alarms \(MX2020 Router\) on page 582](#)  
[show chassis alarms \(MX960, MX480, and MX240 Routers showing Major CB Failure\) on page 582](#)  
[show chassis alarms \(T4000 Router\) on page 583](#)  
[show chassis alarms \(Unreachable Destinations Present on a T Series Router\) on page 583](#)  
[show chassis alarms \(FPC Offline Due to Unreachable Destinations on a T Series Router\) on page 583](#)  
[show chassis alarms \(SCG Absent on a T Series Router\) on page 584](#)  
[show chassis alarms \(Alarms Active on a TX Matrix Router\) on page 584](#)  
[show chassis alarms \(TX Matrix Plus router with 3D SIBs\) on page 584](#)  
[show chassis alarms \(Alarms on a T4000 Router After the enhanced-mode Statement is Enabled\) on page 586](#)  
[show chassis alarms \(Backup Routing Engine\) on page 586](#)  
[show chassis alarms \(EX Series Switch\) on page 586](#)  
[show chassis alarms \(Alarms Active on the QFX Series and OCX Series Switches\) on page 587](#)  
[show chassis alarms node-device \(Alarms Active on the QFabric System\) on page 587](#)  
[show chassis alarms \(Alarms Active on the QFabric System\) on page 587](#)  
[show chassis alarms \(Alarms Active on an EX8200 Switch\) on page 587](#)  
[show chassis alarms \(Alarms Active on a PTX5000 Packet Transport Router\) on page 588](#)  
[show chassis alarms \(Mix of PDUs Alarm on a PTX5000 Packet Transport Router with FPC2-PTX-P1A\) on page 588](#)  
[show chassis alarms \(PDU Converter Failed Alarm on a PTX5000 Packet Transport Router with FPC2-PTX-P1A\) on page 588](#)  
[show chassis alarms \(No Power for System Alarm on a PTX5000 Packet Transport Router with FPC2-PTX-P1A\) on page 588](#)  
[show chassis alarms \(Alarms Active on an ACX2000 Universal Access Router\) on page 589](#)  
[show chassis alarms \(Active Alarm to Indicate Status of the Bad SCB Clock on MX Series\) on page 589](#)

**Output Fields** [Table 46 on page 581](#) lists the output fields for the **show chassis alarms** command. Output fields are listed in the approximate order in which they appear.

**Table 46: show chassis alarms Output Fields**

| Field Name  | Field Description                                             |
|-------------|---------------------------------------------------------------|
| Alarm time  | Date and time the alarm was first recorded.                   |
| Class       | Severity class for this alarm: <b>Minor</b> or <b>Major</b> . |
| Description | Information about the alarm.                                  |

## Sample Output

### show chassis alarms (Alarms Active)

```
user@host> show chassis alarms
3 alarms are currently active
Alarm time Class Description
2000-02-07 10:12:22 UTC Major fxp0: ethernet link down
2000-02-07 10:11:54 UTC Minor YELLOW ALARM - PEM 1 Removed
2000-02-07 10:11:03 UTC Minor YELLOW ALARM - Lower Fan Tray Removed
```

### show chassis alarms (No Alarms Active)

```
user@host> show chassis alarms
No alarms are currently active
```

### show chassis alarms (Fan Tray)

```
user@host> show chassis alarms
4 alarms currently active
Alarm time Class Description
2010-11-11 20:27:38 UTC Major Side Fan Tray 7 Failure
2010-11-11 20:27:13 UTC Minor Side Fan Tray 7 Overspeed
2010-11-11 20:27:13 UTC Major Side Fan Tray 5 Failure
2010-11-11 20:27:13 UTC Major Side Fan Tray 0 Failure
```

### show chassis alarms (MX104 Router)

```
user@host >show chassis alarms
1 alarms currently active
Alarm time Class Description
2013-06-05 14:43:31 IST Minor Backup RE Active
```

### show chassis alarms (MX2010 Router)

```
user@host> show chassis alarms
7 alarms currently active
Alarm time Class Description
2012-08-07 00:46:06 PDT Major Fan Tray 2 Failure
2012-08-06 18:24:36 PDT Minor Redundant feed missing for PSM 6
2012-08-06 07:41:04 PDT Minor Redundant feed missing for PSM 8
2012-08-04 02:42:06 PDT Minor Redundant feed missing for PSM 5
2012-08-03 21:14:24 PDT Minor Loss of communication with Backup RE
2012-08-03 12:26:03 PDT Minor Redundant feed missing for PSM 4
2012-08-03 10:40:18 PDT Minor Redundant feed missing for PSM 7
```

### show chassis alarms (MX2020 Router)

```
user@host> show chassis alarms
1 alarms currently active
Alarm time Class Description
2012-10-03 12:14:59 PDT Minor Plane 0 not online
```

### show chassis alarms (MX960, MX480, and MX240 Routers showing Major CB Failure)

A major CB 0 failure alarm occurs in the event of a bad CB (unknown or mismatched CBs do not trigger this alarm in Junos Release OS 12.3R9 and later). Following GRES or recovery, if the hardware issue persists, the traffic moves to the good CB and continues. If the alarm was triggered by something transient like a power zone budget on GRES, bringing the CB back online can clear the alarm. Otherwise, replace the bad CB. Note

that fabric link speed is not impacted by an offline SCB. The alarm might be raised on CB0, CB1, and CB2.

```
user@host> show chassis alarms
6 alarms currently active
Alarm time Class Description
2014-10-31 16:49:41 EDT Major PEM 3 Not OK
2014-10-31 16:49:41 EDT Major PEM 2 Not OK
2014-10-31 16:49:31 EDT Major CB 0 Failure
2014-10-31 16:49:31 EDT Minor CB 0 Fabric Chip 0 Not Online
2014-10-31 16:49:31 EDT Minor CB 0 Fabric Chip 1 Not Online
2014-10-31 16:49:31 EDT Minor Backup RE Active
```

#### show chassis alarms (T4000 Router)

```
user@host> show chassis alarms
9 alarms currently active
Alarm time Class Description
2007-06-02 01:41:10 UTC Minor RE 0 Not Supported
2007-06-02 01:41:10 UTC Minor CB 0 Not Supported
2007-06-02 01:41:10 UTC Minor Mixed Master and Backup RE types
2007-05-30 19:37:33 UTC Major SPMB 1 not online
2007-05-30 19:37:29 UTC Minor Front Bottom Fan Tray Absent
2007-05-30 19:37:13 UTC Major PEM 1 Input Failure
2007-05-30 19:37:13 UTC Major PEM 0 Not OK
2007-05-30 19:37:03 UTC Major PEM 0 Improper for Platform
2007-05-30 19:37:03 UTC Minor Backup RE Active
```

#### show chassis alarms (Unreachable Destinations Present on a T Series Router)

```
user@host> show chassis alarms
10 alarms currently active
Alarm time Class Description
2011-08-30 18:43:53 PDT Major FPC 7 has unreachable destinations
2011-08-30 18:43:53 PDT Major FPC 5 has unreachable destinations
2011-08-30 18:43:52 PDT Major FPC 3 has unreachable destinations
2011-08-30 18:43:52 PDT Major FPC 2 has unreachable destinations
2011-08-30 18:43:52 PDT Minor SIB 0 Not Online
2011-08-30 18:43:33 PDT Minor SIB 4 Not Online
2011-08-30 18:43:28 PDT Minor SIB 3 Not Online
2011-08-30 18:43:05 PDT Minor SIB 2 Not Online
2011-08-30 18:43:28 PDT Minor SIB 1 Not Online
2011-08-30 18:43:05 PDT Major PEM 1 Not Ok
```

#### show chassis alarms (FPC Offline Due to Unreachable Destinations on a T Series Router)

```
user@host> show chassis alarms
10 alarms currently active
Alarm time Class Description
2011-08-30 18:43:53 PDT Major FPC 7 offline due to unreachable destinations
2011-08-30 18:43:53 PDT Major FPC 5 offline due to unreachable destinations
2011-08-30 18:43:52 PDT Major FPC 3 offline due to unreachable destinations
2011-08-30 18:43:52 PDT Major FPC 2 offline due to unreachable destinations
2011-08-30 18:43:52 PDT Minor SIB 0 Not Online
2011-08-30 18:43:33 PDT Minor SIB 4 Not Online
2011-08-30 18:43:28 PDT Minor SIB 3 Not Online
2011-08-30 18:43:05 PDT Minor SIB 2 Not Online
2011-08-30 18:43:28 PDT Minor SIB 1 Not Online
2011-08-30 18:43:05 PDT Major PEM 1 Not Ok
```

**show chassis alarms (SCG Absent on a T Series Router)**

```

user@host> show chassis alarms
4 alarms currently active
Alarm time Class Description
2011-01-23 21:42:46 PST Major SCG 0 NO EXT CLK MEAS-BKUP SCG ABS

```

**show chassis alarms (Alarms Active on a TX Matrix Router)**

```

user@host> show chassis alarms
scc-re0:

8 alarms currently active
Alarm time Class Description
2004-08-05 18:43:53 PDT Minor LCC 0 Minor Errors
2004-08-05 18:43:53 PDT Minor SIB 3 Not Online
2004-08-05 18:43:52 PDT Major SIB 2 Absent
2004-08-05 18:43:52 PDT Major SIB 1 Absent
2004-08-05 18:43:52 PDT Major SIB 0 Absent
2004-08-05 18:43:33 PDT Major LCC 2 Major Errors
2004-08-05 18:43:28 PDT Major LCC 0 Major Errors
2004-08-05 18:43:05 PDT Minor LCC 2 Minor Errors
lcc0-re0:

5 alarms currently active
Alarm time Class Description
2004-08-05 18:43:53 PDT Minor SIB 3 Not Online
2004-08-05 18:43:49 PDT Major SIB 2 Absent
2004-08-05 18:43:49 PDT Major SIB 1 Absent
2004-08-05 18:43:49 PDT Major SIB 0 Absent
2004-08-05 18:43:28 PDT Major PEM 0 Not OK
lcc2-re0:

5 alarms currently active
Alarm time Class Description
2004-08-05 18:43:35 PDT Minor SIB 3 Not Online
2004-08-05 18:43:33 PDT Major SIB 2 Absent
2004-08-05 18:43:33 PDT Major SIB 1 Absent
2004-08-05 18:43:33 PDT Major SIB 0 Absent
2004-08-05 18:43:05 PDT Minor PEM 1 Absent

```

**show chassis alarms (TX Matrix Plus router with 3D SIBs)**

```

user@host> show chassis alarms
sfc0-re0:

Alarm time Class Description
2014-04-08 14:35:13 IST Minor FPM 0 SFC Config Size Changed
2014-04-08 14:32:58 IST Major Fan Tray Failure
2014-04-08 14:31:53 IST Major SIB F13 6 Fault
2014-04-08 14:31:43 IST Major SIB F13 11 Fault
2014-04-08 14:31:08 IST Minor Check SIB F13 12 CXP 14 Fbr Cbl
2014-04-08 14:31:08 IST Minor Check SIB F13 12 CXP 8 Fbr Cbl
2014-04-08 14:31:08 IST Minor Check SIB F13 12 CXP 3 Fbr Cbl
2014-04-08 14:31:08 IST Major SIB F13 12 CXP 15 fault
2014-04-08 14:31:08 IST Minor SIB F13 12 CXP 14 LOL
2014-04-08 14:31:08 IST Minor Check SIB F13 12 CXP 14
2014-04-08 14:31:08 IST Major SIB F13 12 CXP 10 fault
2014-04-08 14:31:08 IST Minor SIB F13 12 CXP 8 LOL
2014-04-08 14:31:08 IST Minor Check SIB F13 12 CXP 8

```



```

2014-04-08 14:31:08 IST Major SIB F13 12 CXP 7 fault
2014-04-08 14:31:08 IST Major SIB F13 12 CXP 4 fault
2014-04-08 14:31:08 IST Minor SIB F13 12 CXP 3 LOL
2014-04-08 14:31:08 IST Minor Check SIB F13 12 CXP 3
2014-04-08 14:31:08 IST Minor Check SIB F13 6 CXP 14 Fbr Cbl
2014-04-08 14:31:08 IST Minor Check SIB F13 6 CXP 12 Fbr Cbl
2014-04-08 14:31:08 IST Minor Check SIB F13 6 CXP 8 Fbr Cbl
2014-04-08 14:31:08 IST Minor Check SIB F13 6 CXP 6 Fbr Cbl
2014-04-08 14:31:08 IST Minor Check SIB F13 6 CXP 4 Fbr Cbl
2014-04-08 14:31:08 IST Minor Check SIB F13 6 CXP 2 Fbr Cbl
2014-04-08 14:31:08 IST Minor Check SIB F13 6 CXP 0 Fbr Cbl
2014-04-08 14:31:08 IST Minor SIB F13 6 CXP 14 LOL
2014-04-08 14:31:08 IST Minor Check SIB F13 6 CXP 14
2014-04-08 14:31:08 IST Minor SIB F13 6 CXP 12 LOL
2014-04-08 14:31:08 IST Minor Check SIB F13 6 CXP 12
2014-04-08 14:31:08 IST Major SIB F13 6 CXP 10 fault
2014-04-08 14:31:08 IST Minor SIB F13 6 CXP 8 LOL
2014-04-08 14:31:08 IST Minor Check SIB F13 6 CXP 8
2014-04-08 14:31:08 IST Minor SIB F13 6 CXP 6 LOL
2014-04-08 14:31:08 IST Minor Check SIB F13 6 CXP 6
2014-04-08 14:31:08 IST Minor SIB F13 6 CXP 4 LOL
2014-04-08 14:31:08 IST Minor Check SIB F13 6 CXP 4
2014-04-08 14:31:08 IST Minor SIB F13 6 CXP 2 LOL
2014-04-08 14:31:08 IST Minor Check SIB F13 6 CXP 2
2014-04-08 14:31:08 IST Minor SIB F13 6 CXP 0 LOL
2014-04-08 14:31:08 IST Minor Check SIB F13 6 CXP 0
2014-04-08 14:31:08 IST Minor SIB F13 12 CXP 14 XC HSL Link Error
2014-04-08 14:29:27 IST Minor LCC 0 Minor Errors
2014-04-08 14:28:37 IST Major LCC 0 Major Errors
2014-04-08 14:28:37 IST Major LCC 2 Major Errors
2014-04-08 14:28:37 IST Minor LCC 2 Minor Errors
2014-04-08 14:28:24 IST Major SIB F2S 4/6 Absent
2014-04-08 14:28:24 IST Major SIB F2S 4/4 Absent
2014-04-08 14:28:24 IST Major SIB F2S 4/2 Absent
2014-04-08 14:28:24 IST Major SIB F2S 4/0 Absent
2014-04-08 14:28:24 IST Major SIB F2S 3/6 Absent
2014-04-08 14:28:24 IST Major SIB F2S 3/4 Absent
2014-04-08 14:28:24 IST Major SIB F2S 3/2 Absent
2014-04-08 14:28:24 IST Major SIB F2S 3/0 Absent
2014-04-08 14:28:24 IST Major SIB F13 9 Absent
2014-04-08 14:28:24 IST Major SIB F13 8 Absent
2014-04-08 14:28:24 IST Major SIB F13 7 Absent
2014-04-08 14:28:24 IST Major SIB F13 4 Absent
2014-04-08 14:28:24 IST Major SIB F13 1 Absent
2014-04-08 14:28:22 IST Major PEM 0 Input Failure
2014-04-08 14:28:22 IST Major PEM 0 Not OK

```

lcc0-re0:

-----  
12 alarms currently active

| Alarm time              | Class | Description                                 |
|-------------------------|-------|---------------------------------------------|
| 2014-04-08 14:36:08 IST | Minor | CB 1 M/S Switch Changed                     |
| 2014-04-08 14:36:08 IST | Minor | CB 1 CHASSIS ID Changed                     |
| 2014-04-08 14:35:43 IST | Minor | CB 0 M/S Switch Changed                     |
| 2014-04-08 14:35:43 IST | Minor | CB 0 CHASSIS ID Changed                     |
| 2014-04-08 14:29:30 IST | Minor | SIB 4 Not Online                            |
| 2014-04-08 14:29:30 IST | Minor | SIB 3 Not Online                            |
| 2014-04-08 14:29:30 IST | Minor | SIB 2 Not Online                            |
| 2014-04-08 14:29:24 IST | Major | Rear Fan Tray Failure                       |
| 2014-04-08 14:29:24 IST | Major | Front Bottom Fan Tray Improper for Platform |
| 2014-04-08 14:29:24 IST | Major | Front Top Fan Tray Improper for Platform    |

```
2014-04-08 14:28:37 IST Major SIB 4 Absent
2014-04-08 14:28:37 IST Major SIB 3 Absent
```

```
lcc2-re0:
```

```

12 alarms currently active
Alarm time Class Description
2014-04-08 14:36:02 IST Minor CB 1 M/S Switch Changed
2014-04-08 14:36:02 IST Minor CB 1 CHASSIS ID Changed
2014-04-08 14:35:42 IST Minor CB 0 M/S Switch Changed
2014-04-08 14:34:42 IST Minor CB 0 CHASSIS ID Changed
2014-04-08 14:29:29 IST Minor SIB 0 CXP 7 Unsupported Optics
2014-04-08 14:29:27 IST Major Front Bottom Fan Tray Improper for Platform
2014-04-08 14:29:27 IST Major Front Top Fan Tray Improper for Platform
2014-04-08 14:29:25 IST Minor SIB 4 Not Online
2014-04-08 14:29:25 IST Minor SIB 3 Not Online
2014-04-08 14:28:47 IST Major PEM 0 Not OK
2014-04-08 14:28:36 IST Major SIB 2 Absent
2014-04-08 14:28:36 IST Minor Host 0 Boot from alternate media
```

```
lcc6-re0:
```

```

2 alarms currently active
Alarm time Class Description
2013-11-06 04:03:56 PST Minor SIB 1 CXP 0 XC HSL Link Error
2013-11-06 03:49:32 PST Major PEM 1 Not OK
```

### show chassis alarms (Alarms on a T4000 Router After the enhanced-mode Statement is Enabled)

To enable improved virtual private LAN service (VPLS) MAC address learning on T4000 routers, you must include the **enhanced-mode** statement at the **[edit chassis network-services]** hierarchy level and reboot the router. When router reboots, only the T4000 Type 5 FPCs are required to be present on the router. If there are any other FPCs (apart from T4000 Type 5 FPCs) on the T4000 router, such FPCs become offline, and FPC misconfiguration alarms are generated. The **show chassis alarm** command output displays FPC misconfiguration (**FPC *fpc-slot* misconfig**) as the reason for the generation of the alarms.

```
user@host> show chassis alarms
2 alarms currently active
Alarm time Class Description
2011-10-22 10:10:47 PDT Major FPC 1 misconfig
2011-10-22 10:10:46 PDT Major FPC 0 misconfig
```

### show chassis alarms (Backup Routing Engine)

```
user@host> show chassis alarms
2 alarms are currently active
Alarm time Class Description
2005-04-07 10:12:22 PDT Minor Host 1 Boot from alternate media
2005-04-07 10:11:54 PDT Major Host 1 compact-flash missing in Boot List
```

### show chassis alarms (EX Series Switch)

```
user@switch> show chassis alarms
4 alarms currently active
Alarm time Class Description
2014-03-12 15:36:09 UTC Minor Require a Fan Tray upgrade
2014-03-12 15:00:02 UTC Major PEM 0 Input Failure
```

```

2014-03-12 15:00:02 UTC Major PEM 0 Not OK
2014-03-12 14:59:51 UTC Minor Host 1 Boot from alternate media

```

#### show chassis alarms (Alarms Active on the QFX Series and OCX Series Switches)

```

user@switch> show chassis alarms
1 alarms currently active
Alarm time Class Description
2012-03-05 2:10:24 UTC Major FPC 0 PEM 0 Airflow not matching Chassis Airflow

```

#### show chassis alarms node-device (Alarms Active on the QFabric System)

```

user@switch> show chassis alarms node-device ED3691
node-device ED3694
3 alarms currently active
Alarm time Class Description
2011-08-24 16:04:15 UTC Major ED3694:fte-0/1/2: Link down
2011-08-24 16:04:14 UTC Major ED3694:fte-0/1/0: Link down
2011-08-24 14:21:14 UTC Major ED3694 PEM 0 is not supported/powered

```

#### show chassis alarms (Alarms Active on the QFabric System)

```

user@switch> show chassis alarms
IC-A0001:

1 alarms currently active
Alarm time Class Description
2011-08-24 16:04:15 UTC Minor Backup RE Active

ED3694:

3 alarms currently active
Alarm time Class Description
2011-08-24 16:04:15 UTC Major ED3694:fte-0/1/2: Link down
2011-08-24 16:04:14 UTC Major ED3694:fte-0/1/0: Link down
2011-08-24 14:21:14 UTC Major ED3694 PEM 0 is not supported/powered

SNG-0:

NW-NG-0:

1 alarms currently active
Alarm time Class Description
2011-08-24 15:49:27 UTC Major ED3691 PEM 0 is not supported/powered

```

#### show chassis alarms (Alarms Active on an EX8200 Switch)

```

user@switch> show chassis alarms

6 alarms currently active
Alarm time Class Description
2010-12-02 19:15:22 UTC Major Fan Tray Failure
2010-12-02 19:15:22 UTC Major Fan Tray Failure
2010-12-02 19:15:14 UTC Minor Check CB 0 Fabric Chip 1 on Plane/FPC/PFE: 1/5/0,
1/5/1, 1/5/2, 1/5/3, 1/7/0, 1/7/1, 1/7/2, 1/7/3, 2/5/0, 2/5/1, ...
2010-12-02 19:15:14 UTC Minor Check CB 0 Fabric Chip 0 on Plane/FPC/PFE: 1/5/0,
1/5/1, 1/5/2, 1/5/3, 1/7/0, 1/7/1, 1/7/2, 1/7/3, 2/5/0, 2/5/1, ...
2010-12-02 19:14:18 UTC Major PSU 1 Output Failure
2010-12-02 19:14:18 UTC Minor Loss of communication with Backup RE

```

**show chassis alarms (Alarms Active on a PTX5000 Packet Transport Router)**

```
user@host> show chassis alarms
```

```
23 alarms currently active
```

| Alarm time              | Class | Description                         |
|-------------------------|-------|-------------------------------------|
| 2011-07-12 16:22:05 PDT | Minor | No Redundant Power for Rear Chassis |
| 2011-07-12 16:22:05 PDT | Major | PDU 0 PSM 1 Not OK                  |
| 2011-07-12 16:21:57 PDT | Minor | No Redundant Power for Fan 0-2      |
| 2011-07-12 16:21:57 PDT | Major | PDU 0 PSM 0 Not OK                  |
| 2011-07-12 15:56:06 PDT | Major | PDU 1 PSM 2 Not OK                  |
| 2011-07-12 15:56:06 PDT | Minor | No Redundant Power for FPC 0-7      |
| 2011-07-12 15:56:06 PDT | Major | PDU 0 PSM 3 Not OK                  |
| 2011-07-12 15:28:20 PDT | Major | PDU 0 PSM 2 Not OK                  |
| 2011-07-12 15:19:14 PDT | Minor | Backup RE Active                    |

**show chassis alarms (Mix of PDUs Alarm on a PTX5000 Packet Transport Router with FPC2-PTX-P1A)**

All PDUs installed on a PTX5000 router must be of the same type. The **Mix of PDUs or Power Manager Non Operational** alarm is raised when different types of PDUs are installed on a PTX5000 router.

```
user@host> show chassis alarms
```

```
15 alarms currently active
```

| Alarm time                     | Class        | Description        |
|--------------------------------|--------------|--------------------|
| 2013-03-19 23:03:53 PDT        | Minor        | No Redundant Power |
| <b>2013-03-19 23:03:48 PDT</b> | <b>Minor</b> | <b>Mix of PDUs</b> |
| 2013-03-19 23:03:47 PDT        | Minor        | PDU 1 PSM 3 Absent |
| 2013-03-19 23:03:47 PDT        | Minor        | PDU 1 PSM 2 Absent |
| 2013-03-19 23:03:47 PDT        | Minor        | PDU 1 PSM 1 Absent |
| 2013-03-19 23:03:47 PDT        | Minor        | PDU 1 PSM 0 Absent |
| 2013-03-19 23:03:46 PDT        | Major        | No CG Online       |

**show chassis alarms (PDU Converter Failed Alarm on a PTX5000 Packet Transport Router with FPC2-PTX-P1A)**

The **PDU Converter Failed** alarm is raised when one or more 36 V booster converter of a DC PDU fails. If two or more 36 V booster converter fails, fan trays fail and the router might get over heated. Therefore, when this alarm is raised, check the PDU and replace it, if required.

```
user@host> show chassis alarms
```

```
11 alarms currently active
```

| Alarm time                     | Class        | Description                   |
|--------------------------------|--------------|-------------------------------|
| 2013-12-11 22:14:13 PST        | Minor        | No Redundant Power for System |
| 2013-12-11 22:14:10 PST        | Major        | PDU 0 PSM 7 Not OK            |
| 2013-12-11 22:14:10 PST        | Major        | PDU 0 PSM 6 Not OK            |
| 2013-12-11 22:14:10 PST        | Major        | PDU 0 PSM 5 Not OK            |
| 2013-12-11 22:14:10 PST        | Major        | PDU 0 PSM 4 Not OK            |
| 2013-12-11 22:14:10 PST        | Major        | PDU 0 PSM 3 Not OK            |
| 2013-12-11 22:14:10 PST        | Major        | PDU 0 PSM 2 Not OK            |
| 2013-12-11 22:14:10 PST        | Major        | PDU 0 PSM 1 Not OK            |
| 2013-12-11 22:14:10 PST        | Major        | PDU 0 PSM 0 Not OK            |
| 2013-12-11 22:14:10 PST        | Major        | PDU 0 Not OK                  |
| <b>2013-12-11 22:14:01 PST</b> | <b>Major</b> | <b>PDU 0 Converter Failed</b> |

**show chassis alarms (No Power for System Alarm on a PTX5000 Packet Transport Router with FPC2-PTX-P1A)**

```
user@host> show chassis alarms
```

```
8 alarms currently active
```

| Alarm time | Class | Description |
|------------|-------|-------------|
|------------|-------|-------------|

```

2013-11-19 01:58:41 PST Major No Power for System
2013-11-19 01:58:37 PST Major PDU 0 PSM 1 Not OK
2013-11-19 01:56:46 PST Major PDU 0 PSM 2 Not OK
2013-11-19 01:54:26 PST Major PDU 0 PSM 3 Not OK
2013-11-19 01:53:30 PST Major PDU 1 PSM 3 Not OK
2013-11-19 01:53:29 PST Major PDU 1 PSM 2 Not OK
2013-11-19 01:53:29 PST Major PDU 1 PSM 1 Not OK
2013-11-19 01:53:29 PST Major PDU 1 PSM 0 Not OK

```

#### show chassis alarms (Alarms Active on an ACX2000 Universal Access Router)

```

user@host> show chassis alarms
7 alarms currently active
Alarm time Class Description
2012-05-22 11:19:09 UTC Major xe-0/3/1: Link down
2012-05-22 11:19:09 UTC Major xe-0/3/0: Link down
2012-05-22 11:19:09 UTC Major ge-0/1/7: Link down
2012-05-22 11:19:09 UTC Major ge-0/1/6: Link down
2012-05-22 11:19:09 UTC Major ge-0/1/3: Link down
2012-05-22 11:19:09 UTC Major ge-0/1/2: Link down
2012-05-22 11:19:09 UTC Major ge-0/1/1: Link down

```

#### show chassis alarms (Active Alarm to Indicate Status of the Bad SCB Clock on MX Series)

```

user@host> show chassis alarms
1 alarm currently active
Alarm time Class Description
2013-08-06 07:48:35 PDT Major CB 0 19.44 MHz clock failure

```

## show chassis beacon

|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>show chassis beacon (QFX Series)</b> | <pre>show chassis beacon &lt;cb slot-number&gt; &lt;fpc slot-number&gt; &lt;interconnect-device name (cb slot-number   fpc slot-number)&gt; &lt;node-device name&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Release Information</b>              | <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Description</b>                      | Display the beacon LED status on a QFX3500, QFX3600, QFX5100, EX4600, OCX Series standalone switch, Node device, and an Interconnect device. You can also display the beacon LED status of the Control Boards and Flexible PIC Concentrators on the Interconnect device.                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Options</b>                          | <p><b>cb slot-number</b>— (QFabric systems only) (Optional) Display the status of the beacon LEDs for the Control Board on the Interconnect device.</p> <p><b>fpc slot-number</b>— (QFabric systems only) (Optional) Display the status of the beacon LEDs for the Flexible PIC Concentrator (FPC) on the Interconnect device. (Optional) Display the status of the beacon LEDs for the Flexible PIC Concentrator on the standalone switch.</p> <p><b>interconnect-device name</b>— (QFabric systems only) (Optional) Display the status of the beacon LEDs for the Interconnect device.</p> <p><b>node-device name</b>— (QFabric systems only) (Optional) Display the status of the beacon LEDs for the Node device.</p> |
| <b>Required Privilege Level</b>         | view                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Related Documentation</b>            | <ul style="list-style-type: none"> <li><a href="#">request chassis beacon on page 451</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>List of Sample Output</b>            | <p><a href="#">show chassis beacon (QFX Series and OCX Series) on page 591</a></p> <p><a href="#">show chassis beacon interconnect-device (QFabric System) on page 591</a></p> <p><a href="#">show chassis beacon interconnect-device fpc (QFabric System) on page 591</a></p> <p><a href="#">show chassis beacon node-device (QFabric System) on page 591</a></p> <p><a href="#">show chassis beacon node-device fpc (QFabric System) on page 591</a></p>                                                                                                                                                                                                                                                                |
| <b>Output Fields</b>                    | Table 47 on page 590 lists the output fields for the <b>show chassis beacon</b> command. Output fields are listed in the approximate order in which they appear.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

Table 47: show chassis led Output Fields

| Field Name | Field Description                                                                                                       |
|------------|-------------------------------------------------------------------------------------------------------------------------|
| Slot       | FPC slot number of the device whose content is being displayed. On QFX3500 standalone switches, the number is always 0. |

Table 47: show chassis led Output Fields (*continued*)

| Field Name   | Field Description                                                                                                                                    |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Beacon State | Status of the beacon state: <ul style="list-style-type: none"> <li>• Off—The beacon is <b>OFF</b>.</li> <li>• On—The beacon is <b>ON</b>.</li> </ul> |

## Sample Output

### show chassis beacon (QFX Series and OCX Series)

```
user@switch> show chassis beacon
Slot Beacon State
FPC 0 OFF
```

### show chassis beacon interconnect-device (QFabric System)

```
user@switch> show chassis beacon interconnect-device interconnect1
Chassis OFF
CB 0 OFF
CB 1 OFF
FC 0 FPC 0 OFF
FC 1 FPC 1 OFF
RC 0 FPC 8 OFF
RC 1 FPC 9 OFF
```

### show chassis beacon interconnect-device fpc (QFabric System)

```
user@switch> show chassis beacon interconnect-device interconnect1 fpc 0
FPC 0 ON
```

### show chassis beacon node-device (QFabric System)

```
user@switch> show chassis beacon node-device node1
node1 ON
```

### show chassis beacon node-device fpc (QFabric System)

```
user@switch> show chassis beacon node-device node1 fpc 0
FPC 0 ON
```

## show chassis environment

---

- List of Syntax**
- Syntax on page 592
  - Syntax (T320, T640, T1600, and T4000 Routers) on page 592
  - Syntax (TX Matrix Routers) on page 592
  - Syntax (TX Matrix Plus Routers) on page 592
  - Syntax (MX Series Routers) on page 592
  - Syntax (MX104 3D Universal Edge Routers) on page 592
  - Syntax (MX2010 and MX2020 3D Universal Edge Routers) on page 593
  - Syntax (EX8200 Switches) on page 593
  - Syntax (EX Series Switches except EX8200) on page 593
  - Syntax (QFX Series) on page 593
  - Syntax (OCX Series) on page 593
  - Syntax (PTX Series Packet Transport Routers) on page 593
  - Syntax (ACX Series Universal Access Routers) on page 593

**Syntax** show chassis environment

**Syntax (T320, T640, T1600, and T4000 Routers)**

```
show chassis environment
<cb cb-slot-number>
<fpc fpc-slot-number>
<fpm>
<pem pem-slot-number>
<routing-engine re-slot-number>
<scg scg-slot-number>
<sib sib-slot-number>
```

**Syntax (TX Matrix Routers)**

```
show chassis environment
<lcc number | scc>
```

**Syntax (TX Matrix Plus Routers)**

```
show chassis environment
<cb cb-slot-number>
<cip cip-slot-number>
<fpc fpc-slot-number>
<fpm>
<lcc number>
<pem pem-slot-number>
<routing-engine re-slot-number>
<scg scg-slot-number>
<sfc number>
<sib sib-slot-number>
```

**Syntax (MX Series Routers)**

```
show chassis environment
<all-members>
<local>
<member member-id>
```

**Syntax (MX104 3D Universal Edge Routers)**

```
show chassis environment
<cb>
<pem pem-slot-number>
<routing-engine re-slot-number>
```



|                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax (MX2010 and MX2020 3D Universal Edge Routers)</b> | <pre> show chassis environment &lt;adc <i>adc-slot-number</i>&gt; &lt;cb <i>cb-slot-number</i>&gt; &lt;fpc <i>fpc-slot-number</i>&gt; &lt;fpm&gt; &lt;monitored&gt; &lt;psm <i>psm-slot-number</i>&gt; &lt;routing-engine <i>re-slot-number</i>&gt; &lt;sfb <i>sfb-slot-number</i>&gt; </pre>                                                                                                                                    |
| <b>Syntax (EX8200 Switches)</b>                             | <pre> show chassis environment &lt;all-members&gt; &lt;cb <i>cb-slot-number</i>&gt; &lt;fpc <i>fpc-slot-number</i>&gt; &lt;local&gt; &lt;member <i>member-id</i>&gt; &lt;psu <i>psu-slot-number</i>&gt; &lt;routing-engine <i>re-slot-number</i>&gt; </pre>                                                                                                                                                                      |
| <b>Syntax (EX Series Switches except EX8200)</b>            | <pre> show chassis environment &lt;all-members&gt; &lt;fpc <i>fpc-slot-number</i>&gt; &lt;local&gt; &lt;member <i>member-id</i>&gt; &lt;power-supply-unit&gt; &lt;routing-engine&gt; </pre>                                                                                                                                                                                                                                      |
| <b>Syntax (QFX Series)</b>                                  | <pre> show chassis environment &lt;cb <i>slot-number</i> &lt;interconnect-device name&gt;&gt; &lt;fpc <i>slot-number</i> &lt;interconnect-device name&gt;&gt; &lt;interconnect-device name &lt;slot-number&gt; &lt;node-device name&gt; &lt;pem <i>slot-number</i> (interconnect-device name <i>slot-number</i>)   (node-device name)&gt; &lt;routing-engine name &lt;interconnect-device name <i>slot-number</i>&gt;&gt; </pre> |
| <b>Syntax (OCX Series)</b>                                  | <pre> show chassis environment </pre>                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Syntax (PTX Series Packet Transport Routers)</b>         | <pre> show chassis environment &lt;cb <i>cb-slot-number</i>&gt; &lt;ccg <i>ccg-slot-number</i>&gt; &lt;fpc <i>fpc-slot-number</i>&gt; &lt;fpm&gt; &lt;monitored&gt; &lt;pdu <i>pdu-slot-number</i>&gt; &lt;routing-engine <i>re-slot-number</i>&gt; &lt;sib <i>sib-slot-number</i>&gt; </pre>                                                                                                                                    |
| <b>Syntax (ACX Series Universal Access Routers)</b>         | <pre> show chassis environment &lt;cb <i>cb-slot-number</i>&gt; &lt;pem <i>pem-slot-number</i>&gt; &lt;routing-engine <i>re-slot-number</i>&gt; </pre>                                                                                                                                                                                                                                                                           |
| <b>Release Information</b>                                  | <p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p>                                                                                                                                                                                                                                                                                                 |

**sfc** option introduced for the TX Matrix Plus router in Junos OS Release 9.6.  
 Command introduced in Junos OS Release 11.1 for QFX Series.  
 Command introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers.  
**monitored** option added in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers.  
 Command introduced in Junos OS Release 12.1 for T4000 Core Routers.  
 Command introduced in Junos OS Release 12.2 for ACX Series Universal Access Routers.  
 Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.  
 Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.  
**pem** option introduced in Junos OS Release 12.3 for ACX4000 Universal Access Routers.  
 Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.  
 Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

**Description** Display environmental information about the router or switch chassis, including the temperature and information about the fans, power supplies, and Routing Engine.

In addition, on ACX4000 routers, display temperature information about the different channels of a Modular Interface Card (MIC). The number of channels displayed depends on the type of MIC installed.

Starting with Junos OS Release 14.1, the **show chassis environment cb cb-slot-number | ccg ccg-slot-number | fpc fpc-slot-number | fpm | monitored | pdu pdu-slot-number | routing-engine re-slot-number | sib sib-slot-number** operational mode command output displays environmental information for the the new DC power supply module (PSM) and power distribution unit (PDU) that are added to provide power to the high-density FPC (FPC2-PTX-PIA) and other components in a PTX5000 Packet Transport Router.

**Options** **none**—Display environmental information about the router or switch chassis. On a TX Matrix router, display environmental information about the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display environmental information about the TX Matrix Plus router and its attached routers.

**all-members**—(MX Series routers and EX Series switches only) (Optional) Display chassis environmental information for all the members of the Virtual Chassis configuration.

**adc adc-slot-number**—(MX2020 and MX2010 routers only) (Optional) Display chassis environmental information for the adapter cards. For MX2020 routers, replace **adc-slot-number** with a value from 0 through 19. For MX2010 routers, replace **adc-slot-number** with a value from 0 through 9.

**cb cb-slot-number**—(ACX Series Universal Access Routers, EX Series switches, M120, M320, and M40e routers, MX Series routers, MX2020 routers, MX2010 routers, PTX Series Packet Transport Routers, QFX Series, and T Series routers, and TX Matrix Plus routers only) (Optional) Display chassis environmental information for the Control Board. On devices other than EX Series switches, replace **cb-slot** with 0 or 1. For the EX Series switches, see *EX Series Switches Hardware and CLI Terminology Mapping* for information on CB slot numbering.

**cip *cip-slot-number***—(TX Matrix Plus routers only) (Optional) Display chassis environmental information for the Connection Interface Panel (CIP). Replace the *cip-slot-number* variable with a value of 0 or 1.

**cb interconnect-device *name***—(QFabric systems only) (Optional) Display chassis environmental information for the Control Board on an Interconnect device.

**ccg *ccg-slot-number***—(PTX Series only) (Optional) Display chassis environmental information for the Centralized Clock Generator. Replace *cb-slot* with a value of 0 or 1.

**fpc *fpc-slot***—(EX Series switches, M120, M320, and M40e routers, MX Series routers, MX2010 routers, MX2020 routers, PTX Series Packet Transport Routers, QFX Series, QFX3500 switches, QFabric systems, T Series routers, and TX Matrix Plus routers) (Optional) Display chassis environmental information for a specified Flexible PIC Concentrator. For MX2010 routers, replace *fpc-slot* with a value from 0 through 9. For MX2020 routers, replace *fpc-slot* with a value from 0 through 19. For information about FPC numbering, see [show chassis environment fpc](#). On a QFabric system, display chassis environmental information for a specified Flexible PIC Concentrator on an Interconnect device. On an EX Series switch, display chassis environmental information for a specified Flexible PIC Concentrator; see *EX Series Switches Hardware and CLI Terminology Mapping* for information on FPC numbering. On a TX Matrix Plus router with 3D SIBs replace *fpc-slot* with a value from 0 through 63.

**fpm**—(M120, M320, and M40e routers, MX2010 routers, MX2020 routers, PTX Series, Packet Transport Routers, T Series routers, and TX Matrix Plus routers only) (Optional) Display chassis environmental information for the craft interface (FPM).

**interconnect-device *name***—(QFabric systems only) (Optional) Display chassis environmental information for the Interconnect device.

**monitored**—(MX2020 routers and PTX Series Packet Transport Routers only) (Optional) Display chassis environmental information for monitored temperatures only. Temperatures that are not included in temperature alarm computations are not displayed.

**lcc *number***—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(MX Series routers and EX Series switches) (Optional) Display chassis environmental information for the local Virtual Chassis member.

**member *member-id***—(MX Series routers and EX Series switches only) (Optional) Display chassis environmental information for the specified member of the Virtual Chassis configuration. On MX Series routers, replace *member-id* variable with a value of **0** or **1**. For EX Series switches, see *member* for member ID values.

**node-device *name***—(QFabric systems only) (Optional) Display chassis environmental information for the Node device.

**pdu *pdu-slot-number***—(PTX Series only) (Optional) Display chassis environmental information for the specified power distribution unit.

**pem**—(QFX3500 switches and QFabric systems only) (Optional) Display chassis environmental information for the Power Entry Module on the specified Interconnect device or Node device.

**pem *pem-slot-number***—(ACX Series Universal Access Routers, M120, M320, and M40e routers, MX Series routers, MX104 routers, QFX Series, and T Series routers only) (Optional) Display chassis environmental information for the Power Entry Module on the specified Power Entry Module. For information about the options, see [show chassis environment pem](#).

**psm *psm-slot-number***—(MX2020 and MX2010 routers only) (Optional) Display chassis environmental information for the power supply module. For MX2020 routers, replace *psm-slot-number* with a value from **0** through **17**. For MX2010 routers, replace *psm-slot-number* with a value from **0** through **8**.

**psu *psu-slot-number***—(EX Series switches only) (Optional) Display chassis environmental information for a specified power supply. See *EX Series Switches Hardware and CLI Terminology Mapping* for detailed information.

**routing-engine**—(QFX3500 switches and QFabric systems only) (Optional) Display chassis environmental information for the Routing Engine on the specified Interconnect device.

**routing-engine *re-slot-number***—(Optional) Display chassis environmental information for the specified Routing Engine. For information about the options, see [show chassis environment routing-engine](#).

**scg**—(T Series routers only) (Optional) Display chassis environmental information about the SONET Clock Generator.

**scc**—(TX Matrix routers only) (Optional) Display chassis environmental information about the TX Matrix router (switch-card chassis).

**sfb *sfb-slot-number***—(MX2020 and MX2010 routers only) (Optional) Display chassis environmental information for the power supply module. Replace *sfb-slot-number* with a value from **0** through **7**.

**sfc *number***—(TX Matrix Plus routers only) (Optional) Display chassis environmental information about the respective TX Matrix Plus router ( switch-fabric chassis). Replace ***number*** variable with **0**.

**sib *sib-slot-number***—(M320 routers, PTX Series Packet Transport Routers, and T Series routers only) (Optional) Display chassis environmental information about the specified switch interface board. For information about the options, see *show chassis environment sib*.

**Required Privilege Level** view

**Related Documentation**

- *show chassis environment adc*
- *show chassis environment cb*
- *show chassis environment ccg*
- *show chassis environment cip*
- [show chassis environment fpc on page 656](#)
- *show chassis environment fpm*
- *show chassis environment lcc*
- *show chassis environment mcs*
- *show chassis environment monitored*
- *show chassis environment pcg*
- *show chassis environment pdu*
- [show chassis environment pem on page 682](#)
- *show chassis environment psm*
- *show chassis environment psu*
- [show chassis environment routing-engine on page 691](#)
- *show chassis environment scg*
- *show chassis environment sfb*
- *show chassis environment sib*
- *show chassis environment sfc*

**List of Sample Output**

[show chassis environment \(J2300 Router\) on page 600](#)  
[show chassis environment \(J4300 or J6300 Router\) on page 600](#)  
[show chassis environment \(M5 Router\) on page 600](#)  
[show chassis environment \(M7i Router\) on page 601](#)  
[show chassis environment \(M10 Router\) on page 601](#)  
[show chassis environment \(M10i Router\) on page 601](#)  
[show chassis environment \(M20 Router\) on page 602](#)  
[show chassis environment \(M40 Router\) on page 602](#)

[show chassis environment \(M40e Router\) on page 602](#)  
[show chassis environment \(M120 Router\) on page 603](#)  
[show chassis environment \(M160 Router\) on page 604](#)  
[show chassis environment \(M320 Router\) on page 604](#)  
[show chassis environment \(MX104 Router\) on page 605](#)  
[show chassis environment \(MX240 Router\) on page 606](#)  
[show chassis environment \(MX240 Router with SCBE\) on page 607](#)  
[show chassis environment \(MX480 Router\) on page 607](#)  
[show chassis environment \(MX480 Router with SCBE\) on page 608](#)  
[show chassis environment \(MX960 Router\) on page 609](#)  
[show chassis environment \(MX960 Router with SCBE\) on page 610](#)  
[show chassis environment \(MX960 Router with MPC5EQ\) on page 613](#)  
[show chassis environment \(MX2020 Router\) on page 617](#)  
[show chassis environment \(MX2020 Router with MPC5EQ and MPC6E\) on page 626](#)  
[show chassis environment \(MX2010 Router\) on page 630](#)  
[show chassis environment \(T320 Router\) on page 635](#)  
[show chassis environment \(T640 Router\) on page 636](#)  
[show chassis environment \(T4000 Router\) on page 637](#)  
[show chassis environment \(TX Matrix Router\) on page 639](#)  
[show chassis environment \(T1600 Router\) on page 640](#)  
[show chassis environment \(TX Matrix Plus Router\) on page 641](#)  
[show chassis environment \(TX Matrix Plus router with 3D SIBs\) on page 643](#)  
[show chassis environment \(EX4200 Standalone Switch\) on page 646](#)  
[show chassis environment \(EX8216 Switch\) on page 647](#)  
[show chassis environment \(EX9200 Switch\) on page 647](#)  
[show chassis environment \(QFX Series and OCX Series\) on page 648](#)  
[show chassis environment interconnect-device \(QFabric System\) on page 648](#)  
[show chassis environment node-device \(QFabric System\) on page 650](#)  
[show chassis environment pem node-device \(QFabric System\) on page 650](#)  
[show chassis environment \(PTX5000 Packet Transport Router\) on page 651](#)  
[show chassis environment \(PTX5000 Packet Transport Router with FPC2-PTX-PIA\) on page 653](#)  
[show chassis environment \(ACX2000 Universal Access Router\) on page 654](#)  
[show chassis environment \(ACX4000 Universal Access Router\) on page 654](#)

**Output Fields** [Table 48 on page 599](#) lists the output fields for the **show chassis environment** command. Output fields are listed in the approximate order in which they appear.

Table 48: show chassis environment Output Fields

| Field Name   | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Class</b> | <p>Information about the category or class of chassis component:</p> <ul style="list-style-type: none"> <li>• <b>Power:</b> Power information: <ul style="list-style-type: none"> <li>• (M5, M10, M20, and M40 routers and EX Series switches only) Power supply status: <b>OK</b>, <b>Testing</b>, (during initial power-on), <b>Failed</b>, or <b>Absent</b>.</li> <li>• (M7i, M10i, M40e, M120, M160, M320, and T Series routers and EX Series switches only) Power Entry Modules status: <b>OK</b>, <b>Testing</b>, (during initial power-on), <b>Check</b>, <b>Failed</b>, or <b>Absent</b>.</li> <li>• (PTX Series only) Power information is reported in PDU or PSM combinations. The status is: <b>OK</b>, <b>Testing</b>, (during initial power-on), <b>Check</b>, <b>Failed</b>, or <b>Absent</b>.</li> </ul> </li> <li>• <b>Temp:</b> Temperature of air flowing through the chassis in degrees Celsius (C) and Fahrenheit (F). <ul style="list-style-type: none"> <li>• On PTX Series Packet Transport Routers and MX2010 and MX2020 Routers, multiple cooling zones are supported. FRU temperatures in each zone are coordinated with the fan speed of fan trays in those zones.</li> <li>• EX2200 switches have a side-to-rear cooling system. The <b>Local Intake</b> temperature is measured by the sensor on the right side of the chassis, and the <b>Remote Intake</b> temperature is measured by the sensor on the left side of the chassis.</li> </ul> </li> <li>• <b>Pic:</b> On ACX4000 Routers, multiple temperature channels on a MIC. The status is: <b>OK</b> and the <b>Measurement</b> is in degrees Celsius (C) and Fahrenheit (F).</li> <li>• <b>Fan:</b> Fan status: <b>OK</b>, <b>Testing</b> (during initial power-on), <b>Failed</b>, or <b>Absent</b>.<br/>On PTX Series Packet Transport Routers and MX2010 and MX2020 Routers, multiple fan trays are supported. Fan status is reported in Fan Tray or Fan combinations. <b>Measurement</b> indicates actual fan RPM (PTX and MX2010 and MX2020 Routers only).</li> <li>• <b>Misc:</b> Information about other components of the chassis. <ul style="list-style-type: none"> <li>• On some routers, this field indicates the status of one or more additional components.</li> <li>• On the M40e, M160, and M320 router, <b>Misc</b> includes <b>CIP</b> (Connector Interface Panel). <b>OK</b> indicates that the CIP is present. <b>Absent</b> indicates that the CIP is not present.</li> <li>• On T Series routers, <b>Misc</b> includes <b>CIP</b> and <b>SPMB</b> (Switch Processor Mezzanine Board). <b>OK</b> indicates that the <b>CIP</b> or <b>SPMB</b> is present. <b>Absent</b> indicates that the <b>CIP</b> or <b>SPMB</b> is not present.</li> <li>• On PTX Series Packet Transport Routers, <b>Misc</b> includes the <b>SPMB</b> (Switch Processor Mezzanine Board). The SPMB is located on the control boards. <b>OK</b> indicates that the control board is present. <b>Absent</b> indicates that the control board is not present.</li> </ul> </li> </ul> |
| <b>Item</b>  | <p>(MX2010 and MX2020 Routers) Information about the chassis component: Routing Engines, Controls Boards (CBs), Switch Fabric Boards (SFBs), PICs, Flexible PIC Concentrators (FPCs), and Adapter Cards (ADCs).</p> <p>(MX104 Routers) Information about the chassis components: Routing Engines, Control Board (CB), Power Entry Module (PEM), and Compact Forwarding Engine Board (AFEB).</p> <p>(QFabric Systems) Information about the chassis component: Control Boards, Routing Engines, Flexible PIC Concentrators (FPCs), and Power Entry Modules (PEMs), Node Devices, and Interconnect Devices.</p> <p>(QFX Series) Information about the chassis component: Flexible PIC Concentrators (FPCs), and Power Entry Modules (PEMs).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

Table 48: show chassis environment Output Fields (*continued*)

| Field Name         | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Status</b>      | <p>(MX104, MX2010, and MX2020 Routers) Status of the specified chassis component. For example, if the Class is Fan, the fan status can be:</p> <ul style="list-style-type: none"> <li>• <b>OK:</b> The fans are operational.</li> <li>• <b>Testing:</b> The fans are being tested during initial power-on.</li> <li>• <b>Failed:</b> The fans have failed or the fans are not spinning.</li> <li>• <b>Absent:</b> The fan tray is not installed.</li> </ul> <p>If the Class is Power, the power supply status can be:</p> <ul style="list-style-type: none"> <li>• <b>OK:</b> The power component is operational.</li> <li>• <b>Testing:</b> The power component is being tested during initial power-on.</li> <li>• <b>Check:</b> There is insufficient power---that is, fewer than the minimum required feeds are connected.</li> <li>• <b>Failed:</b> The inputs leads have failed.</li> <li>• <b>Absent:</b> The power component is not installed.</li> </ul> |
| <b>Measurement</b> | <p>(MX104, MX2010, and MX2020 Routers) Dependant on the Class. For example, if the Class is Temp, indicates the temperature in degree Celsius and degrees Fahrenheit. If the Class is Fan, indicates actual fan RPM.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

## Sample Output

### show chassis environment (J2300 Router)

```

user@host> show chassis environment
Class Item Status Measurement
Temp Routing Engine OK 40 degrees C / 104 degrees F
Fan Fan OK

```

### show chassis environment (J4300 or J6300 Router)

```

user@host> show chassis environment
Class Item Status Measurement
Temp Routing Engine OK 41 degrees C / 105 degrees F
Fan Fan 0 OK
 Fan 1 OK

```

### show chassis environment (M5 Router)

```

user@host> show chassis environment
Class Item Status Measurement
Power Power Supply A OK
 Power Supply B Absent
Temp FPC 0 OK 30 degrees C / 86 degrees F
 FEB OK 33 degrees C / 91 degrees F
 PS Intake OK 27 degrees C / 80 degrees F
 PS Exhaust OK 27 degrees C / 80 degrees F
 Routing Engine OK 34 degrees C / 93 degrees F
Fans Left Fan 1 OK Spinning at normal speed
 Left Fan 2 OK Spinning at normal speed
 Left Fan 3 OK Spinning at normal speed
 Left Fan 4 OK Spinning at normal speed
Misc Craft Interface OK

```



## show chassis environment (M7i Router)

```

user@host> show chassis environment
Class Item Status Measurement
Power Power Supply 0 OK
 Power Supply 1 Absent
Temp Intake OK 22 degrees C / 71 degrees F
 FPC 0 OK 23 degrees C / 73 degrees F
 Power Supplies OK 23 degrees C / 73 degrees F
 CFEB Intake OK 24 degrees C / 75 degrees F
 CFEB Exhaust OK 29 degrees C / 84 degrees F
 Routing Engine OK 26 degrees C / 78 degrees F
Fans Fan 1 OK Spinning at normal speed
 Fan 2 OK Spinning at normal speed
 Fan 3 OK Spinning at normal speed
 Fan 4 OK Spinning at normal speed

```

## show chassis environment (M10 Router)

```

user@host> show chassis environment
Class Item Status Measurement
Power Power Supply A OK
 Power Supply B Failed
Temp FPC 0 OK 36 degrees C / 96 degrees F
 FPC 1 OK 35 degrees C / 95 degrees F
 FEB OK 34 degrees C / 93 degrees F
 PS Intake OK 31 degrees C / 87 degrees F
 PS Exhaust OK 34 degrees C / 93 degrees F
 Routing Engine OK 35 degrees C / 95 degrees F
Fans Left Fan 1 OK Spinning at normal speed
 Left Fan 2 OK Spinning at normal speed
 Left Fan 3 OK Spinning at normal speed
 Left Fan 4 OK Spinning at normal speed
Misc Craft Interface OK

```

## show chassis environment (M10i Router)

```

user@host> show chassis environment
Class Item Status Measurement
Power Power Supply 0 OK
 Power Supply 1 OK
 Power Supply 2 Absent
 Power Supply 3 Absent
Temp Intake OK 26 degrees C / 78 degrees F
 FPC 0 OK 27 degrees C / 80 degrees F
 FPC 1 OK 28 degrees C / 82 degrees F
 Lower Power Supplies OK 29 degrees C / 84 degrees F
 Upper Power Supplies OK 28 degrees C / 82 degrees F
 CFEB Intake OK 27 degrees C / 80 degrees F
 CFEB Exhaust OK 36 degrees C / 96 degrees F
 Routing Engine 0 OK 31 degrees C / 87 degrees F
 Routing Engine 1 OK 27 degrees C / 80 degrees F
Fans Fan Tray 0 Fan 1 OK Spinning at normal speed
 Fan Tray 0 Fan 2 OK Spinning at normal speed
 Fan Tray 0 Fan 3 OK Spinning at normal speed
 Fan Tray 0 Fan 4 OK Spinning at normal speed
 Fan Tray 0 Fan 5 OK Spinning at normal speed
 Fan Tray 0 Fan 6 OK Spinning at normal speed
 Fan Tray 0 Fan 7 OK Spinning at normal speed

```

|                  |        |                          |
|------------------|--------|--------------------------|
| Fan Tray 0 Fan 8 | OK     | Spinning at normal speed |
| Fan Tray 1 Fan 1 | Absent |                          |
| Fan Tray 1 Fan 2 | Absent |                          |
| Fan Tray 1 Fan 3 | Absent |                          |
| Fan Tray 1 Fan 4 | Absent |                          |
| Fan Tray 1 Fan 5 | Absent |                          |
| Fan Tray 1 Fan 6 | Absent |                          |
| Fan Tray 1 Fan 7 | Absent |                          |
| Fan Tray 1 Fan 8 | Absent |                          |

#### show chassis environment (M20 Router)

```
user@host> show chassis environment
```

| Class | Item             | Status  | Measurement                 |
|-------|------------------|---------|-----------------------------|
| Power | Power Supply A   | OK      |                             |
|       | Power Supply B   | Absent  |                             |
| Temp  | FPC 0            | OK      | 28 degrees C / 82 degrees F |
|       | FPC 1            | OK      | 27 degrees C / 80 degrees F |
|       | Power Supply A   | OK      | 22 degrees C / 71 degrees F |
|       | Power Supply B   | Absent  |                             |
|       | SSB 0            | OK      | 30 degrees C / 86 degrees F |
|       | Backplane        | OK      | 22 degrees C / 71 degrees F |
|       | Routing Engine 0 | OK      | 26 degrees C / 78 degrees F |
|       | Routing Engine 1 | Testing |                             |
| Fans  | Rear Fan         | OK      | Spinning at normal speed    |
|       | Front Upper Fan  | OK      | Spinning at normal speed    |
|       | Front Middle Fan | OK      | Spinning at normal speed    |
|       | Front Bottom Fan | OK      | Spinning at normal speed    |
| Misc  | Craft Interface  | OK      |                             |

#### show chassis environment (M40 Router)

```
user@host> show chassis environment
```

| Class | Item            | Status | Measurement                 |
|-------|-----------------|--------|-----------------------------|
| Power | Power Supply A  | OK     |                             |
|       | Power Supply B  | Absent |                             |
| Temp  | FPC 3           | OK     | 24 degrees C / 75 degrees F |
|       | FPC 6           | OK     | 26 degrees C / 78 degrees F |
|       | SCB             | OK     | 26 degrees C / 78 degrees F |
|       | Backplane @ A1  | OK     | 28 degrees C / 82 degrees F |
|       | Backplane @ A2  | OK     | 23 degrees C / 73 degrees F |
|       | Routing Engine  | OK     | 26 degrees C / 78 degrees F |
| Fans  | Top Impeller    | OK     | Spinning at normal speed    |
|       | Bottom impeller | OK     | Spinning at normal speed    |
|       | Rear Left Fan   | OK     | Spinning at normal speed    |
|       | Rear Center Fan | OK     | Spinning at normal speed    |
|       | Rear Right Fan  | OK     | Spinning at normal speed    |
| Misc  | Craft Interface | OK     |                             |

#### show chassis environment (M40e Router)

```
user@host> show chassis environment
```

| Class | Item             | Status | Measurement                  |
|-------|------------------|--------|------------------------------|
| Power | PEM 0            | OK     |                              |
|       | PEM 1            | Absent |                              |
| Temp  | PCG 0            | OK     | 44 degrees C / 111 degrees F |
|       | PCG 1            | OK     | 47 degrees C / 116 degrees F |
|       | Routing Engine 0 | OK     | 40 degrees C / 104 degrees F |
|       | Routing Engine 1 | OK     | 37 degrees C / 98 degrees F  |

|                         |    |                              |
|-------------------------|----|------------------------------|
| MCS 0                   | OK | 45 degrees C / 113 degrees F |
| MCS 1                   | OK | 42 degrees C / 107 degrees F |
| SFM 0 SPP               | OK | 40 degrees C / 104 degrees F |
| SFM 0 SPR               | OK | 44 degrees C / 111 degrees F |
| SFM 1 SPP               | OK | 43 degrees C / 109 degrees F |
| SFM 1 SPR               | OK | 45 degrees C / 113 degrees F |
| FPC 0                   | OK | 38 degrees C / 100 degrees F |
| FPC 1                   | OK | 40 degrees C / 104 degrees F |
| FPC 2                   | OK | 38 degrees C / 100 degrees F |
| FPC 4                   | OK | 34 degrees C / 93 degrees F  |
| FPC 5                   | OK | 43 degrees C / 109 degrees F |
| FPC 6                   | OK | 41 degrees C / 105 degrees F |
| FPC 7                   | OK | 43 degrees C / 109 degrees F |
| FPM CMB                 | OK | 28 degrees C / 82 degrees F  |
| FPM Display             | OK | 28 degrees C / 82 degrees F  |
| Fans Rear Bottom Blower | OK | Spinning at normal speed     |
| Rear Top Blower         | OK | Spinning at normal speed     |
| Front Top Blower        | OK | Spinning at normal speed     |
| Fan Tray Rear Left      | OK | Spinning at normal speed     |
| Fan Tray Rear Right     | OK | Spinning at normal speed     |
| Fan Tray Front Left     | OK | Spinning at normal speed     |
| Fan Tray Front Right    | OK | Spinning at normal speed     |
| Misc CIP                | OK |                              |

### show chassis environment (M120 Router)

```
user@host> show chassis environment
```

| Class | Item                    | Status | Measurement                  |
|-------|-------------------------|--------|------------------------------|
| Temp  | PEM 0                   | OK     |                              |
|       | PEM 1                   | OK     |                              |
|       | Routing Engine 0        | OK     | 43 degrees C / 109 degrees F |
|       | Routing Engine 1        | OK     | 44 degrees C / 111 degrees F |
|       | CB 0 Intake             | OK     | 33 degrees C / 91 degrees F  |
|       | CB 0 Exhaust A          | OK     | 36 degrees C / 96 degrees F  |
|       | CB 0 Exhaust B          | OK     | 35 degrees C / 95 degrees F  |
|       | CB 1 Intake             | OK     | 34 degrees C / 93 degrees F  |
|       | CB 1 Exhaust A          | OK     | 38 degrees C / 100 degrees F |
|       | CB 1 Exhaust B          | OK     | 35 degrees C / 95 degrees F  |
|       | FEB 3 Intake            | OK     | 35 degrees C / 95 degrees F  |
|       | FEB 3 Exhaust A         | OK     | 37 degrees C / 98 degrees F  |
|       | FEB 3 Exhaust B         | OK     | 39 degrees C / 102 degrees F |
|       | FEB 4 Intake            | OK     | 33 degrees C / 91 degrees F  |
|       | FEB 4 Exhaust A         | OK     | 39 degrees C / 102 degrees F |
|       | FEB 4 Exhaust B         | OK     | 36 degrees C / 96 degrees F  |
|       | FPC 2 Exhaust A         | OK     | 32 degrees C / 89 degrees F  |
|       | FPC 2 Exhaust B         | OK     | 31 degrees C / 87 degrees F  |
|       | FPC 3 Exhaust A         | OK     | 32 degrees C / 89 degrees F  |
|       | FPC 3 Exhaust B         | OK     | 33 degrees C / 91 degrees F  |
|       | FPC 4 Exhaust A         | OK     | 32 degrees C / 89 degrees F  |
|       | FPC 4 Exhaust B         | OK     | 30 degrees C / 86 degrees F  |
| Fans  | Front Top Tray Fan 1    | OK     | Spinning at normal speed     |
|       | Front Top Tray Fan 2    | OK     | Spinning at normal speed     |
|       | Front Top Tray Fan 3    | OK     | Spinning at normal speed     |
|       | Front Top Tray Fan 4    | OK     | Spinning at normal speed     |
|       | Front Top Tray Fan 5    | OK     | Spinning at normal speed     |
|       | Front Top Tray Fan 6    | OK     | Spinning at normal speed     |
|       | Front Top Tray Fan 7    | OK     | Spinning at normal speed     |
|       | Front Top Tray Fan 8    | OK     | Spinning at normal speed     |
|       | Front Bottom Tray Fan 1 | OK     | Spinning at normal speed     |
|       | Front Bottom Tray Fan 2 | OK     | Spinning at normal speed     |

|                         |    |                          |
|-------------------------|----|--------------------------|
| Front Bottom Tray Fan 3 | OK | Spinning at normal speed |
| Front Bottom Tray Fan 4 | OK | Spinning at normal speed |
| Front Bottom Tray Fan 5 | OK | Spinning at normal speed |
| Front Bottom Tray Fan 6 | OK | Spinning at normal speed |
| Front Bottom Tray Fan 7 | OK | Spinning at normal speed |
| Front Bottom Tray Fan 8 | OK | Spinning at normal speed |
| Rear Top Tray Fan 1     | OK | Spinning at normal speed |
| Rear Top Tray Fan 2     | OK | Spinning at normal speed |
| Rear Top Tray Fan 3     | OK | Spinning at normal speed |
| Rear Top Tray Fan 4     | OK | Spinning at normal speed |
| Rear Top Tray Fan 5     | OK | Spinning at normal speed |
| Rear Top Tray Fan 6     | OK | Spinning at normal speed |
| Rear Top Tray Fan 7     | OK | Spinning at normal speed |
| Rear Top Tray Fan 8     | OK | Spinning at normal speed |
| Rear Bottom Tray Fan 1  | OK | Spinning at normal speed |
| Rear Bottom Tray Fan 2  | OK | Spinning at normal speed |
| Rear Bottom Tray Fan 3  | OK | Spinning at normal speed |
| Rear Bottom Tray Fan 4  | OK | Spinning at normal speed |
| Rear Bottom Tray Fan 5  | OK | Spinning at normal speed |
| Rear Bottom Tray Fan 6  | OK | Spinning at normal speed |
| Rear Bottom Tray Fan 7  | OK | Spinning at normal speed |
| Rear Bottom Tray Fan 8  | OK | Spinning at normal speed |

#### show chassis environment (M160 Router)

```
user@host> show chassis environment
```

| Class | Item                 | Status | Measurement                  |
|-------|----------------------|--------|------------------------------|
| Power | PEM 0                | OK     | PEM 1                        |
| Temp  | PCG 0                | OK     | 45 degrees C / 113 degrees F |
|       | PCG 1                | Absent |                              |
|       | Routing Engine 0     | OK     | 35 degrees C / 95 degrees F  |
|       | Routing Engine 1     | Absent |                              |
|       | MCS 0                | OK     | 50 degrees C / 122 degrees F |
|       | SFM 0 SPP            | OK     | 47 degrees C / 116 degrees F |
|       | SFM 0 SPR            | OK     | 49 degrees C / 120 degrees F |
|       | SFM 1 SPP            | OK     | 50 degrees C / 122 degrees F |
|       | SFM 1 SPR            | OK     | 50 degrees C / 122 degrees F |
|       | SFM 2 SPP            | OK     | 51 degrees C / 123 degrees F |
|       | SFM 2 SPR            | OK     | 52 degrees C / 125 degrees F |
|       | SFM 3 SPP            | OK     | 52 degrees C / 125 degrees F |
|       | SFM 3 SPR            | OK     | 48 degrees C / 118 degrees F |
|       | FPC 0                | OK     | 45 degrees C / 113 degrees F |
|       | FPC 6                | OK     | 43 degrees C / 109 degrees F |
|       | FPM CMB              | OK     | 31 degrees C / 87 degrees F  |
|       | FPM Display          | OK     | 33 degrees C / 91 degrees F  |
| Fans  | Rear Bottom Blower   | OK     | Spinning at normal speed     |
|       | Rear Top Blower      | OK     | Spinning at normal speed     |
|       | Front Top Blower     | OK     | Spinning at normal speed     |
|       | Fan Tray Rear Left   | OK     | Spinning at normal speed     |
|       | Fan Tray Rear Right  | OK     | Spinning at normal speed     |
|       | Fan Tray Front Left  | OK     | Spinning at normal speed     |
|       | Fan Tray Front Right | OK     | Spinning at normal speed     |
| Misc  | CIP                  | OK     |                              |

#### show chassis environment (M320 Router)

```
user@host> show chassis environment
```

| Class | Item  | Status | Measurement |
|-------|-------|--------|-------------|
| Temp  | PEM 0 | Absent |             |
|       | PEM 1 | Absent |             |

|                        |    |                              |
|------------------------|----|------------------------------|
| PEM 2                  | OK |                              |
| PEM 3                  | OK |                              |
| Routing Engine 0       | OK | 33 degrees C / 91 degrees F  |
| Routing Engine 1       | OK | 32 degrees C / 89 degrees F  |
| CB 0                   | OK | 36 degrees C / 96 degrees F  |
| CB 1                   | OK | 36 degrees C / 96 degrees F  |
| SIB 0                  | OK | 38 degrees C / 100 degrees F |
| SIB 1                  | OK | 29 degrees C / 84 degrees F  |
| SIB 2                  | OK | 38 degrees C / 100 degrees F |
| SIB 3                  | OK | 41 degrees C / 105 degrees F |
| FPC 0 Intake           | OK | 28 degrees C / 82 degrees F  |
| FPC 0 Exhaust          | OK | 40 degrees C / 104 degrees F |
| FPC 1 Intake           | OK | 29 degrees C / 84 degrees F  |
| FPC 1 Exhaust          | OK | 39 degrees C / 102 degrees F |
| FPC 2 Intake           | OK | 28 degrees C / 82 degrees F  |
| FPC 2 Exhaust          | OK | 38 degrees C / 100 degrees F |
| FPC 3 Intake           | OK | 28 degrees C / 82 degrees F  |
| FPC 3 Exhaust          | OK | 39 degrees C / 102 degrees F |
| FPC 6 Intake           | OK | 27 degrees C / 80 degrees F  |
| FPC 6 Exhaust          | OK | 39 degrees C / 102 degrees F |
| FPC 7 Intake           | OK | 27 degrees C / 80 degrees F  |
| FPC 7 Exhaust          | OK | 42 degrees C / 107 degrees F |
| FPM GBUS               | OK | 30 degrees C / 86 degrees F  |
| Fan Top Left Front fan | OK | Spinning at normal speed     |
| Top Right Rear fan     | OK | Spinning at normal speed     |
| Top Right Front fan    | OK | Spinning at normal speed     |
| Top Left Rear fan      | OK | Spinning at normal speed     |
| Bottom Left Front fan  | OK | Spinning at normal speed     |
| Bottom Right Rear fan  | OK | Spinning at normal speed     |
| Bottom Right Front fan | OK | Spinning at normal speed     |
| Bottom Left Rear fan   | OK | Spinning at normal speed     |
| Rear Fan 1 (TOP)       | OK | Spinning at normal speed     |
| Rear Fan 2             | OK | Spinning at normal speed     |
| Rear Fan 3             | OK | Spinning at normal speed     |
| Rear Fan 4             | OK | Spinning at normal speed     |
| Rear Fan 5             | OK | Spinning at normal speed     |
| Rear Fan 6             | OK | Spinning at normal speed     |
| Rear Fan 7 (Bottom)    | OK | Spinning at normal speed     |
| Misc CIP               | OK |                              |

### show chassis environment (MX104 Router)

```
user@host> show chassis environment
```

| Class | Item                  | Status | Measurement                  |
|-------|-----------------------|--------|------------------------------|
| Temp  | PEM 0                 | OK     | 34 degrees C / 93 degrees F  |
|       | PEM 1                 | Absent |                              |
|       | ABB 0 Intake          | OK     | 33 degrees C / 91 degrees F  |
|       | ABB 0 Exhaust A       | OK     | 42 degrees C / 107 degrees F |
|       | ABB 0 Exhaust B       | OK     | 43 degrees C / 109 degrees F |
|       | ABB 1 Intake          | Absent |                              |
|       | ABB 1 Exhaust A       | Absent |                              |
|       | ABB 1 Exhaust B       | Absent |                              |
|       | Routing Engine 0      | OK     | 34 degrees C / 93 degrees F  |
|       | Routing Engine 0 CPU  | OK     | 46 degrees C / 114 degrees F |
| Fans  | Routing Engine 1      | Absent |                              |
|       | Routing Engine 1 CPU  | Absent |                              |
|       | AFEB 0 AFEB Processor | OK     | 33 degrees C / 91 degrees F  |
|       | Fan 1                 | OK     | Spinning at normal speed     |
|       | Fan 2                 | OK     | Spinning at normal speed     |
|       | Fan 3                 | OK     | Spinning at normal speed     |

|       |    |                          |
|-------|----|--------------------------|
| Fan 4 | OK | Spinning at normal speed |
| Fan 5 | OK | Spinning at normal speed |

**show chassis environment (MX240 Router)**

user@host&gt; show chassis environment

| Class | Item               | Status | Measurement                  |
|-------|--------------------|--------|------------------------------|
| Temp  | PEM 0              | OK     | 40 degrees C / 104 degrees F |
|       | PEM 1              | OK     | 45 degrees C / 113 degrees F |
|       | PEM 2              | Absent |                              |
|       | PEM 3              | Absent |                              |
|       | Routing Engine 0   | OK     | 39 degrees C / 102 degrees F |
|       | Routing Engine 1   | OK     | 37 degrees C / 98 degrees F  |
|       | CB 0 Intake        | OK     | 36 degrees C / 96 degrees F  |
|       | CB 0 Exhaust A     | OK     | 34 degrees C / 93 degrees F  |
|       | CB 0 Exhaust B     | OK     | 38 degrees C / 100 degrees F |
|       | CB 0 ACBC          | OK     | 37 degrees C / 98 degrees F  |
|       | CB 0 SF A          | OK     | 49 degrees C / 120 degrees F |
|       | CB 0 SF B          | OK     | 41 degrees C / 105 degrees F |
|       | CB 1 Intake        | OK     | 37 degrees C / 98 degrees F  |
|       | CB 1 Exhaust A     | OK     | 34 degrees C / 93 degrees F  |
|       | CB 1 Exhaust B     | OK     | 39 degrees C / 102 degrees F |
|       | CB 1 ACBC          | OK     | 38 degrees C / 100 degrees F |
|       | CB 1 SF A          | OK     | 47 degrees C / 116 degrees F |
|       | CB 1 SF B          | OK     | 41 degrees C / 105 degrees F |
|       | FPC 1 Intake       | OK     | 33 degrees C / 91 degrees F  |
|       | FPC 1 Exhaust A    | OK     | 38 degrees C / 100 degrees F |
|       | FPC 1 Exhaust B    | OK     | 53 degrees C / 127 degrees F |
|       | FPC 1 I3 0 TSensor | OK     | 50 degrees C / 122 degrees F |
|       | FPC 1 I3 0 Chip    | OK     | 53 degrees C / 127 degrees F |
|       | FPC 1 I3 1 TSensor | OK     | 49 degrees C / 120 degrees F |
|       | FPC 1 I3 1 Chip    | OK     | 52 degrees C / 125 degrees F |
|       | FPC 1 I3 2 TSensor | OK     | 47 degrees C / 116 degrees F |
|       | FPC 1 I3 2 Chip    | OK     | 49 degrees C / 120 degrees F |
|       | FPC 1 I3 3 TSensor | OK     | 44 degrees C / 111 degrees F |
|       | FPC 1 I3 3 Chip    | OK     | 46 degrees C / 114 degrees F |
|       | FPC 1 IA 0 TSensor | OK     | 45 degrees C / 113 degrees F |
|       | FPC 1 IA 0 Chip    | OK     | 44 degrees C / 111 degrees F |
|       | FPC 1 IA 1 TSensor | OK     | 44 degrees C / 111 degrees F |
|       | FPC 1 IA 1 Chip    | OK     | 48 degrees C / 118 degrees F |
|       | FPC 2 Intake       | OK     | 32 degrees C / 89 degrees F  |
|       | FPC 2 Exhaust A    | OK     | 40 degrees C / 104 degrees F |
|       | FPC 2 Exhaust B    | OK     | 52 degrees C / 125 degrees F |
|       | FPC 2 I3 0 TSensor | OK     | 52 degrees C / 125 degrees F |
|       | FPC 2 I3 0 Chip    | OK     | 56 degrees C / 132 degrees F |
|       | FPC 2 I3 1 TSensor | OK     | 52 degrees C / 125 degrees F |
|       | FPC 2 I3 1 Chip    | OK     | 55 degrees C / 131 degrees F |
|       | FPC 2 I3 2 TSensor | OK     | 49 degrees C / 120 degrees F |
|       | FPC 2 I3 2 Chip    | OK     | 52 degrees C / 125 degrees F |
|       | FPC 2 I3 3 TSensor | OK     | 44 degrees C / 111 degrees F |
|       | FPC 2 I3 3 Chip    | OK     | 48 degrees C / 118 degrees F |
|       | FPC 2 IA 0 TSensor | OK     | 50 degrees C / 122 degrees F |
|       | FPC 2 IA 0 Chip    | OK     | 48 degrees C / 118 degrees F |
|       | FPC 2 IA 1 TSensor | OK     | 47 degrees C / 116 degrees F |
|       | FPC 2 IA 1 Chip    | OK     | 53 degrees C / 127 degrees F |
| Fans  | Front Fan          | OK     | Spinning at normal speed     |
|       | Middle Fan         | OK     | Spinning at normal speed     |
|       | Rear Fan           | OK     | Spinning at normal speed     |

## show chassis environment (MX240 Router with SCBE)

```

user@host> show chassis environment
Class Item Status Measurement
Temp PEM 0 OK 40 degrees C / 104 degrees F
 PEM 1 OK 45 degrees C / 113 degrees F
 PEM 2 Absent
 PEM 3 Absent
 Routing Engine 0 OK 39 degrees C / 102 degrees F
 Routing Engine 1 OK 37 degrees C / 98 degrees F
 CB 0 Intake OK 36 degrees C / 96 degrees F
 CB 0 Exhaust A OK 34 degrees C / 93 degrees F
 CB 0 Exhaust B OK 38 degrees C / 100 degrees F
 CB 0 ACBC OK 37 degrees C / 98 degrees F
 CB 0 XF A OK 49 degrees C / 120 degrees F
 CB 0 XF B OK 41 degrees C / 105 degrees F
 CB 1 Intake OK 37 degrees C / 98 degrees F
 CB 1 Exhaust A OK 34 degrees C / 93 degrees F
 CB 1 Exhaust B OK 39 degrees C / 102 degrees F
 CB 1 ACBC OK 38 degrees C / 100 degrees F
 CB 1 XF A OK 47 degrees C / 116 degrees F
 CB 1 XF B OK 41 degrees C / 105 degrees F
 FPC 1 Intake OK 33 degrees C / 91 degrees F
 FPC 1 Exhaust A OK 38 degrees C / 100 degrees F
 FPC 1 Exhaust B OK 53 degrees C / 127 degrees F
 FPC 1 I3 0 TSensor OK 50 degrees C / 122 degrees F
 FPC 1 I3 0 Chip OK 53 degrees C / 127 degrees F
 FPC 1 I3 1 TSensor OK 49 degrees C / 120 degrees F
 FPC 1 I3 1 Chip OK 52 degrees C / 125 degrees F
 FPC 1 I3 2 TSensor OK 47 degrees C / 116 degrees F
 FPC 1 I3 2 Chip OK 49 degrees C / 120 degrees F
 FPC 1 I3 3 TSensor OK 44 degrees C / 111 degrees F
 FPC 1 I3 3 Chip OK 46 degrees C / 114 degrees F
 FPC 1 IA 0 TSensor OK 45 degrees C / 113 degrees F
 FPC 1 IA 0 Chip OK 44 degrees C / 111 degrees F
 FPC 1 IA 1 TSensor OK 44 degrees C / 111 degrees F
 FPC 1 IA 1 Chip OK 48 degrees C / 118 degrees F
 FPC 2 Intake OK 32 degrees C / 89 degrees F
 FPC 2 Exhaust A OK 40 degrees C / 104 degrees F
 FPC 2 Exhaust B OK 52 degrees C / 125 degrees F
 FPC 2 I3 0 TSensor OK 52 degrees C / 125 degrees F
 FPC 2 I3 0 Chip OK 56 degrees C / 132 degrees F
 FPC 2 I3 1 TSensor OK 52 degrees C / 125 degrees F
 FPC 2 I3 1 Chip OK 55 degrees C / 131 degrees F
 FPC 2 I3 2 TSensor OK 49 degrees C / 120 degrees F
 FPC 2 I3 2 Chip OK 52 degrees C / 125 degrees F
 FPC 2 I3 3 TSensor OK 44 degrees C / 111 degrees F
 FPC 2 I3 3 Chip OK 48 degrees C / 118 degrees F
 FPC 2 IA 0 TSensor OK 50 degrees C / 122 degrees F
 FPC 2 IA 0 Chip OK 48 degrees C / 118 degrees F
 FPC 2 IA 1 TSensor OK 47 degrees C / 116 degrees F
 FPC 2 IA 1 Chip OK 53 degrees C / 127 degrees F
Fans Front Fan OK Spinning at normal speed
 Middle Fan OK Spinning at normal speed
 Rear Fan OK Spinning at normal speed

```

## show chassis environment (MX480 Router)

```

user@host> show chassis environment
Class Item Status Measurement
Temp PEM 0 OK 35 degrees C / 95 degrees F

```

|      |                    |        |                              |
|------|--------------------|--------|------------------------------|
|      | PEM 1              | OK     | 40 degrees C / 104 degrees F |
|      | PEM 2              | Absent |                              |
|      | PEM 3              | Absent |                              |
|      | Routing Engine 0   | OK     | 44 degrees C / 111 degrees F |
|      | Routing Engine 1   | OK     | 45 degrees C / 113 degrees F |
|      | CB 0 Intake        | OK     | 36 degrees C / 96 degrees F  |
|      | CB 0 Exhaust A     | OK     | 38 degrees C / 100 degrees F |
|      | CB 0 Exhaust B     | OK     | 39 degrees C / 102 degrees F |
|      | CB 0 ACBC          | OK     | 37 degrees C / 98 degrees F  |
|      | CB 0 SF A          | OK     | 51 degrees C / 123 degrees F |
|      | CB 0 SF B          | OK     | 44 degrees C / 111 degrees F |
|      | CB 1 Intake        | OK     | 36 degrees C / 96 degrees F  |
|      | CB 1 Exhaust A     | OK     | 39 degrees C / 102 degrees F |
|      | CB 1 Exhaust B     | OK     | 40 degrees C / 104 degrees F |
|      | CB 1 ACBC          | OK     | 37 degrees C / 98 degrees F  |
|      | CB 1 SF A          | OK     | 50 degrees C / 122 degrees F |
|      | CB 1 SF B          | OK     | 43 degrees C / 109 degrees F |
|      | FPC 0 Intake       | OK     | 36 degrees C / 96 degrees F  |
|      | FPC 0 Exhaust A    | OK     | 39 degrees C / 102 degrees F |
|      | FPC 0 Exhaust B    | OK     | 51 degrees C / 123 degrees F |
|      | FPC 0 I3 0 TSensor | OK     | 49 degrees C / 120 degrees F |
|      | FPC 0 I3 0 Chip    | OK     | 56 degrees C / 132 degrees F |
|      | FPC 0 I3 1 TSensor | OK     | 47 degrees C / 116 degrees F |
|      | FPC 0 I3 1 Chip    | OK     | 52 degrees C / 125 degrees F |
|      | FPC 0 I3 2 TSensor | OK     | 46 degrees C / 114 degrees F |
|      | FPC 0 I3 2 Chip    | OK     | 48 degrees C / 118 degrees F |
|      | FPC 0 I3 3 TSensor | OK     | 42 degrees C / 107 degrees F |
|      | FPC 0 I3 3 Chip    | OK     | 45 degrees C / 113 degrees F |
|      | FPC 0 IA 0 TSensor | OK     | 45 degrees C / 113 degrees F |
|      | FPC 0 IA 0 Chip    | OK     | 45 degrees C / 113 degrees F |
|      | FPC 0 IA 1 TSensor | OK     | 44 degrees C / 111 degrees F |
|      | FPC 0 IA 1 Chip    | OK     | 48 degrees C / 118 degrees F |
|      | FPC 1 Intake       | OK     | 37 degrees C / 98 degrees F  |
|      | FPC 1 Exhaust A    | OK     | 41 degrees C / 105 degrees F |
|      | FPC 1 Exhaust B    | OK     | 52 degrees C / 125 degrees F |
|      | FPC 1 I3 0 TSensor | OK     | 51 degrees C / 123 degrees F |
|      | FPC 1 I3 0 Chip    | OK     | 57 degrees C / 134 degrees F |
|      | FPC 1 I3 1 TSensor | OK     | 48 degrees C / 118 degrees F |
|      | FPC 1 I3 1 Chip    | OK     | 52 degrees C / 125 degrees F |
|      | FPC 1 I3 2 TSensor | OK     | 46 degrees C / 114 degrees F |
|      | FPC 1 I3 2 Chip    | OK     | 50 degrees C / 122 degrees F |
|      | FPC 1 I3 3 TSensor | OK     | 42 degrees C / 107 degrees F |
|      | FPC 1 I3 3 Chip    | OK     | 46 degrees C / 114 degrees F |
|      | FPC 1 IA 0 TSensor | OK     | 49 degrees C / 120 degrees F |
|      | FPC 1 IA 0 Chip    | OK     | 48 degrees C / 118 degrees F |
|      | FPC 1 IA 1 TSensor | OK     | 46 degrees C / 114 degrees F |
|      | FPC 1 IA 1 Chip    | OK     | 50 degrees C / 122 degrees F |
| Fans | Top Rear Fan       | OK     | Spinning at normal speed     |
|      | Bottom Rear Fan    | OK     | Spinning at normal speed     |
|      | Top Middle Fan     | OK     | Spinning at normal speed     |
|      | Bottom Middle Fan  | OK     | Spinning at normal speed     |
|      | Top Front Fan      | OK     | Spinning at normal speed     |
|      | Bottom Front Fan   | OK     | Spinning at normal speed     |

#### show chassis environment (MX480 Router with SCBE)

```
user@host> show chassis environment
```

| Class | Item  | Status | Measurement                  |
|-------|-------|--------|------------------------------|
| Temp  | PEM 0 | OK     | 35 degrees C / 95 degrees F  |
|       | PEM 1 | OK     | 40 degrees C / 104 degrees F |
|       | PEM 2 | Absent |                              |



|                    |        |                              |
|--------------------|--------|------------------------------|
| PEM 3              | Absent |                              |
| Routing Engine 0   | OK     | 44 degrees C / 111 degrees F |
| Routing Engine 1   | OK     | 45 degrees C / 113 degrees F |
| CB 0 Intake        | OK     | 36 degrees C / 96 degrees F  |
| CB 0 Exhaust A     | OK     | 38 degrees C / 100 degrees F |
| CB 0 Exhaust B     | OK     | 39 degrees C / 102 degrees F |
| CB 0 ACBC          | OK     | 37 degrees C / 98 degrees F  |
| CB 0 XF A          | OK     | 51 degrees C / 123 degrees F |
| CB 0 XF B          | OK     | 44 degrees C / 111 degrees F |
| CB 1 Intake        | OK     | 36 degrees C / 96 degrees F  |
| CB 1 Exhaust A     | OK     | 39 degrees C / 102 degrees F |
| CB 1 Exhaust B     | OK     | 40 degrees C / 104 degrees F |
| CB 1 ACBC          | OK     | 37 degrees C / 98 degrees F  |
| CB 1 XF A          | OK     | 50 degrees C / 122 degrees F |
| CB 1 XF B          | OK     | 43 degrees C / 109 degrees F |
| FPC 0 Intake       | OK     | 36 degrees C / 96 degrees F  |
| FPC 0 Exhaust A    | OK     | 39 degrees C / 102 degrees F |
| FPC 0 Exhaust B    | OK     | 51 degrees C / 123 degrees F |
| FPC 0 I3 0 TSensor | OK     | 49 degrees C / 120 degrees F |
| FPC 0 I3 0 Chip    | OK     | 56 degrees C / 132 degrees F |
| FPC 0 I3 1 TSensor | OK     | 47 degrees C / 116 degrees F |
| FPC 0 I3 1 Chip    | OK     | 52 degrees C / 125 degrees F |
| FPC 0 I3 2 TSensor | OK     | 46 degrees C / 114 degrees F |
| FPC 0 I3 2 Chip    | OK     | 48 degrees C / 118 degrees F |
| FPC 0 I3 3 TSensor | OK     | 42 degrees C / 107 degrees F |
| FPC 0 I3 3 Chip    | OK     | 45 degrees C / 113 degrees F |
| FPC 0 IA 0 TSensor | OK     | 45 degrees C / 113 degrees F |
| FPC 0 IA 0 Chip    | OK     | 45 degrees C / 113 degrees F |
| FPC 0 IA 1 TSensor | OK     | 44 degrees C / 111 degrees F |
| FPC 0 IA 1 Chip    | OK     | 48 degrees C / 118 degrees F |
| FPC 1 Intake       | OK     | 37 degrees C / 98 degrees F  |
| FPC 1 Exhaust A    | OK     | 41 degrees C / 105 degrees F |
| FPC 1 Exhaust B    | OK     | 52 degrees C / 125 degrees F |
| FPC 1 I3 0 TSensor | OK     | 51 degrees C / 123 degrees F |
| FPC 1 I3 0 Chip    | OK     | 57 degrees C / 134 degrees F |
| FPC 1 I3 1 TSensor | OK     | 48 degrees C / 118 degrees F |
| FPC 1 I3 1 Chip    | OK     | 52 degrees C / 125 degrees F |
| FPC 1 I3 2 TSensor | OK     | 46 degrees C / 114 degrees F |
| FPC 1 I3 2 Chip    | OK     | 50 degrees C / 122 degrees F |
| FPC 1 I3 3 TSensor | OK     | 42 degrees C / 107 degrees F |
| FPC 1 I3 3 Chip    | OK     | 46 degrees C / 114 degrees F |
| FPC 1 IA 0 TSensor | OK     | 49 degrees C / 120 degrees F |
| FPC 1 IA 0 Chip    | OK     | 48 degrees C / 118 degrees F |
| FPC 1 IA 1 TSensor | OK     | 46 degrees C / 114 degrees F |
| FPC 1 IA 1 Chip    | OK     | 50 degrees C / 122 degrees F |
| Fans               |        |                              |
| Top Rear Fan       | OK     | Spinning at normal speed     |
| Bottom Rear Fan    | OK     | Spinning at normal speed     |
| Top Middle Fan     | OK     | Spinning at normal speed     |
| Bottom Middle Fan  | OK     | Spinning at normal speed     |
| Top Front Fan      | OK     | Spinning at normal speed     |
| Bottom Front Fan   | OK     | Spinning at normal speed     |

### show chassis environment (MX960 Router)

|                                     |                  |        |                             |
|-------------------------------------|------------------|--------|-----------------------------|
| user@host> show chassis environment |                  |        |                             |
| Class                               | Item             | Status | Measurement                 |
| Temp                                | PEM 0            | Absent |                             |
|                                     | PEM 1            | Absent |                             |
|                                     | PEM 2            | Check  |                             |
|                                     | PEM 3            | OK     | 35 degrees C / 95 degrees F |
|                                     | Routing Engine 0 | OK     | 37 degrees C / 98 degrees F |

|      |                      |        |                              |
|------|----------------------|--------|------------------------------|
|      | Routing Engine 1     | Absent |                              |
|      | CB 0 Intake          | OK     | 24 degrees C / 75 degrees F  |
|      | CB 0 Exhaust A       | OK     | 30 degrees C / 86 degrees F  |
|      | CB 0 Exhaust B       | OK     | 27 degrees C / 80 degrees F  |
|      | CB 1 Intake          | Absent |                              |
|      | CB 1 Exhaust A       | Absent |                              |
|      | CB 1 Exhaust B       | Absent |                              |
|      | CB 1 ACBC            | Absent |                              |
|      | CB 1 SF A            | Absent |                              |
|      | CB 1 SF B            | Absent |                              |
|      | CB 2 Intake          | Absent |                              |
|      | CB 2 Exhaust A       | Absent |                              |
|      | CB 2 Exhaust B       | Absent |                              |
|      | CB 2 ACBC            | Absent |                              |
|      | CB 2 SF A            | Absent |                              |
|      | CB 2 SF B            | Absent |                              |
|      | FPC 4 Intake         | OK     | 24 degrees C / 75 degrees F  |
|      | FPC 4 Exhaust A      | OK     | 36 degrees C / 96 degrees F  |
|      | FPC 4 Exhaust B      | OK     | 38 degrees C / 100 degrees F |
|      | FPC 7 Intake         | OK     | 24 degrees C / 75 degrees F  |
|      | FPC 7 Exhaust A      | OK     | 36 degrees C / 96 degrees F  |
|      | FPC 7 Exhaust B      | OK     | 42 degrees C / 107 degrees F |
| Fans | Top Fan Tray Temp    | Failed |                              |
|      | Top Tray Fan 1       | OK     | Spinning at normal speed     |
|      | Top Tray Fan 2       | OK     | Spinning at normal speed     |
|      | Top Tray Fan 3       | OK     | Spinning at normal speed     |
|      | Top Tray Fan 4       | OK     | Spinning at normal speed     |
|      | Top Tray Fan 5       | OK     | Spinning at normal speed     |
|      | Top Tray Fan 6       | OK     | Spinning at normal speed     |
|      | Bottom Fan Tray Temp | Failed |                              |
|      | Bottom Tray Fan 1    | OK     | Spinning at normal speed     |
|      | Bottom Tray Fan 2    | OK     | Spinning at normal speed     |
|      | Bottom Tray Fan 3    | OK     | Spinning at normal speed     |
|      | Bottom Tray Fan 4    | OK     | Spinning at normal speed     |
|      | Bottom Tray Fan 5    | OK     | Spinning at normal speed     |
|      | Bottom Tray Fan 6    | OK     | Spinning at normal speed     |

### show chassis environment (MX960 Router with SCBE)

|                                     |                      |        |                              |
|-------------------------------------|----------------------|--------|------------------------------|
| user@host> show chassis environment |                      |        |                              |
| Class                               | Item                 | Status | Measurement                  |
| Temp                                | PEM 0                | Absent |                              |
|                                     | PEM 1                | OK     | 50 degrees C / 122 degrees F |
|                                     | PEM 2                | OK     | 50 degrees C / 122 degrees F |
|                                     | PEM 3                | OK     | 50 degrees C / 122 degrees F |
|                                     | Routing Engine 0     | OK     | 42 degrees C / 107 degrees F |
|                                     | Routing Engine 0 CPU | OK     | 51 degrees C / 123 degrees F |
|                                     | Routing Engine 1     | OK     | 39 degrees C / 102 degrees F |
|                                     | Routing Engine 1 CPU | OK     | 44 degrees C / 111 degrees F |
|                                     | CB 0 Intake          | OK     | 35 degrees C / 95 degrees F  |
|                                     | CB 0 Exhaust A       | OK     | 36 degrees C / 96 degrees F  |
|                                     | CB 0 Exhaust B       | OK     | 43 degrees C / 109 degrees F |
|                                     | CB 0 ACBC            | OK     | 38 degrees C / 100 degrees F |
|                                     | CB 0 XF A            | OK     | 53 degrees C / 127 degrees F |
|                                     | CB 0 XF B            | OK     | 47 degrees C / 116 degrees F |
|                                     | CB 1 Intake          | OK     | 35 degrees C / 95 degrees F  |
|                                     | CB 1 Exhaust A       | OK     | 35 degrees C / 95 degrees F  |
|                                     | CB 1 Exhaust B       | OK     | 41 degrees C / 105 degrees F |
|                                     | CB 1 ACBC            | OK     | 38 degrees C / 100 degrees F |
|                                     | CB 1 XF A            | OK     | 52 degrees C / 125 degrees F |
|                                     | CB 1 XF B            | OK     | 47 degrees C / 116 degrees F |

|                         |    |                              |
|-------------------------|----|------------------------------|
| CB 2 Intake             | OK | 32 degrees C / 89 degrees F  |
| CB 2 Exhaust A          | OK | 30 degrees C / 86 degrees F  |
| CB 2 Exhaust B          | OK | 35 degrees C / 95 degrees F  |
| CB 2 ACBC               | OK | 33 degrees C / 91 degrees F  |
| CB 2 XF A               | OK | 51 degrees C / 123 degrees F |
| CB 2 XF B               | OK | 50 degrees C / 122 degrees F |
| FPC 0 Intake            | OK | 35 degrees C / 95 degrees F  |
| FPC 0 Exhaust A         | OK | 39 degrees C / 102 degrees F |
| FPC 0 Exhaust B         | OK | 50 degrees C / 122 degrees F |
| FPC 0 I3 0 TSensor      | OK | 50 degrees C / 122 degrees F |
| FPC 0 I3 0 Chip         | OK | 56 degrees C / 132 degrees F |
| FPC 0 I3 1 TSensor      | OK | 47 degrees C / 116 degrees F |
| FPC 0 I3 1 Chip         | OK | 50 degrees C / 122 degrees F |
| FPC 0 I3 2 TSensor      | OK | 45 degrees C / 113 degrees F |
| FPC 0 I3 2 Chip         | OK | 48 degrees C / 118 degrees F |
| FPC 0 I3 3 TSensor      | OK | 41 degrees C / 105 degrees F |
| FPC 0 I3 3 Chip         | OK | 44 degrees C / 111 degrees F |
| FPC 0 IA 0 TSensor      | OK | 45 degrees C / 113 degrees F |
| FPC 0 IA 0 Chip         | OK | 45 degrees C / 113 degrees F |
| FPC 0 IA 1 TSensor      | OK | 44 degrees C / 111 degrees F |
| FPC 0 IA 1 Chip         | OK | 48 degrees C / 118 degrees F |
| FPC 1 Intake            | OK | 36 degrees C / 96 degrees F  |
| FPC 1 Exhaust A         | OK | 47 degrees C / 116 degrees F |
| FPC 1 Exhaust B         | OK | 43 degrees C / 109 degrees F |
| FPC 1 LU 0 TCAM TSensor | OK | 53 degrees C / 127 degrees F |
| FPC 1 LU 0 TCAM Chip    | OK | 57 degrees C / 134 degrees F |
| FPC 1 LU 0 TSensor      | OK | 53 degrees C / 127 degrees F |
| FPC 1 LU 0 Chip         | OK | 60 degrees C / 140 degrees F |
| FPC 1 MQ 0 TSensor      | OK | 53 degrees C / 127 degrees F |
| FPC 1 MQ 0 Chip         | OK | 56 degrees C / 132 degrees F |
| FPC 1 LU 1 TCAM TSensor | OK | 51 degrees C / 123 degrees F |
| FPC 1 LU 1 TCAM Chip    | OK | 52 degrees C / 125 degrees F |
| FPC 1 LU 1 TSensor      | OK | 51 degrees C / 123 degrees F |
| FPC 1 LU 1 Chip         | OK | 53 degrees C / 127 degrees F |
| FPC 1 MQ 1 TSensor      | OK | 51 degrees C / 123 degrees F |
| FPC 1 MQ 1 Chip         | OK | 58 degrees C / 136 degrees F |
| FPC 2 Intake            | OK | 35 degrees C / 95 degrees F  |
| FPC 2 Exhaust A         | OK | 39 degrees C / 102 degrees F |
| FPC 2 Exhaust B         | OK | 54 degrees C / 129 degrees F |
| FPC 2 I3 0 TSensor      | OK | 52 degrees C / 125 degrees F |
| FPC 2 I3 0 Chip         | OK | 59 degrees C / 138 degrees F |
| FPC 2 I3 1 TSensor      | OK | 48 degrees C / 118 degrees F |
| FPC 2 I3 1 Chip         | OK | 52 degrees C / 125 degrees F |
| FPC 2 I3 2 TSensor      | OK | 47 degrees C / 116 degrees F |
| FPC 2 I3 2 Chip         | OK | 49 degrees C / 120 degrees F |
| FPC 2 I3 3 TSensor      | OK | 41 degrees C / 105 degrees F |
| FPC 2 I3 3 Chip         | OK | 44 degrees C / 111 degrees F |
| FPC 2 IA 0 TSensor      | OK | 47 degrees C / 116 degrees F |
| FPC 2 IA 0 Chip         | OK | 46 degrees C / 114 degrees F |
| FPC 2 IA 1 TSensor      | OK | 45 degrees C / 113 degrees F |
| FPC 2 IA 1 Chip         | OK | 49 degrees C / 120 degrees F |
| FPC 3 Intake            | OK | 34 degrees C / 93 degrees F  |
| FPC 3 Exhaust A         | OK | 34 degrees C / 93 degrees F  |
| FPC 3 Exhaust B         | OK | 47 degrees C / 116 degrees F |
| FPC 3 I3 0 TSensor      | OK | 48 degrees C / 118 degrees F |
| FPC 3 I3 0 Chip         | OK | 52 degrees C / 125 degrees F |
| FPC 3 I3 1 TSensor      | OK | 46 degrees C / 114 degrees F |
| FPC 3 I3 1 Chip         | OK | 48 degrees C / 118 degrees F |
| FPC 3 IA 0 TSensor      | OK | 41 degrees C / 105 degrees F |
| FPC 3 IA 0 Chip         | OK | 40 degrees C / 104 degrees F |
| FPC 5 Intake            | OK | 42 degrees C / 107 degrees F |

|      |                         |    |                              |
|------|-------------------------|----|------------------------------|
|      | FPC 5 Exhaust A         | OK | 42 degrees C / 107 degrees F |
|      | FPC 5 Exhaust B         | OK | 53 degrees C / 127 degrees F |
|      | FPC 5 LU 0 TSensor      | OK | 53 degrees C / 127 degrees F |
|      | FPC 5 LU 0 Chip         | OK | 54 degrees C / 129 degrees F |
|      | FPC 5 LU 1 TSensor      | OK | 53 degrees C / 127 degrees F |
|      | FPC 5 LU 1 Chip         | OK | 61 degrees C / 141 degrees F |
|      | FPC 5 LU 2 TSensor      | OK | 53 degrees C / 127 degrees F |
|      | FPC 5 LU 2 Chip         | OK | 51 degrees C / 123 degrees F |
|      | FPC 5 LU 3 TSensor      | OK | 53 degrees C / 127 degrees F |
|      | FPC 5 LU 3 Chip         | OK | 53 degrees C / 127 degrees F |
|      | FPC 5 MQ 0 TSensor      | OK | 47 degrees C / 116 degrees F |
|      | FPC 5 MQ 0 Chip         | OK | 52 degrees C / 125 degrees F |
|      | FPC 5 MQ 1 TSensor      | OK | 47 degrees C / 116 degrees F |
|      | FPC 5 MQ 1 Chip         | OK | 52 degrees C / 125 degrees F |
|      | FPC 5 MQ 2 TSensor      | OK | 47 degrees C / 116 degrees F |
|      | FPC 5 MQ 2 Chip         | OK | 46 degrees C / 114 degrees F |
|      | FPC 5 MQ 3 TSensor      | OK | 47 degrees C / 116 degrees F |
|      | FPC 5 MQ 3 Chip         | OK | 45 degrees C / 113 degrees F |
|      | FPC 7 Intake            | OK | 36 degrees C / 96 degrees F  |
|      | FPC 7 Exhaust A         | OK | 35 degrees C / 95 degrees F  |
|      | FPC 7 Exhaust B         | OK | 33 degrees C / 91 degrees F  |
|      | FPC 7 QX 0 TSensor      | OK | 42 degrees C / 107 degrees F |
|      | FPC 7 QX 0 Chip         | OK | 47 degrees C / 116 degrees F |
|      | FPC 7 LU 0 TCAM TSensor | OK | 42 degrees C / 107 degrees F |
|      | FPC 7 LU 0 TCAM Chip    | OK | 44 degrees C / 111 degrees F |
|      | FPC 7 LU 0 TSensor      | OK | 42 degrees C / 107 degrees F |
|      | FPC 7 LU 0 Chip         | OK | 46 degrees C / 114 degrees F |
|      | FPC 7 MQ 0 TSensor      | OK | 42 degrees C / 107 degrees F |
|      | FPC 7 MQ 0 Chip         | OK | 45 degrees C / 113 degrees F |
|      | FPC 8 Intake            | OK | 33 degrees C / 91 degrees F  |
|      | FPC 8 Exhaust A         | OK | 33 degrees C / 91 degrees F  |
|      | FPC 8 Exhaust B         | OK | 36 degrees C / 96 degrees F  |
|      | FPC 8 I3 0 TSensor      | OK | 38 degrees C / 100 degrees F |
|      | FPC 8 I3 0 Chip         | OK | 43 degrees C / 109 degrees F |
|      | FPC 8 BDS 0 TSensor     | OK | 37 degrees C / 98 degrees F  |
|      | FPC 8 BDS 0 Chip        | OK | 36 degrees C / 96 degrees F  |
|      | FPC 8 IA 0 TSensor      | OK | 37 degrees C / 98 degrees F  |
|      | FPC 8 IA 0 Chip         | OK | 37 degrees C / 98 degrees F  |
|      | FPC 10 Intake           | OK | 38 degrees C / 100 degrees F |
|      | FPC 10 Exhaust A        | OK | 36 degrees C / 96 degrees F  |
|      | FPC 10 Exhaust B        | OK | 41 degrees C / 105 degrees F |
|      | FPC 10 I3 0 TSensor     | OK | 40 degrees C / 104 degrees F |
|      | FPC 10 I3 0 Chip        | OK | 42 degrees C / 107 degrees F |
|      | FPC 10 I3 1 TSensor     | OK | 40 degrees C / 104 degrees F |
|      | FPC 10 I3 1 Chip        | OK | 44 degrees C / 111 degrees F |
|      | FPC 10 I3 2 TSensor     | OK | 42 degrees C / 107 degrees F |
|      | FPC 10 I3 2 Chip        | OK | 43 degrees C / 109 degrees F |
|      | FPC 10 I3 3 TSensor     | OK | 39 degrees C / 102 degrees F |
|      | FPC 10 I3 3 Chip        | OK | 44 degrees C / 111 degrees F |
|      | FPC 10 IA 0 TSensor     | OK | 36 degrees C / 96 degrees F  |
|      | FPC 10 IA 0 Chip        | OK | 36 degrees C / 96 degrees F  |
|      | FPC 10 IA 1 TSensor     | OK | 43 degrees C / 109 degrees F |
|      | FPC 10 IA 1 Chip        | OK | 42 degrees C / 107 degrees F |
| Fans | Top Fan Tray Temp       | OK | 37 degrees C / 98 degrees F  |
|      | Top Tray Fan 1          | OK | Spinning at normal speed     |
|      | Top Tray Fan 2          | OK | Spinning at normal speed     |
|      | Top Tray Fan 3          | OK | Spinning at normal speed     |
|      | Top Tray Fan 4          | OK | Spinning at normal speed     |
|      | Top Tray Fan 5          | OK | Spinning at normal speed     |
|      | Top Tray Fan 6          | OK | Spinning at normal speed     |
|      | Bottom Fan Tray Temp    | OK | 28 degrees C / 82 degrees F  |

|                   |    |                          |
|-------------------|----|--------------------------|
| Bottom Tray Fan 1 | OK | Spinning at normal speed |
| Bottom Tray Fan 2 | OK | Spinning at normal speed |
| Bottom Tray Fan 3 | OK | Spinning at normal speed |
| Bottom Tray Fan 4 | OK | Spinning at normal speed |
| Bottom Tray Fan 5 | OK | Spinning at normal speed |
| Bottom Tray Fan 6 | OK | Spinning at normal speed |

### show chassis environment (MX960 Router with MPC5EQ)

```
user@host> show chassis environment
```

| Class | Item                      | Status  | Measurement                  |
|-------|---------------------------|---------|------------------------------|
| Temp  | PEM 0                     | OK      | 50 degrees C / 122 degrees F |
|       | PEM 1                     | OK      | 45 degrees C / 113 degrees F |
|       | PEM 2                     | OK      | 45 degrees C / 113 degrees F |
|       | PEM 3                     | Absent  |                              |
|       | Routing Engine 0          | OK      | 31 degrees C / 87 degrees F  |
|       | Routing Engine 0 CPU      | OK      | 30 degrees C / 86 degrees F  |
|       | Routing Engine 1          | Present |                              |
|       | Routing Engine 1 CPU      | Present |                              |
|       | CB 0 Intake               | OK      | 29 degrees C / 84 degrees F  |
|       | CB 0 Exhaust A            | OK      | 29 degrees C / 84 degrees F  |
|       | CB 0 Exhaust B            | OK      | 34 degrees C / 93 degrees F  |
|       | CB 0 ACBC                 | OK      | 32 degrees C / 89 degrees F  |
|       | CB 0 XF A                 | OK      | 49 degrees C / 120 degrees F |
|       | CB 0 XF B                 | OK      | 45 degrees C / 113 degrees F |
|       | CB 1 Intake               | OK      | 26 degrees C / 78 degrees F  |
|       | CB 1 Exhaust A            | OK      | 26 degrees C / 78 degrees F  |
|       | CB 1 Exhaust B            | OK      | 27 degrees C / 80 degrees F  |
|       | CB 1 ACBC                 | OK      | 26 degrees C / 78 degrees F  |
|       | CB 1 XF A                 | OK      | 32 degrees C / 89 degrees F  |
|       | CB 1 XF B                 | OK      | 32 degrees C / 89 degrees F  |
|       | CB 2 Intake               | OK      | 28 degrees C / 82 degrees F  |
|       | CB 2 Exhaust A            | OK      | 27 degrees C / 80 degrees F  |
|       | CB 2 Exhaust B            | OK      | 33 degrees C / 91 degrees F  |
|       | CB 2 ACBC                 | OK      | 30 degrees C / 86 degrees F  |
|       | CB 2 XF A                 | OK      | 48 degrees C / 118 degrees F |
|       | CB 2 XF B                 | OK      | 46 degrees C / 114 degrees F |
|       | FPC 0 Intake              | OK      | 38 degrees C / 100 degrees F |
|       | FPC 0 Exhaust A           | OK      | 48 degrees C / 118 degrees F |
|       | FPC 0 Exhaust B           | OK      | 49 degrees C / 120 degrees F |
|       | FPC 0 XL TSen             | OK      | 48 degrees C / 118 degrees F |
|       | FPC 0 XL Chip             | OK      | 50 degrees C / 122 degrees F |
|       | FPC 0 XL_XR0 TSen         | OK      | 48 degrees C / 118 degrees F |
|       | FPC 0 XL_XR0 Chip         | OK      | 53 degrees C / 127 degrees F |
|       | FPC 0 XL_XR1 TSen         | OK      | 48 degrees C / 118 degrees F |
|       | FPC 0 XL_XR1 Chip         | OK      | 54 degrees C / 129 degrees F |
|       | FPC 0 XQ TSen             | OK      | 48 degrees C / 118 degrees F |
|       | FPC 0 XQ Chip             | OK      | 52 degrees C / 125 degrees F |
|       | FPC 0 XQ_XR0 TSen         | OK      | 48 degrees C / 118 degrees F |
|       | FPC 0 XQ_XR0 Chip         | OK      | 62 degrees C / 143 degrees F |
|       | FPC 0 XQ_XR1 TSen         | OK      | 48 degrees C / 118 degrees F |
|       | FPC 0 XQ_XR1 Chip         | OK      | 62 degrees C / 143 degrees F |
|       | FPC 0 XM 0 TSen           | OK      | 53 degrees C / 127 degrees F |
|       | FPC 0 XM 0 Chip           | OK      | 63 degrees C / 145 degrees F |
|       | FPC 0 XM 1 TSen           | OK      | 53 degrees C / 127 degrees F |
|       | FPC 0 XM 1 Chip           | OK      | 46 degrees C / 114 degrees F |
|       | FPC 0 PLX PCIe Switch TSe | OK      | 53 degrees C / 127 degrees F |
|       | FPC 0 PLX PCIe Switch Chi | OK      | 66 degrees C / 150 degrees F |
|       | FPC 1 Intake              | OK      | 31 degrees C / 87 degrees F  |
|       | FPC 1 Exhaust A           | OK      | 38 degrees C / 100 degrees F |
|       | FPC 1 Exhaust B           | OK      | 49 degrees C / 120 degrees F |

|                           |    |                              |
|---------------------------|----|------------------------------|
| FPC 1 LU 0 TSen           | OK | 41 degrees C / 105 degrees F |
| FPC 1 LU 0 Chip           | OK | 47 degrees C / 116 degrees F |
| FPC 1 LU 1 TSen           | OK | 41 degrees C / 105 degrees F |
| FPC 1 LU 1 Chip           | OK | 42 degrees C / 107 degrees F |
| FPC 1 LU 2 TSen           | OK | 41 degrees C / 105 degrees F |
| FPC 1 LU 2 Chip           | OK | 46 degrees C / 114 degrees F |
| FPC 1 LU 3 TSen           | OK | 41 degrees C / 105 degrees F |
| FPC 1 LU 3 Chip           | OK | 51 degrees C / 123 degrees F |
| FPC 1 XM 0 TSen           | OK | 41 degrees C / 105 degrees F |
| FPC 1 XM 0 Chip           | OK | 49 degrees C / 120 degrees F |
| FPC 1 XF 0 TSen           | OK | 41 degrees C / 105 degrees F |
| FPC 1 XF 0 Chip           | OK | 63 degrees C / 145 degrees F |
| FPC 1 PLX Switch TSen     | OK | 41 degrees C / 105 degrees F |
| FPC 1 PLX Switch Chip     | OK | 43 degrees C / 109 degrees F |
| FPC 3 Intake              | OK | 31 degrees C / 87 degrees F  |
| FPC 3 Exhaust A           | OK | 37 degrees C / 98 degrees F  |
| FPC 3 Exhaust B           | OK | 43 degrees C / 109 degrees F |
| FPC 3 LU 0 TSen           | OK | 42 degrees C / 107 degrees F |
| FPC 3 LU 0 Chip           | OK | 43 degrees C / 109 degrees F |
| FPC 3 LU 1 TSen           | OK | 42 degrees C / 107 degrees F |
| FPC 3 LU 1 Chip           | OK | 46 degrees C / 114 degrees F |
| FPC 3 LU 2 TSen           | OK | 42 degrees C / 107 degrees F |
| FPC 3 LU 2 Chip           | OK | 40 degrees C / 104 degrees F |
| FPC 3 LU 3 TSen           | OK | 42 degrees C / 107 degrees F |
| FPC 3 LU 3 Chip           | OK | 41 degrees C / 105 degrees F |
| FPC 3 MQ 0 TSen           | OK | 37 degrees C / 98 degrees F  |
| FPC 3 MQ 0 Chip           | OK | 37 degrees C / 98 degrees F  |
| FPC 3 MQ 1 TSen           | OK | 37 degrees C / 98 degrees F  |
| FPC 3 MQ 1 Chip           | OK | 40 degrees C / 104 degrees F |
| FPC 3 MQ 2 TSen           | OK | 37 degrees C / 98 degrees F  |
| FPC 3 MQ 2 Chip           | OK | 36 degrees C / 96 degrees F  |
| FPC 3 MQ 3 TSen           | OK | 37 degrees C / 98 degrees F  |
| FPC 3 MQ 3 Chip           | OK | 38 degrees C / 100 degrees F |
| FPC 4 Intake              | OK | 34 degrees C / 93 degrees F  |
| FPC 4 Exhaust A           | OK | 45 degrees C / 113 degrees F |
| FPC 4 Exhaust B           | OK | 47 degrees C / 116 degrees F |
| FPC 4 XL TSen             | OK | 44 degrees C / 111 degrees F |
| FPC 4 XL Chip             | OK | 47 degrees C / 116 degrees F |
| FPC 4 XL_XR0 TSen         | OK | 44 degrees C / 111 degrees F |
| FPC 4 XL_XR0 Chip         | OK | 48 degrees C / 118 degrees F |
| FPC 4 XL_XR1 TSen         | OK | 44 degrees C / 111 degrees F |
| FPC 4 XL_XR1 Chip         | OK | 47 degrees C / 116 degrees F |
| FPC 4 XQ TSen             | OK | 44 degrees C / 111 degrees F |
| FPC 4 XQ Chip             | OK | 47 degrees C / 116 degrees F |
| FPC 4 XQ_XR0 TSen         | OK | 44 degrees C / 111 degrees F |
| FPC 4 XQ_XR0 Chip         | OK | 57 degrees C / 134 degrees F |
| FPC 4 XQ_XR1 TSen         | OK | 44 degrees C / 111 degrees F |
| FPC 4 XQ_XR1 Chip         | OK | 58 degrees C / 136 degrees F |
| FPC 4 XM 0 TSen           | OK | 51 degrees C / 123 degrees F |
| FPC 4 XM 0 Chip           | OK | 61 degrees C / 141 degrees F |
| FPC 4 XM 1 TSen           | OK | 51 degrees C / 123 degrees F |
| FPC 4 XM 1 Chip           | OK | 47 degrees C / 116 degrees F |
| FPC 4 PLX PCIe Switch TSe | OK | 51 degrees C / 123 degrees F |
| FPC 4 PLX PCIe Switch Chi | OK | 60 degrees C / 140 degrees F |
| FPC 5 Intake              | OK | 34 degrees C / 93 degrees F  |
| FPC 5 Exhaust A           | OK | 45 degrees C / 113 degrees F |
| FPC 5 Exhaust B           | OK | 47 degrees C / 116 degrees F |
| FPC 5 XL TSen             | OK | 45 degrees C / 113 degrees F |
| FPC 5 XL Chip             | OK | 47 degrees C / 116 degrees F |
| FPC 5 XL_XR0 TSen         | OK | 45 degrees C / 113 degrees F |
| FPC 5 XL_XR0 Chip         | OK | 49 degrees C / 120 degrees F |

|                           |    |                              |
|---------------------------|----|------------------------------|
| FPC 5 XL_XR1 TSen         | OK | 45 degrees C / 113 degrees F |
| FPC 5 XL_XR1 Chip         | OK | 49 degrees C / 120 degrees F |
| FPC 5 XQ TSen             | OK | 45 degrees C / 113 degrees F |
| FPC 5 XQ Chip             | OK | 48 degrees C / 118 degrees F |
| FPC 5 XQ_XR0 TSen         | OK | 45 degrees C / 113 degrees F |
| FPC 5 XQ_XR0 Chip         | OK | 60 degrees C / 140 degrees F |
| FPC 5 XQ_XR1 TSen         | OK | 45 degrees C / 113 degrees F |
| FPC 5 XQ_XR1 Chip         | OK | 58 degrees C / 136 degrees F |
| FPC 5 XM 0 TSen           | OK | 50 degrees C / 122 degrees F |
| FPC 5 XM 0 Chip           | OK | 48 degrees C / 118 degrees F |
| FPC 5 XM 1 TSen           | OK | 50 degrees C / 122 degrees F |
| FPC 5 XM 1 Chip           | OK | 47 degrees C / 116 degrees F |
| FPC 5 PLX PCIe Switch TSe | OK | 50 degrees C / 122 degrees F |
| FPC 5 PLX PCIe Switch Chi | OK | 59 degrees C / 138 degrees F |
| FPC 7 Intake              | OK | 32 degrees C / 89 degrees F  |
| FPC 7 Exhaust A           | OK | 32 degrees C / 89 degrees F  |
| FPC 7 Exhaust B           | OK | 33 degrees C / 91 degrees F  |
| FPC 7 LU 0 TSen           | OK | 49 degrees C / 120 degrees F |
| FPC 7 LU 0 Chip           | OK | 44 degrees C / 111 degrees F |
| FPC 7 LU 1 TSen           | OK | 49 degrees C / 120 degrees F |
| FPC 7 LU 1 Chip           | OK | 47 degrees C / 116 degrees F |
| FPC 7 LU 2 TSen           | OK | 49 degrees C / 120 degrees F |
| FPC 7 LU 2 Chip           | OK | 39 degrees C / 102 degrees F |
| FPC 7 LU 3 TSen           | OK | 49 degrees C / 120 degrees F |
| FPC 7 LU 3 Chip           | OK | 43 degrees C / 109 degrees F |
| FPC 7 XM 0 TSen           | OK | 49 degrees C / 120 degrees F |
| FPC 7 XM 0 Chip           | OK | 57 degrees C / 134 degrees F |
| FPC 7 XM 1 TSen           | OK | 49 degrees C / 120 degrees F |
| FPC 7 XM 1 Chip           | OK | 48 degrees C / 118 degrees F |
| FPC 7 PLX Switch TSen     | OK | 49 degrees C / 120 degrees F |
| FPC 7 PLX Switch Chip     | OK | 45 degrees C / 113 degrees F |
| FPC 8 Intake              | OK | 36 degrees C / 96 degrees F  |
| FPC 8 Exhaust A           | OK | 51 degrees C / 123 degrees F |
| FPC 8 Exhaust B           | OK | 46 degrees C / 114 degrees F |
| FPC 8 XL TSen             | OK | 46 degrees C / 114 degrees F |
| FPC 8 XL Chip             | OK | 47 degrees C / 116 degrees F |
| FPC 8 XL_XR0 TSen         | OK | 46 degrees C / 114 degrees F |
| FPC 8 XL_XR0 Chip         | OK | 53 degrees C / 127 degrees F |
| FPC 8 XL_XR1 TSen         | OK | 46 degrees C / 114 degrees F |
| FPC 8 XL_XR1 Chip         | OK | 52 degrees C / 125 degrees F |
| FPC 8 XQ TSen             | OK | 46 degrees C / 114 degrees F |
| FPC 8 XQ Chip             | OK | 46 degrees C / 114 degrees F |
| FPC 8 XQ_XR0 TSen         | OK | 46 degrees C / 114 degrees F |
| FPC 8 XQ_XR0 Chip         | OK | 59 degrees C / 138 degrees F |
| FPC 8 XQ_XR1 TSen         | OK | 46 degrees C / 114 degrees F |
| FPC 8 XQ_XR1 Chip         | OK | 57 degrees C / 134 degrees F |
| FPC 8 XM 0 TSen           | OK | 52 degrees C / 125 degrees F |
| FPC 8 XM 0 Chip           | OK | 61 degrees C / 141 degrees F |
| FPC 8 XM 1 TSen           | OK | 52 degrees C / 125 degrees F |
| FPC 8 XM 1 Chip           | OK | 47 degrees C / 116 degrees F |
| FPC 8 PLX PCIe Switch TSe | OK | 52 degrees C / 125 degrees F |
| FPC 8 PLX PCIe Switch Chi | OK | 63 degrees C / 145 degrees F |
| FPC 9 Intake              | OK | 31 degrees C / 87 degrees F  |
| FPC 9 Exhaust A           | OK | 34 degrees C / 93 degrees F  |
| FPC 9 Exhaust B           | OK | 35 degrees C / 95 degrees F  |
| FPC 9 QX 0 TSen           | OK | 42 degrees C / 107 degrees F |
| FPC 9 QX 0 Chip           | OK | 45 degrees C / 113 degrees F |
| FPC 9 LU 0 TCAM TSen      | OK | 42 degrees C / 107 degrees F |
| FPC 9 LU 0 TCAM Chip      | OK | 41 degrees C / 105 degrees F |
| FPC 9 LU 0 TSen           | OK | 42 degrees C / 107 degrees F |
| FPC 9 LU 0 Chip           | OK | 43 degrees C / 109 degrees F |

|                |                            |                        |                              |
|----------------|----------------------------|------------------------|------------------------------|
|                | FPC 9 MQ 0 TSen            | OK                     | 42 degrees C / 107 degrees F |
|                | FPC 9 MQ 0 Chip            | OK                     | 43 degrees C / 109 degrees F |
|                | FPC 9 QX 1 TSen            | OK                     | 38 degrees C / 100 degrees F |
|                | FPC 9 QX 1 Chip            | OK                     | 40 degrees C / 104 degrees F |
|                | FPC 9 LU 1 TCAM TSen       | OK                     | 38 degrees C / 100 degrees F |
|                | FPC 9 LU 1 TCAM Chip       | OK                     | 38 degrees C / 100 degrees F |
|                | FPC 9 LU 1 TSen            | OK                     | 38 degrees C / 100 degrees F |
|                | FPC 9 LU 1 Chip            | OK                     | 41 degrees C / 105 degrees F |
|                | FPC 9 MQ 1 TSen            | OK                     | 38 degrees C / 100 degrees F |
|                | FPC 9 MQ 1 Chip            | OK                     | 41 degrees C / 105 degrees F |
|                | FPC 10 Intake              | OK                     | 35 degrees C / 95 degrees F  |
|                | FPC 10 Exhaust A           | OK                     | 51 degrees C / 123 degrees F |
|                | FPC 10 Exhaust B           | OK                     | 46 degrees C / 114 degrees F |
|                | FPC 10 XL TSen             | OK                     | 42 degrees C / 107 degrees F |
|                | FPC 10 XL Chip             | OK                     | 44 degrees C / 111 degrees F |
|                | FPC 10 XL_XR0 TSen         | OK                     | 42 degrees C / 107 degrees F |
|                | FPC 10 XL_XR0 Chip         | OK                     | 47 degrees C / 116 degrees F |
|                | FPC 10 XL_XR1 TSen         | OK                     | 42 degrees C / 107 degrees F |
|                | FPC 10 XL_XR1 Chip         | OK                     | 48 degrees C / 118 degrees F |
|                | FPC 10 XQ TSen             | OK                     | 42 degrees C / 107 degrees F |
|                | FPC 10 XQ Chip             | OK                     | 46 degrees C / 114 degrees F |
|                | FPC 10 XQ_XR0 TSen         | OK                     | 42 degrees C / 107 degrees F |
|                | FPC 10 XQ_XR0 Chip         | OK                     | 57 degrees C / 134 degrees F |
|                | FPC 10 XQ_XR1 TSen         | OK                     | 42 degrees C / 107 degrees F |
|                | FPC 10 XQ_XR1 Chip         | OK                     | 53 degrees C / 127 degrees F |
|                | FPC 10 XM 0 TSen           | OK                     | 51 degrees C / 123 degrees F |
|                | FPC 10 XM 0 Chip           | OK                     | 61 degrees C / 141 degrees F |
|                | FPC 10 XM 1 TSen           | OK                     | 51 degrees C / 123 degrees F |
|                | FPC 10 XM 1 Chip           | OK                     | 49 degrees C / 120 degrees F |
|                | FPC 10 PLX PCIe Switch TSe | OK                     | 51 degrees C / 123 degrees F |
|                | FPC 10 PLX PCIe Switch Chi | OK                     | 61 degrees C / 141 degrees F |
|                | FPC 11 Intake              | OK                     | 33 degrees C / 91 degrees F  |
|                | FPC 11 Exhaust A           | OK                     | 33 degrees C / 91 degrees F  |
|                | FPC 11 Exhaust B           | OK                     | 34 degrees C / 93 degrees F  |
|                | FPC 11 LU 0 TSen           | OK                     | 50 degrees C / 122 degrees F |
|                | FPC 11 LU 0 Chip           | OK                     | 48 degrees C / 118 degrees F |
|                | FPC 11 LU 1 TSen           | OK                     | 50 degrees C / 122 degrees F |
|                | FPC 11 LU 1 Chip           | OK                     | 50 degrees C / 122 degrees F |
|                | FPC 11 LU 2 TSen           | OK                     | 50 degrees C / 122 degrees F |
|                | FPC 11 LU 2 Chip           | OK                     | 41 degrees C / 105 degrees F |
|                | FPC 11 LU 3 TSen           | OK                     | 50 degrees C / 122 degrees F |
|                | FPC 11 LU 3 Chip           | OK                     | 48 degrees C / 118 degrees F |
|                | FPC 11 XM 0 TSen           | OK                     | 50 degrees C / 122 degrees F |
|                | FPC 11 XM 0 Chip           | OK                     | 57 degrees C / 134 degrees F |
|                | FPC 11 XM 1 TSen           | OK                     | 50 degrees C / 122 degrees F |
|                | FPC 11 XM 1 Chip           | OK                     | 52 degrees C / 125 degrees F |
|                | FPC 11 PLX Switch TSen     | OK                     | 50 degrees C / 122 degrees F |
|                | FPC 11 PLX Switch Chip     | OK                     | 45 degrees C / 113 degrees F |
| Fans           | Top Fan Tray Temp          | OK                     | 42 degrees C / 107 degrees F |
|                | Top Tray Fan 1             | OK                     | Spinning at high speed       |
| Top Tray Fan 2 | OK                         | Spinning at high speed |                              |
|                | Top Tray Fan 3             | OK                     | Spinning at high speed       |
|                | Top Tray Fan 4             | OK                     | Spinning at high speed       |
|                | Top Tray Fan 5             | OK                     | Spinning at high speed       |
|                | Top Tray Fan 6             | OK                     | Spinning at high speed       |
|                | Top Tray Fan 7             | OK                     | Spinning at high speed       |
|                | Top Tray Fan 8             | OK                     | Spinning at high speed       |
|                | Top Tray Fan 9             | OK                     | Spinning at high speed       |
|                | Top Tray Fan 10            | OK                     | Spinning at high speed       |
|                | Top Tray Fan 11            | OK                     | Spinning at high speed       |
|                | Top Tray Fan 12            | OK                     | Spinning at high speed       |



|                      |    |                             |
|----------------------|----|-----------------------------|
| Bottom Fan Tray Temp | OK | 33 degrees C / 91 degrees F |
| Bottom Tray Fan 1    | OK | Spinning at high speed      |
| Bottom Tray Fan 2    | OK | Spinning at high speed      |
| Bottom Tray Fan 3    | OK | Spinning at high speed      |
| Bottom Tray Fan 4    | OK | Spinning at high speed      |
| Bottom Tray Fan 5    | OK | Spinning at high speed      |
| Bottom Tray Fan 6    | OK | Spinning at high speed      |
| Bottom Tray Fan 7    | OK | Spinning at high speed      |
| Bottom Tray Fan 8    | OK | Spinning at high speed      |
| Bottom Tray Fan 9    | OK | Spinning at high speed      |
| Bottom Tray Fan 10   | OK | Spinning at high speed      |
| Bottom Tray Fan 11   | OK | Spinning at high speed      |
| Bottom Tray Fan 12   | OK | Spinning at high speed      |

### show chassis environment (MX2020 Router)

```
user@host> show chassis environment
```

| Class | Item                 | Status | Measurement                  |
|-------|----------------------|--------|------------------------------|
| Temp  | PSM 0                | Absent |                              |
|       | PSM 1                | Absent |                              |
|       | PSM 2                | OK     | 41 degrees C / 105 degrees F |
|       | PSM 3                | OK     | 39 degrees C / 102 degrees F |
|       | PSM 4                | OK     | 39 degrees C / 102 degrees F |
|       | PSM 5                | OK     | 38 degrees C / 100 degrees F |
|       | PSM 6                | OK     | 38 degrees C / 100 degrees F |
|       | PSM 7                | OK     | 38 degrees C / 100 degrees F |
|       | PSM 8                | OK     | 37 degrees C / 98 degrees F  |
|       | PSM 9                | Absent |                              |
|       | PSM 10               | Absent |                              |
|       | PSM 11               | OK     | 47 degrees C / 116 degrees F |
|       | PSM 12               | OK     | 45 degrees C / 113 degrees F |
|       | PSM 13               | OK     | 44 degrees C / 111 degrees F |
|       | PSM 14               | OK     | 44 degrees C / 111 degrees F |
|       | PSM 15               | OK     | 43 degrees C / 109 degrees F |
|       | PSM 16               | OK     | 42 degrees C / 107 degrees F |
|       | PSM 17               | OK     | 41 degrees C / 105 degrees F |
|       | PDM 0                | OK     |                              |
|       | PDM 1                | Absent |                              |
|       | PDM 2                | Absent |                              |
|       | PDM 3                | OK     |                              |
|       | CB 0 IntakeA-Zone0   | OK     | 45 degrees C / 113 degrees F |
|       | CB 0 IntakeB-Zone1   | OK     | 34 degrees C / 93 degrees F  |
|       | CB 0 IntakeC-Zone0   | OK     | 48 degrees C / 118 degrees F |
|       | CB 0 ExhaustA-Zone0  | OK     | 45 degrees C / 113 degrees F |
|       | CB 0 ExhaustB-Zone1  | OK     | 37 degrees C / 98 degrees F  |
|       | CB 0 TCBC-Zone0      | OK     | 41 degrees C / 105 degrees F |
|       | CB 1 IntakeA-Zone0   | OK     | 46 degrees C / 114 degrees F |
|       | CB 1 IntakeB-Zone1   | OK     | 42 degrees C / 107 degrees F |
|       | CB 1 IntakeC-Zone0   | OK     | 49 degrees C / 120 degrees F |
|       | CB 1 ExhaustA-Zone0  | OK     | 46 degrees C / 114 degrees F |
|       | CB 1 ExhaustB-Zone1  | OK     | 41 degrees C / 105 degrees F |
|       | CB 1 TCBC-Zone0      | OK     | 46 degrees C / 114 degrees F |
|       | SPMB 0 Intake        | OK     | 33 degrees C / 91 degrees F  |
|       | SPMB 1 Intake        | OK     | 42 degrees C / 107 degrees F |
|       | Routing Engine 0     | OK     | 35 degrees C / 95 degrees F  |
|       | Routing Engine 0 CPU | OK     | 34 degrees C / 93 degrees F  |
|       | Routing Engine 1     | OK     | 44 degrees C / 111 degrees F |
|       | Routing Engine 1 CPU | OK     | 42 degrees C / 107 degrees F |
|       | SFB 0 Intake-Zone0   | OK     | 55 degrees C / 131 degrees F |
|       | SFB 0 Exhaust-Zone1  | OK     | 48 degrees C / 118 degrees F |
|       | SFB 0 IntakeA-Zone0  | OK     | 50 degrees C / 122 degrees F |

|                     |    |                              |
|---------------------|----|------------------------------|
| SFB 0 IntakeB-Zone1 | OK | 40 degrees C / 104 degrees F |
| SFB 0 Exhaust-Zone0 | OK | 52 degrees C / 125 degrees F |
| SFB 0 SFB-XF2-Zone1 | OK | 61 degrees C / 141 degrees F |
| SFB 0 SFB-XF1-Zone0 | OK | 69 degrees C / 156 degrees F |
| SFB 0 SFB-XF0-Zone0 | OK | 68 degrees C / 154 degrees F |
| SFB 1 Intake-Zone0  | OK | 56 degrees C / 132 degrees F |
| SFB 1 Exhaust-Zone1 | OK | 47 degrees C / 116 degrees F |
| SFB 1 IntakeA-Zone0 | OK | 51 degrees C / 123 degrees F |
| SFB 1 IntakeB-Zone1 | OK | 40 degrees C / 104 degrees F |
| SFB 1 Exhaust-Zone0 | OK | 51 degrees C / 123 degrees F |
| SFB 1 SFB-XF2-Zone1 | OK | 62 degrees C / 143 degrees F |
| SFB 1 SFB-XF1-Zone0 | OK | 67 degrees C / 152 degrees F |
| SFB 1 SFB-XF0-Zone0 | OK | 69 degrees C / 156 degrees F |
| SFB 2 Intake-Zone0  | OK | 56 degrees C / 132 degrees F |
| SFB 2 Exhaust-Zone1 | OK | 47 degrees C / 116 degrees F |
| SFB 2 IntakeA-Zone0 | OK | 51 degrees C / 123 degrees F |
| SFB 2 IntakeB-Zone1 | OK | 40 degrees C / 104 degrees F |
| SFB 2 Exhaust-Zone0 | OK | 53 degrees C / 127 degrees F |
| SFB 2 SFB-XF2-Zone1 | OK | 65 degrees C / 149 degrees F |
| SFB 2 SFB-XF1-Zone0 | OK | 69 degrees C / 156 degrees F |
| SFB 2 SFB-XF0-Zone0 | OK | 70 degrees C / 158 degrees F |
| SFB 3 Intake-Zone0  | OK | 57 degrees C / 134 degrees F |
| SFB 3 Exhaust-Zone1 | OK | 48 degrees C / 118 degrees F |
| SFB 3 IntakeA-Zone0 | OK | 52 degrees C / 125 degrees F |
| SFB 3 IntakeB-Zone1 | OK | 41 degrees C / 105 degrees F |
| SFB 3 Exhaust-Zone0 | OK | 53 degrees C / 127 degrees F |
| SFB 3 SFB-XF2-Zone1 | OK | 66 degrees C / 150 degrees F |
| SFB 3 SFB-XF1-Zone0 | OK | 69 degrees C / 156 degrees F |
| SFB 3 SFB-XF0-Zone0 | OK | 71 degrees C / 159 degrees F |
| SFB 4 Intake-Zone0  | OK | 58 degrees C / 136 degrees F |
| SFB 4 Exhaust-Zone1 | OK | 49 degrees C / 120 degrees F |
| SFB 4 IntakeA-Zone0 | OK | 54 degrees C / 129 degrees F |
| SFB 4 IntakeB-Zone1 | OK | 42 degrees C / 107 degrees F |
| SFB 4 Exhaust-Zone0 | OK | 53 degrees C / 127 degrees F |
| SFB 4 SFB-XF2-Zone1 | OK | 64 degrees C / 147 degrees F |
| SFB 4 SFB-XF1-Zone0 | OK | 68 degrees C / 154 degrees F |
| SFB 4 SFB-XF0-Zone0 | OK | 71 degrees C / 159 degrees F |
| SFB 5 Intake-Zone0  | OK | 58 degrees C / 136 degrees F |
| SFB 5 Exhaust-Zone1 | OK | 50 degrees C / 122 degrees F |
| SFB 5 IntakeA-Zone0 | OK | 53 degrees C / 127 degrees F |
| SFB 5 IntakeB-Zone1 | OK | 43 degrees C / 109 degrees F |
| SFB 5 Exhaust-Zone0 | OK | 54 degrees C / 129 degrees F |
| SFB 5 SFB-XF2-Zone1 | OK | 66 degrees C / 150 degrees F |
| SFB 5 SFB-XF1-Zone0 | OK | 69 degrees C / 156 degrees F |
| SFB 5 SFB-XF0-Zone0 | OK | 74 degrees C / 165 degrees F |
| SFB 6 Intake-Zone0  | OK | 58 degrees C / 136 degrees F |
| SFB 6 Exhaust-Zone1 | OK | 49 degrees C / 120 degrees F |
| SFB 6 IntakeA-Zone0 | OK | 53 degrees C / 127 degrees F |
| SFB 6 IntakeB-Zone1 | OK | 43 degrees C / 109 degrees F |
| SFB 6 Exhaust-Zone0 | OK | 53 degrees C / 127 degrees F |
| SFB 6 SFB-XF2-Zone1 | OK | 65 degrees C / 149 degrees F |
| SFB 6 SFB-XF1-Zone0 | OK | 68 degrees C / 154 degrees F |
| SFB 6 SFB-XF0-Zone0 | OK | 72 degrees C / 161 degrees F |
| SFB 7 Intake-Zone0  | OK | 57 degrees C / 134 degrees F |
| SFB 7 Exhaust-Zone1 | OK | 50 degrees C / 122 degrees F |
| SFB 7 IntakeA-Zone0 | OK | 53 degrees C / 127 degrees F |
| SFB 7 IntakeB-Zone1 | OK | 43 degrees C / 109 degrees F |
| SFB 7 Exhaust-Zone0 | OK | 54 degrees C / 129 degrees F |
| SFB 7 SFB-XF2-Zone1 | OK | 68 degrees C / 154 degrees F |
| SFB 7 SFB-XF1-Zone0 | OK | 69 degrees C / 156 degrees F |
| SFB 7 SFB-XF0-Zone0 | OK | 73 degrees C / 163 degrees F |

|                 |    |                              |
|-----------------|----|------------------------------|
| FPC 0 Intake    | OK | 41 degrees C / 105 degrees F |
| FPC 0 Exhaust A | OK | 48 degrees C / 118 degrees F |
| FPC 0 Exhaust B | OK | 62 degrees C / 143 degrees F |
| FPC 0 LU 0 TSen | OK | 59 degrees C / 138 degrees F |
| FPC 0 LU 0 Chip | OK | 62 degrees C / 143 degrees F |
| FPC 0 LU 1 TSen | OK | 59 degrees C / 138 degrees F |
| FPC 0 LU 1 Chip | OK | 64 degrees C / 147 degrees F |
| FPC 0 LU 2 TSen | OK | 59 degrees C / 138 degrees F |
| FPC 0 LU 2 Chip | OK | 53 degrees C / 127 degrees F |
| FPC 0 LU 3 TSen | OK | 59 degrees C / 138 degrees F |
| FPC 0 LU 3 Chip | OK | 53 degrees C / 127 degrees F |
| FPC 0 MQ 0 TSen | OK | 47 degrees C / 116 degrees F |
| FPC 0 MQ 0 Chip | OK | 49 degrees C / 120 degrees F |
| FPC 0 MQ 1 TSen | OK | 47 degrees C / 116 degrees F |
| FPC 0 MQ 1 Chip | OK | 51 degrees C / 123 degrees F |
| FPC 0 MQ 2 TSen | OK | 47 degrees C / 116 degrees F |
| FPC 0 MQ 2 Chip | OK | 44 degrees C / 111 degrees F |
| FPC 0 MQ 3 TSen | OK | 47 degrees C / 116 degrees F |
| FPC 0 MQ 3 Chip | OK | 45 degrees C / 113 degrees F |
| FPC 1 Intake    | OK | 40 degrees C / 104 degrees F |
| FPC 1 Exhaust A | OK | 49 degrees C / 120 degrees F |
| FPC 1 Exhaust B | OK | 58 degrees C / 136 degrees F |
| FPC 1 LU 0 TSen | OK | 55 degrees C / 131 degrees F |
| FPC 1 LU 0 Chip | OK | 56 degrees C / 132 degrees F |
| FPC 1 LU 1 TSen | OK | 55 degrees C / 131 degrees F |
| FPC 1 LU 1 Chip | OK | 58 degrees C / 136 degrees F |
| FPC 1 LU 2 TSen | OK | 55 degrees C / 131 degrees F |
| FPC 1 LU 2 Chip | OK | 49 degrees C / 120 degrees F |
| FPC 1 LU 3 TSen | OK | 55 degrees C / 131 degrees F |
| FPC 1 LU 3 Chip | OK | 51 degrees C / 123 degrees F |
| FPC 1 MQ 0 TSen | OK | 47 degrees C / 116 degrees F |
| FPC 1 MQ 0 Chip | OK | 48 degrees C / 118 degrees F |
| FPC 1 MQ 1 TSen | OK | 47 degrees C / 116 degrees F |
| FPC 1 MQ 1 Chip | OK | 50 degrees C / 122 degrees F |
| FPC 1 MQ 2 TSen | OK | 47 degrees C / 116 degrees F |
| FPC 1 MQ 2 Chip | OK | 44 degrees C / 111 degrees F |
| FPC 1 MQ 3 TSen | OK | 47 degrees C / 116 degrees F |
| FPC 1 MQ 3 Chip | OK | 44 degrees C / 111 degrees F |
| FPC 2 Intake    | OK | 39 degrees C / 102 degrees F |
| FPC 2 Exhaust A | OK | 49 degrees C / 120 degrees F |
| FPC 2 Exhaust B | OK | 61 degrees C / 141 degrees F |
| FPC 2 LU 0 TSen | OK | 58 degrees C / 136 degrees F |
| FPC 2 LU 0 Chip | OK | 60 degrees C / 140 degrees F |
| FPC 2 LU 1 TSen | OK | 58 degrees C / 136 degrees F |
| FPC 2 LU 1 Chip | OK | 65 degrees C / 149 degrees F |
| FPC 2 LU 2 TSen | OK | 58 degrees C / 136 degrees F |
| FPC 2 LU 2 Chip | OK | 51 degrees C / 123 degrees F |
| FPC 2 LU 3 TSen | OK | 58 degrees C / 136 degrees F |
| FPC 2 LU 3 Chip | OK | 53 degrees C / 127 degrees F |
| FPC 2 MQ 0 TSen | OK | 47 degrees C / 116 degrees F |
| FPC 2 MQ 0 Chip | OK | 50 degrees C / 122 degrees F |
| FPC 2 MQ 1 TSen | OK | 47 degrees C / 116 degrees F |
| FPC 2 MQ 1 Chip | OK | 52 degrees C / 125 degrees F |
| FPC 2 MQ 2 TSen | OK | 47 degrees C / 116 degrees F |
| FPC 2 MQ 2 Chip | OK | 45 degrees C / 113 degrees F |
| FPC 2 MQ 3 TSen | OK | 47 degrees C / 116 degrees F |
| FPC 2 MQ 3 Chip | OK | 46 degrees C / 114 degrees F |
| FPC 3 Intake    | OK | 40 degrees C / 104 degrees F |
| FPC 3 Exhaust A | OK | 49 degrees C / 120 degrees F |
| FPC 3 Exhaust B | OK | 61 degrees C / 141 degrees F |
| FPC 3 LU 0 TSen | OK | 58 degrees C / 136 degrees F |

|                 |    |                              |
|-----------------|----|------------------------------|
| FPC 3 LU 0 Chip | OK | 61 degrees C / 141 degrees F |
| FPC 3 LU 1 TSen | OK | 58 degrees C / 136 degrees F |
| FPC 3 LU 1 Chip | OK | 62 degrees C / 143 degrees F |
| FPC 3 LU 2 TSen | OK | 58 degrees C / 136 degrees F |
| FPC 3 LU 2 Chip | OK | 51 degrees C / 123 degrees F |
| FPC 3 LU 3 TSen | OK | 58 degrees C / 136 degrees F |
| FPC 3 LU 3 Chip | OK | 53 degrees C / 127 degrees F |
| FPC 3 MQ 0 TSen | OK | 48 degrees C / 118 degrees F |
| FPC 3 MQ 0 Chip | OK | 50 degrees C / 122 degrees F |
| FPC 3 MQ 1 TSen | OK | 48 degrees C / 118 degrees F |
| FPC 3 MQ 1 Chip | OK | 54 degrees C / 129 degrees F |
| FPC 3 MQ 2 TSen | OK | 48 degrees C / 118 degrees F |
| FPC 3 MQ 2 Chip | OK | 45 degrees C / 113 degrees F |
| FPC 3 MQ 3 TSen | OK | 48 degrees C / 118 degrees F |
| FPC 3 MQ 3 Chip | OK | 48 degrees C / 118 degrees F |
| FPC 4 Intake    | OK | 40 degrees C / 104 degrees F |
| FPC 4 Exhaust A | OK | 49 degrees C / 120 degrees F |
| FPC 4 Exhaust B | OK | 62 degrees C / 143 degrees F |
| FPC 4 LU 0 TSen | OK | 59 degrees C / 138 degrees F |
| FPC 4 LU 0 Chip | OK | 62 degrees C / 143 degrees F |
| FPC 4 LU 1 TSen | OK | 59 degrees C / 138 degrees F |
| FPC 4 LU 1 Chip | OK | 65 degrees C / 149 degrees F |
| FPC 4 LU 2 TSen | OK | 59 degrees C / 138 degrees F |
| FPC 4 LU 2 Chip | OK | 51 degrees C / 123 degrees F |
| FPC 4 LU 3 TSen | OK | 59 degrees C / 138 degrees F |
| FPC 4 LU 3 Chip | OK | 53 degrees C / 127 degrees F |
| FPC 4 MQ 0 TSen | OK | 48 degrees C / 118 degrees F |
| FPC 4 MQ 0 Chip | OK | 52 degrees C / 125 degrees F |
| FPC 4 MQ 1 TSen | OK | 48 degrees C / 118 degrees F |
| FPC 4 MQ 1 Chip | OK | 53 degrees C / 127 degrees F |
| FPC 4 MQ 2 TSen | OK | 48 degrees C / 118 degrees F |
| FPC 4 MQ 2 Chip | OK | 46 degrees C / 114 degrees F |
| FPC 4 MQ 3 TSen | OK | 48 degrees C / 118 degrees F |
| FPC 4 MQ 3 Chip | OK | 47 degrees C / 116 degrees F |
| FPC 5 Intake    | OK | 41 degrees C / 105 degrees F |
| FPC 5 Exhaust A | OK | 50 degrees C / 122 degrees F |
| FPC 5 Exhaust B | OK | 63 degrees C / 145 degrees F |
| FPC 5 LU 0 TSen | OK | 60 degrees C / 140 degrees F |
| FPC 5 LU 0 Chip | OK | 63 degrees C / 145 degrees F |
| FPC 5 LU 1 TSen | OK | 60 degrees C / 140 degrees F |
| FPC 5 LU 1 Chip | OK | 66 degrees C / 150 degrees F |
| FPC 5 LU 2 TSen | OK | 60 degrees C / 140 degrees F |
| FPC 5 LU 2 Chip | OK | 56 degrees C / 132 degrees F |
| FPC 5 LU 3 TSen | OK | 60 degrees C / 140 degrees F |
| FPC 5 LU 3 Chip | OK | 54 degrees C / 129 degrees F |
| FPC 5 MQ 0 TSen | OK | 49 degrees C / 120 degrees F |
| FPC 5 MQ 0 Chip | OK | 52 degrees C / 125 degrees F |
| FPC 5 MQ 1 TSen | OK | 49 degrees C / 120 degrees F |
| FPC 5 MQ 1 Chip | OK | 53 degrees C / 127 degrees F |
| FPC 5 MQ 2 TSen | OK | 49 degrees C / 120 degrees F |
| FPC 5 MQ 2 Chip | OK | 48 degrees C / 118 degrees F |
| FPC 5 MQ 3 TSen | OK | 49 degrees C / 120 degrees F |
| FPC 5 MQ 3 Chip | OK | 47 degrees C / 116 degrees F |
| FPC 6 Intake    | OK | 42 degrees C / 107 degrees F |
| FPC 6 Exhaust A | OK | 51 degrees C / 123 degrees F |
| FPC 6 Exhaust B | OK | 63 degrees C / 145 degrees F |
| FPC 6 LU 0 TSen | OK | 61 degrees C / 141 degrees F |
| FPC 6 LU 0 Chip | OK | 64 degrees C / 147 degrees F |
| FPC 6 LU 1 TSen | OK | 61 degrees C / 141 degrees F |
| FPC 6 LU 1 Chip | OK | 66 degrees C / 150 degrees F |
| FPC 6 LU 2 TSen | OK | 61 degrees C / 141 degrees F |

|                 |    |                              |
|-----------------|----|------------------------------|
| FPC 6 LU 2 Chip | OK | 56 degrees C / 132 degrees F |
| FPC 6 LU 3 TSen | OK | 61 degrees C / 141 degrees F |
| FPC 6 LU 3 Chip | OK | 56 degrees C / 132 degrees F |
| FPC 6 MQ 0 TSen | OK | 50 degrees C / 122 degrees F |
| FPC 6 MQ 0 Chip | OK | 56 degrees C / 132 degrees F |
| FPC 6 MQ 1 TSen | OK | 50 degrees C / 122 degrees F |
| FPC 6 MQ 1 Chip | OK | 59 degrees C / 138 degrees F |
| FPC 6 MQ 2 TSen | OK | 50 degrees C / 122 degrees F |
| FPC 6 MQ 2 Chip | OK | 49 degrees C / 120 degrees F |
| FPC 6 MQ 3 TSen | OK | 50 degrees C / 122 degrees F |
| FPC 6 MQ 3 Chip | OK | 49 degrees C / 120 degrees F |
| FPC 7 Intake    | OK | 41 degrees C / 105 degrees F |
| FPC 7 Exhaust A | OK | 51 degrees C / 123 degrees F |
| FPC 7 Exhaust B | OK | 63 degrees C / 145 degrees F |
| FPC 7 LU 0 TSen | OK | 60 degrees C / 140 degrees F |
| FPC 7 LU 0 Chip | OK | 61 degrees C / 141 degrees F |
| FPC 7 LU 1 TSen | OK | 60 degrees C / 140 degrees F |
| FPC 7 LU 1 Chip | OK | 65 degrees C / 149 degrees F |
| FPC 7 LU 2 TSen | OK | 60 degrees C / 140 degrees F |
| FPC 7 LU 2 Chip | OK | 54 degrees C / 129 degrees F |
| FPC 7 LU 3 TSen | OK | 60 degrees C / 140 degrees F |
| FPC 7 LU 3 Chip | OK | 53 degrees C / 127 degrees F |
| FPC 7 MQ 0 TSen | OK | 50 degrees C / 122 degrees F |
| FPC 7 MQ 0 Chip | OK | 53 degrees C / 127 degrees F |
| FPC 7 MQ 1 TSen | OK | 50 degrees C / 122 degrees F |
| FPC 7 MQ 1 Chip | OK | 54 degrees C / 129 degrees F |
| FPC 7 MQ 2 TSen | OK | 50 degrees C / 122 degrees F |
| FPC 7 MQ 2 Chip | OK | 47 degrees C / 116 degrees F |
| FPC 7 MQ 3 TSen | OK | 50 degrees C / 122 degrees F |
| FPC 7 MQ 3 Chip | OK | 47 degrees C / 116 degrees F |
| FPC 8 Intake    | OK | 41 degrees C / 105 degrees F |
| FPC 8 Exhaust A | OK | 50 degrees C / 122 degrees F |
| FPC 8 Exhaust B | OK | 62 degrees C / 143 degrees F |
| FPC 8 LU 0 TSen | OK | 59 degrees C / 138 degrees F |
| FPC 8 LU 0 Chip | OK | 62 degrees C / 143 degrees F |
| FPC 8 LU 1 TSen | OK | 59 degrees C / 138 degrees F |
| FPC 8 LU 1 Chip | OK | 64 degrees C / 147 degrees F |
| FPC 8 LU 2 TSen | OK | 59 degrees C / 138 degrees F |
| FPC 8 LU 2 Chip | OK | 55 degrees C / 131 degrees F |
| FPC 8 LU 3 TSen | OK | 59 degrees C / 138 degrees F |
| FPC 8 LU 3 Chip | OK | 54 degrees C / 129 degrees F |
| FPC 8 MQ 0 TSen | OK | 49 degrees C / 120 degrees F |
| FPC 8 MQ 0 Chip | OK | 51 degrees C / 123 degrees F |
| FPC 8 MQ 1 TSen | OK | 49 degrees C / 120 degrees F |
| FPC 8 MQ 1 Chip | OK | 52 degrees C / 125 degrees F |
| FPC 8 MQ 2 TSen | OK | 49 degrees C / 120 degrees F |
| FPC 8 MQ 2 Chip | OK | 46 degrees C / 114 degrees F |
| FPC 8 MQ 3 TSen | OK | 49 degrees C / 120 degrees F |
| FPC 8 MQ 3 Chip | OK | 47 degrees C / 116 degrees F |
| FPC 9 Intake    | OK | 42 degrees C / 107 degrees F |
| FPC 9 Exhaust A | OK | 51 degrees C / 123 degrees F |
| FPC 9 Exhaust B | OK | 63 degrees C / 145 degrees F |
| FPC 9 LU 0 TSen | OK | 60 degrees C / 140 degrees F |
| FPC 9 LU 0 Chip | OK | 65 degrees C / 149 degrees F |
| FPC 9 LU 1 TSen | OK | 60 degrees C / 140 degrees F |
| FPC 9 LU 1 Chip | OK | 67 degrees C / 152 degrees F |
| FPC 9 LU 2 TSen | OK | 60 degrees C / 140 degrees F |
| FPC 9 LU 2 Chip | OK | 54 degrees C / 129 degrees F |
| FPC 9 LU 3 TSen | OK | 60 degrees C / 140 degrees F |
| FPC 9 LU 3 Chip | OK | 54 degrees C / 129 degrees F |
| FPC 9 MQ 0 TSen | OK | 51 degrees C / 123 degrees F |

|                  |    |                              |
|------------------|----|------------------------------|
| FPC 9 MQ 0 Chip  | OK | 55 degrees C / 131 degrees F |
| FPC 9 MQ 1 TSen  | OK | 51 degrees C / 123 degrees F |
| FPC 9 MQ 1 Chip  | OK | 59 degrees C / 138 degrees F |
| FPC 9 MQ 2 TSen  | OK | 51 degrees C / 123 degrees F |
| FPC 9 MQ 2 Chip  | OK | 49 degrees C / 120 degrees F |
| FPC 9 MQ 3 TSen  | OK | 51 degrees C / 123 degrees F |
| FPC 9 MQ 3 Chip  | OK | 49 degrees C / 120 degrees F |
| FPC 10 Intake    | OK | 44 degrees C / 111 degrees F |
| FPC 10 Exhaust A | OK | 49 degrees C / 120 degrees F |
| FPC 10 Exhaust B | OK | 55 degrees C / 131 degrees F |
| FPC 10 LU 0 TSen | OK | 54 degrees C / 129 degrees F |
| FPC 10 LU 0 Chip | OK | 55 degrees C / 131 degrees F |
| FPC 10 LU 1 TSen | OK | 54 degrees C / 129 degrees F |
| FPC 10 LU 1 Chip | OK | 59 degrees C / 138 degrees F |
| FPC 10 LU 2 TSen | OK | 54 degrees C / 129 degrees F |
| FPC 10 LU 2 Chip | OK | 52 degrees C / 125 degrees F |
| FPC 10 LU 3 TSen | OK | 54 degrees C / 129 degrees F |
| FPC 10 LU 3 Chip | OK | 51 degrees C / 123 degrees F |
| FPC 10 MQ 0 TSen | OK | 48 degrees C / 118 degrees F |
| FPC 10 MQ 0 Chip | OK | 49 degrees C / 120 degrees F |
| FPC 10 MQ 1 TSen | OK | 48 degrees C / 118 degrees F |
| FPC 10 MQ 1 Chip | OK | 52 degrees C / 125 degrees F |
| FPC 10 MQ 2 TSen | OK | 48 degrees C / 118 degrees F |
| FPC 10 MQ 2 Chip | OK | 47 degrees C / 116 degrees F |
| FPC 10 MQ 3 TSen | OK | 48 degrees C / 118 degrees F |
| FPC 10 MQ 3 Chip | OK | 47 degrees C / 116 degrees F |
| FPC 11 Intake    | OK | 30 degrees C / 86 degrees F  |
| FPC 11 Exhaust A | OK | 35 degrees C / 95 degrees F  |
| FPC 11 Exhaust B | OK | 30 degrees C / 86 degrees F  |
| FPC 11 LU 0 TSen | OK | 57 degrees C / 134 degrees F |
| FPC 11 LU 0 Chip | OK | 58 degrees C / 136 degrees F |
| FPC 11 LU 1 TSen | OK | 57 degrees C / 134 degrees F |
| FPC 11 LU 1 Chip | OK | 62 degrees C / 143 degrees F |
| FPC 11 LU 2 TSen | OK | 57 degrees C / 134 degrees F |
| FPC 11 LU 2 Chip | OK | 53 degrees C / 127 degrees F |
| FPC 11 LU 3 TSen | OK | 57 degrees C / 134 degrees F |
| FPC 11 LU 3 Chip | OK | 54 degrees C / 129 degrees F |
| FPC 11 MQ 0 TSen | OK | 52 degrees C / 125 degrees F |
| FPC 11 MQ 0 Chip | OK | 52 degrees C / 125 degrees F |
| FPC 11 MQ 1 TSen | OK | 52 degrees C / 125 degrees F |
| FPC 11 MQ 1 Chip | OK | 57 degrees C / 134 degrees F |
| FPC 11 MQ 2 TSen | OK | 52 degrees C / 125 degrees F |
| FPC 11 MQ 2 Chip | OK | 48 degrees C / 118 degrees F |
| FPC 11 MQ 3 TSen | OK | 52 degrees C / 125 degrees F |
| FPC 11 MQ 3 Chip | OK | 52 degrees C / 125 degrees F |
| FPC 12 Intake    | OK | 40 degrees C / 104 degrees F |
| FPC 12 Exhaust A | OK | 47 degrees C / 116 degrees F |
| FPC 12 Exhaust B | OK | 52 degrees C / 125 degrees F |
| FPC 12 LU 0 TSen | OK | 51 degrees C / 123 degrees F |
| FPC 12 LU 0 Chip | OK | 52 degrees C / 125 degrees F |
| FPC 12 LU 1 TSen | OK | 51 degrees C / 123 degrees F |
| FPC 12 LU 1 Chip | OK | 55 degrees C / 131 degrees F |
| FPC 12 LU 2 TSen | OK | 51 degrees C / 123 degrees F |
| FPC 12 LU 2 Chip | OK | 47 degrees C / 116 degrees F |
| FPC 12 LU 3 TSen | OK | 51 degrees C / 123 degrees F |
| FPC 12 LU 3 Chip | OK | 50 degrees C / 122 degrees F |
| FPC 12 MQ 0 TSen | OK | 46 degrees C / 114 degrees F |
| FPC 12 MQ 0 Chip | OK | 46 degrees C / 114 degrees F |
| FPC 12 MQ 1 TSen | OK | 46 degrees C / 114 degrees F |
| FPC 12 MQ 1 Chip | OK | 50 degrees C / 122 degrees F |
| FPC 12 MQ 2 TSen | OK | 46 degrees C / 114 degrees F |

|                        |    |                              |
|------------------------|----|------------------------------|
| FPC 12 MQ 2 Chip       | OK | 44 degrees C / 111 degrees F |
| FPC 12 MQ 3 TSen       | OK | 46 degrees C / 114 degrees F |
| FPC 12 MQ 3 Chip       | OK | 46 degrees C / 114 degrees F |
| FPC 13 Intake          | OK | 40 degrees C / 104 degrees F |
| FPC 13 Exhaust A       | OK | 48 degrees C / 118 degrees F |
| FPC 13 Exhaust B       | OK | 52 degrees C / 125 degrees F |
| FPC 13 LU 0 TSen       | OK | 51 degrees C / 123 degrees F |
| FPC 13 LU 0 Chip       | OK | 52 degrees C / 125 degrees F |
| FPC 13 LU 1 TSen       | OK | 51 degrees C / 123 degrees F |
| FPC 13 LU 1 Chip       | OK | 55 degrees C / 131 degrees F |
| FPC 13 LU 2 TSen       | OK | 51 degrees C / 123 degrees F |
| FPC 13 LU 2 Chip       | OK | 48 degrees C / 118 degrees F |
| FPC 13 LU 3 TSen       | OK | 51 degrees C / 123 degrees F |
| FPC 13 LU 3 Chip       | OK | 48 degrees C / 118 degrees F |
| FPC 13 MQ 0 TSen       | OK | 46 degrees C / 114 degrees F |
| FPC 13 MQ 0 Chip       | OK | 46 degrees C / 114 degrees F |
| FPC 13 MQ 1 TSen       | OK | 46 degrees C / 114 degrees F |
| FPC 13 MQ 1 Chip       | OK | 50 degrees C / 122 degrees F |
| FPC 13 MQ 2 TSen       | OK | 46 degrees C / 114 degrees F |
| FPC 13 MQ 2 Chip       | OK | 44 degrees C / 111 degrees F |
| FPC 13 MQ 3 TSen       | OK | 46 degrees C / 114 degrees F |
| FPC 13 MQ 3 Chip       | OK | 46 degrees C / 114 degrees F |
| FPC 14 Intake          | OK | 40 degrees C / 104 degrees F |
| FPC 14 Exhaust A       | OK | 50 degrees C / 122 degrees F |
| FPC 14 Exhaust B       | OK | 51 degrees C / 123 degrees F |
| FPC 14 LU 0 TSen       | OK | 50 degrees C / 122 degrees F |
| FPC 14 LU 0 Chip       | OK | 50 degrees C / 122 degrees F |
| FPC 14 LU 1 TSen       | OK | 50 degrees C / 122 degrees F |
| FPC 14 LU 1 Chip       | OK | 54 degrees C / 129 degrees F |
| FPC 14 LU 2 TSen       | OK | 50 degrees C / 122 degrees F |
| FPC 14 LU 2 Chip       | OK | 47 degrees C / 116 degrees F |
| FPC 14 LU 3 TSen       | OK | 50 degrees C / 122 degrees F |
| FPC 14 LU 3 Chip       | OK | 49 degrees C / 120 degrees F |
| FPC 14 MQ 0 TSen       | OK | 47 degrees C / 116 degrees F |
| FPC 14 MQ 0 Chip       | OK | 46 degrees C / 114 degrees F |
| FPC 14 MQ 1 TSen       | OK | 47 degrees C / 116 degrees F |
| FPC 14 MQ 1 Chip       | OK | 51 degrees C / 123 degrees F |
| FPC 14 MQ 2 TSen       | OK | 47 degrees C / 116 degrees F |
| FPC 14 MQ 2 Chip       | OK | 45 degrees C / 113 degrees F |
| FPC 14 MQ 3 TSen       | OK | 47 degrees C / 116 degrees F |
| FPC 14 MQ 3 Chip       | OK | 48 degrees C / 118 degrees F |
| FPC 15 Intake          | OK | 44 degrees C / 111 degrees F |
| FPC 15 Exhaust A       | OK | 49 degrees C / 120 degrees F |
| FPC 15 Exhaust B       | OK | 60 degrees C / 140 degrees F |
| FPC 15 LU 0 TSen       | OK | 50 degrees C / 122 degrees F |
| FPC 15 LU 0 Chip       | OK | 56 degrees C / 132 degrees F |
| FPC 15 LU 1 TSen       | OK | 50 degrees C / 122 degrees F |
| FPC 15 LU 1 Chip       | OK | 50 degrees C / 122 degrees F |
| FPC 15 LU 2 TSen       | OK | 50 degrees C / 122 degrees F |
| FPC 15 LU 2 Chip       | OK | 58 degrees C / 136 degrees F |
| FPC 15 LU 3 TSen       | OK | 50 degrees C / 122 degrees F |
| FPC 15 LU 3 Chip       | OK | 63 degrees C / 145 degrees F |
| FPC 15 XM 0 TSen       | OK | 50 degrees C / 122 degrees F |
| FPC 15 XM 0 Chip       | OK | 56 degrees C / 132 degrees F |
| FPC 15 XF 0 TSen       | OK | 50 degrees C / 122 degrees F |
| FPC 15 XF 0 Chip       | OK | 68 degrees C / 154 degrees F |
| FPC 15 PLX Switch TSen | OK | 50 degrees C / 122 degrees F |
| FPC 15 PLX Switch Chip | OK | 56 degrees C / 132 degrees F |
| FPC 16 Intake          | OK | 42 degrees C / 107 degrees F |
| FPC 16 Exhaust A       | OK | 51 degrees C / 123 degrees F |
| FPC 16 Exhaust B       | OK | 53 degrees C / 127 degrees F |

|                  |    |                              |
|------------------|----|------------------------------|
| FPC 16 LU 0 TSen | OK | 51 degrees C / 123 degrees F |
| FPC 16 LU 0 Chip | OK | 52 degrees C / 125 degrees F |
| FPC 16 LU 1 TSen | OK | 51 degrees C / 123 degrees F |
| FPC 16 LU 1 Chip | OK | 55 degrees C / 131 degrees F |
| FPC 16 LU 2 TSen | OK | 51 degrees C / 123 degrees F |
| FPC 16 LU 2 Chip | OK | 48 degrees C / 118 degrees F |
| FPC 16 LU 3 TSen | OK | 51 degrees C / 123 degrees F |
| FPC 16 LU 3 Chip | OK | 49 degrees C / 120 degrees F |
| FPC 16 MQ 0 TSen | OK | 49 degrees C / 120 degrees F |
| FPC 16 MQ 0 Chip | OK | 48 degrees C / 118 degrees F |
| FPC 16 MQ 1 TSen | OK | 49 degrees C / 120 degrees F |
| FPC 16 MQ 1 Chip | OK | 53 degrees C / 127 degrees F |
| FPC 16 MQ 2 TSen | OK | 49 degrees C / 120 degrees F |
| FPC 16 MQ 2 Chip | OK | 46 degrees C / 114 degrees F |
| FPC 16 MQ 3 TSen | OK | 49 degrees C / 120 degrees F |
| FPC 16 MQ 3 Chip | OK | 49 degrees C / 120 degrees F |
| FPC 17 Intake    | OK | 43 degrees C / 109 degrees F |
| FPC 17 Exhaust A | OK | 51 degrees C / 123 degrees F |
| FPC 17 Exhaust B | OK | 55 degrees C / 131 degrees F |
| FPC 17 LU 0 TSen | OK | 54 degrees C / 129 degrees F |
| FPC 17 LU 0 Chip | OK | 57 degrees C / 134 degrees F |
| FPC 17 LU 1 TSen | OK | 54 degrees C / 129 degrees F |
| FPC 17 LU 1 Chip | OK | 60 degrees C / 140 degrees F |
| FPC 17 LU 2 TSen | OK | 54 degrees C / 129 degrees F |
| FPC 17 LU 2 Chip | OK | 53 degrees C / 127 degrees F |
| FPC 17 LU 3 TSen | OK | 54 degrees C / 129 degrees F |
| FPC 17 LU 3 Chip | OK | 53 degrees C / 127 degrees F |
| FPC 17 MQ 0 TSen | OK | 49 degrees C / 120 degrees F |
| FPC 17 MQ 0 Chip | OK | 50 degrees C / 122 degrees F |
| FPC 17 MQ 1 TSen | OK | 49 degrees C / 120 degrees F |
| FPC 17 MQ 1 Chip | OK | 54 degrees C / 129 degrees F |
| FPC 17 MQ 2 TSen | OK | 49 degrees C / 120 degrees F |
| FPC 17 MQ 2 Chip | OK | 47 degrees C / 116 degrees F |
| FPC 17 MQ 3 TSen | OK | 49 degrees C / 120 degrees F |
| FPC 17 MQ 3 Chip | OK | 51 degrees C / 123 degrees F |
| FPC 18 Intake    | OK | 44 degrees C / 111 degrees F |
| FPC 18 Exhaust A | OK | 53 degrees C / 127 degrees F |
| FPC 18 Exhaust B | OK | 57 degrees C / 134 degrees F |
| FPC 18 LU 0 TSen | OK | 56 degrees C / 132 degrees F |
| FPC 18 LU 0 Chip | OK | 57 degrees C / 134 degrees F |
| FPC 18 LU 1 TSen | OK | 56 degrees C / 132 degrees F |
| FPC 18 LU 1 Chip | OK | 62 degrees C / 143 degrees F |
| FPC 18 LU 2 TSen | OK | 56 degrees C / 132 degrees F |
| FPC 18 LU 2 Chip | OK | 53 degrees C / 127 degrees F |
| FPC 18 LU 3 TSen | OK | 56 degrees C / 132 degrees F |
| FPC 18 LU 3 Chip | OK | 55 degrees C / 131 degrees F |
| FPC 18 MQ 0 TSen | OK | 51 degrees C / 123 degrees F |
| FPC 18 MQ 0 Chip | OK | 54 degrees C / 129 degrees F |
| FPC 18 MQ 1 TSen | OK | 51 degrees C / 123 degrees F |
| FPC 18 MQ 1 Chip | OK | 58 degrees C / 136 degrees F |
| FPC 18 MQ 2 TSen | OK | 51 degrees C / 123 degrees F |
| FPC 18 MQ 2 Chip | OK | 50 degrees C / 122 degrees F |
| FPC 18 MQ 3 TSen | OK | 51 degrees C / 123 degrees F |
| FPC 18 MQ 3 Chip | OK | 53 degrees C / 127 degrees F |
| FPC 19 Intake    | OK | 48 degrees C / 118 degrees F |
| FPC 19 Exhaust A | OK | 56 degrees C / 132 degrees F |
| FPC 19 Exhaust B | OK | 64 degrees C / 147 degrees F |
| FPC 19 LU 0 TSen | OK | 63 degrees C / 145 degrees F |
| FPC 19 LU 0 Chip | OK | 64 degrees C / 147 degrees F |
| FPC 19 LU 1 TSen | OK | 63 degrees C / 145 degrees F |
| FPC 19 LU 1 Chip | OK | 70 degrees C / 158 degrees F |



|                  |    |                              |
|------------------|----|------------------------------|
| FPC 19 LU 2 TSen | OK | 63 degrees C / 145 degrees F |
| FPC 19 LU 2 Chip | OK | 61 degrees C / 141 degrees F |
| FPC 19 LU 3 TSen | OK | 63 degrees C / 145 degrees F |
| FPC 19 LU 3 Chip | OK | 62 degrees C / 143 degrees F |
| FPC 19 MQ 0 TSen | OK | 56 degrees C / 132 degrees F |
| FPC 19 MQ 0 Chip | OK | 60 degrees C / 140 degrees F |
| FPC 19 MQ 1 TSen | OK | 56 degrees C / 132 degrees F |
| FPC 19 MQ 1 Chip | OK | 62 degrees C / 143 degrees F |
| FPC 19 MQ 2 TSen | OK | 56 degrees C / 132 degrees F |
| FPC 19 MQ 2 Chip | OK | 56 degrees C / 132 degrees F |
| FPC 19 MQ 3 TSen | OK | 56 degrees C / 132 degrees F |
| FPC 19 MQ 3 Chip | OK | 57 degrees C / 134 degrees F |
| ADC 0 Intake     | OK | 40 degrees C / 104 degrees F |
| ADC 0 Exhaust    | OK | 52 degrees C / 125 degrees F |
| ADC 0 ADC-XF1    | OK | 59 degrees C / 138 degrees F |
| ADC 0 ADC-XF0    | OK | 66 degrees C / 150 degrees F |
| ADC 1 Intake     | OK | 38 degrees C / 100 degrees F |
| ADC 1 Exhaust    | OK | 50 degrees C / 122 degrees F |
| ADC 1 ADC-XF1    | OK | 59 degrees C / 138 degrees F |
| ADC 1 ADC-XF0    | OK | 63 degrees C / 145 degrees F |
| ADC 2 Intake     | OK | 37 degrees C / 98 degrees F  |
| ADC 2 Exhaust    | OK | 52 degrees C / 125 degrees F |
| ADC 2 ADC-XF1    | OK | 53 degrees C / 127 degrees F |
| ADC 2 ADC-XF0    | OK | 61 degrees C / 141 degrees F |
| ADC 3 Intake     | OK | 40 degrees C / 104 degrees F |
| ADC 3 Exhaust    | OK | 51 degrees C / 123 degrees F |
| ADC 3 ADC-XF1    | OK | 61 degrees C / 141 degrees F |
| ADC 3 ADC-XF0    | OK | 64 degrees C / 147 degrees F |
| ADC 4 Intake     | OK | 39 degrees C / 102 degrees F |
| ADC 4 Exhaust    | OK | 51 degrees C / 123 degrees F |
| ADC 4 ADC-XF1    | OK | 60 degrees C / 140 degrees F |
| ADC 4 ADC-XF0    | OK | 63 degrees C / 145 degrees F |
| ADC 5 Intake     | OK | 38 degrees C / 100 degrees F |
| ADC 5 Exhaust    | OK | 54 degrees C / 129 degrees F |
| ADC 5 ADC-XF1    | OK | 56 degrees C / 132 degrees F |
| ADC 5 ADC-XF0    | OK | 67 degrees C / 152 degrees F |
| ADC 6 Intake     | OK | 39 degrees C / 102 degrees F |
| ADC 6 Exhaust    | OK | 52 degrees C / 125 degrees F |
| ADC 6 ADC-XF1    | OK | 59 degrees C / 138 degrees F |
| ADC 6 ADC-XF0    | OK | 66 degrees C / 150 degrees F |
| ADC 7 Intake     | OK | 39 degrees C / 102 degrees F |
| ADC 7 Exhaust    | OK | 54 degrees C / 129 degrees F |
| ADC 7 ADC-XF1    | OK | 62 degrees C / 143 degrees F |
| ADC 7 ADC-XF0    | OK | 70 degrees C / 158 degrees F |
| ADC 8 Intake     | OK | 39 degrees C / 102 degrees F |
| ADC 8 Exhaust    | OK | 52 degrees C / 125 degrees F |
| ADC 8 ADC-XF1    | OK | 61 degrees C / 141 degrees F |
| ADC 8 ADC-XF0    | OK | 65 degrees C / 149 degrees F |
| ADC 9 Intake     | OK | 41 degrees C / 105 degrees F |
| ADC 9 Exhaust    | OK | 51 degrees C / 123 degrees F |
| ADC 9 ADC-XF1    | OK | 63 degrees C / 145 degrees F |
| ADC 9 ADC-XF0    | OK | 63 degrees C / 145 degrees F |
| ADC 10 Intake    | OK | 48 degrees C / 118 degrees F |
| ADC 10 Exhaust   | OK | 53 degrees C / 127 degrees F |
| ADC 10 ADC-XF1   | OK | 67 degrees C / 152 degrees F |
| ADC 10 ADC-XF0   | OK | 66 degrees C / 150 degrees F |
| ADC 12 Intake    | OK | 49 degrees C / 120 degrees F |
| ADC 12 Exhaust   | OK | 54 degrees C / 129 degrees F |
| ADC 12 ADC-XF1   | OK | 67 degrees C / 152 degrees F |
| ADC 12 ADC-XF0   | OK | 67 degrees C / 152 degrees F |
| ADC 13 Intake    | OK | 49 degrees C / 120 degrees F |

|      |                  |    |                              |
|------|------------------|----|------------------------------|
|      | ADC 13 Exhaust   | OK | 57 degrees C / 134 degrees F |
|      | ADC 13 ADC-XF1   | OK | 66 degrees C / 150 degrees F |
|      | ADC 13 ADC-XF0   | OK | 69 degrees C / 156 degrees F |
|      | ADC 14 Intake    | OK | 51 degrees C / 123 degrees F |
|      | ADC 14 Exhaust   | OK | 59 degrees C / 138 degrees F |
|      | ADC 14 ADC-XF1   | OK | 69 degrees C / 156 degrees F |
|      | ADC 14 ADC-XF0   | OK | 74 degrees C / 165 degrees F |
|      | ADC 15 Intake    | OK | 50 degrees C / 122 degrees F |
|      | ADC 15 Exhaust   | OK | 59 degrees C / 138 degrees F |
|      | ADC 15 ADC-XF1   | OK | 68 degrees C / 154 degrees F |
|      | ADC 15 ADC-XF0   | OK | 69 degrees C / 156 degrees F |
|      | ADC 16 Intake    | OK | 52 degrees C / 125 degrees F |
|      | ADC 16 Exhaust   | OK | 58 degrees C / 136 degrees F |
|      | ADC 16 ADC-XF1   | OK | 68 degrees C / 154 degrees F |
|      | ADC 16 ADC-XF0   | OK | 70 degrees C / 158 degrees F |
|      | ADC 17 Intake    | OK | 52 degrees C / 125 degrees F |
|      | ADC 17 Exhaust   | OK | 59 degrees C / 138 degrees F |
|      | ADC 17 ADC-XF1   | OK | 69 degrees C / 156 degrees F |
|      | ADC 17 ADC-XF0   | OK | 71 degrees C / 159 degrees F |
|      | ADC 18 Intake    | OK | 53 degrees C / 127 degrees F |
|      | ADC 18 Exhaust   | OK | 59 degrees C / 138 degrees F |
|      | ADC 18 ADC-XF1   | OK | 68 degrees C / 154 degrees F |
|      | ADC 18 ADC-XF0   | OK | 73 degrees C / 163 degrees F |
|      | ADC 19 Intake    | OK | 50 degrees C / 122 degrees F |
|      | ADC 19 Exhaust   | OK | 59 degrees C / 138 degrees F |
|      | ADC 19 ADC-XF1   | OK | 68 degrees C / 154 degrees F |
|      | ADC 19 ADC-XF0   | OK | 72 degrees C / 161 degrees F |
| Fans | Fan Tray 0 Fan 1 | OK | 7440 RPM                     |
|      | Fan Tray 0 Fan 2 | OK | 7200 RPM                     |
|      | Fan Tray 0 Fan 3 | OK | 6960 RPM                     |
|      | Fan Tray 0 Fan 4 | OK | 7200 RPM                     |
|      | Fan Tray 0 Fan 5 | OK | 7080 RPM                     |
|      | Fan Tray 0 Fan 6 | OK | 6840 RPM                     |
|      | Fan Tray 1 Fan 1 | OK | 6840 RPM                     |
|      | Fan Tray 1 Fan 2 | OK | 6960 RPM                     |
|      | Fan Tray 1 Fan 3 | OK | 6960 RPM                     |
|      | Fan Tray 1 Fan 4 | OK | 7080 RPM                     |
|      | Fan Tray 1 Fan 5 | OK | 6960 RPM                     |
|      | Fan Tray 1 Fan 6 | OK | 6960 RPM                     |
|      | Fan Tray 2 Fan 1 | OK | 8640 RPM                     |
|      | Fan Tray 2 Fan 2 | OK | 8640 RPM                     |
|      | Fan Tray 2 Fan 3 | OK | 8760 RPM                     |
|      | Fan Tray 2 Fan 4 | OK | 8760 RPM                     |
|      | Fan Tray 2 Fan 5 | OK | 8640 RPM                     |
|      | Fan Tray 2 Fan 6 | OK | 8640 RPM                     |
|      | Fan Tray 3 Fan 1 | OK | 8520 RPM                     |
|      | Fan Tray 3 Fan 2 | OK | 8520 RPM                     |
|      | Fan Tray 3 Fan 3 | OK | 8640 RPM                     |
|      | Fan Tray 3 Fan 4 | OK | 8640 RPM                     |
|      | Fan Tray 3 Fan 5 | OK | 8520 RPM                     |
|      | Fan Tray 3 Fan 6 | OK | 8520 RPM                     |

#### show chassis environment (MX2020 Router with MPC5EQ and MPC6E)

| Class | Item  | Status | Measurement                 |
|-------|-------|--------|-----------------------------|
| Temp  | PSM 0 | OK     | 32 degrees C / 89 degrees F |
|       | PSM 1 | OK     | 32 degrees C / 89 degrees F |
|       | PSM 2 | OK     | 32 degrees C / 89 degrees F |
|       | PSM 3 | OK     | 32 degrees C / 89 degrees F |
|       | PSM 4 | OK     | 32 degrees C / 89 degrees F |
|       | PSM 5 | OK     | 33 degrees C / 91 degrees F |

|                      |        |                              |
|----------------------|--------|------------------------------|
| PSM 6                | OK     | 32 degrees C / 89 degrees F  |
| PSM 7                | OK     | 32 degrees C / 89 degrees F  |
| PSM 8                | OK     | 32 degrees C / 89 degrees F  |
| PSM 9                | Absent |                              |
| PSM 10               | Absent |                              |
| PSM 11               | Absent |                              |
| PSM 12               | OK     | 33 degrees C / 91 degrees F  |
| PSM 13               | OK     | 33 degrees C / 91 degrees F  |
| PSM 14               | OK     | 34 degrees C / 93 degrees F  |
| PSM 15               | OK     | 34 degrees C / 93 degrees F  |
| PSM 16               | OK     | 33 degrees C / 91 degrees F  |
| PSM 17               | OK     | 33 degrees C / 91 degrees F  |
| PDM 0                | OK     |                              |
| PDM 1                | OK     |                              |
| PDM 2                | OK     |                              |
| PDM 3                | OK     |                              |
| CB 0 IntakeA-Zone0   | OK     | 34 degrees C / 93 degrees F  |
| CB 0 IntakeB-Zone1   | OK     | 26 degrees C / 78 degrees F  |
| CB 0 IntakeC-Zone0   | OK     | 38 degrees C / 100 degrees F |
| CB 0 ExhaustA-Zone0  | OK     | 34 degrees C / 93 degrees F  |
| CB 0 ExhaustB-Zone1  | OK     | 27 degrees C / 80 degrees F  |
| CB 0 TCBC-Zone0      | OK     | 32 degrees C / 89 degrees F  |
| CB 1 IntakeA-Zone0   | OK     | 24 degrees C / 75 degrees F  |
| CB 1 IntakeB-Zone1   | OK     | 22 degrees C / 71 degrees F  |
| CB 1 IntakeC-Zone0   | OK     | 34 degrees C / 93 degrees F  |
| CB 1 ExhaustA-Zone0  | OK     | 31 degrees C / 87 degrees F  |
| CB 1 ExhaustB-Zone1  | OK     | 24 degrees C / 75 degrees F  |
| CB 1 TCBC-Zone0      | OK     | 27 degrees C / 80 degrees F  |
| SPMB 0 Intake        | OK     | 25 degrees C / 77 degrees F  |
| SPMB 1 Intake        | OK     | 23 degrees C / 73 degrees F  |
| Routing Engine 0     | OK     | 28 degrees C / 82 degrees F  |
| Routing Engine 0 CPU | OK     | 25 degrees C / 77 degrees F  |
| Routing Engine 1     | OK     | 25 degrees C / 77 degrees F  |
| Routing Engine 1 CPU | OK     | 24 degrees C / 75 degrees F  |
| SFB 0 Intake-Zone0   | OK     | 45 degrees C / 113 degrees F |
| SFB 0 Exhaust-Zone1  | OK     | 34 degrees C / 93 degrees F  |
| SFB 0 IntakeA-Zone0  | OK     | 32 degrees C / 89 degrees F  |
| SFB 0 IntakeB-Zone1  | OK     | 28 degrees C / 82 degrees F  |
| SFB 0 Exhaust-Zone0  | OK     | 36 degrees C / 96 degrees F  |
| SFB 0 SFB-XF2-Zone1  | OK     | 46 degrees C / 114 degrees F |
| SFB 0 SFB-XF1-Zone0  | OK     | 48 degrees C / 118 degrees F |
| SFB 0 SFB-XF0-Zone0  | OK     | 60 degrees C / 140 degrees F |
| SFB 1 Intake-Zone0   | OK     | 44 degrees C / 111 degrees F |
| SFB 1 Exhaust-Zone1  | OK     | 34 degrees C / 93 degrees F  |
| SFB 1 IntakeA-Zone0  | OK     | 35 degrees C / 95 degrees F  |
| SFB 1 IntakeB-Zone1  | OK     | 27 degrees C / 80 degrees F  |
| SFB 1 Exhaust-Zone0  | OK     | 37 degrees C / 98 degrees F  |
| SFB 1 SFB-XF2-Zone1  | OK     | 47 degrees C / 116 degrees F |
| SFB 1 SFB-XF1-Zone0  | OK     | 49 degrees C / 120 degrees F |
| SFB 1 SFB-XF0-Zone0  | OK     | 56 degrees C / 132 degrees F |
| SFB 2 Intake-Zone0   | OK     | 41 degrees C / 105 degrees F |
| SFB 2 Exhaust-Zone1  | OK     | 34 degrees C / 93 degrees F  |
| SFB 2 IntakeA-Zone0  | OK     | 35 degrees C / 95 degrees F  |
| SFB 2 IntakeB-Zone1  | OK     | 28 degrees C / 82 degrees F  |
| SFB 2 Exhaust-Zone0  | OK     | 37 degrees C / 98 degrees F  |
| SFB 2 SFB-XF2-Zone1  | OK     | 47 degrees C / 116 degrees F |
| SFB 2 SFB-XF1-Zone0  | OK     | 55 degrees C / 131 degrees F |
| SFB 2 SFB-XF0-Zone0  | OK     | 55 degrees C / 131 degrees F |
| SFB 3 Intake-Zone0   | OK     | 43 degrees C / 109 degrees F |
| SFB 3 Exhaust-Zone1  | OK     | 33 degrees C / 91 degrees F  |
| SFB 3 IntakeA-Zone0  | OK     | 35 degrees C / 95 degrees F  |

|                           |    |                              |
|---------------------------|----|------------------------------|
| SFB 3 IntakeB-Zone1       | OK | 27 degrees C / 80 degrees F  |
| SFB 3 Exhaust-Zone0       | OK | 36 degrees C / 96 degrees F  |
| SFB 3 SFB-XF2-Zone1       | OK | 46 degrees C / 114 degrees F |
| SFB 3 SFB-XF1-Zone0       | OK | 46 degrees C / 114 degrees F |
| SFB 3 SFB-XF0-Zone0       | OK | 57 degrees C / 134 degrees F |
| SFB 4 Intake-Zone0        | OK | 36 degrees C / 96 degrees F  |
| SFB 4 Exhaust-Zone1       | OK | 32 degrees C / 89 degrees F  |
| SFB 4 IntakeA-Zone0       | OK | 31 degrees C / 87 degrees F  |
| SFB 4 IntakeB-Zone1       | OK | 26 degrees C / 78 degrees F  |
| SFB 4 Exhaust-Zone0       | OK | 32 degrees C / 89 degrees F  |
| SFB 4 SFB-XF2-Zone1       | OK | 44 degrees C / 111 degrees F |
| SFB 4 SFB-XF1-Zone0       | OK | 45 degrees C / 113 degrees F |
| SFB 4 SFB-XF0-Zone0       | OK | 52 degrees C / 125 degrees F |
| SFB 5 Intake-Zone0        | OK | 31 degrees C / 87 degrees F  |
| SFB 5 Exhaust-Zone1       | OK | 30 degrees C / 86 degrees F  |
| SFB 5 IntakeA-Zone0       | OK | 26 degrees C / 78 degrees F  |
| SFB 5 IntakeB-Zone1       | OK | 24 degrees C / 75 degrees F  |
| SFB 5 Exhaust-Zone0       | OK | 29 degrees C / 84 degrees F  |
| SFB 5 SFB-XF2-Zone1       | OK | 43 degrees C / 109 degrees F |
| SFB 5 SFB-XF1-Zone0       | OK | 47 degrees C / 116 degrees F |
| SFB 5 SFB-XF0-Zone0       | OK | 49 degrees C / 120 degrees F |
| SFB 6 Intake-Zone0        | OK | 30 degrees C / 86 degrees F  |
| SFB 6 Exhaust-Zone1       | OK | 29 degrees C / 84 degrees F  |
| SFB 6 IntakeA-Zone0       | OK | 25 degrees C / 77 degrees F  |
| SFB 6 IntakeB-Zone1       | OK | 24 degrees C / 75 degrees F  |
| SFB 6 Exhaust-Zone0       | OK | 29 degrees C / 84 degrees F  |
| SFB 6 SFB-XF2-Zone1       | OK | 43 degrees C / 109 degrees F |
| SFB 6 SFB-XF1-Zone0       | OK | 44 degrees C / 111 degrees F |
| SFB 6 SFB-XF0-Zone0       | OK | 45 degrees C / 113 degrees F |
| SFB 7 Intake-Zone0        | OK | 31 degrees C / 87 degrees F  |
| SFB 7 Exhaust-Zone1       | OK | 30 degrees C / 86 degrees F  |
| SFB 7 IntakeA-Zone0       | OK | 26 degrees C / 78 degrees F  |
| SFB 7 IntakeB-Zone1       | OK | 24 degrees C / 75 degrees F  |
| SFB 7 Exhaust-Zone0       | OK | 28 degrees C / 82 degrees F  |
| SFB 7 SFB-XF2-Zone1       | OK | 50 degrees C / 122 degrees F |
| SFB 7 SFB-XF1-Zone0       | OK | 43 degrees C / 109 degrees F |
| SFB 7 SFB-XF0-Zone0       | OK | 47 degrees C / 116 degrees F |
| FPC 0 Intake              | OK | 31 degrees C / 87 degrees F  |
| FPC 0 Exhaust A           | OK | 49 degrees C / 120 degrees F |
| FPC 0 Exhaust B           | OK | 43 degrees C / 109 degrees F |
| FPC 0 XL TSen             | OK | 42 degrees C / 107 degrees F |
| FPC 0 XL Chip             | OK | 46 degrees C / 114 degrees F |
| FPC 0 XL_XR0 TSen         | OK | 42 degrees C / 107 degrees F |
| FPC 0 XL_XR0 Chip         | OK | 48 degrees C / 118 degrees F |
| FPC 0 XL_XR1 TSen         | OK | 42 degrees C / 107 degrees F |
| FPC 0 XL_XR1 Chip         | OK | 48 degrees C / 118 degrees F |
| FPC 0 XQ TSen             | OK | 42 degrees C / 107 degrees F |
| FPC 0 XQ Chip             | OK | 44 degrees C / 111 degrees F |
| FPC 0 XQ_XR0 TSen         | OK | 42 degrees C / 107 degrees F |
| FPC 0 XQ_XR0 Chip         | OK | 57 degrees C / 134 degrees F |
| FPC 0 XQ_XR1 TSen         | OK | 42 degrees C / 107 degrees F |
| FPC 0 XQ_XR1 Chip         | OK | 55 degrees C / 131 degrees F |
| FPC 0 XM 0 TSen           | OK | 48 degrees C / 118 degrees F |
| FPC 0 XM 0 Chip           | OK | 62 degrees C / 143 degrees F |
| FPC 0 XM 1 TSen           | OK | 48 degrees C / 118 degrees F |
| FPC 0 XM 1 Chip           | OK | 44 degrees C / 111 degrees F |
| FPC 0 PLX PCIe Switch TSe | OK | 48 degrees C / 118 degrees F |
| FPC 0 PLX PCIe Switch Chi | OK | 57 degrees C / 134 degrees F |
| FPC 1 Intake              | OK | 29 degrees C / 84 degrees F  |
| FPC 1 Exhaust A           | OK | 36 degrees C / 96 degrees F  |
| FPC 1 Exhaust B           | OK | 44 degrees C / 111 degrees F |

|                       |    |                              |
|-----------------------|----|------------------------------|
| FPC 1 LU 0 TSen       | OK | 38 degrees C / 100 degrees F |
| FPC 1 LU 0 Chip       | OK | 45 degrees C / 113 degrees F |
| FPC 1 LU 1 TSen       | OK | 38 degrees C / 100 degrees F |
| FPC 1 LU 1 Chip       | OK | 38 degrees C / 100 degrees F |
| FPC 1 LU 2 TSen       | OK | 38 degrees C / 100 degrees F |
| FPC 1 LU 2 Chip       | OK | 42 degrees C / 107 degrees F |
| FPC 1 LU 3 TSen       | OK | 38 degrees C / 100 degrees F |
| FPC 1 LU 3 Chip       | OK | 47 degrees C / 116 degrees F |
| FPC 1 XM 0 TSen       | OK | 38 degrees C / 100 degrees F |
| FPC 1 XM 0 Chip       | OK | 44 degrees C / 111 degrees F |
| FPC 1 XF 0 TSen       | OK | 38 degrees C / 100 degrees F |
| FPC 1 XF 0 Chip       | OK | 54 degrees C / 129 degrees F |
| FPC 1 PLX Switch TSen | OK | 38 degrees C / 100 degrees F |
| FPC 1 PLX Switch Chip | OK | 41 degrees C / 105 degrees F |
| FPC 2 Intake          | OK | 28 degrees C / 82 degrees F  |
| FPC 2 Exhaust A       | OK | 28 degrees C / 82 degrees F  |
| FPC 2 Exhaust B       | OK | 28 degrees C / 82 degrees F  |
| FPC 2 LU 0 TSen       | OK | 40 degrees C / 104 degrees F |
| FPC 2 LU 0 Chip       | OK | 40 degrees C / 104 degrees F |
| FPC 2 LU 1 TSen       | OK | 40 degrees C / 104 degrees F |
| FPC 2 LU 1 Chip       | OK | 41 degrees C / 105 degrees F |
| FPC 2 LU 2 TSen       | OK | 40 degrees C / 104 degrees F |
| FPC 2 LU 2 Chip       | OK | 34 degrees C / 93 degrees F  |
| FPC 2 LU 3 TSen       | OK | 40 degrees C / 104 degrees F |
| FPC 2 LU 3 Chip       | OK | 38 degrees C / 100 degrees F |
| FPC 2 XM 0 TSen       | OK | 40 degrees C / 104 degrees F |
| FPC 2 XM 0 Chip       | OK | 47 degrees C / 116 degrees F |
| FPC 2 XM 1 TSen       | OK | 40 degrees C / 104 degrees F |
| FPC 2 XM 1 Chip       | OK | 42 degrees C / 107 degrees F |
| FPC 2 PLX Switch TSen | OK | 40 degrees C / 104 degrees F |
| FPC 2 PLX Switch Chip | OK | 39 degrees C / 102 degrees F |
| FPC 3 Intake          | OK | 27 degrees C / 80 degrees F  |
| FPC 3 Exhaust A       | OK | 38 degrees C / 100 degrees F |
| FPC 3 Exhaust B       | OK | 31 degrees C / 87 degrees F  |
| FPC 3 QX 0 TSen       | OK | 38 degrees C / 100 degrees F |
| FPC 3 QX 0 Chip       | OK | 42 degrees C / 107 degrees F |
| FPC 3 LU 0 TCAM TSen  | OK | 38 degrees C / 100 degrees F |
| FPC 3 LU 0 TCAM Chip  | OK | 43 degrees C / 109 degrees F |
| FPC 3 LU 0 TSen       | OK | 38 degrees C / 100 degrees F |
| FPC 3 LU 0 Chip       | OK | 42 degrees C / 107 degrees F |
| FPC 3 MQ 0 TSen       | OK | 38 degrees C / 100 degrees F |
| FPC 3 MQ 0 Chip       | OK | 39 degrees C / 102 degrees F |
| FPC 3 QX 1 TSen       | OK | 32 degrees C / 89 degrees F  |
| FPC 3 QX 1 Chip       | OK | 36 degrees C / 96 degrees F  |
| FPC 3 LU 1 TCAM TSen  | OK | 32 degrees C / 89 degrees F  |
| FPC 3 LU 1 TCAM Chip  | OK | 35 degrees C / 95 degrees F  |
| FPC 3 LU 1 TSen       | OK | 32 degrees C / 89 degrees F  |
| FPC 3 LU 1 Chip       | OK | 37 degrees C / 98 degrees F  |
| FPC 3 MQ 1 TSen       | OK | 32 degrees C / 89 degrees F  |
| FPC 3 MQ 1 Chip       | OK | 36 degrees C / 96 degrees F  |
| FPC 4 Intake          | OK | 29 degrees C / 84 degrees F  |
| FPC 4 Exhaust A       | OK | 36 degrees C / 96 degrees F  |
| FPC 4 Exhaust B       | OK | 40 degrees C / 104 degrees F |
| FPC 4 XL TSen         | OK | 39 degrees C / 102 degrees F |
| FPC 4 XL Chip         | OK | 42 degrees C / 107 degrees F |
| FPC 4 XL_XR0 TSen     | OK | 39 degrees C / 102 degrees F |
| FPC 4 XL_XR0 Chip     | OK | 45 degrees C / 113 degrees F |
| FPC 4 XL_XR1 TSen     | OK | 39 degrees C / 102 degrees F |
| FPC 4 XL_XR1 Chip     | OK | 46 degrees C / 114 degrees F |
| FPC 4 XQ TSen         | OK | 39 degrees C / 102 degrees F |
| FPC 4 XQ Chip         | OK | 42 degrees C / 107 degrees F |

|                           |    |                              |
|---------------------------|----|------------------------------|
| FPC 4 XQ_XR0 TSen         | OK | 39 degrees C / 102 degrees F |
| FPC 4 XQ_XR0 Chip         | OK | 54 degrees C / 129 degrees F |
| FPC 4 XQ_XR1 TSen         | OK | 39 degrees C / 102 degrees F |
| FPC 4 XQ_XR1 Chip         | OK | 53 degrees C / 127 degrees F |
| FPC 4 XM 0 TSen           | OK | 45 degrees C / 113 degrees F |
| FPC 4 XM 0 Chip           | OK | 59 degrees C / 138 degrees F |
| FPC 4 XM 1 TSen           | OK | 45 degrees C / 113 degrees F |
| FPC 4 XM 1 Chip           | OK | 41 degrees C / 105 degrees F |
| FPC 4 PLX PCIe Switch TSe | OK | 45 degrees C / 113 degrees F |
| FPC 4 PLX PCIe Switch Chi | OK | 58 degrees C / 136 degrees F |
| FPC 5 Intake              | OK | 29 degrees C / 84 degrees F  |
| FPC 5 Exhaust A           | OK | 33 degrees C / 91 degrees F  |
| FPC 5 Exhaust B           | OK | 39 degrees C / 102 degrees F |
| FPC 5 LU 0 TSen           | OK | 40 degrees C / 104 degrees F |
| FPC 5 LU 0 Chip           | OK | 40 degrees C / 104 degrees F |
| FPC 5 LU 1 TSen           | OK | 40 degrees C / 104 degrees F |
| FPC 5 LU 1 Chip           | OK | 45 degrees C / 113 degrees F |
| FPC 5 LU 2 TSen           | OK | 40 degrees C / 104 degrees F |
| FPC 5 LU 2 Chip           | OK | 40 degrees C / 104 degrees F |
| FPC 5 LU 3 TSen           | OK | 40 degrees C / 104 degrees F |
| FPC 5 LU 3 Chip           | OK | 46 degrees C / 114 degrees F |
| FPC 5 MQ 0 TSen           | OK | 32 degrees C / 89 degrees F  |
| FPC 5 MQ 0 Chip           | OK | 33 degrees C / 91 degrees F  |
| FPC 5 MQ 1 TSen           | OK | 32 degrees C / 89 degrees F  |
| FPC 5 MQ 1 Chip           | OK | 35 degrees C / 95 degrees F  |
| FPC 5 MQ 2 TSen           | OK | 32 degrees C / 89 degrees F  |
| FPC 5 MQ 2 Chip           | OK | 32 degrees C / 89 degrees F  |
| FPC 5 MQ 3 TSen           | OK | 32 degrees C / 89 degrees F  |
| FPC 5 MQ 3 Chip           | OK | 32 degrees C / 89 degrees F  |
| FPC 9 Intake              | OK | 25 degrees C / 77 degrees F  |
| FPC 9 Exhaust A           | OK | 37 degrees C / 98 degrees F  |
| FPC 9 Exhaust B           | OK | 40 degrees C / 104 degrees F |
| FPC 9 XL 0 TSen           | OK | 40 degrees C / 104 degrees F |

...

### show chassis environment (MX2010 Router)

```
user@host> show chassis environment
```

| Class | Item                | Status | Measurement                 |
|-------|---------------------|--------|-----------------------------|
| Temp  | PSM 0               | OK     | 7 degrees C / 44 degrees F  |
|       | PSM 1               | OK     | 7 degrees C / 44 degrees F  |
|       | PSM 2               | OK     | 7 degrees C / 44 degrees F  |
|       | PSM 3               | OK     | 6 degrees C / 42 degrees F  |
|       | PSM 4               | OK     | 6 degrees C / 42 degrees F  |
|       | PSM 5               | OK     | 6 degrees C / 42 degrees F  |
|       | PSM 6               | OK     | 6 degrees C / 42 degrees F  |
|       | PSM 7               | OK     | 7 degrees C / 44 degrees F  |
|       | PSM 8               | OK     | 7 degrees C / 44 degrees F  |
|       | PDM 0               | OK     |                             |
|       | PDM 1               | Absent |                             |
|       | CB 0 IntakeA-Zone0  | OK     | 14 degrees C / 57 degrees F |
|       | CB 0 IntakeB-Zone1  | OK     | 7 degrees C / 44 degrees F  |
|       | CB 0 IntakeC-Zone0  | OK     | 22 degrees C / 71 degrees F |
|       | CB 0 ExhaustA-Zone0 | OK     | 14 degrees C / 57 degrees F |
|       | CB 0 ExhaustB-Zone1 | OK     | 9 degrees C / 48 degrees F  |
|       | CB 0 TCBC-Zone0     | OK     | 11 degrees C / 51 degrees F |
|       | CB 1 IntakeA-Zone0  | OK     | 9 degrees C / 48 degrees F  |
|       | CB 1 IntakeB-Zone1  | OK     | 5 degrees C / 41 degrees F  |
|       | CB 1 IntakeC-Zone0  | OK     | 20 degrees C / 68 degrees F |
|       | CB 1 ExhaustA-Zone0 | OK     | 12 degrees C / 53 degrees F |
|       | CB 1 ExhaustB-Zone1 | OK     | 7 degrees C / 44 degrees F  |

|                      |    |                             |
|----------------------|----|-----------------------------|
| CB 1 TCBC-Zone0      | OK | 10 degrees C / 50 degrees F |
| SPMB 0 Intake        | OK | 5 degrees C / 41 degrees F  |
| SPMB 1 Intake        | OK | 4 degrees C / 39 degrees F  |
| Routing Engine 0     | OK | 9 degrees C / 48 degrees F  |
| Routing Engine 0 CPU | OK | 9 degrees C / 48 degrees F  |
| Routing Engine 1     | OK | 6 degrees C / 42 degrees F  |
| Routing Engine 1 CPU | OK | 6 degrees C / 42 degrees F  |
| SFB 0 Intake-Zone0   | OK | 26 degrees C / 78 degrees F |
| SFB 0 Exhaust-Zone1  | OK | 17 degrees C / 62 degrees F |
| SFB 0 IntakeA-Zone0  | OK | 16 degrees C / 60 degrees F |
| SFB 0 IntakeB-Zone1  | OK | 11 degrees C / 51 degrees F |
| SFB 0 Exhaust-Zone0  | OK | 18 degrees C / 64 degrees F |
| SFB 0 SFB-XF2-Zone1  | OK | 25 degrees C / 77 degrees F |
| SFB 0 SFB-XF1-Zone0  | OK | 23 degrees C / 73 degrees F |
| SFB 0 SFB-XF0-Zone0  | OK | 33 degrees C / 91 degrees F |
| SFB 1 Intake-Zone0   | OK | 27 degrees C / 80 degrees F |
| SFB 1 Exhaust-Zone1  | OK | 15 degrees C / 59 degrees F |
| SFB 1 IntakeA-Zone0  | OK | 20 degrees C / 68 degrees F |
| SFB 1 IntakeB-Zone1  | OK | 10 degrees C / 50 degrees F |
| SFB 1 Exhaust-Zone0  | OK | 19 degrees C / 66 degrees F |
| SFB 1 SFB-XF2-Zone1  | OK | 26 degrees C / 78 degrees F |
| SFB 1 SFB-XF1-Zone0  | OK | 27 degrees C / 80 degrees F |
| SFB 1 SFB-XF0-Zone0  | OK | 32 degrees C / 89 degrees F |
| SFB 2 Intake-Zone0   | OK | 21 degrees C / 69 degrees F |
| SFB 2 Exhaust-Zone1  | OK | 13 degrees C / 55 degrees F |
| SFB 2 IntakeA-Zone0  | OK | 18 degrees C / 64 degrees F |
| SFB 2 IntakeB-Zone1  | OK | 9 degrees C / 48 degrees F  |
| SFB 2 Exhaust-Zone0  | OK | 16 degrees C / 60 degrees F |
| SFB 2 SFB-XF2-Zone1  | OK | 24 degrees C / 75 degrees F |
| SFB 2 SFB-XF1-Zone0  | OK | 21 degrees C / 69 degrees F |
| SFB 2 SFB-XF0-Zone0  | OK | 26 degrees C / 78 degrees F |
| SFB 4 Intake-Zone0   | OK | 28 degrees C / 82 degrees F |
| SFB 4 Exhaust-Zone1  | OK | 16 degrees C / 60 degrees F |
| SFB 4 IntakeA-Zone0  | OK | 18 degrees C / 64 degrees F |
| SFB 4 IntakeB-Zone1  | OK | 11 degrees C / 51 degrees F |
| SFB 4 Exhaust-Zone0  | OK | 19 degrees C / 66 degrees F |
| SFB 4 SFB-XF2-Zone1  | OK | 27 degrees C / 80 degrees F |
| SFB 4 SFB-XF1-Zone0  | OK | 27 degrees C / 80 degrees F |
| SFB 4 SFB-XF0-Zone0  | OK | 32 degrees C / 89 degrees F |
| SFB 5 Intake-Zone0   | OK | 22 degrees C / 71 degrees F |
| SFB 5 Exhaust-Zone1  | OK | 14 degrees C / 57 degrees F |
| SFB 5 IntakeA-Zone0  | OK | 18 degrees C / 64 degrees F |
| SFB 5 IntakeB-Zone1  | OK | 10 degrees C / 50 degrees F |
| SFB 5 Exhaust-Zone0  | OK | 17 degrees C / 62 degrees F |
| SFB 5 SFB-XF2-Zone1  | OK | 22 degrees C / 71 degrees F |
| SFB 5 SFB-XF1-Zone0  | OK | 29 degrees C / 84 degrees F |
| SFB 5 SFB-XF0-Zone0  | OK | 27 degrees C / 80 degrees F |
| SFB 6 Intake-Zone0   | OK | 27 degrees C / 80 degrees F |
| SFB 6 Exhaust-Zone1  | OK | 13 degrees C / 55 degrees F |
| SFB 6 IntakeA-Zone0  | OK | 19 degrees C / 66 degrees F |
| SFB 6 IntakeB-Zone1  | OK | 10 degrees C / 50 degrees F |
| SFB 6 Exhaust-Zone0  | OK | 20 degrees C / 68 degrees F |
| SFB 6 SFB-XF2-Zone1  | OK | 24 degrees C / 75 degrees F |
| SFB 6 SFB-XF1-Zone0  | OK | 32 degrees C / 89 degrees F |
| SFB 6 SFB-XF0-Zone0  | OK | 33 degrees C / 91 degrees F |
| SFB 7 Intake-Zone0   | OK | 25 degrees C / 77 degrees F |
| SFB 7 Exhaust-Zone1  | OK | 13 degrees C / 55 degrees F |
| SFB 7 IntakeA-Zone0  | OK | 14 degrees C / 57 degrees F |
| SFB 7 IntakeB-Zone1  | OK | 8 degrees C / 46 degrees F  |
| SFB 7 Exhaust-Zone0  | OK | 17 degrees C / 62 degrees F |
| SFB 7 SFB-XF2-Zone1  | OK | 21 degrees C / 69 degrees F |

|                       |    |                             |
|-----------------------|----|-----------------------------|
| SFB 7 SFB-XF1-Zone0   | OK | 21 degrees C / 69 degrees F |
| SFB 7 SFB-XF0-Zone0   | OK | 33 degrees C / 91 degrees F |
| FPC 0 Intake          | OK | 13 degrees C / 55 degrees F |
| FPC 0 Exhaust A       | OK | 13 degrees C / 55 degrees F |
| FPC 0 Exhaust B       | OK | 14 degrees C / 57 degrees F |
| FPC 0 LU 0 TSen       | OK | 28 degrees C / 82 degrees F |
| FPC 0 LU 0 Chip       | OK | 25 degrees C / 77 degrees F |
| FPC 0 LU 1 TSen       | OK | 28 degrees C / 82 degrees F |
| FPC 0 LU 1 Chip       | OK | 27 degrees C / 80 degrees F |
| FPC 0 LU 2 TSen       | OK | 28 degrees C / 82 degrees F |
| FPC 0 LU 2 Chip       | OK | 19 degrees C / 66 degrees F |
| FPC 0 LU 3 TSen       | OK | 28 degrees C / 82 degrees F |
| FPC 0 LU 3 Chip       | OK | 23 degrees C / 73 degrees F |
| FPC 0 XM 0 TSen       | OK | 28 degrees C / 82 degrees F |
| FPC 0 XM 0 Chip       | OK | 33 degrees C / 91 degrees F |
| FPC 0 XM 1 TSen       | OK | 28 degrees C / 82 degrees F |
| FPC 0 XM 1 Chip       | OK | 26 degrees C / 78 degrees F |
| FPC 0 PLX Switch TSen | OK | 28 degrees C / 82 degrees F |
| FPC 0 PLX Switch Chip | OK | 26 degrees C / 78 degrees F |
| FPC 1 Intake          | OK | 10 degrees C / 50 degrees F |
| FPC 1 Exhaust A       | OK | 24 degrees C / 75 degrees F |
| FPC 1 Exhaust B       | OK | 28 degrees C / 82 degrees F |
| FPC 1 LU 0 TSen       | OK | 22 degrees C / 71 degrees F |
| FPC 1 LU 0 Chip       | OK | 31 degrees C / 87 degrees F |
| FPC 1 LU 1 TSen       | OK | 22 degrees C / 71 degrees F |
| FPC 1 LU 1 Chip       | OK | 21 degrees C / 69 degrees F |
| FPC 1 LU 2 TSen       | OK | 22 degrees C / 71 degrees F |
| FPC 1 LU 2 Chip       | OK | 25 degrees C / 77 degrees F |
| FPC 1 LU 3 TSen       | OK | 22 degrees C / 71 degrees F |
| FPC 1 LU 3 Chip       | OK | 33 degrees C / 91 degrees F |
| FPC 1 XM 0 TSen       | OK | 22 degrees C / 71 degrees F |
| FPC 1 XM 0 Chip       | OK | 30 degrees C / 86 degrees F |
| FPC 1 XF 0 TSen       | OK | 22 degrees C / 71 degrees F |
| FPC 1 XF 0 Chip       | OK | 37 degrees C / 98 degrees F |
| FPC 1 PLX Switch TSen | OK | 22 degrees C / 71 degrees F |
| FPC 1 PLX Switch Chip | OK | 22 degrees C / 71 degrees F |
| FPC 2 Intake          | OK | 9 degrees C / 48 degrees F  |
| FPC 2 Exhaust A       | OK | 10 degrees C / 50 degrees F |
| FPC 2 Exhaust B       | OK | 10 degrees C / 50 degrees F |
| FPC 2 LU 0 TSen       | OK | 26 degrees C / 78 degrees F |
| FPC 2 LU 0 Chip       | OK | 25 degrees C / 77 degrees F |
| FPC 2 LU 1 TSen       | OK | 26 degrees C / 78 degrees F |
| FPC 2 LU 1 Chip       | OK | 26 degrees C / 78 degrees F |
| FPC 2 LU 2 TSen       | OK | 26 degrees C / 78 degrees F |
| FPC 2 LU 2 Chip       | OK | 17 degrees C / 62 degrees F |
| FPC 2 LU 3 TSen       | OK | 26 degrees C / 78 degrees F |
| FPC 2 LU 3 Chip       | OK | 22 degrees C / 71 degrees F |
| FPC 2 XM 0 TSen       | OK | 26 degrees C / 78 degrees F |
| FPC 2 XM 0 Chip       | OK | 34 degrees C / 93 degrees F |
| FPC 2 XM 1 TSen       | OK | 26 degrees C / 78 degrees F |
| FPC 2 XM 1 Chip       | OK | 26 degrees C / 78 degrees F |
| FPC 2 PLX Switch TSen | OK | 26 degrees C / 78 degrees F |
| FPC 2 PLX Switch Chip | OK | 20 degrees C / 68 degrees F |
| FPC 3 Intake          | OK | 12 degrees C / 53 degrees F |
| FPC 3 Exhaust A       | OK | 16 degrees C / 60 degrees F |
| FPC 3 Exhaust B       | OK | 26 degrees C / 78 degrees F |
| FPC 3 LU 0 TSen       | OK | 23 degrees C / 73 degrees F |
| FPC 3 LU 0 Chip       | OK | 26 degrees C / 78 degrees F |
| FPC 3 LU 1 TSen       | OK | 23 degrees C / 73 degrees F |
| FPC 3 LU 1 Chip       | OK | 27 degrees C / 80 degrees F |
| FPC 3 LU 2 TSen       | OK | 23 degrees C / 73 degrees F |



|                       |    |                             |
|-----------------------|----|-----------------------------|
| FPC 3 LU 2 Chip       | OK | 22 degrees C / 71 degrees F |
| FPC 3 LU 3 TSen       | OK | 23 degrees C / 73 degrees F |
| FPC 3 LU 3 Chip       | OK | 21 degrees C / 69 degrees F |
| FPC 3 MQ 0 TSen       | OK | 15 degrees C / 59 degrees F |
| FPC 3 MQ 0 Chip       | OK | 18 degrees C / 64 degrees F |
| FPC 3 MQ 1 TSen       | OK | 15 degrees C / 59 degrees F |
| FPC 3 MQ 1 Chip       | OK | 20 degrees C / 68 degrees F |
| FPC 3 MQ 2 TSen       | OK | 15 degrees C / 59 degrees F |
| FPC 3 MQ 2 Chip       | OK | 17 degrees C / 62 degrees F |
| FPC 3 MQ 3 TSen       | OK | 15 degrees C / 59 degrees F |
| FPC 3 MQ 3 Chip       | OK | 16 degrees C / 60 degrees F |
| FPC 4 Intake          | OK | 11 degrees C / 51 degrees F |
| FPC 4 Exhaust A       | OK | 22 degrees C / 71 degrees F |
| FPC 4 Exhaust B       | OK | 28 degrees C / 82 degrees F |
| FPC 4 LU 0 TSen       | OK | 22 degrees C / 71 degrees F |
| FPC 4 LU 0 Chip       | OK | 33 degrees C / 91 degrees F |
| FPC 4 LU 1 TSen       | OK | 22 degrees C / 71 degrees F |
| FPC 4 LU 1 Chip       | OK | 21 degrees C / 69 degrees F |
| FPC 4 LU 2 TSen       | OK | 22 degrees C / 71 degrees F |
| FPC 4 LU 2 Chip       | OK | 26 degrees C / 78 degrees F |
| FPC 4 LU 3 TSen       | OK | 22 degrees C / 71 degrees F |
| FPC 4 LU 3 Chip       | OK | 33 degrees C / 91 degrees F |
| FPC 4 XM 0 TSen       | OK | 22 degrees C / 71 degrees F |
| FPC 4 XM 0 Chip       | OK | 30 degrees C / 86 degrees F |
| FPC 4 XF 0 TSen       | OK | 22 degrees C / 71 degrees F |
| FPC 4 XF 0 Chip       | OK | 37 degrees C / 98 degrees F |
| FPC 4 PLX Switch TSen | OK | 22 degrees C / 71 degrees F |
| FPC 4 PLX Switch Chip | OK | 23 degrees C / 73 degrees F |
| FPC 5 Intake          | OK | 12 degrees C / 53 degrees F |
| FPC 5 Exhaust A       | OK | 12 degrees C / 53 degrees F |
| FPC 5 Exhaust B       | OK | 12 degrees C / 53 degrees F |
| FPC 5 LU 0 TSen       | OK | 27 degrees C / 80 degrees F |
| FPC 5 LU 0 Chip       | OK | 28 degrees C / 82 degrees F |
| FPC 5 LU 1 TSen       | OK | 27 degrees C / 80 degrees F |
| FPC 5 LU 1 Chip       | OK | 27 degrees C / 80 degrees F |
| FPC 5 LU 2 TSen       | OK | 27 degrees C / 80 degrees F |
| FPC 5 LU 2 Chip       | OK | 19 degrees C / 66 degrees F |
| FPC 5 LU 3 TSen       | OK | 27 degrees C / 80 degrees F |
| FPC 5 LU 3 Chip       | OK | 22 degrees C / 71 degrees F |
| FPC 5 XM 0 TSen       | OK | 27 degrees C / 80 degrees F |
| FPC 5 XM 0 Chip       | OK | 36 degrees C / 96 degrees F |
| FPC 5 XM 1 TSen       | OK | 27 degrees C / 80 degrees F |
| FPC 5 XM 1 Chip       | OK | 26 degrees C / 78 degrees F |
| FPC 5 PLX Switch TSen | OK | 27 degrees C / 80 degrees F |
| FPC 5 PLX Switch Chip | OK | 24 degrees C / 75 degrees F |
| FPC 6 Intake          | OK | 12 degrees C / 53 degrees F |
| FPC 6 Exhaust A       | OK | 17 degrees C / 62 degrees F |
| FPC 6 Exhaust B       | OK | 28 degrees C / 82 degrees F |
| FPC 6 LU 0 TSen       | OK | 24 degrees C / 75 degrees F |
| FPC 6 LU 0 Chip       | OK | 29 degrees C / 84 degrees F |
| FPC 6 LU 1 TSen       | OK | 24 degrees C / 75 degrees F |
| FPC 6 LU 1 Chip       | OK | 30 degrees C / 86 degrees F |
| FPC 6 LU 2 TSen       | OK | 24 degrees C / 75 degrees F |
| FPC 6 LU 2 Chip       | OK | 24 degrees C / 75 degrees F |
| FPC 6 LU 3 TSen       | OK | 24 degrees C / 75 degrees F |
| FPC 6 LU 3 Chip       | OK | 22 degrees C / 71 degrees F |
| FPC 6 MQ 0 TSen       | OK | 16 degrees C / 60 degrees F |
| FPC 6 MQ 0 Chip       | OK | 19 degrees C / 66 degrees F |
| FPC 6 MQ 1 TSen       | OK | 16 degrees C / 60 degrees F |
| FPC 6 MQ 1 Chip       | OK | 20 degrees C / 68 degrees F |
| FPC 6 MQ 2 TSen       | OK | 16 degrees C / 60 degrees F |

|                       |    |                              |
|-----------------------|----|------------------------------|
| FPC 6 MQ 2 Chip       | OK | 17 degrees C / 62 degrees F  |
| FPC 6 MQ 3 TSen       | OK | 16 degrees C / 60 degrees F  |
| FPC 6 MQ 3 Chip       | OK | 16 degrees C / 60 degrees F  |
| FPC 7 Intake          | OK | 10 degrees C / 50 degrees F  |
| FPC 7 Exhaust A       | OK | 10 degrees C / 50 degrees F  |
| FPC 7 Exhaust B       | OK | 11 degrees C / 51 degrees F  |
| FPC 7 LU 0 TSen       | OK | 26 degrees C / 78 degrees F  |
| FPC 7 LU 0 Chip       | OK | 26 degrees C / 78 degrees F  |
| FPC 7 LU 1 TSen       | OK | 26 degrees C / 78 degrees F  |
| FPC 7 LU 1 Chip       | OK | 29 degrees C / 84 degrees F  |
| FPC 7 LU 2 TSen       | OK | 26 degrees C / 78 degrees F  |
| FPC 7 LU 2 Chip       | OK | 19 degrees C / 66 degrees F  |
| FPC 7 LU 3 TSen       | OK | 26 degrees C / 78 degrees F  |
| FPC 7 LU 3 Chip       | OK | 24 degrees C / 75 degrees F  |
| FPC 7 XM 0 TSen       | OK | 26 degrees C / 78 degrees F  |
| FPC 7 XM 0 Chip       | OK | 34 degrees C / 93 degrees F  |
| FPC 7 XM 1 TSen       | OK | 26 degrees C / 78 degrees F  |
| FPC 7 XM 1 Chip       | OK | 32 degrees C / 89 degrees F  |
| FPC 7 PLX Switch TSen | OK | 26 degrees C / 78 degrees F  |
| FPC 7 PLX Switch Chip | OK | 22 degrees C / 71 degrees F  |
| FPC 8 Intake          | OK | 10 degrees C / 50 degrees F  |
| FPC 8 Exhaust A       | OK | 22 degrees C / 71 degrees F  |
| FPC 8 Exhaust B       | OK | 28 degrees C / 82 degrees F  |
| FPC 8 LU 0 TSen       | OK | 20 degrees C / 68 degrees F  |
| FPC 8 LU 0 Chip       | OK | 33 degrees C / 91 degrees F  |
| FPC 8 LU 1 TSen       | OK | 20 degrees C / 68 degrees F  |
| FPC 8 LU 1 Chip       | OK | 23 degrees C / 73 degrees F  |
| FPC 8 LU 2 TSen       | OK | 20 degrees C / 68 degrees F  |
| FPC 8 LU 2 Chip       | OK | 26 degrees C / 78 degrees F  |
| FPC 8 LU 3 TSen       | OK | 20 degrees C / 68 degrees F  |
| FPC 8 LU 3 Chip       | OK | 33 degrees C / 91 degrees F  |
| FPC 8 XM 0 TSen       | OK | 20 degrees C / 68 degrees F  |
| FPC 8 XM 0 Chip       | OK | 29 degrees C / 84 degrees F  |
| FPC 8 XF 0 TSen       | OK | 20 degrees C / 68 degrees F  |
| FPC 8 XF 0 Chip       | OK | 38 degrees C / 100 degrees F |
| FPC 8 PLX Switch TSen | OK | 20 degrees C / 68 degrees F  |
| FPC 8 PLX Switch Chip | OK | 24 degrees C / 75 degrees F  |
| FPC 9 Intake          | OK | 11 degrees C / 51 degrees F  |
| FPC 9 Exhaust A       | OK | 11 degrees C / 51 degrees F  |
| FPC 9 Exhaust B       | OK | 11 degrees C / 51 degrees F  |
| FPC 9 LU 0 TSen       | OK | 25 degrees C / 77 degrees F  |
| FPC 9 LU 0 Chip       | OK | 24 degrees C / 75 degrees F  |
| FPC 9 LU 1 TSen       | OK | 25 degrees C / 77 degrees F  |
| FPC 9 LU 1 Chip       | OK | 26 degrees C / 78 degrees F  |
| FPC 9 LU 2 TSen       | OK | 25 degrees C / 77 degrees F  |
| FPC 9 LU 2 Chip       | OK | 16 degrees C / 60 degrees F  |
| FPC 9 LU 3 TSen       | OK | 25 degrees C / 77 degrees F  |
| FPC 9 LU 3 Chip       | OK | 21 degrees C / 69 degrees F  |
| FPC 9 XM 0 TSen       | OK | 25 degrees C / 77 degrees F  |
| FPC 9 XM 0 Chip       | OK | 32 degrees C / 89 degrees F  |
| FPC 9 XM 1 TSen       | OK | 25 degrees C / 77 degrees F  |
| FPC 9 XM 1 Chip       | OK | 25 degrees C / 77 degrees F  |
| FPC 9 PLX Switch TSen | OK | 25 degrees C / 77 degrees F  |
| FPC 9 PLX Switch Chip | OK | 21 degrees C / 69 degrees F  |
| ADC 0 Intake          | OK | 12 degrees C / 53 degrees F  |
| ADC 0 Exhaust         | OK | 20 degrees C / 68 degrees F  |
| ADC 0 ADC-XF1         | OK | 26 degrees C / 78 degrees F  |
| ADC 0 ADC-XF0         | OK | 32 degrees C / 89 degrees F  |
| ADC 1 Intake          | OK | 11 degrees C / 51 degrees F  |
| ADC 1 Exhaust         | OK | 21 degrees C / 69 degrees F  |
| ADC 1 ADC-XF1         | OK | 24 degrees C / 75 degrees F  |

```

ADC 1 ADC-XF0 OK 31 degrees C / 87 degrees F
ADC 2 Intake OK 14 degrees C / 57 degrees F
ADC 2 Exhaust OK 21 degrees C / 69 degrees F
ADC 2 ADC-XF1 OK 28 degrees C / 82 degrees F
ADC 2 ADC-XF0 OK 34 degrees C / 93 degrees F
ADC 3 Intake OK 13 degrees C / 55 degrees F
ADC 3 Exhaust OK 19 degrees C / 66 degrees F
ADC 3 ADC-XF1 OK 24 degrees C / 75 degrees F
ADC 3 ADC-XF0 OK 31 degrees C / 87 degrees F
ADC 4 Intake OK 9 degrees C / 48 degrees F
ADC 4 Exhaust OK 22 degrees C / 71 degrees F
ADC 4 ADC-XF1 OK 28 degrees C / 82 degrees F
ADC 4 ADC-XF0 OK 35 degrees C / 95 degrees F
ADC 5 Intake OK 12 degrees C / 53 degrees F
ADC 5 Exhaust OK 22 degrees C / 71 degrees F
ADC 5 ADC-XF1 OK 28 degrees C / 82 degrees F
ADC 5 ADC-XF0 OK 34 degrees C / 93 degrees F
ADC 6 Intake OK 11 degrees C / 51 degrees F
ADC 6 Exhaust OK 21 degrees C / 69 degrees F
ADC 6 ADC-XF1 OK 26 degrees C / 78 degrees F
ADC 6 ADC-XF0 OK 35 degrees C / 95 degrees F
ADC 7 Intake OK 14 degrees C / 57 degrees F
ADC 7 Exhaust OK 22 degrees C / 71 degrees F
ADC 7 ADC-XF1 OK 26 degrees C / 78 degrees F
ADC 7 ADC-XF0 OK 34 degrees C / 93 degrees F
ADC 8 Intake OK 14 degrees C / 57 degrees F
ADC 8 Exhaust OK 21 degrees C / 69 degrees F
ADC 8 ADC-XF1 OK 24 degrees C / 75 degrees F
ADC 8 ADC-XF0 OK 31 degrees C / 87 degrees F
ADC 9 Intake OK 10 degrees C / 50 degrees F
ADC 9 Exhaust OK 22 degrees C / 71 degrees F
ADC 9 ADC-XF1 OK 28 degrees C / 82 degrees F
ADC 9 ADC-XF0 OK 36 degrees C / 96 degrees F
Fans Fan Tray 0 Fan 1 OK 3480 RPM
Fans Fan Tray 0 Fan 2 OK 3480 RPM
Fans Fan Tray 0 Fan 3 OK 3480 RPM
Fans Fan Tray 0 Fan 4 OK 3360 RPM
Fans Fan Tray 0 Fan 5 OK 3360 RPM
Fans Fan Tray 0 Fan 6 OK 3480 RPM
Fans Fan Tray 1 Fan 1 OK 3360 RPM
Fans Fan Tray 1 Fan 2 OK 3360 RPM
Fans Fan Tray 1 Fan 3 OK 3360 RPM
Fans Fan Tray 1 Fan 4 OK 3480 RPM
Fans Fan Tray 1 Fan 5 OK 3480 RPM
Fans Fan Tray 1 Fan 6 OK 3480 RPM
Fans Fan Tray 2 Fan 1 OK 3360 RPM
Fans Fan Tray 2 Fan 2 OK 3360 RPM
Fans Fan Tray 2 Fan 3 OK 3480 RPM
Fans Fan Tray 2 Fan 4 OK 3480 RPM
Fans Fan Tray 2 Fan 5 OK 3360 RPM
Fans Fan Tray 2 Fan 6 OK 3480 RPM
Fans Fan Tray 3 Fan 1 OK 3360 RPM
Fans Fan Tray 3 Fan 2 OK 3360 RPM
Fans Fan Tray 3 Fan 3 OK 3480 RPM
Fans Fan Tray 3 Fan 4 OK 3480 RPM
Fans Fan Tray 3 Fan 5 OK 3480 RPM
Fans Fan Tray 3 Fan 6 OK 3360 RPM

```

### show chassis environment (T320 Router)

```
user@host> show chassis environment
```

| Class | Item                    | Status | Measurement                  |
|-------|-------------------------|--------|------------------------------|
| Power | PEM 0                   | OK     |                              |
|       | PEM 1                   | Absent |                              |
| Temp  | SCG 0                   | OK     | 28 degrees C / 82 degrees F  |
|       | SCG 1                   | OK     | 28 degrees C / 82 degrees F  |
|       | Routing Engine 0        | OK     | 31 degrees C / 87 degrees F  |
|       | Routing Engine 1        | OK     | 30 degrees C / 86 degrees F  |
|       | CB 0                    | OK     | 32 degrees C / 89 degrees F  |
|       | CB 1                    | OK     | 32 degrees C / 89 degrees F  |
|       | SIB 0                   | OK     | 33 degrees C / 91 degrees F  |
|       | SIB 1                   | OK     | 33 degrees C / 91 degrees F  |
|       | SIB 2                   | OK     | 34 degrees C / 93 degrees F  |
|       | FPC 0 Top               | OK     | 38 degrees C / 100 degrees F |
|       | FPC 0 Bottom            | OK     | 32 degrees C / 89 degrees F  |
|       | FPC 1 Top               | OK     | 38 degrees C / 100 degrees F |
|       | FPC 1 Bottom            | OK     | 33 degrees C / 91 degrees F  |
|       | FPC 2 Top               | OK     | 36 degrees C / 96 degrees F  |
|       | FPC 2 Bottom            | OK     | 31 degrees C / 87 degrees F  |
|       | FPM GBUS                | OK     | 26 degrees C / 78 degrees F  |
|       | FPM Display             | OK     | 29 degrees C / 84 degrees F  |
| Fans  | Top Left Front fan      | OK     | Spinning at normal speed     |
|       | Top Left Middle fan     | OK     | Spinning at normal speed     |
|       | Top Left Rear fan       | OK     | Spinning at normal speed     |
|       | Top Right Front fan     | OK     | Spinning at normal speed     |
|       | Top Right Middle fan    | OK     | Spinning at normal speed     |
|       | Top Right Rear fan      | OK     | Spinning at normal speed     |
|       | Bottom Left Front fan   | OK     | Spinning at normal speed     |
|       | Bottom Left Middle fan  | OK     | Spinning at normal speed     |
|       | Bottom Left Rear fan    | OK     | Spinning at normal speed     |
|       | Bottom Right Front fan  | OK     | Spinning at normal speed     |
|       | Bottom Right Middle fan | OK     | Spinning at normal speed     |
|       | Bottom Right Rear fan   | OK     | Spinning at normal speed     |
|       | Rear Tray Top fan       | OK     | Spinning at normal speed     |
|       | Rear Tray Second fan    | OK     | Spinning at normal speed     |
|       | Rear Tray Middle fan    | OK     | Spinning at normal speed     |
|       | Rear Tray Fourth fan    | OK     | Spinning at normal speed     |
| Misc  | Rear Tray Bottom fan    | OK     | Spinning at normal speed     |
|       | CIP                     | OK     |                              |
|       | SPMB 0                  | OK     |                              |
|       | SPMB 1                  | OK     |                              |

### show chassis environment (T640 Router)

```
user@host> show chassis environment
```

| Class | Item             | Status  | Measurement                 |
|-------|------------------|---------|-----------------------------|
| Temp  | PEM 0            | Absent  |                             |
|       | PEM 1            | OK      | 22 degrees C / 71 degrees F |
|       | SCG 0            | OK      | 30 degrees C / 86 degrees F |
|       | SCG 1            | OK      | 30 degrees C / 86 degrees F |
|       | Routing Engine 0 | Present |                             |
|       | Routing Engine 1 | OK      | 27 degrees C / 80 degrees F |
|       | CB 0             | Present |                             |
|       | CB 1             | OK      | 33 degrees C / 91 degrees F |
|       | SIB 0            | Absent  |                             |
|       | SIB 1            | Absent  |                             |
|       | SIB 2            | Absent  |                             |
|       | SIB 3            | Absent  |                             |
|       | SIB 4            | Absent  |                             |
|       | FPC 4 Top        | Testing |                             |
|       | FPC 4 Bottom     | Testing |                             |

|      |                         |         |                             |
|------|-------------------------|---------|-----------------------------|
|      | FPC 5 Top               | Testing |                             |
|      | FPC 5 Bottom            | Testing |                             |
|      | FPC 6 Top               | Testing |                             |
|      | FPC 6 Bottom            | Testing |                             |
|      | FPM GBUS                | OK      | 23 degrees C / 73 degrees F |
|      | FPM Display             | Absent  |                             |
| Fans | Top Left Front fan      | OK      | Spinning at normal speed    |
|      | Top Left Middle fan     | OK      | Spinning at normal speed    |
|      | Top Left Rear fan       | OK      | Spinning at normal speed    |
|      | Top Right Front fan     | OK      | Spinning at normal speed    |
|      | Top Right Middle fan    | OK      | Spinning at normal speed    |
|      | Top Right Rear fan      | OK      | Spinning at normal speed    |
|      | Bottom Left Front fan   | OK      | Spinning at normal speed    |
|      | Bottom Left Middle fan  | OK      | Spinning at normal speed    |
|      | Bottom Left Rear fan    | OK      | Spinning at normal speed    |
|      | Bottom Right Front fan  | OK      | Spinning at normal speed    |
|      | Bottom Right Middle fan | OK      | Spinning at normal speed    |
|      | Bottom Right Rear fan   | OK      | Spinning at normal speed    |
|      | Fourth Blower from top  | OK      | Spinning at normal speed    |
|      | Bottom Blower           | OK      | Spinning at normal speed    |
|      | Middle Blower           | OK      | Spinning at normal speed    |
|      | Top Blower              | OK      | Spinning at normal speed    |
|      | Second Blower from top  | OK      | Spinning at normal speed    |
| Misc | CIP                     | OK      |                             |
|      | SPMB 0                  | OK      |                             |
|      | SPMB 1                  | OK      |                             |

### show chassis environment (T4000 Router)

```
user@host> show chassis environment
```

| Class | Item                 | Status | Measurement                  |
|-------|----------------------|--------|------------------------------|
| Temp  | PEM 0                | OK     | 33 degrees C / 91 degrees F  |
|       | PEM 1                | Absent |                              |
|       | SCG 0                | OK     | 33 degrees C / 91 degrees F  |
|       | SCG 1                | OK     | 33 degrees C / 91 degrees F  |
|       | Routing Engine 0     | OK     | 33 degrees C / 91 degrees F  |
|       | Routing Engine 0 CPU | OK     | 50 degrees C / 122 degrees F |
|       | Routing Engine 1     | OK     | 32 degrees C / 89 degrees F  |
|       | Routing Engine 1 CPU | OK     | 46 degrees C / 114 degrees F |
|       | CB 0                 | OK     | 32 degrees C / 89 degrees F  |
|       | CB 1                 | OK     | 33 degrees C / 91 degrees F  |
|       | SIB 0                | OK     | 42 degrees C / 107 degrees F |
|       | SIB 1                | OK     | 42 degrees C / 107 degrees F |
|       | SIB 2                | OK     | 42 degrees C / 107 degrees F |
|       | SIB 3                | OK     | 43 degrees C / 109 degrees F |
|       | SIB 4                | OK     | 45 degrees C / 113 degrees F |
|       | FPC 0 Fan Intake     | OK     | 34 degrees C / 93 degrees F  |
|       | FPC 0 Fan Exhaust    | OK     | 48 degrees C / 118 degrees F |
|       | FPC 0 PMB            | OK     | 47 degrees C / 116 degrees F |
|       | FPC 0 LMB0           | OK     | 50 degrees C / 122 degrees F |
|       | FPC 0 LMB1           | OK     | 41 degrees C / 105 degrees F |
|       | FPC 0 LMB2           | OK     | 35 degrees C / 95 degrees F  |
|       | FPC 0 PFE1 LU2       | OK     | 46 degrees C / 114 degrees F |
|       | FPC 0 PFE1 LU0       | OK     | 41 degrees C / 105 degrees F |
|       | FPC 0 PFE0 LU0       | OK     | 57 degrees C / 134 degrees F |
|       | FPC 0 XF1            | OK     | 46 degrees C / 114 degrees F |
|       | FPC 0 XF0            | OK     | 52 degrees C / 125 degrees F |
|       | FPC 0 XM1            | OK     | 41 degrees C / 105 degrees F |
|       | FPC 0 XM0            | OK     | 50 degrees C / 122 degrees F |
|       | FPC 0 PFE0 LU1       | OK     | 56 degrees C / 132 degrees F |

|      |                         |    |                              |
|------|-------------------------|----|------------------------------|
|      | FPC 0 PFE0 LU2          | OK | 45 degrees C / 113 degrees F |
|      | FPC 0 PFE1 LU1          | OK | 37 degrees C / 98 degrees F  |
|      | FPC 3 Fan Intake        | OK | 36 degrees C / 96 degrees F  |
|      | FPC 3 Fan Exhaust       | OK | 51 degrees C / 123 degrees F |
|      | FPC 3 PMB               | OK | 43 degrees C / 109 degrees F |
|      | FPC 3 LMB0              | OK | 57 degrees C / 134 degrees F |
|      | FPC 3 LMB1              | OK | 54 degrees C / 129 degrees F |
|      | FPC 3 LMB2              | OK | 38 degrees C / 100 degrees F |
|      | FPC 3 PFE1 LU2          | OK | 63 degrees C / 145 degrees F |
|      | FPC 3 PFE1 LU0          | OK | 45 degrees C / 113 degrees F |
|      | FPC 3 PFE0 LU0          | OK | 69 degrees C / 156 degrees F |
|      | FPC 3 XF1               | OK | 62 degrees C / 143 degrees F |
|      | FPC 3 XF0               | OK | 63 degrees C / 145 degrees F |
|      | FPC 3 XM1               | OK | 43 degrees C / 109 degrees F |
|      | FPC 3 XM0               | OK | 67 degrees C / 152 degrees F |
|      | FPC 3 PFE0 LU1          | OK | 63 degrees C / 145 degrees F |
|      | FPC 3 PFE0 LU2          | OK | 66 degrees C / 150 degrees F |
|      | FPC 3 PFE1 LU1          | OK | 41 degrees C / 105 degrees F |
|      | FPC 5 Top               | OK | 39 degrees C / 102 degrees F |
|      | FPC 5 Bottom            | OK | 38 degrees C / 100 degrees F |
|      | FPC 6 Fan Intake        | OK | 33 degrees C / 91 degrees F  |
|      | FPC 6 Fan Exhaust       | OK | 49 degrees C / 120 degrees F |
|      | FPC 6 PMB               | OK | 40 degrees C / 104 degrees F |
|      | FPC 6 LMB0              | OK | 60 degrees C / 140 degrees F |
|      | FPC 6 LMB1              | OK | 58 degrees C / 136 degrees F |
|      | FPC 6 LMB2              | OK | 40 degrees C / 104 degrees F |
|      | FPC 6 PFE1 LU2          | OK | 69 degrees C / 156 degrees F |
|      | FPC 6 PFE1 LU0          | OK | 45 degrees C / 113 degrees F |
|      | FPC 6 PFE0 LU0          | OK | 71 degrees C / 159 degrees F |
|      | FPC 6 XF1               | OK | 58 degrees C / 136 degrees F |
|      | FPC 6 XF0               | OK | 65 degrees C / 149 degrees F |
|      | FPC 6 XM1               | OK | 39 degrees C / 102 degrees F |
|      | FPC 6 XM0               | OK | 66 degrees C / 150 degrees F |
|      | FPC 6 PFE0 LU1          | OK | 69 degrees C / 156 degrees F |
|      | FPC 6 PFE0 LU2          | OK | 69 degrees C / 156 degrees F |
|      | FPC 6 PFE1 LU1          | OK | 42 degrees C / 107 degrees F |
|      | FPM GBUS                | OK | 24 degrees C / 75 degrees F  |
|      | FPM Display             | OK | 27 degrees C / 80 degrees F  |
| Fans | Top Left Front fan      | OK | Spinning at high speed       |
|      | Top Left Middle fan     | OK | Spinning at high speed       |
|      | Top Left Rear fan       | OK | Spinning at high speed       |
|      | Top Right Front fan     | OK | Spinning at high speed       |
|      | Top Right Middle fan    | OK | Spinning at high speed       |
|      | Top Right Rear fan      | OK | Spinning at high speed       |
|      | Bottom Left Front fan   | OK | Spinning at high speed       |
|      | Bottom Left Middle fan  | OK | Spinning at high speed       |
|      | Bottom Left Rear fan    | OK | Spinning at high speed       |
|      | Bottom Right Front fan  | OK | Spinning at high speed       |
|      | Bottom Right Middle fan | OK | Spinning at high speed       |
|      | Bottom Right Rear fan   | OK | Spinning at high speed       |
|      | Rear Tray Top fan       | OK | Spinning at high speed       |
|      | Rear Tray Second fan    | OK | Spinning at high speed       |
|      | Rear Tray Third fan     | OK | Spinning at high speed       |
|      | Rear Tray Fourth fan    | OK | Spinning at high speed       |
| Misc | Rear Tray Fifth fan     | OK | Spinning at high speed       |
|      | Rear Tray Sixth fan     | OK | Spinning at high speed       |
|      | Rear Tray Seventh fan   | OK | Spinning at high speed       |
|      | Rear Tray Bottom fan    | OK | Spinning at high speed       |
|      | CIP                     | OK |                              |
|      | SPMB 0                  | OK |                              |
|      | SPMB 1                  | OK |                              |

## show chassis environment (TX Matrix Router)

```
user@host> show chassis environment
scc-re0:
```

| Class | Item                    | Status | Measurement                  |
|-------|-------------------------|--------|------------------------------|
| Temp  | PEM 0                   | Absent |                              |
|       | PEM 1                   | OK     | 29 degrees C / 84 degrees F  |
|       | Routing Engine 0        | OK     | 34 degrees C / 93 degrees F  |
|       | Routing Engine 1        | OK     | 34 degrees C / 93 degrees F  |
|       | CB 0                    | OK     | 32 degrees C / 89 degrees F  |
|       | CB 1                    | OK     | 32 degrees C / 89 degrees F  |
|       | SIB 0                   | OK     | 44 degrees C / 111 degrees F |
|       | SIB 0 (B)               | OK     | 44 degrees C / 111 degrees F |
|       | FPM GBUS                | OK     | 27 degrees C / 80 degrees F  |
|       | FPM Display             | OK     | 32 degrees C / 89 degrees F  |
| Fans  | Top Left Front fan      | OK     | Spinning at normal speed     |
|       | Top Left Middle fan     | OK     | Spinning at normal speed     |
|       | Top Left Rear fan       | OK     | Spinning at normal speed     |
|       | Top Right Front fan     | OK     | Spinning at normal speed     |
|       | Top Right Middle fan    | OK     | Spinning at normal speed     |
|       | Top Right Rear fan      | OK     | Spinning at normal speed     |
|       | Bottom Left Front fan   | OK     | Spinning at normal speed     |
|       | Bottom Left Middle fan  | OK     | Spinning at normal speed     |
|       | Bottom Left Rear fan    | OK     | Spinning at normal speed     |
|       | Bottom Right Front fan  | OK     | Spinning at normal speed     |
|       | Bottom Right Middle fan | OK     | Spinning at normal speed     |
|       | Bottom Right Rear fan   | OK     | Spinning at normal speed     |
|       | Rear Tray Top fan       | OK     | Spinning at normal speed     |
|       | Rear Tray Second fan    | OK     | Spinning at normal speed     |
|       | Rear Tray Third fan     | OK     | Spinning at normal speed     |
|       | Rear Tray Fourth fan    | OK     | Spinning at normal speed     |
|       | Rear Tray Fifth fan     | OK     | Spinning at normal speed     |
|       | Rear Tray Sixth fan     | OK     | Spinning at normal speed     |
|       | Rear Tray Seventh fan   | OK     | Spinning at normal speed     |
|       | Rear Tray Bottom fan    | OK     | Spinning at normal speed     |
| Misc  | CIP 0                   | OK     |                              |
|       | CIP 1                   | OK     |                              |
|       | SPMB 0                  | OK     |                              |
|       | SPMB 1                  | OK     |                              |

```
lcc0-re0:
```

| Class | Item               | Status | Measurement                  |
|-------|--------------------|--------|------------------------------|
| Temp  | PEM 0              | OK     | 29 degrees C / 84 degrees F  |
|       | PEM 1              | Absent |                              |
|       | SCG 0              | OK     | 35 degrees C / 95 degrees F  |
|       | SCG 1              | Absent |                              |
|       | Routing Engine 0   | OK     | 39 degrees C / 102 degrees F |
|       | Routing Engine 1   | OK     | 36 degrees C / 96 degrees F  |
|       | CB 0               | OK     | 32 degrees C / 89 degrees F  |
|       | CB 1               | OK     | 32 degrees C / 89 degrees F  |
|       | SIB 0              | OK     | 40 degrees C / 104 degrees F |
|       | SIB 0 (B)          | OK     | 51 degrees C / 123 degrees F |
|       | FPC 0 Top          | OK     | 45 degrees C / 113 degrees F |
|       | FPC 0 Bottom       | OK     | 31 degrees C / 87 degrees F  |
|       | FPC 1 Top          | OK     | 34 degrees C / 93 degrees F  |
|       | FPC 1 Bottom       | OK     | 31 degrees C / 87 degrees F  |
|       | FPM GBUS           | OK     | 30 degrees C / 86 degrees F  |
|       | FPM Display        | OK     | 34 degrees C / 93 degrees F  |
| Fans  | Top Left Front fan | OK     | Spinning at normal speed     |

```

Top Left Middle fan OK Spinning at normal speed
Top Left Rear fan OK Spinning at normal speed
Top Right Front fan OK Spinning at normal speed
Top Right Middle fan OK Spinning at normal speed
Top Right Rear fan OK Spinning at normal speed
Bottom Left Front fan OK Spinning at normal speed
Bottom Left Middle fan OK Spinning at normal speed
Bottom Left Rear fan OK Spinning at normal speed
Bottom Right Front fan OK Spinning at normal speed
Bottom Right Middle fan OK Spinning at normal speed
Bottom Right Rear fan OK Spinning at normal speed
Rear Tray Top fan OK Spinning at normal speed
Rear Tray Second fan OK Spinning at normal speed
Rear Tray Third fan OK Spinning at normal speed
Rear Tray Fourth fan OK Spinning at normal speed
Rear Tray Fifth fan OK Spinning at normal speed
Rear Tray Sixth fan OK Spinning at normal speed
Rear Tray Seventh fan OK Spinning at normal speed
Rear Tray Bottom fan OK Spinning at normal speed
Misc CIP OK
SPMB 0 OK
SPMB 1 OK

```

```
lcc2-re0:
```

```

Class Item Status Measurement
Temp PEM 0 OK 29 degrees C / 84 degrees F
 PEM 1 Absent
 SCG 0 OK 32 degrees C / 89 degrees F
 SCG 1 Absent
 Routing Engine 0 OK 31 degrees C / 87 degrees F
 Routing Engine 1 OK 32 degrees C / 89 degrees F
 CB 0 OK 30 degrees C / 86 degrees F
 SIB 0 OK 38 degrees C / 100 degrees F
 SIB 0 (B) OK 49 degrees C / 120 degrees F
 FPC 0 Top OK 45 degrees C / 113 degrees F
 FPC 0 Bottom OK 33 degrees C / 91 degrees F
 FPC 1 Top OK 37 degrees C / 98 degrees F
 FPC 1 Bottom OK 33 degrees C / 91 degrees F
 FPM GBUS OK 30 degrees C / 86 degrees F
 FPM Display OK 34 degrees C / 93 degrees F
Fans Top Left Front fan OK Spinning at normal speed
 Top Left Middle fan OK Spinning at normal speed
...

```

#### show chassis environment (T1600 Router)

```

user@host> show chassis environment
Class Item Status Measurement
Temp PEM 0 OK 27 degrees C / 80 degrees F
 PEM 1 Absent
 SCG 0 OK 31 degrees C / 87 degrees F
 SCG 1 OK 35 degrees C / 95 degrees F
 Routing Engine 0 OK 30 degrees C / 86 degrees F
 Routing Engine 1 OK 30 degrees C / 86 degrees F
 CB 0 OK 31 degrees C / 87 degrees F
 CB 1 OK 31 degrees C / 87 degrees F
 SIB 0 OK 41 degrees C / 105 degrees F
 SIB 0 (B) OK 34 degrees C / 93 degrees F
 SIB 1 OK 0 degrees C / 32 degrees F
 SIB 1 (B) OK 0 degrees C / 32 degrees F

```



|      |                         |    |                              |
|------|-------------------------|----|------------------------------|
|      | SIB 2                   | OK | 0 degrees C / 32 degrees F   |
|      | SIB 2 (B)               | OK | 0 degrees C / 32 degrees F   |
|      | SIB 3                   | OK | 0 degrees C / 32 degrees F   |
|      | SIB 3 (B)               | OK | 0 degrees C / 32 degrees F   |
|      | SIB 4                   | OK | 0 degrees C / 32 degrees F   |
|      | SIB 4 (B)               | OK | 0 degrees C / 32 degrees F   |
|      | FPC 0 Top               | OK | 49 degrees C / 120 degrees F |
|      | FPC 0 Bottom            | OK | 50 degrees C / 122 degrees F |
|      | FPC 1 Top               | OK | 48 degrees C / 118 degrees F |
|      | FPC 1 Bottom            | OK | 49 degrees C / 120 degrees F |
|      | FPM GBUS                | OK | 27 degrees C / 80 degrees F  |
|      | FPM Display             | OK | 30 degrees C / 86 degrees F  |
| Fans | Top Left Front fan      | OK | Spinning at normal speed     |
|      | Top Left Middle fan     | OK | Spinning at normal speed     |
|      | Top Left Rear fan       | OK | Spinning at normal speed     |
|      | Top Right Front fan     | OK | Spinning at normal speed     |
|      | Top Right Middle fan    | OK | Spinning at normal speed     |
|      | Top Right Rear fan      | OK | Spinning at normal speed     |
|      | Bottom Left Front fan   | OK | Spinning at normal speed     |
|      | Bottom Left Middle fan  | OK | Spinning at normal speed     |
|      | Bottom Left Rear fan    | OK | Spinning at normal speed     |
|      | Bottom Right Front fan  | OK | Spinning at normal speed     |
|      | Bottom Right Middle fan | OK | Spinning at normal speed     |
|      | Bottom Right Rear fan   | OK | Spinning at normal speed     |
|      | Rear Tray Top fan       | OK | Spinning at normal speed     |
|      | Rear Tray Second fan    | OK | Spinning at normal speed     |
|      | Rear Tray Third fan     | OK | Spinning at normal speed     |
|      | Rear Tray Fourth fan    | OK | Spinning at normal speed     |
|      | Rear Tray Fifth fan     | OK | Spinning at normal speed     |
|      | Rear Tray Sixth fan     | OK | Spinning at normal speed     |
|      | Rear Tray Seventh fan   | OK | Spinning at normal speed     |
|      | Rear Tray Bottom fan    | OK | Spinning at normal speed     |
| Misc | CIP                     | OK |                              |
|      | SPMB 0                  | OK |                              |
|      | SPMB 1                  | OK |                              |

### show chassis environment (TX Matrix Plus Router)

```
user@host> show chassis environment
sfc0-re0:
```

| Class | Item             | Status | Measurement                  |
|-------|------------------|--------|------------------------------|
| Temp  | PEM 0            | OK     | 28 degrees C / 82 degrees F  |
|       | PEM 1            | Absent |                              |
|       | Routing Engine 0 | OK     | 27 degrees C / 80 degrees F  |
|       | Routing Engine 1 | OK     | 29 degrees C / 84 degrees F  |
|       | CB 0 Intake      | OK     | 26 degrees C / 78 degrees F  |
|       | CB 0 Exhaust A   | OK     | 25 degrees C / 77 degrees F  |
|       | CB 0 Exhaust B   | OK     | 25 degrees C / 77 degrees F  |
|       | CB 1 Intake      | OK     | 26 degrees C / 78 degrees F  |
|       | CB 1 Exhaust A   | OK     | 26 degrees C / 78 degrees F  |
|       | CB 1 Exhaust B   | OK     | 26 degrees C / 78 degrees F  |
|       | SIB F13 0        | OK     | 47 degrees C / 116 degrees F |
|       | SIB F13 0 (B)    | OK     | 48 degrees C / 118 degrees F |
|       | SIB F13 1        | OK     | 38 degrees C / 100 degrees F |
|       | SIB F13 1 (B)    | OK     | 37 degrees C / 98 degrees F  |
|       | SIB F2S 0/0      | OK     | 27 degrees C / 80 degrees F  |
|       | SIB F2S 0/2      | OK     | 28 degrees C / 82 degrees F  |
|       | SIB F2S 0/4      | OK     | 27 degrees C / 80 degrees F  |
|       | SIB F2S 0/6      | OK     | 28 degrees C / 82 degrees F  |
|       | SIB F2S 1/0      | OK     | 26 degrees C / 78 degrees F  |

|      |                  |    |                             |
|------|------------------|----|-----------------------------|
|      | SIB F2S 1/2      | OK | 26 degrees C / 78 degrees F |
|      | SIB F2S 1/4      | OK | 26 degrees C / 78 degrees F |
|      | SIB F2S 1/6      | OK | 26 degrees C / 78 degrees F |
|      | SIB F2S 2/0      | OK | 25 degrees C / 77 degrees F |
|      | SIB F2S 2/2      | OK | 25 degrees C / 77 degrees F |
|      | SIB F2S 2/4      | OK | 23 degrees C / 73 degrees F |
|      | CIP 0 Intake     | OK | 23 degrees C / 73 degrees F |
|      | CIP 0 Exhaust A  | OK | 24 degrees C / 75 degrees F |
|      | CIP 0 Exhaust B  | OK | 24 degrees C / 75 degrees F |
|      | CIP 1 Intake     | OK | 24 degrees C / 75 degrees F |
|      | CIP 1 Exhaust A  | OK | 25 degrees C / 77 degrees F |
|      | CIP 1 Exhaust B  | OK | 25 degrees C / 77 degrees F |
| Fans | Fan Tray 0 Fan 1 | OK | Spinning at normal speed    |
|      | Fan Tray 0 Fan 2 | OK | Spinning at normal speed    |
|      | Fan Tray 0 Fan 3 | OK | Spinning at normal speed    |
|      | Fan Tray 0 Fan 4 | OK | Spinning at normal speed    |
|      | Fan Tray 0 Fan 5 | OK | Spinning at normal speed    |
|      | Fan Tray 0 Fan 6 | OK | Spinning at normal speed    |
|      | Fan Tray 1 Fan 1 | OK | Spinning at normal speed    |
|      | Fan Tray 1 Fan 2 | OK | Spinning at normal speed    |
|      | Fan Tray 1 Fan 3 | OK | Spinning at normal speed    |
|      | Fan Tray 1 Fan 4 | OK | Spinning at normal speed    |
|      | Fan Tray 1 Fan 5 | OK | Spinning at normal speed    |
|      | Fan Tray 1 Fan 6 | OK | Spinning at normal speed    |
|      | Fan Tray 2 Fan 1 | OK | Spinning at normal speed    |
|      | Fan Tray 2 Fan 2 | OK | Spinning at normal speed    |
|      | Fan Tray 2 Fan 3 | OK | Spinning at normal speed    |
|      | Fan Tray 2 Fan 4 | OK | Spinning at normal speed    |
|      | Fan Tray 2 Fan 5 | OK | Spinning at normal speed    |
|      | Fan Tray 2 Fan 6 | OK | Spinning at normal speed    |
|      | Fan Tray 2 Fan 7 | OK | Spinning at normal speed    |
|      | Fan Tray 2 Fan 8 | OK | Spinning at normal speed    |
|      | Fan Tray 2 Fan 9 | OK | Spinning at normal speed    |
|      | Fan Tray 3 Fan 1 | OK | Spinning at normal speed    |
|      | Fan Tray 3 Fan 2 | OK | Spinning at normal speed    |
|      | Fan Tray 3 Fan 3 | OK | Spinning at normal speed    |
|      | Fan Tray 3 Fan 4 | OK | Spinning at normal speed    |
|      | Fan Tray 3 Fan 5 | OK | Spinning at normal speed    |
|      | Fan Tray 3 Fan 6 | OK | Spinning at normal speed    |
|      | Fan Tray 3 Fan 7 | OK | Spinning at normal speed    |
|      | Fan Tray 3 Fan 8 | OK | Spinning at normal speed    |
|      | Fan Tray 3 Fan 9 | OK | Spinning at normal speed    |
|      | Fan Tray 4 Fan 1 | OK | Spinning at normal speed    |
|      | Fan Tray 4 Fan 2 | OK | Spinning at normal speed    |
|      | Fan Tray 4 Fan 3 | OK | Spinning at normal speed    |
|      | Fan Tray 4 Fan 4 | OK | Spinning at normal speed    |
|      | Fan Tray 4 Fan 5 | OK | Spinning at normal speed    |
|      | Fan Tray 4 Fan 6 | OK | Spinning at normal speed    |
|      | Fan Tray 4 Fan 7 | OK | Spinning at normal speed    |
|      | Fan Tray 4 Fan 8 | OK | Spinning at normal speed    |
|      | Fan Tray 4 Fan 9 | OK | Spinning at normal speed    |
|      | Fan Tray 5 Fan 1 | OK | Spinning at normal speed    |
|      | Fan Tray 5 Fan 2 | OK | Spinning at normal speed    |
|      | Fan Tray 5 Fan 3 | OK | Spinning at normal speed    |
|      | Fan Tray 5 Fan 4 | OK | Spinning at normal speed    |
|      | Fan Tray 5 Fan 5 | OK | Spinning at normal speed    |
|      | Fan Tray 5 Fan 6 | OK | Spinning at normal speed    |
|      | Fan Tray 5 Fan 7 | OK | Spinning at normal speed    |
|      | Fan Tray 5 Fan 8 | OK | Spinning at normal speed    |
|      | Fan Tray 5 Fan 9 | OK | Spinning at normal speed    |
| Misc | SPMB 0           | OK |                             |

```

SPMB 1 OK

lcc0-re0:

Class Item Status Measurement
Temp PEM 0 OK 27 degrees C / 80 degrees F
 PEM 1 Absent
 SCG 0 OK 31 degrees C / 87 degrees F
 SCG 1 OK 35 degrees C / 95 degrees F
 Routing Engine 0 OK 30 degrees C / 86 degrees F
 Routing Engine 1 OK 30 degrees C / 86 degrees F
 CB 0 OK 31 degrees C / 87 degrees F
 CB 1 OK 31 degrees C / 87 degrees F
 SIB 0 OK 41 degrees C / 105 degrees F
 SIB 0 (B) OK 34 degrees C / 93 degrees F
 SIB 1 OK 0 degrees C / 32 degrees F
 SIB 1 (B) OK 0 degrees C / 32 degrees F
 SIB 2 OK 0 degrees C / 32 degrees F
 SIB 2 (B) OK 0 degrees C / 32 degrees F
 SIB 3 OK 0 degrees C / 32 degrees F
 SIB 3 (B) OK 0 degrees C / 32 degrees F
 SIB 4 OK 0 degrees C / 32 degrees F
 SIB 4 (B) OK 0 degrees C / 32 degrees F
 FPC 0 Top OK 49 degrees C / 120 degrees F
 FPC 0 Bottom OK 50 degrees C / 122 degrees F
 FPC 1 Top OK 48 degrees C / 118 degrees F
 FPC 1 Bottom OK 49 degrees C / 120 degrees F
 FPM GBUS OK 27 degrees C / 80 degrees F
 FPM Display OK 30 degrees C / 86 degrees F
Fans Top Left Front fan OK Spinning at normal speed
 Top Left Middle fan OK Spinning at normal speed
 Top Left Rear fan OK Spinning at normal speed
 Top Right Front fan OK Spinning at normal speed
 Top Right Middle fan OK Spinning at normal speed
 Top Right Rear fan OK Spinning at normal speed
 Bottom Left Front fan OK Spinning at normal speed
 Bottom Left Middle fan OK Spinning at normal speed
 Bottom Left Rear fan OK Spinning at normal speed
 Bottom Right Front fan OK Spinning at normal speed
 Bottom Right Middle fan OK Spinning at normal speed
 Bottom Right Rear fan OK Spinning at normal speed
 Rear Tray Top fan OK Spinning at normal speed
 Rear Tray Second fan OK Spinning at normal speed
 Rear Tray Third fan OK Spinning at normal speed
 Rear Tray Fourth fan OK Spinning at normal speed
 Rear Tray Fifth fan OK Spinning at normal speed
 Rear Tray Sixth fan OK Spinning at normal speed
 Rear Tray Seventh fan OK Spinning at normal speed
 Rear Tray Bottom fan OK Spinning at normal speed
Misc CIP OK
 SPMB 0 OK
 SPMB 1 OK

```

#### show chassis environment (TX Matrix Plus router with 3D SIBs)

```

user@host> show chassis environment
sfc0-re0:

Class Item Status Measurement
Temp PEM 0 Check 30 degrees C / 86 degrees F
 PEM 1 OK 33 degrees C / 91 degrees F

```

|      |                         |    |                              |
|------|-------------------------|----|------------------------------|
|      | Routing Engine 0        | OK | 28 degrees C / 82 degrees F  |
|      | Routing Engine 0 CPU    | OK | 42 degrees C / 107 degrees F |
|      | Routing Engine 1        | OK | 29 degrees C / 84 degrees F  |
|      | Routing Engine 1 CPU    | OK | 44 degrees C / 111 degrees F |
|      | CB 0 Intake             | OK | 30 degrees C / 86 degrees F  |
|      | CB 0 Exhaust A          | OK | 28 degrees C / 82 degrees F  |
|      | CB 0 Exhaust B          | OK | 30 degrees C / 86 degrees F  |
|      | CB 1 Intake             | OK | 31 degrees C / 87 degrees F  |
|      | CB 1 Exhaust A          | OK | 27 degrees C / 80 degrees F  |
|      | CB 1 Exhaust B          | OK | 31 degrees C / 87 degrees F  |
|      | SIB F13 0 Board         | OK | 44 degrees C / 111 degrees F |
|      | SIB F13 0 XF Junction   | OK | 62 degrees C / 143 degrees F |
|      | SIB F13 3 Board         | OK | 45 degrees C / 113 degrees F |
|      | SIB F13 3 XF Junction   | OK | 60 degrees C / 140 degrees F |
|      | SIB F13 6 Board         | OK | 47 degrees C / 116 degrees F |
|      | SIB F13 6 XF Junction   | OK | 62 degrees C / 143 degrees F |
|      | SIB F2S 0/0 Board       | OK | 32 degrees C / 89 degrees F  |
|      | SIB F2S 0/0 XF Junction | OK | 42 degrees C / 107 degrees F |
|      | SIB F2S 0/2 Board       | OK | 31 degrees C / 87 degrees F  |
|      | SIB F2S 0/2 XF Junction | OK | 41 degrees C / 105 degrees F |
|      | SIB F2S 0/4 Board       | OK | 31 degrees C / 87 degrees F  |
|      | SIB F2S 0/4 XF Junction | OK | 42 degrees C / 107 degrees F |
|      | SIB F2S 0/6 Board       | OK | 31 degrees C / 87 degrees F  |
|      | SIB F2S 0/6 XF Junction | OK | 41 degrees C / 105 degrees F |
|      | SIB F2S 1/0 Board       | OK | 31 degrees C / 87 degrees F  |
|      | SIB F2S 1/0 XF Junction | OK | 41 degrees C / 105 degrees F |
|      | SIB F2S 1/2 Board       | OK | 29 degrees C / 84 degrees F  |
|      | SIB F2S 1/2 XF Junction | OK | 39 degrees C / 102 degrees F |
|      | SIB F2S 1/4 Board       | OK | 29 degrees C / 84 degrees F  |
|      | SIB F2S 1/4 XF Junction | OK | 35 degrees C / 95 degrees F  |
|      | SIB F2S 1/6 Board       | OK | 30 degrees C / 86 degrees F  |
|      | SIB F2S 1/6 XF Junction | OK | 41 degrees C / 105 degrees F |
|      | SIB F2S 2/0 Board       | OK | 30 degrees C / 86 degrees F  |
|      | SIB F2S 2/0 XF Junction | OK | 42 degrees C / 107 degrees F |
|      | SIB F2S 2/2 Board       | OK | 28 degrees C / 82 degrees F  |
|      | SIB F2S 2/2 XF Junction | OK | 39 degrees C / 102 degrees F |
|      | SIB F2S 2/4 Board       | OK | 29 degrees C / 84 degrees F  |
|      | SIB F2S 2/4 XF Junction | OK | 42 degrees C / 107 degrees F |
|      | SIB F2S 2/6 Board       | OK | 29 degrees C / 84 degrees F  |
|      | SIB F2S 2/6 XF Junction | OK | 41 degrees C / 105 degrees F |
|      | CIP 0 Intake            | OK | 25 degrees C / 77 degrees F  |
|      | CIP 0 Exhaust A         | OK | 26 degrees C / 78 degrees F  |
|      | CIP 0 Exhaust B         | OK | 26 degrees C / 78 degrees F  |
|      | CIP 1 Intake            | OK | 26 degrees C / 78 degrees F  |
|      | CIP 1 Exhaust A         | OK | 27 degrees C / 80 degrees F  |
|      | CIP 1 Exhaust B         | OK | 27 degrees C / 80 degrees F  |
| Fans | Fan Tray 0 Fan 1        | OK | Spinning at normal speed     |
|      | Fan Tray 0 Fan 2        | OK | Spinning at normal speed     |
|      | Fan Tray 0 Fan 3        | OK | Spinning at normal speed     |
|      | Fan Tray 0 Fan 4        | OK | Spinning at normal speed     |
|      | Fan Tray 0 Fan 5        | OK | Spinning at normal speed     |
|      | Fan Tray 0 Fan 6        | OK | Spinning at normal speed     |
|      | Fan Tray 1 Fan 1        | OK | Spinning at normal speed     |
|      | Fan Tray 1 Fan 2        | OK | Spinning at normal speed     |
|      | Fan Tray 1 Fan 3        | OK | Spinning at normal speed     |
|      | Fan Tray 1 Fan 4        | OK | Spinning at normal speed     |
|      | Fan Tray 1 Fan 5        | OK | Spinning at normal speed     |
|      | Fan Tray 1 Fan 6        | OK | Spinning at normal speed     |
|      | Fan Tray 2 Fan 1        | OK | Spinning at normal speed     |
|      | Fan Tray 2 Fan 2        | OK | Spinning at normal speed     |
|      | Fan Tray 2 Fan 3        | OK | Spinning at normal speed     |

|                  |       |                          |
|------------------|-------|--------------------------|
| Fan Tray 2 Fan 4 | OK    | Spinning at normal speed |
| Fan Tray 2 Fan 5 | OK    | Spinning at normal speed |
| Fan Tray 2 Fan 6 | OK    | Spinning at normal speed |
| Fan Tray 2 Fan 7 | OK    | Spinning at normal speed |
| Fan Tray 2 Fan 8 | OK    | Spinning at normal speed |
| Fan Tray 2 Fan 9 | OK    | Spinning at normal speed |
| Fan Tray 3 Fan 1 | OK    | Spinning at normal speed |
| Fan Tray 3 Fan 2 | OK    | Spinning at normal speed |
| Fan Tray 3 Fan 3 | OK    | Spinning at normal speed |
| Fan Tray 3 Fan 4 | OK    | Spinning at normal speed |
| Fan Tray 3 Fan 5 | OK    | Spinning at normal speed |
| Fan Tray 3 Fan 6 | OK    | Spinning at normal speed |
| Fan Tray 3 Fan 7 | OK    | Spinning at normal speed |
| Fan Tray 3 Fan 8 | OK    | Spinning at normal speed |
| Fan Tray 3 Fan 9 | OK    | Spinning at normal speed |
| Fan Tray 4 Fan 1 | OK    | Spinning at normal speed |
| Fan Tray 4 Fan 2 | OK    | Spinning at normal speed |
| Fan Tray 4 Fan 3 | OK    | Spinning at normal speed |
| Fan Tray 4 Fan 4 | OK    | Spinning at normal speed |
| Fan Tray 4 Fan 5 | OK    | Spinning at normal speed |
| Fan Tray 4 Fan 6 | OK    | Spinning at normal speed |
| Fan Tray 4 Fan 7 | OK    | Spinning at normal speed |
| Fan Tray 4 Fan 8 | OK    | Spinning at normal speed |
| Fan Tray 4 Fan 9 | OK    | Spinning at normal speed |
| Fan Tray 5 Fan 1 | OK    | Spinning at normal speed |
| Fan Tray 5 Fan 2 | OK    | Spinning at normal speed |
| Fan Tray 5 Fan 3 | OK    | Spinning at normal speed |
| Fan Tray 5 Fan 4 | OK    | Spinning at normal speed |
| Fan Tray 5 Fan 5 | OK    | Spinning at normal speed |
| Fan Tray 5 Fan 6 | OK    | Spinning at normal speed |
| Fan Tray 5 Fan 7 | OK    | Spinning at normal speed |
| Fan Tray 5 Fan 8 | OK    | Spinning at normal speed |
| Fan Tray 5 Fan 9 | Check |                          |
| Misc SPMB 0      | OK    |                          |
| SPMB 1           | OK    |                          |

```
1cc0-re0:
```

| Class | Item                 | Status | Measurement                  |
|-------|----------------------|--------|------------------------------|
| Temp  | PEM 0                | OK     | 29 degrees C / 84 degrees F  |
|       | PEM 1                | Check  | 29 degrees C / 84 degrees F  |
|       | SCG 0                | OK     | 32 degrees C / 89 degrees F  |
|       | SCG 1                | OK     | 33 degrees C / 91 degrees F  |
|       | Routing Engine 0     | OK     | 32 degrees C / 89 degrees F  |
|       | Routing Engine 0 CPU | OK     | 51 degrees C / 123 degrees F |
|       | Routing Engine 1     | OK     | 32 degrees C / 89 degrees F  |
|       | Routing Engine 1 CPU | OK     | 49 degrees C / 120 degrees F |
|       | CB 0                 | OK     | 34 degrees C / 93 degrees F  |
|       | CB 1                 | OK     | 34 degrees C / 93 degrees F  |
|       | SIB 0                | OK     | 39 degrees C / 102 degrees F |
|       | SIB 0 (B)            | Absent |                              |
|       | SIB 1                | OK     | 39 degrees C / 102 degrees F |
|       | SIB 1 (B)            | Absent |                              |
|       | SIB 2                | OK     | 39 degrees C / 102 degrees F |
|       | SIB 2 (B)            | Absent |                              |
|       | FPC 4 Top            | OK     | 43 degrees C / 109 degrees F |
|       | FPC 4 Bottom         | OK     | 43 degrees C / 109 degrees F |
|       | FPC 7 Fan Intake     | OK     | 35 degrees C / 95 degrees F  |
|       | FPC 7 Fan Exhaust    | OK     | 50 degrees C / 122 degrees F |
|       | FPC 7 PMB            | OK     | 50 degrees C / 122 degrees F |
|       | FPC 7 LMB0           | OK     | 55 degrees C / 131 degrees F |

|      |                           |    |                              |
|------|---------------------------|----|------------------------------|
|      | FPC 7 LMB1                | OK | 49 degrees C / 120 degrees F |
|      | FPC 7 LMB2                | OK | 39 degrees C / 102 degrees F |
|      | FPC 7 PFE1 LU2            | OK | 55 degrees C / 131 degrees F |
|      | FPC 7 PFE1 LU0            | OK | 45 degrees C / 113 degrees F |
|      | FPC 7 PFE0 LU0            | OK | 62 degrees C / 143 degrees F |
|      | FPC 7 XF1                 | OK | 52 degrees C / 125 degrees F |
|      | FPC 7 XF0                 | OK | 61 degrees C / 141 degrees F |
|      | FPC 7 XM1                 | OK | 39 degrees C / 102 degrees F |
|      | FPC 7 XM0                 | OK | 56 degrees C / 132 degrees F |
|      | FPC 7 PFE0 LU1            | OK | 60 degrees C / 140 degrees F |
|      | FPC 7 PFE0 LU2            | OK | 55 degrees C / 131 degrees F |
|      | FPC 7 PFE1 LU1            | OK | 41 degrees C / 105 degrees F |
|      | FPM GBUS                  | OK | 24 degrees C / 75 degrees F  |
|      | FPM Display               | OK | 28 degrees C / 82 degrees F  |
| Fans | Top Left Front fan        | OK | Spinning at normal speed     |
|      | Top Left Middle fan       | OK | Spinning at normal speed     |
|      | Top Left Rear fan         | OK | Spinning at normal speed     |
|      | Top Right Front fan       | OK | Spinning at normal speed     |
|      | Top Right Middle fan      | OK | Spinning at normal speed     |
|      | Top Right Rear fan        | OK | Spinning at normal speed     |
|      | Bottom Left Front fan     | OK | Spinning at normal speed     |
|      | Bottom Left Middle fan    | OK | Spinning at normal speed     |
|      | Bottom Left Rear fan      | OK | Spinning at normal speed     |
|      | Bottom Right Front fan    | OK | Spinning at normal speed     |
|      | Bottom Right Middle fan   | OK | Spinning at normal speed     |
|      | Bottom Right Rear fan     | OK | Spinning at normal speed     |
|      | Rear Tray fan 1 (Top)     | OK | Spinning at normal speed     |
|      | Rear Tray fan 2           | OK | Spinning at normal speed     |
|      | Rear Tray fan 3           | OK | Spinning at normal speed     |
|      | Rear Tray fan 4           | OK | Spinning at normal speed     |
|      | Rear Tray fan 5           | OK | Spinning at normal speed     |
|      | Rear Tray fan 6           | OK | Spinning at normal speed     |
|      | Rear Tray fan 7           | OK | Spinning at normal speed     |
|      | Rear Tray fan 8           | OK | Spinning at normal speed     |
|      | Rear Tray fan 9           | OK | Spinning at normal speed     |
|      | Rear Tray fan 10          | OK | Spinning at normal speed     |
|      | Rear Tray fan 11          | OK | Spinning at normal speed     |
|      | Rear Tray fan 12          | OK | Spinning at normal speed     |
|      | Rear Tray fan 13          | OK | Spinning at normal speed     |
|      | Rear Tray fan 14          | OK | Spinning at normal speed     |
|      | Rear Tray fan 15          | OK | Spinning at normal speed     |
|      | Rear Tray fan 16 (Bottom) | OK | Spinning at normal speed     |
| Misc | CIP                       | OK |                              |
|      | SPMB 0                    | OK |                              |
|      | SPMB 1                    | OK |                              |

### show chassis environment (EX4200 Standalone Switch)

|                                       |                         |        |                              |
|---------------------------------------|-------------------------|--------|------------------------------|
| user@switch> show chassis environment |                         |        |                              |
| Class                                 | Item                    | Status | Measurement                  |
| Power                                 | FPC 0 Power Supply 0    | OK     |                              |
|                                       | FPC 0 Power Supply 1    | Absent |                              |
| Temp                                  | FPC 0 CPU               | OK     | 41 degrees C / 105 degrees F |
|                                       | FPC 0 EX-PFE1           | OK     | 42 degrees C / 107 degrees F |
|                                       | FPC 0 EX-PFE2           | OK     | 46 degrees C / 114 degrees F |
|                                       | FPC 0 GEPHY Front Left  | OK     | 25 degrees C / 77 degrees F  |
|                                       | FPC 0 GEPHY Front Right | OK     | 27 degrees C / 80 degrees F  |
|                                       | FPC 0 Uplink Conn       | OK     | 29 degrees C / 84 degrees F  |
| Fans                                  | FPC 0 Fan 1             | OK     | Spinning at normal speed     |
|                                       | FPC 0 Fan 2             | OK     | Spinning at normal speed     |
|                                       | FPC 0 Fan 3             | OK     | Spinning at normal speed     |

## show chassis environment (EX8216 Switch)

```

user@switch> show chassis environment
Class Item Status Measurement
Power PSU 0 OK
 PSU 1 OK
 PSU 2 OK
 PSU 3 Check
 PSU 4 Absent
 PSU 5 Absent
Temp CB 0 Intake OK 23 degrees C / 73 degrees F
 CB 0 Exhaust OK 26 degrees C / 78 degrees F
 CB 1 Intake OK 22 degrees C / 71 degrees F
 CB 1 Exhaust OK 25 degrees C / 77 degrees F
 FPC 4 Intake OK 49 degrees C / 120 degrees F
 FPC 4 Exhaust OK 59 degrees C / 138 degrees F
 SIB 5 Intake OK 25 degrees C / 77 degrees F
 SIB 5 Exhaust OK 35 degrees C / 95 degrees F
 SIB 6 Intake OK 25 degrees C / 77 degrees F
 SIB 6 Exhaust OK 38 degrees C / 100 degrees F
Fans Top Fan 1 OK Spinning at normal speed
 Top Fan 2 OK Spinning at normal speed
 Top Fan 3 OK Spinning at normal speed
 Top Fan 4 OK Spinning at normal speed
 Top Fan 5 OK Spinning at normal speed
 Top Fan 6 OK Spinning at normal speed
 Top Fan 7 OK Spinning at normal speed
 Top Fan 8 OK Spinning at normal speed
 Top Fan 9 OK Spinning at normal speed
 Bottom Fan 1 OK Spinning at normal speed
 Bottom Fan 2 OK Spinning at normal speed
 Bottom Fan 3 OK Spinning at normal speed
 Bottom Fan 4 OK Spinning at normal speed
 Bottom Fan 5 OK Spinning at normal speed
 Bottom Fan 6 OK Spinning at normal speed
 Bottom Fan 7 OK Spinning at normal speed
 Bottom Fan 8 OK Spinning at normal speed
 Bottom Fan 9 OK Spinning at normal speed

```

## show chassis environment (EX9200 Switch)

```

user@switch> show chassis environment
Class Item Status Measurement
Temp PEM 0 Check
 PEM 1 OK 40 degrees C / 104 degrees F
 PEM 2 OK 40 degrees C / 104 degrees F
 PEM 3 Absent
 Routing Engine 0 OK 35 degrees C / 95 degrees F
 Routing Engine 0 CPU OK 33 degrees C / 91 degrees F
 Routing Engine 1 OK 38 degrees C / 100 degrees F
 Routing Engine 1 CPU OK 33 degrees C / 91 degrees F
 CB 0 Intake OK 35 degrees C / 95 degrees F
 CB 0 Exhaust A OK 33 degrees C / 91 degrees F
 CB 0 Exhaust B OK 40 degrees C / 104 degrees F
 CB 0 ACBC OK 39 degrees C / 102 degrees F
 CB 0 XF A OK 49 degrees C / 120 degrees F
 CB 0 XF B OK 46 degrees C / 114 degrees F
 CB 1 Intake OK 37 degrees C / 98 degrees F
 CB 1 Exhaust A OK 32 degrees C / 89 degrees F
 CB 1 Exhaust B OK 39 degrees C / 102 degrees F
 CB 1 ACBC OK 41 degrees C / 105 degrees F

```

|                      |    |                              |
|----------------------|----|------------------------------|
| CB 1 XF A            | OK | 49 degrees C / 120 degrees F |
| CB 1 XF B            | OK | 49 degrees C / 120 degrees F |
| FPC 2 Intake         | OK | 37 degrees C / 98 degrees F  |
| FPC 2 Exhaust A      | OK | 40 degrees C / 104 degrees F |
| FPC 2 Exhaust B      | OK | 34 degrees C / 93 degrees F  |
| FPC 2 LU 0 TCAM TSen | OK | 44 degrees C / 111 degrees F |
| FPC 2 LU 0 TCAM Chip | OK | 48 degrees C / 118 degrees F |
| FPC 2 LU 0 TSen      | OK | 44 degrees C / 111 degrees F |
| FPC 2 LU 0 Chip      | OK | 60 degrees C / 140 degrees F |
| FPC 2 MQ 0 TSen      | OK | 44 degrees C / 111 degrees F |
| FPC 2 MQ 0 Chip      | OK | 51 degrees C / 123 degrees F |
| FPC 3 Intake         | OK | 39 degrees C / 102 degrees F |
| FPC 3 Exhaust A      | OK | 51 degrees C / 123 degrees F |

[...Output truncated...]

|      |                   |    |                                |
|------|-------------------|----|--------------------------------|
| Fans | Top Rear Fan      | OK | Spinning at intermediate-speed |
|      | Bottom Rear Fan   | OK | Spinning at intermediate-speed |
|      | Top Middle Fan    | OK | Spinning at intermediate-speed |
|      | Bottom Middle Fan | OK | Spinning at intermediate-speed |
|      | Top Front Fan     | OK | Spinning at intermediate-speed |
|      | Bottom Front Fan  | OK | Spinning at intermediate-speed |

**show chassis environment (QFX Series and OCX Series)**

```
user@switch> show chassis environment
```

| Class | Item                     | Status | Measurement                  |
|-------|--------------------------|--------|------------------------------|
| Power | FPC 0 Power Supply 0     | OK     |                              |
|       | FPC 0 Power Supply 1     | OK     |                              |
| Temp  | FPC 0 Sensor TopLeft I   | OK     | 26 degrees C / 78 degrees F  |
|       | FPC 0 Sensor TopRight I  | OK     | 24 degrees C / 75 degrees F  |
|       | FPC 0 Sensor TopLeft E   | OK     | 30 degrees C / 86 degrees F  |
|       | FPC 0 Sensor TopRight E  | OK     | 30 degrees C / 86 degrees F  |
|       | FPC 0 Sensor TopMiddle I | OK     | 30 degrees C / 86 degrees F  |
|       | FPC 0 Sensor TopMiddle E | OK     | 38 degrees C / 100 degrees F |
|       | FPC 0 Sensor Bottom I    | OK     | 34 degrees C / 93 degrees F  |
|       | FPC 0 Sensor Bottom E    | OK     | 38 degrees C / 100 degrees F |
|       | FPC 0 Sensor Die Temp    | OK     | 38 degrees C / 100 degrees F |
|       | FPC 0 Sensor Mgmt Brd I  | OK     | 24 degrees C / 75 degrees F  |
|       | FPC 0 Sensor Switch I    | OK     | 28 degrees C / 82 degrees F  |
| Fans  | FPC 0 Fan 1 (left)       | Failed |                              |
|       | FPC 0 Fan 2 (right)      | OK     | Spinning at normal speed     |
|       | FPC 0 Fan 3 (middle)     | OK     | Spinning at normal speed     |

**show chassis environment interconnect-device (QFabric System)**

```
user@switch> show chassis environment interconnect-device IC-A0004
```

| Class | Item                      | Status | Measurement                  |
|-------|---------------------------|--------|------------------------------|
| CB 0  |                           |        |                              |
|       | CB 0 L Intake             | OK     | 30 degrees C / 86 degrees F  |
|       | CB 0 R Intake             | OK     | 31 degrees C / 87 degrees F  |
|       | CB 0 L Exhaust            | OK     | 32 degrees C / 89 degrees F  |
|       | CB 0 R Exhaust            | OK     | 33 degrees C / 91 degrees F  |
|       | Routing Engine 0 CPU temp | OK     | 51 degrees C / 123 degrees F |
| CB 1  |                           |        |                              |
|       | CB 1 L Intake             | OK     | 27 degrees C / 80 degrees F  |
|       | CB 1 R Intake             | OK     | 29 degrees C / 84 degrees F  |
|       | CB 1 L Exhaust            | OK     | 31 degrees C / 87 degrees F  |
|       | CB 1 R Exhaust            | OK     | 32 degrees C / 89 degrees F  |
|       | Routing Engine 1 CPU temp | OK     | 40 degrees C / 104 degrees F |
| FC 0  | FPC 0                     |        |                              |



|                          |       |                             |
|--------------------------|-------|-----------------------------|
| FPC 0 L Intake           | OK    | 25 degrees C / 77 degrees F |
| FPC 0 R Intake           | OK    | 28 degrees C / 82 degrees F |
| FPC 0 L Exhaust          | OK    | 28 degrees C / 82 degrees F |
| FPC 0 R Exhaust          | OK    | 29 degrees C / 84 degrees F |
| FC 7 FPC 7               |       |                             |
| FPC 7 L Intake           | OK    | 25 degrees C / 77 degrees F |
| FPC 7 R Intake           | OK    | 26 degrees C / 78 degrees F |
| FPC 7 L Exhaust          | OK    | 28 degrees C / 82 degrees F |
| FPC 7 R Exhaust          | OK    | 29 degrees C / 84 degrees F |
| RC 0 FPC 8               |       |                             |
| FPC 8 L Intake           | OK    | 25 degrees C / 77 degrees F |
| FPC 8 R Intake           | OK    | 26 degrees C / 78 degrees F |
| FPC 8 L Exhaust          | OK    | 32 degrees C / 89 degrees F |
| FPC 8 R Exhaust          | OK    | 30 degrees C / 86 degrees F |
| RC 7 FPC 15              |       |                             |
| FPC 15 L Intake          | OK    | 24 degrees C / 75 degrees F |
| FPC 15 R Intake          | OK    | 25 degrees C / 77 degrees F |
| FPC 15 L Exhaust         | OK    | 33 degrees C / 91 degrees F |
| FPC 15 R Exhaust         | OK    | 31 degrees C / 87 degrees F |
| Fans TFT 0 Fan 0         | OK    | Spinning at normal speed    |
| Fans TFT 0 Fan 1         | OK    | Spinning at normal speed    |
| Fans TFT 0 Fan 2         | OK    | Spinning at normal speed    |
| Fans TFT 0 Fan 3         | OK    | Spinning at normal speed    |
| Fans TFT 0 Fan 4         | OK    | Spinning at normal speed    |
| Fans TFT 0 Fan 5         | OK    | Spinning at normal speed    |
| Fans BFT 1 Fan 0         | OK    | Spinning at normal speed    |
| Fans BFT 1 Fan 1         | OK    | Spinning at normal speed    |
| Fans BFT 1 Fan 2         | OK    | Spinning at normal speed    |
| Fans BFT 1 Fan 3         | Check |                             |
| Fans BFT 1 Fan 4         | OK    | Spinning at normal speed    |
| Fans BFT 1 Fan 5         | OK    | Spinning at normal speed    |
| Fans SFT 0 Fan 0 Rotor 0 | OK    | Spinning at normal speed    |
| Fans SFT 0 Fan 0 Rotor 1 | OK    | Spinning at normal speed    |
| Fans SFT 0 Fan 1 Rotor 0 | OK    | Spinning at normal speed    |
| Fans SFT 0 Fan 1 Rotor 1 | OK    | Spinning at normal speed    |
| Fans SFT 0 Fan 2 Rotor 0 | OK    | Spinning at normal speed    |
| Fans SFT 0 Fan 2 Rotor 1 | OK    | Spinning at normal speed    |
| Fans SFT 0 Fan 3 Rotor 0 | OK    | Spinning at normal speed    |
| Fans SFT 0 Fan 3 Rotor 1 | OK    | Spinning at normal speed    |
| Fans SFT 1 Fan 0 Rotor 0 | OK    | Spinning at normal speed    |
| Fans SFT 1 Fan 0 Rotor 1 | OK    | Spinning at normal speed    |
| Fans SFT 1 Fan 1 Rotor 0 | OK    | Spinning at normal speed    |
| Fans SFT 1 Fan 1 Rotor 1 | OK    | Spinning at normal speed    |
| Fans SFT 1 Fan 2 Rotor 0 | OK    | Spinning at normal speed    |
| Fans SFT 1 Fan 2 Rotor 1 | OK    | Spinning at normal speed    |
| Fans SFT 1 Fan 3 Rotor 0 | OK    | Spinning at normal speed    |
| Fans SFT 1 Fan 3 Rotor 1 | OK    | Spinning at normal speed    |
| Fans SFT 2 Fan 0 Rotor 0 | OK    | Spinning at normal speed    |
| Fans SFT 2 Fan 0 Rotor 1 | OK    | Spinning at normal speed    |
| Fans SFT 2 Fan 1 Rotor 0 | OK    | Spinning at normal speed    |
| Fans SFT 2 Fan 1 Rotor 1 | OK    | Spinning at normal speed    |
| Fans SFT 2 Fan 2 Rotor 0 | OK    | Spinning at normal speed    |
| Fans SFT 2 Fan 2 Rotor 1 | OK    | Spinning at normal speed    |
| Fans SFT 2 Fan 3 Rotor 0 | OK    | Spinning at normal speed    |
| Fans SFT 2 Fan 3 Rotor 1 | OK    | Spinning at normal speed    |
| Fans SFT 3 Fan 0 Rotor 0 | OK    | Spinning at normal speed    |
| Fans SFT 3 Fan 0 Rotor 1 | OK    | Spinning at normal speed    |
| Fans SFT 3 Fan 1 Rotor 0 | OK    | Spinning at normal speed    |
| Fans SFT 3 Fan 1 Rotor 1 | OK    | Spinning at normal speed    |
| Fans SFT 3 Fan 2 Rotor 0 | OK    | Spinning at normal speed    |
| Fans SFT 3 Fan 2 Rotor 1 | OK    | Spinning at normal speed    |

|       |       |       |         |        |                             |
|-------|-------|-------|---------|--------|-----------------------------|
| Fans  | SFT 3 | Fan 3 | Rotor 0 | OK     | Spinning at normal speed    |
| Fans  | SFT 3 | Fan 3 | Rotor 1 | OK     | Spinning at normal speed    |
| Fans  | SFT 4 | Fan 0 | Rotor 0 | OK     | Spinning at normal speed    |
| Fans  | SFT 4 | Fan 0 | Rotor 1 | OK     | Spinning at normal speed    |
| Fans  | SFT 4 | Fan 1 | Rotor 0 | OK     | Spinning at normal speed    |
| Fans  | SFT 4 | Fan 1 | Rotor 1 | OK     | Spinning at normal speed    |
| Fans  | SFT 4 | Fan 2 | Rotor 0 | OK     | Spinning at normal speed    |
| Fans  | SFT 4 | Fan 2 | Rotor 1 | OK     | Spinning at normal speed    |
| Fans  | SFT 4 | Fan 3 | Rotor 0 | OK     | Spinning at normal speed    |
| Fans  | SFT 4 | Fan 3 | Rotor 1 | OK     | Spinning at normal speed    |
| Fans  | SFT 5 | Fan 0 | Rotor 0 | OK     | Spinning at normal speed    |
| Fans  | SFT 5 | Fan 0 | Rotor 1 | OK     | Spinning at normal speed    |
| Fans  | SFT 5 | Fan 1 | Rotor 0 | OK     | Spinning at normal speed    |
| Fans  | SFT 5 | Fan 1 | Rotor 1 | OK     | Spinning at normal speed    |
| Fans  | SFT 5 | Fan 2 | Rotor 0 | OK     | Spinning at normal speed    |
| Fans  | SFT 5 | Fan 2 | Rotor 1 | OK     | Spinning at normal speed    |
| Fans  | SFT 5 | Fan 3 | Rotor 0 | OK     | Spinning at normal speed    |
| Fans  | SFT 5 | Fan 3 | Rotor 1 | OK     | Spinning at normal speed    |
| Fans  | SFT 6 | Fan 0 | Rotor 0 | OK     | Spinning at normal speed    |
| Fans  | SFT 6 | Fan 0 | Rotor 1 | OK     | Spinning at normal speed    |
| Fans  | SFT 6 | Fan 1 | Rotor 0 | OK     | Spinning at normal speed    |
| Fans  | SFT 6 | Fan 1 | Rotor 1 | OK     | Spinning at normal speed    |
| Fans  | SFT 6 | Fan 2 | Rotor 0 | OK     | Spinning at normal speed    |
| Fans  | SFT 6 | Fan 2 | Rotor 1 | OK     | Spinning at normal speed    |
| Fans  | SFT 6 | Fan 3 | Rotor 0 | OK     | Spinning at normal speed    |
| Fans  | SFT 6 | Fan 3 | Rotor 1 | OK     | Spinning at normal speed    |
| Fans  | SFT 7 | Fan 0 | Rotor 0 | OK     | Spinning at normal speed    |
| Fans  | SFT 7 | Fan 0 | Rotor 1 | OK     | Spinning at normal speed    |
| Fans  | SFT 7 | Fan 1 | Rotor 0 | OK     | Spinning at normal speed    |
| Fans  | SFT 7 | Fan 1 | Rotor 1 | OK     | Spinning at normal speed    |
| Fans  | SFT 7 | Fan 2 | Rotor 0 | OK     | Spinning at normal speed    |
| Fans  | SFT 7 | Fan 2 | Rotor 1 | OK     | Spinning at normal speed    |
| Fans  | SFT 7 | Fan 3 | Rotor 0 | OK     | Spinning at normal speed    |
| Fans  | SFT 7 | Fan 3 | Rotor 1 | OK     | Spinning at normal speed    |
| Power | PEM 0 |       |         | OK     | 30 degrees C / 86 degrees F |
| Power | PEM 1 |       |         | OK     | 30 degrees C / 86 degrees F |
| Power | PEM 2 |       |         | OK     | 30 degrees C / 86 degrees F |
| Power | PEM 3 |       |         | Absent |                             |
| Power | PEM 4 |       |         | Absent |                             |
| Power | PEM 5 |       |         | Absent |                             |

#### show chassis environment node-device (QFabric System)

```

user@switch> show chassis environment node-device node1
Class Item Status Measurement
Power node1 Power Supply 0 Absent
 node1 Power Supply 1 Absent
Fans node1 Fan Tray 0 Testing
 node1 Fan Tray 1 Testing
 node1 Fan Tray 2 Testing

```

#### show chassis environment pem node-device (QFabric System)

```

user@switch> show chassis environment pem node-device node1
FPC 0 PEM 0 status:
State Check
Airflow Front to Back
Temperature OK
AC Input: OK
DC Output Voltage(V) Current(A) Power(W) Load(%)
 12 10 120 18

```

```

FPC 0 PEM 1 status:
 State Online
 Airflow Back to Front
 Temperature OK
 AC Input: OK
 DC Output Voltage(V) Current(A) Power(W) Load(%)
 11 10 110 17

```

#### show chassis environment (PTX5000 Packet Transport Router)

```

user@host> show chassis environment
Class Item Status Measurement
Temp PDU 0 OK
 PDU 0 PSM 0 OK 36 degrees C / 96 degrees F
 PDU 0 PSM 1 OK 38 degrees C / 100 degrees F
 PDU 0 PSM 2 OK 38 degrees C / 100 degrees F
 PDU 0 PSM 3 OK 37 degrees C / 98 degrees F
 PDU 1 Absent
 CCG 0 OK 44 degrees C / 111 degrees F
 CCG 1 OK 44 degrees C / 111 degrees F
 Routing Engine 0 OK 62 degrees C / 143 degrees F
 Routing Engine 0 CPU OK 75 degrees C / 167 degrees F
 Routing Engine 1 OK 51 degrees C / 123 degrees F
 Routing Engine 1 CPU OK 64 degrees C / 147 degrees F
 CB 0 Intake OK 38 degrees C / 100 degrees F
 CB 0 Exhaust A OK 46 degrees C / 114 degrees F
 CB 0 Exhaust B OK 42 degrees C / 107 degrees F
 CB 1 Intake OK 35 degrees C / 95 degrees F
 CB 1 Exhaust A OK 39 degrees C / 102 degrees F
 CB 1 Exhaust B OK 36 degrees C / 96 degrees F
 SIB 0 Exhaust OK 47 degrees C / 116 degrees F
 SIB 0 Junction OK 45 degrees C / 113 degrees F
 SIB 1 Exhaust OK 44 degrees C / 111 degrees F
 SIB 1 Junction OK 43 degrees C / 109 degrees F
 SIB 2 Exhaust OK 47 degrees C / 116 degrees F
 SIB 2 Junction OK 42 degrees C / 107 degrees F
 SIB 3 Exhaust OK 43 degrees C / 109 degrees F
 SIB 3 Junction OK 43 degrees C / 109 degrees F
 SIB 4 Exhaust OK 47 degrees C / 116 degrees F
 SIB 4 Junction OK 42 degrees C / 107 degrees F
 SIB 5 Exhaust OK 42 degrees C / 107 degrees F
 SIB 5 Junction OK 40 degrees C / 104 degrees F
 SIB 6 Exhaust OK 46 degrees C / 114 degrees F
 SIB 6 Junction OK 42 degrees C / 107 degrees F
 SIB 7 Exhaust OK 43 degrees C / 109 degrees F
 SIB 7 Junction OK 39 degrees C / 102 degrees F
 SIB 8 Exhaust OK 44 degrees C / 111 degrees F
 SIB 8 Junction OK 41 degrees C / 105 degrees F
 FPC 0 PMB OK 35 degrees C / 95 degrees F
 FPC 0 Intake OK 33 degrees C / 91 degrees F
 FPC 0 Exhaust A OK 51 degrees C / 123 degrees F
 FPC 0 Exhaust B OK 43 degrees C / 109 degrees F
 FPC 0 TL0 OK 48 degrees C / 118 degrees F
 FPC 0 TQ0 OK 53 degrees C / 127 degrees F
 FPC 0 TL1 OK 56 degrees C / 132 degrees F
 FPC 0 TQ1 OK 58 degrees C / 136 degrees F
 FPC 0 TL2 OK 55 degrees C / 131 degrees F
 FPC 0 TQ2 OK 56 degrees C / 132 degrees F
 FPC 0 TL3 OK 59 degrees C / 138 degrees F
 FPC 0 TQ3 OK 59 degrees C / 138 degrees F
 FPC 2 PMB OK 35 degrees C / 95 degrees F

```

|                   |        |                              |
|-------------------|--------|------------------------------|
| FPC 2 Intake      | OK     | 34 degrees C / 93 degrees F  |
| FPC 2 Exhaust A   | OK     | 51 degrees C / 123 degrees F |
| FPC 2 Exhaust B   | OK     | 52 degrees C / 125 degrees F |
| FPC 2 TL0         | OK     | 53 degrees C / 127 degrees F |
| FPC 2 TQ0         | OK     | 53 degrees C / 127 degrees F |
| FPC 2 TL1         | OK     | 57 degrees C / 134 degrees F |
| FPC 2 TQ1         | OK     | 58 degrees C / 136 degrees F |
| FPC 2 TL2         | OK     | 54 degrees C / 129 degrees F |
| FPC 2 TQ2         | OK     | 59 degrees C / 138 degrees F |
| FPC 2 TL3         | OK     | 60 degrees C / 140 degrees F |
| FPC 2 TQ3         | OK     | 64 degrees C / 147 degrees F |
| PIC 2/0 Ambient   | OK     | 49 degrees C / 120 degrees F |
| FPC 3 PMB         | OK     | 34 degrees C / 93 degrees F  |
| FPC 3 Intake      | OK     | 35 degrees C / 95 degrees F  |
| FPC 3 Exhaust A   | OK     | 54 degrees C / 129 degrees F |
| FPC 3 Exhaust B   | OK     | 49 degrees C / 120 degrees F |
| FPC 3 TL0         | OK     | 49 degrees C / 120 degrees F |
| FPC 3 TQ0         | OK     | 55 degrees C / 131 degrees F |
| FPC 3 TL1         | OK     | 56 degrees C / 132 degrees F |
| FPC 3 TQ1         | OK     | 58 degrees C / 136 degrees F |
| FPC 3 TL2         | OK     | 56 degrees C / 132 degrees F |
| FPC 3 TQ2         | OK     | 59 degrees C / 138 degrees F |
| FPC 3 TL3         | OK     | 62 degrees C / 143 degrees F |
| FPC 3 TQ3         | OK     | 63 degrees C / 145 degrees F |
| PIC 3/1           | Absent |                              |
| FPC 5 PMB         | OK     | 35 degrees C / 95 degrees F  |
| FPC 5 Intake      | OK     | 34 degrees C / 93 degrees F  |
| FPC 5 Exhaust A   | OK     | 51 degrees C / 123 degrees F |
| FPC 5 Exhaust B   | OK     | 53 degrees C / 127 degrees F |
| FPC 5 TL0         | OK     | 54 degrees C / 129 degrees F |
| FPC 5 TQ0         | OK     | 52 degrees C / 125 degrees F |
| FPC 5 TL1         | OK     | 61 degrees C / 141 degrees F |
| FPC 5 TQ1         | OK     | 60 degrees C / 140 degrees F |
| FPC 5 TL2         | OK     | 55 degrees C / 131 degrees F |
| FPC 5 TQ2         | OK     | 55 degrees C / 131 degrees F |
| FPC 5 TL3         | OK     | 59 degrees C / 138 degrees F |
| FPC 5 TQ3         | OK     | 58 degrees C / 136 degrees F |
| PIC 5/0 Ambient   | OK     | 51 degrees C / 123 degrees F |
| PIC 5/1 Ambient   | OK     | 34 degrees C / 93 degrees F  |
| PIC 5/1 cfp-5/1/0 | OK     | 34 degrees C / 93 degrees F  |
| PIC 5/1 cfp-5/1/1 | OK     | 36 degrees C / 96 degrees F  |
| FPC 6 PMB         | OK     | 36 degrees C / 96 degrees F  |
| FPC 6 Intake      | OK     | 33 degrees C / 91 degrees F  |
| FPC 6 Exhaust A   | OK     | 51 degrees C / 123 degrees F |
| FPC 6 Exhaust B   | OK     | 39 degrees C / 102 degrees F |
| FPC 6 TL0         | OK     | 44 degrees C / 111 degrees F |
| FPC 6 TQ0         | OK     | 54 degrees C / 129 degrees F |
| FPC 6 TL1         | OK     | 59 degrees C / 138 degrees F |
| FPC 6 TQ1         | OK     | 58 degrees C / 136 degrees F |
| FPC 6 TL2         | OK     | 60 degrees C / 140 degrees F |
| FPC 6 TQ2         | OK     | 57 degrees C / 134 degrees F |
| FPC 6 TL3         | OK     | 65 degrees C / 149 degrees F |
| FPC 6 TQ3         | OK     | 60 degrees C / 140 degrees F |
| FPC 7 PMB         | OK     | 35 degrees C / 95 degrees F  |
| FPC 7 Intake      | OK     | 33 degrees C / 91 degrees F  |
| FPC 7 Exhaust A   | OK     | 53 degrees C / 127 degrees F |
| FPC 7 Exhaust B   | OK     | 40 degrees C / 104 degrees F |
| FPC 7 TL0         | OK     | 46 degrees C / 114 degrees F |
| FPC 7 TQ0         | OK     | 58 degrees C / 136 degrees F |
| FPC 7 TL1         | OK     | 53 degrees C / 127 degrees F |
| FPC 7 TQ1         | OK     | 59 degrees C / 138 degrees F |

|      |                   |    |                              |
|------|-------------------|----|------------------------------|
|      | FPC 7 TL2         | OK | 56 degrees C / 132 degrees F |
|      | FPC 7 TQ2         | OK | 61 degrees C / 141 degrees F |
|      | FPC 7 TL3         | OK | 63 degrees C / 145 degrees F |
|      | FPC 7 TQ3         | OK | 63 degrees C / 145 degrees F |
|      | FPM I2CS          | OK | 37 degrees C / 98 degrees F  |
| Fans | Fan Tray 0 Fan 1  | OK | 3042 RPM                     |
|      | Fan Tray 0 Fan 2  | OK | 3042 RPM                     |
|      | Fan Tray 0 Fan 3  | OK | 3000 RPM                     |
|      | Fan Tray 0 Fan 4  | OK | 3042 RPM                     |
|      | Fan Tray 0 Fan 5  | OK | 3000 RPM                     |
|      | Fan Tray 0 Fan 6  | OK | 3042 RPM                     |
|      | Fan Tray 0 Fan 7  | OK | 3085 RPM                     |
|      | Fan Tray 0 Fan 8  | OK | 3042 RPM                     |
|      | Fan Tray 0 Fan 9  | OK | 3042 RPM                     |
|      | Fan Tray 0 Fan 10 | OK | 3085 RPM                     |
|      | Fan Tray 0 Fan 11 | OK | 3085 RPM                     |
|      | Fan Tray 0 Fan 12 | OK | 3128 RPM                     |
|      | Fan Tray 0 Fan 13 | OK | 3128 RPM                     |
|      | Fan Tray 0 Fan 14 | OK | 3042 RPM                     |
|      | Fan Tray 1 Fan 1  | OK | 2299 RPM                     |
|      | Fan Tray 1 Fan 2  | OK | 2399 RPM                     |
|      | Fan Tray 1 Fan 3  | OK | 2299 RPM                     |
|      | Fan Tray 1 Fan 4  | OK | 2266 RPM                     |
|      | Fan Tray 1 Fan 5  | OK | 2266 RPM                     |
|      | Fan Tray 1 Fan 6  | OK | 2366 RPM                     |
|      | Fan Tray 2 Fan 1  | OK | 2199 RPM                     |
|      | Fan Tray 2 Fan 2  | OK | 2133 RPM                     |
|      | Fan Tray 2 Fan 3  | OK | 2366 RPM                     |
|      | Fan Tray 2 Fan 4  | OK | 2233 RPM                     |
|      | Fan Tray 2 Fan 5  | OK | 2399 RPM                     |
|      | Fan Tray 2 Fan 6  | OK | 2233 RPM                     |
| Misc | SPMB 0 Intake     | OK | 50 degrees C / 122 degrees F |
|      | SPMB 1 Intake     | OK | 40 degrees C / 104 degrees F |

#### show chassis environment (PTX5000 Packet Transport Router with FPC2-PTX-P1A)

```

user@host> show chassis environment
Class Item Status Measurement
Temp PDU 0 OK
 PDU 0 PSM 0 OK 41 degrees C / 105 degrees F
 PDU 0 PSM 1 Absent
 PDU 0 PSM 2 OK 43 degrees C / 109 degrees F
 PDU 0 PSM 3 Absent
 PDU 0 PSM 4 OK 44 degrees C / 111 degrees F
 PDU 0 PSM 5 Absent
 PDU 0 PSM 6 OK 45 degrees C / 113 degrees F
 PDU 0 PSM 7 Absent
 PDU 1 OK
 PDU 1 PSM 0 Absent
 PDU 1 PSM 1 OK 45 degrees C / 113 degrees F
 PDU 1 PSM 2 Absent
 PDU 1 PSM 3 OK 43 degrees C / 109 degrees F
 PDU 1 PSM 4 Absent
 PDU 1 PSM 5 OK 46 degrees C / 114 degrees F
 PDU 1 PSM 6 Absent
 PDU 1 PSM 7 OK 46 degrees C / 114 degrees F
 CCG 0 OK 27 degrees C / 80 degrees F
 CCG 1 OK 29 degrees C / 84 degrees F
...

```

**show chassis environment (ACX2000 Universal Access Router)**

```

user@host> show chassis environment
Class Item Status Measurement
PCB Left OK 44 degrees C / 111 degrees F
SFP+ Xcvr OK 50 degrees C / 122 degrees F
FEB OK 70 degrees C / 158 degrees F
PCB Up OK 63 degrees C / 145 degrees F
PCB Mid OK 66 degrees C / 150 degrees F
Telecom Mod OK 65 degrees C / 149 degrees F
Routing Engine OK 54 degrees C / 129 degrees F
Heater off

```

**show chassis environment (ACX4000 Universal Access Router)**

On the ACX4000 router, the MIC output of the **show chassis environment** command varies depending on the number of temperature channels present in the installed MIC.

```

user@host> show chassis environment
Class Item Status Measurement
Temp PEM 0 OK 33 degrees C / 91 degrees F
 PEM 1 Absent
 PCB Bottom OK 30 degrees C / 86 degrees F
 PCB Middle OK 34 degrees C / 93 degrees F
 BCM56445 OK 33 degrees C / 91 degrees F
 SFP+ Xcvr OK 32 degrees C / 89 degrees F
 Fan tray inlet OK 39 degrees C / 102 degrees F
 Exhaust OK 30 degrees C / 86 degrees F
 Routing Engine OK 32 degrees C / 89 degrees F
 Heater off
Pic PIC 0/0 Channel 0 OK 28 degrees C / 82 degrees F
 PIC 0/0 Channel 1 OK 29 degrees C / 84 degrees F
 PIC 0/0 Channel 2 OK 0 degrees C / 32 degrees F
 PIC 0/0 Channel 3 OK 0 degrees C / 32 degrees F
 PIC 0/0 Channel 4 OK 0 degrees C / 32 degrees F
 PIC 0/0 Channel 5 OK 0 degrees C / 32 degrees F
 PIC 0/0 Channel 6 OK 0 degrees C / 32 degrees F
 PIC 0/0 Channel 7 OK 0 degrees C / 32 degrees F
 PIC 0/0 Channel 8 OK 0 degrees C / 32 degrees F
 PIC 0/0 Channel 9 OK 0 degrees C / 32 degrees F
 PIC 1/0 Channel 0 OK 33 degrees C / 91 degrees F
 PIC 1/0 Channel 1 OK 31 degrees C / 87 degrees F
 PIC 1/0 Channel 2 OK 30 degrees C / 86 degrees F
 PIC 1/0 Channel 3 OK 0 degrees C / 32 degrees F
 PIC 1/0 Channel 4 OK 0 degrees C / 32 degrees F
 PIC 1/0 Channel 5 OK 0 degrees C / 32 degrees F
 PIC 1/0 Channel 6 OK 0 degrees C / 32 degrees F
 PIC 1/0 Channel 7 OK 0 degrees C / 32 degrees F
 PIC 1/0 Channel 8 OK 0 degrees C / 32 degrees F
 PIC 1/1 Channel 0 OK 31 degrees C / 87 degrees F
 PIC 1/1 Channel 1 OK 29 degrees C / 84 degrees F
 PIC 1/1 Channel 2 OK 28 degrees C / 82 degrees F
 PIC 1/1 Channel 3 OK 0 degrees C / 32 degrees F
 PIC 1/1 Channel 4 OK 0 degrees C / 32 degrees F
 PIC 1/1 Channel 5 OK 0 degrees C / 32 degrees F
 PIC 1/1 Channel 6 OK 0 degrees C / 32 degrees F
 PIC 1/1 Channel 7 OK 0 degrees C / 32 degrees F
 PIC 1/1 Channel 8 OK 0 degrees C / 32 degrees F

```

|      |       |    |                          |
|------|-------|----|--------------------------|
| Fans | Fan 1 | OK | Spinning at normal speed |
|      | Fan 2 | OK | Spinning at normal speed |

## show chassis environment fpc

---

|                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                                | <a href="#">Syntax on page 656</a><br><a href="#">Syntax (TX Matrix and TX Matrix Plus Routers) on page 656</a><br><a href="#">Syntax (MX Series Routers) on page 656</a><br><a href="#">Syntax (MX2010 3D Universal Edge Routers) on page 656</a><br><a href="#">Syntax (MX2020 3D Universal Edge Routers) on page 656</a><br><a href="#">Syntax (QFX Series) on page 656</a><br><a href="#">Syntax (OCX Series) on page 656</a>                                                                                                                                                                          |
| <b>Syntax</b>                                        | show chassis environment fpc<br><slot>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Syntax (TX Matrix and TX Matrix Plus Routers)</b> | show chassis environment fpc<br><lcc number><br><slot>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Syntax (MX Series Routers)</b>                    | show chassis environment fpc<br><slot><br><all-members><br><local><br><member member-id>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Syntax (MX2010 3D Universal Edge Routers)</b>     | show chassis environment fpc<br><slot>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Syntax (MX2020 3D Universal Edge Routers)</b>     | show chassis environment fpc<br><slot>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Syntax (QFX Series)</b>                           | show chassis environment fpc<br><fpc-slot><br>interconnect-device <i>name</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Syntax (OCX Series)</b>                           | show chassis environment fpc <fpc-slot>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Release Information</b>                           | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br>Command introduced in Junos OS Release 11.1 for QFX Series.<br>Command introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers.<br>Command introduced in Junos OS Release 12.1 for T4000 Core Routers.<br>Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.<br>Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>                                   | (M40e, M120, M160, M320, MX Series, T Series routers, EX Series, QFX Series, and PTX Series routers only) Display environmental information about Flexible PIC Concentrators (FPCs).                                                                                                                                                                                                                                                                                                                                                                                                                       |



**Options** **none**—Display environmental information about all FPCs. On a TX Matrix router, display environmental information about all FPCs on the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display environmental information about all FPCs on the TX Matrix Plus router and its attached routers.

**all-members**—(MX Series routers only) (Optional) Display environmental information for the FPCs in all the members of the Virtual Chassis configuration.

**interconnect-device *name***—(QFabric systems only) (Optional) Display chassis environmental information for the Interconnect device.

**lcc *number***—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(MX Series routers only) (Optional) Display environmental information for the FPCs in the local Virtual Chassis member.

**member *member-id***—(MX Series routers only) (Optional) Display environmental information for the FPCs in the specified member of the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

**slot or fpc-slot**—(Optional) Display environmental information about an individual FPC:

- (TX Matrix and TX Matrix Plus routers only) On a TX Matrix router, if you specify the number of the T640 router by using only the **lcc *number*** option (the recommended method), replace **slot** with a value from 0 through 7. Similarly, on a TX Matrix Plus router, if you specify the number of the router by using only the **lcc *number*** option (the recommended method), replace **slot** with a value from 0 through 7. Otherwise, replace **slot** with a value from 0 through 31. For example, the following commands have the same result:

```
user@host> show chassis environment fpc 1 lcc 1
user@host> show chassis environment fpc 9
```

- M120 router—Replace **slot** with a value from 0 through 5.
- MX240 router—Replace **slot** with a value from 0 through 2.
- MX480 router—Replace **slot** with a value from 0 through 5.
- MX960 router—Replace **slot** with a value from 0 through 11.
- MX2010 router—Replace **slot** with a value from 0 through 9.

- MX2020 router—Replace **slot** with a value from 0 through 19.
- Other routers—Replace **slot** with a value from 0 through 7.
- EX Series switches:
  - EX3200 switches and EX4200 standalone switches—Replace **slot** with 0.
  - EX4200 switches in a Virtual Chassis configuration—Replace **slot** with a value from 0 through 9 (switch's member ID).
  - EX6210 switches—Replace **slot** with a value from 0 through 3 (line card only), 4 or 5 (line card or Switch Fabric and Routing Engine (SRE) module), or 6 through 9 (line card only).
  - EX8208 switches—Replace **slot** with a value from 0 through 7 (line card).
  - EX8216 switches—Replace **slot** with a value from 0 through 15 (line card).
- QFX3500 switches —Replace **fpc-slot** with 0 through 15.
- PTX5000 Packet Transport Router—Replace **fpc-slot** with 0 through 7.

**Required Privilege Level** view

- Related Documentation**
- [request chassis fpc on page 453](#)
  - [show chassis fpc on page 720](#)
  - *show chassis fpc-feb-connectivity*
  - *Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online*
  - *MX960 Flexible PIC Concentrator Description*

- List of Sample Output**
- [show chassis environment fpc \(M120 Router\) on page 660](#)
  - [show chassis environment fpc \(M160 Router\) on page 661](#)
  - [show chassis environment fpc \(M320 Router\) on page 661](#)
  - [show chassis environment fpc \(MX2020 Router\) on page 662](#)
  - [show chassis environment fpc \(MX2010 Router\) on page 665](#)
  - [show chassis environment fpc \(MX240 Router\) on page 667](#)
  - [show chassis environment fpc \(MX480 Router\) on page 668](#)
  - [show chassis environment fpc \(MX960 Router\) on page 669](#)
  - [show chassis environment fpc \(MX480 Router with 100-Gigabit Ethernet CFP\) on page 670](#)
  - [show chassis environment fpc \(MX240, MX480, MX960 with Application Services Modular Line Card\) on page 671](#)
  - [show chassis environment fpc \(T320, T640, and T1600 Routers\) on page 672](#)
  - [show chassis environment fpc \(T4000 Router\) on page 672](#)
  - [show chassis environment fpc lcc \(TX Matrix Router\) on page 677](#)
  - [show chassis environment fpc lcc \(TX Matrix Plus Router\) on page 678](#)
  - [show chassis environment fpc \(QFX Series and OCX Series\) on page 679](#)
  - [show chassis environment fpc interconnect-device \(QFabric Systems\) on page 679](#)

[show chassis environment fpc 0 \(PTX5000 Packet Transport Router\) on page 679](#)  
[show chassis environment fpc 07 \(PTX5000 Packet Transport Router with FPC2-PTX-P1A\) on page 680](#)  
[show chassis environment FPC 1 \(MX Routers with Media Services Blade \[MSB\]\) on page 681](#)

**Output Fields** [Table 49 on page 659](#) lists the output fields for the **show chassis environment fpc** command. Output fields are listed in the approximate order in which they appear.

**Table 49: show chassis environment fpc Output Fields**

| Field Name                     | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>State</b>                   | <p>Status of the FPC:</p> <ul style="list-style-type: none"> <li>• <b>Unknown</b>—FPC is not detected by the router.</li> <li>• <b>Empty</b>—No FPC is present.</li> <li>• <b>Present</b>—FPC is detected by the chassis daemon but is either not supported by the current version of the Junos OS, or the FPC is coming up but not yet online.</li> <li>• <b>Ready</b>—FPC is in intermediate or transition state.</li> <li>• <b>Announce online</b>—Intermediate state during which the FPC is coming up but not yet online, and the chassis manager acknowledges the chassisd FPC online initiative.</li> <li>• <b>Online</b>—FPC is online and running.</li> <li>• <b>Offline</b>—FPC is powered down.</li> <li>• <b>Diagnostics</b>—FPC is set to operate in diagnostics mode.</li> </ul> |
| <b>Temperature</b>             | (M40e and M160 routers and QFX Series only) Temperature of the air flowing past the FPC.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>PMB Temperature</b>         | <p>(PTX Series only) Temperature of the air flowing past the PMB (bottom of the FPC).</p> <p>The PTX5000 Packet Transport Router with FPC2-PTX-P1A include multiple temperatures for PMB (<b>TEMPO</b> and <b>TEMP1</b>).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>PMB CPU Temperature</b>     | (PTX5000 Packet Transport Router with FPC2-PTX-P1A only) Temperature of the air flowing past the PMB CPU.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Temperature Intake</b>      | (M320 routers, MX2010 routers, MX2020 routers, and PTX Series only) Temperature of the air flowing into the chassis.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Temperature Top</b>         | (T Series routers only) Temperature of the air flowing past the top of the FPC.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Temperature Exhaust</b>     | <p>(M120 and M320 routers, MX2010 routers, MX2020 routers, and PTX Series only) Temperature of the air flowing out of the chassis.</p> <p>The PTX Series Packet Transport Routers, and the MX2010 and MX2020 routers include exhaust temperatures for multiple zones (<b>Exhaust A</b> and <b>Exhaust B</b>).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Temperature Bottom</b>      | (T Series routers only) Temperature of the air flowing past the bottom of the FPC.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>TL <i>n</i> Temperature</b> | (PTX Series only) Temperature of the air flowing past the specified TL area of the packet forwarding engine (PFE) on the FPC.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>TQ <i>n</i> Temperature</b> | (PTX Series only) Temperature of the air flowing past the specified TQ area of the packet forwarding engine (PFE) on the FPC.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

Table 49: show chassis environment fpc Output Fields (*continued*)

| Field Name                          | Field Description                                                                                                                                                      |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Temperature MMBO</b>             | (T640 router only) Temperature of the air flowing past the type 3 FPC.                                                                                                 |
| <b>Temperature MMB1</b>             | (M320 and T Series routers only) Temperature of the air flowing past the type 1, type 2, and type 3 FPC.                                                               |
| <b>Power</b>                        | Information about the voltage supplied to the FPC. The left column displays the required power, in volts. The right column displays the measured power, in millivolts. |
| <b>CMB Revision or BUS revision</b> | Revision level of the chassis management bus device (M Series router) or bus (T Series routers).                                                                       |

## Sample Output

### show chassis environment fpc (M120 Router)

```

user@host> show chassis environment fpc
FPC 2 status:
 State Online
 Temperature Exhaust A 32 degrees C / 89 degrees F
 Temperature Exhaust B 31 degrees C / 87 degrees F
 Power A-Board
 1.2 V 1202 mV
 1.5 V 1508 mV
 1.8 V 1798 mV
 2.5 V 2507 mV
 3.3 V 3351 mV
 5.0 V 4995 mV
 3.3 V bias 3296 mV
 1.2 V Rocket IO 1205 mV
 1.5 V Rocket IO 1501 mV
 I2C Slave Revision 12
FPC 3 status:
 State Online
 Temperature Exhaust A 31 degrees C / 87 degrees F
 Temperature Exhaust B 33 degrees C / 91 degrees F
 Power A-Board
 1.2 V 1211 mV
 1.5 V 1501 mV
 1.8 V 1798 mV
 2.5 V 2471 mV
 3.3 V 3293 mV
 5.0 V 4930 mV
 3.3 V bias 3296 mV
 1.2 V Rocket IO 1205 mV
 1.5 V Rocket IO 1501 mV
 Power B-Board
 1.2 V 1214 mV
 1.5 V 1501 mV
 2.5 V 2471 mV
 3.3 V 3300 mV
 5.0 V 4943 mV
 3.3 V bias 3296 mV
 1.2 V Rocket IO 1205 mV
 1.5 V Rocket IO 1501 mV

```

```

I2C Slave Revision 12
FPC 4 status:
State Online
Temperature Exhaust A 32 degrees C / 89 degrees F
Temperature Exhaust B 30 degrees C / 86 degrees F
Power A-Board
 1.2 V 1195 mV
 1.5 V 1504 mV
 1.8 V 1801 mV
 2.5 V 2504 mV
 3.3 V 3293 mV
 5.0 V 4917 mV
 3.3 V bias 3296 mV
 1.2 V Rocket IO 1202 mV
 1.5 V Rocket IO 1492 mV
I2C Slave Revision 12

```

#### show chassis environment fpc (M160 Router)

```

user@host> show chassis environment fpc
FPC 0 status:
State Online
Temperature 42 degrees C / 107 degrees F
Power:
 1.5 V 1500 mV
 2.5 V 2509 mV
 3.3 V 3308 mV
 5.0 V 4991 mV
 5.0 V bias 4952 mV
 8.0 V bias 8307 mV
CMB Revision 12
FPC 1 status:
State Online
Temperature 45 degrees C / 113 degrees F
Power:
 1.5 V 1498 mV
 2.5 V 2501 mV
 3.3 V 3319 mV
 5.0 V 5020 mV
 5.0 V bias 5025 mV
 8.0 V bias 8307 mV
CMB Revision 12

```

#### show chassis environment fpc (M320 Router)

```

user@host> show chassis environment fpc
FPC 0 status:
State Online
Temperature Intake 27 degrees C / 80 degrees F
Temperature Exhaust 38 degrees C / 100 degrees F
Temperature MMB1 31 degrees C / 87 degrees F
Power:
 1.5 V 1487 mV
 1.5 V * 1494 mV
 1.8 V 1821 mV
 2.5 V 2533 mV
 3.3 V 3323 mV
 5.0 V 5028 mV
 3.3 V bias 3296 mV
 5.0 V bias 4984 mV
CMB Revision 16

```

```

FPC 1 status:
State Online
Temperature Intake 27 degrees C / 80 degrees F
Temperature Exhaust 37 degrees C / 98 degrees F
Temperature MMB1 32 degrees C / 89 degrees F
Power:
 1.5 V 1504 mV
 1.5 V * 1499 mV
 1.8 V 1820 mV
 2.5 V 2529 mV
 3.3 V 3328 mV
 5.0 V 5013 mV
 3.3 V bias 3294 mV
 5.0 V bias 4984 mV
CMB Revision 16
FPC 2 status:
State Online
Temperature Intake 28 degrees C / 82 degrees F
Temperature Exhaust 38 degrees C / 100 degrees F
Temperature MMB1 32 degrees C / 89 degrees F
Power:
 1.5 V 1498 mV
 1.5 V * 1487 mV
 1.8 V 1816 mV
 2.5 V 2531 mV
 3.3 V 3324 mV
 5.0 V 5025 mV
 3.3 V bias 3277 mV
 5.0 V bias 5013 mV
CMB Revision 17
FPC 3 status:
...

```

### show chassis environment fpc (MX2020 Router)

```

user@host> show chassis environment fpc
FPC 0 status:
State Online
Temperature Intake 41 degrees C / 105 degrees F
Temperature Exhaust A 48 degrees C / 118 degrees F
Temperature Exhaust B 60 degrees C / 140 degrees F
Temperature LU 0 TSen 56 degrees C / 132 degrees F
Temperature LU 0 Chip 59 degrees C / 138 degrees F
Temperature LU 1 TSen 56 degrees C / 132 degrees F
Temperature LU 1 Chip 61 degrees C / 141 degrees F
Temperature LU 2 TSen 56 degrees C / 132 degrees F
Temperature LU 2 Chip 52 degrees C / 125 degrees F
Temperature LU 3 TSen 56 degrees C / 132 degrees F
Temperature LU 3 Chip 52 degrees C / 125 degrees F
Temperature MQ 0 TSen 49 degrees C / 120 degrees F
Temperature MQ 0 Chip 49 degrees C / 120 degrees F
Temperature MQ 1 TSen 49 degrees C / 120 degrees F
Temperature MQ 1 Chip 52 degrees C / 125 degrees F
Temperature MQ 2 TSen 49 degrees C / 120 degrees F
Temperature MQ 2 Chip 45 degrees C / 113 degrees F
Temperature MQ 3 TSen 49 degrees C / 120 degrees F
Temperature MQ 3 Chip 46 degrees C / 114 degrees F
Power
 AS-BIAS3V3-z12105 3299 mV
 AS-VDD1V8-z12006 1807 mV
 AS-VDD2V5-z12006 2512 mV

```

```

AS-AVDD1V0-z12004 997 mV
AS-PCIE_1V0-z12004 996 mV
AS-VDD3V3-z12004 3294 mV
AS-VDD_1V5A-z12004 1501 mV
AS-VDD_1V5B-z12004 1498 mV
AS-LU0_1V0-z12004 998 mV
AS-LU1_1V0-z12004 1002 mV
AS-MQ0_1V0-z12004 999 mV
AS-MQ1_1V0-z12004 994 mV
AS-LU2_1V0-z12004 1000 mV
AS-LU3_1V0-z12004 998 mV
AS-MQ2_1V0-z12004 1002 mV
AS-MQ3_1V0-z12004 999 mV
AS-PMB_1V1-z12006 1096 mV
I2C Slave Revision 68
FPC 1 status:
State Online
Temperature Intake 39 degrees C / 102 degrees F
Temperature Exhaust A 48 degrees C / 118 degrees F
Temperature Exhaust B 55 degrees C / 131 degrees F
Temperature LU 0 TSen 52 degrees C / 125 degrees F
Temperature LU 0 Chip 54 degrees C / 129 degrees F
Temperature LU 1 TSen 52 degrees C / 125 degrees F
Temperature LU 1 Chip 56 degrees C / 132 degrees F
Temperature LU 2 TSen 52 degrees C / 125 degrees F
Temperature LU 2 Chip 49 degrees C / 120 degrees F
Temperature LU 3 TSen 52 degrees C / 125 degrees F
Temperature LU 3 Chip 50 degrees C / 122 degrees F
Temperature MQ 0 TSen 48 degrees C / 118 degrees F
Temperature MQ 0 Chip 48 degrees C / 118 degrees F
Temperature MQ 1 TSen 48 degrees C / 118 degrees F
Temperature MQ 1 Chip 51 degrees C / 123 degrees F
Temperature MQ 2 TSen 48 degrees C / 118 degrees F
Temperature MQ 2 Chip 45 degrees C / 113 degrees F
Temperature MQ 3 TSen 48 degrees C / 118 degrees F
Temperature MQ 3 Chip 45 degrees C / 113 degrees F
Power
AS-BIAS3V3-z12105 3291 mV
AS-VDD1V8-z12006 1786 mV
AS-VDD2V5-z12006 2496 mV
AS-AVDD1V0-z12004 1000 mV
AS-PCIE_1V0-z12004 1000 mV
AS-VDD3V3-z12004 3294 mV
AS-VDD_1V5A-z12004 1500 mV
AS-VDD_1V5B-z12004 1498 mV
AS-LU0_1V0-z12004 1003 mV
AS-LU1_1V0-z12004 1000 mV
AS-MQ0_1V0-z12004 1000 mV
AS-MQ1_1V0-z12004 995 mV
AS-LU2_1V0-z12004 1002 mV
AS-LU3_1V0-z12004 997 mV
AS-MQ2_1V0-z12004 1000 mV
AS-MQ3_1V0-z12004 998 mV
AS-PMB_1V1-z12006 1096 mV
I2C Slave Revision 68
FPC 2 status:
State Online
Temperature Intake 39 degrees C / 102 degrees F
Temperature Exhaust A 48 degrees C / 118 degrees F
Temperature Exhaust B 58 degrees C / 136 degrees F
Temperature LU 0 TSen 55 degrees C / 131 degrees F

```

```

Temperature LU 0 Chip 57 degrees C / 134 degrees F
Temperature LU 1 TSen 55 degrees C / 131 degrees F
Temperature LU 1 Chip 63 degrees C / 145 degrees F
Temperature LU 2 TSen 55 degrees C / 131 degrees F
Temperature LU 2 Chip 51 degrees C / 123 degrees F
Temperature LU 3 TSen 55 degrees C / 131 degrees F
Temperature LU 3 Chip 52 degrees C / 125 degrees F
Temperature MQ 0 TSen 48 degrees C / 118 degrees F
Temperature MQ 0 Chip 50 degrees C / 122 degrees F
Temperature MQ 1 TSen 48 degrees C / 118 degrees F
Temperature MQ 1 Chip 52 degrees C / 125 degrees F
Temperature MQ 2 TSen 48 degrees C / 118 degrees F
Temperature MQ 2 Chip 47 degrees C / 116 degrees F
Temperature MQ 3 TSen 48 degrees C / 118 degrees F
Temperature MQ 3 Chip 47 degrees C / 116 degrees F
Power
 AS-BIAS3V3-z12105 3299 mV
 AS-VDD1V8-z12006 1805 mV
 AS-VDD2V5-z12006 2510 mV
 AS-AVDD1V0-z12004 999 mV
 AS-PCIE_1V0-z12004 998 mV
 AS-VDD3V3-z12004 3296 mV
 AS-VDD_1V5A-z12004 1492 mV
 AS-VDD_1V5B-z12004 1497 mV
 AS-LU0_1V0-z12004 997 mV
 AS-LU1_1V0-z12004 1000 mV
 AS-MQ0_1V0-z12004 998 mV
 AS-MQ1_1V0-z12004 1001 mV
 AS-LU2_1V0-z12004 996 mV
 AS-LU3_1V0-z12004 995 mV
 AS-MQ2_1V0-z12004 998 mV
 AS-MQ3_1V0-z12004 997 mV
 AS-PMB_1V1-z12006 1100 mV
I2C Slave Revision 68
FPC 3 status:
State Online
Temperature Intake 41 degrees C / 105 degrees F
Temperature Exhaust A 48 degrees C / 118 degrees F
Temperature Exhaust B 58 degrees C / 136 degrees F
Temperature LU 0 TSen 56 degrees C / 132 degrees F
Temperature LU 0 Chip 59 degrees C / 138 degrees F
Temperature LU 1 TSen 56 degrees C / 132 degrees F
Temperature LU 1 Chip 61 degrees C / 141 degrees F
Temperature LU 2 TSen 56 degrees C / 132 degrees F
Temperature LU 2 Chip 51 degrees C / 123 degrees F
Temperature LU 3 TSen 56 degrees C / 132 degrees F
Temperature LU 3 Chip 53 degrees C / 127 degrees F
Temperature MQ 0 TSen 50 degrees C / 122 degrees F
Temperature MQ 0 Chip 51 degrees C / 123 degrees F
Temperature MQ 1 TSen 50 degrees C / 122 degrees F
Temperature MQ 1 Chip 55 degrees C / 131 degrees F
Temperature MQ 2 TSen 50 degrees C / 122 degrees F
Temperature MQ 2 Chip 47 degrees C / 116 degrees F
Temperature MQ 3 TSen 50 degrees C / 122 degrees F
Temperature MQ 3 Chip 50 degrees C / 122 degrees F
Power
 AS-BIAS3V3-z12105 3305 mV
 AS-VDD1V8-z12006 1810 mV
 AS-VDD2V5-z12006 2508 mV
 AS-AVDD1V0-z12004 999 mV
 AS-PCIE_1V0-z12004 1001 mV

```



```

AS-VDD3V3-z12004 3294 mV
AS-VDD_1V5A-z12004 1500 mV
AS-VDD_1V5B-z12004 1498 mV
AS-LU0_1V0-z12004 998 mV
AS-LU1_1V0-z12004 998 mV
AS-MQ0_1V0-z12004 999 mV
AS-MQ1_1V0-z12004 998 mV
AS-LU2_1V0-z12004 1000 mV
AS-LU3_1V0-z12004 1001 mV
AS-MQ2_1V0-z12004 996 mV
AS-MQ3_1V0-z12004 998 mV
AS-PMB_1V1-z12006 1098 mV
I2C Slave Revision 68
FPC 4 status:
...

```

### show chassis environment fpc (MX2010 Router)

```

user@host> show chassis environment fpc
FPC 0 status:
State Online
Temperature Intake 36 degrees C / 96 degrees F
Temperature Exhaust A 42 degrees C / 107 degrees F
Temperature Exhaust B 51 degrees C / 123 degrees F
Temperature LU 0 TSen 49 degrees C / 120 degrees F
Temperature LU 0 Chip 50 degrees C / 122 degrees F
Temperature LU 1 TSen 49 degrees C / 120 degrees F
Temperature LU 1 Chip 54 degrees C / 129 degrees F
Temperature LU 2 TSen 49 degrees C / 120 degrees F
Temperature LU 2 Chip 45 degrees C / 113 degrees F
Temperature LU 3 TSen 49 degrees C / 120 degrees F
Temperature LU 3 Chip 46 degrees C / 114 degrees F
Temperature MQ 0 TSen 40 degrees C / 104 degrees F
Temperature MQ 0 Chip 41 degrees C / 105 degrees F
Temperature MQ 1 TSen 40 degrees C / 104 degrees F
Temperature MQ 1 Chip 44 degrees C / 111 degrees F
Temperature MQ 2 TSen 40 degrees C / 104 degrees F
Temperature MQ 2 Chip 38 degrees C / 100 degrees F
Temperature MQ 3 TSen 40 degrees C / 104 degrees F
Temperature MQ 3 Chip 41 degrees C / 105 degrees F
Power
AS-BIAS3V3-z12105 3300 mV
AS-VDD1V8-z12006 1805 mV
AS-VDD2V5-z12006 2505 mV
AS-AVDD1V0-z12004 998 mV
AS-PCIE_1V0-z12004 999 mV
AS-VDD3V3-z12004 3303 mV
AS-VDD_1V5A-z12004 1497 mV
AS-VDD_1V5B-z12004 1497 mV
AS-LU0_1V0-z12004 998 mV
AS-LU1_1V0-z12004 1003 mV
AS-MQ0_1V0-z12004 998 mV
AS-MQ1_1V0-z12004 998 mV
AS-LU2_1V0-z12004 997 mV
AS-LU3_1V0-z12004 1001 mV
AS-MQ2_1V0-z12004 996 mV
AS-MQ3_1V0-z12004 994 mV
AS-PMB_1V1-z12006 1097 mV
I2C Slave Revision 68
FPC 1 status:
State Online

```

```

Temperature Intake 34 degrees C / 93 degrees F
Temperature Exhaust A 46 degrees C / 114 degrees F
Temperature Exhaust B 54 degrees C / 129 degrees F
Temperature LU 0 TSen 45 degrees C / 113 degrees F
Temperature LU 0 Chip 55 degrees C / 131 degrees F
Temperature LU 1 TSen 45 degrees C / 113 degrees F
Temperature LU 1 Chip 44 degrees C / 111 degrees F
Temperature LU 2 TSen 45 degrees C / 113 degrees F
Temperature LU 2 Chip 50 degrees C / 122 degrees F
Temperature LU 3 TSen 45 degrees C / 113 degrees F
Temperature LU 3 Chip 58 degrees C / 136 degrees F
Temperature XM 0 TSen 45 degrees C / 113 degrees F
Temperature XM 0 Chip 51 degrees C / 123 degrees F
Temperature XF 0 TSen 45 degrees C / 113 degrees F
Temperature XF 0 Chip 63 degrees C / 145 degrees F
Temperature PLX Switch TSen 45 degrees C / 113 degrees F
Temperature PLX Switch Chip 47 degrees C / 116 degrees F
Power
MPC-BIAS3V3-z12105 3300 mV
MPC-VDD3V3-z16100 3294 mV
MPC-VDD2V5-z16100 2505 mV
MPC-VDD1V8-z12004 1796 mV
MPC-AVDD1V0-z12004 991 mV
MPC-VDD1V2-z16100 1196 mV
MPC-VDD1V5A-z12004 1491 mV
MPC-VDD1V5B-z12004 1492 mV
MPC-XF_0V9-z12004 996 mV
MPC-PCIE_1V0-z16100 1003 mV
MPC-LU0_1V0-z12004 996 mV
MPC-LU1_1V0-z12004 996 mV
MPC-LU2_1V0-z12004 998 mV
MPC-LU3_1V0-z12004 994 mV
MPC-12VA-BMR453 12031 mV
MPC-12VB-BMR453 12003 mV
MPC-PMB_1V1-z12006 1104 mV
MPC-PMB_1V2-z12106 1194 mV
MPC-XM_0V9-vt273m 911 mV
I2C Slave Revision 110
FPC 8 status:
State Online
Temperature Intake 32 degrees C / 89 degrees F
Temperature Exhaust A 44 degrees C / 111 degrees F
Temperature Exhaust B 37 degrees C / 98 degrees F
Temperature LU 0 TCAM TSen 41 degrees C / 105 degrees F
Temperature LU 0 TCAM Chip 49 degrees C / 120 degrees F
Temperature LU 0 TSen 41 degrees C / 105 degrees F
Temperature LU 0 Chip 52 degrees C / 125 degrees F
Temperature MQ 0 TSen 41 degrees C / 105 degrees F
Temperature MQ 0 Chip 47 degrees C / 116 degrees F
Temperature LU 1 TCAM TSen 39 degrees C / 102 degrees F
Temperature LU 1 TCAM Chip 42 degrees C / 107 degrees F
Temperature LU 1 TSen 39 degrees C / 102 degrees F
Temperature LU 1 Chip 46 degrees C / 114 degrees F
Temperature MQ 1 TSen 39 degrees C / 102 degrees F
Temperature MQ 1 Chip 45 degrees C / 113 degrees F
Power
MPC-BIAS3V3-z12105 3296 mV
MPC-VDD3V3-z12006 3298 mV
MPC-VDD2V5-z12006 2505 mV
MPC-TCAM_1V0-z12004 997 mV
MPC-AVDD1V0-z12006 1007 mV

```

```

MPC-VDD1V8-z12006 1803 mV
MPC-PCIE_1V0-z12006 1004 mV
MPC-LU0_1V0-z12004 1000 mV
MPC-MQ0_1V0-z12004 999 mV
MPC-VDD_1V5-z12004 1498 mV
MPC-PMB_1V1-z12006 1102 mV
MPC-9VA-BMR453 9009 mV
MPC-9VB-BMR453 8960 mV
MPC-PMB_1V2-z12105 1202 mV
MPC-LU1_1V0-z12004 1005 mV
MPC-MQ1_1V0-z12004 1000 mV
I2C Slave Revision 70
FPC 9 status:
State Online
Temperature Intake 34 degrees C / 93 degrees F
Temperature Exhaust A 41 degrees C / 105 degrees F
Temperature Exhaust B 54 degrees C / 129 degrees F
Temperature LU 0 TSen 51 degrees C / 123 degrees F
Temperature LU 0 Chip 52 degrees C / 125 degrees F
Temperature LU 1 TSen 51 degrees C / 123 degrees F
Temperature LU 1 Chip 55 degrees C / 131 degrees F
Temperature LU 2 TSen 51 degrees C / 123 degrees F
Temperature LU 2 Chip 47 degrees C / 116 degrees F
Temperature LU 3 TSen 51 degrees C / 123 degrees F
Temperature LU 3 Chip 47 degrees C / 116 degrees F
Temperature MQ 0 TSen 40 degrees C / 104 degrees F
Temperature MQ 0 Chip 42 degrees C / 107 degrees F
Temperature MQ 1 TSen 40 degrees C / 104 degrees F
Temperature MQ 1 Chip 44 degrees C / 111 degrees F
Temperature MQ 2 TSen 40 degrees C / 104 degrees F
Temperature MQ 2 Chip 38 degrees C / 100 degrees F
Temperature MQ 3 TSen 40 degrees C / 104 degrees F
Temperature MQ 3 Chip 40 degrees C / 104 degrees F
Power
AS-BIAS3V3-z12105 3302 mV
AS-VDD1V8-z12006 1808 mV
AS-VDD2V5-z12006 2513 mV
AS-AVDD1V0-z12004 997 mV
AS-PCIE_1V0-z12004 999 mV
AS-VDD3V3-z12004 3294 mV
AS-VDD_1V5A-z12004 1503 mV
AS-VDD_1V5B-z12004 1502 mV
AS-LU0_1V0-z12004 996 mV
AS-LU1_1V0-z12004 999 mV
AS-MQ0_1V0-z12004 997 mV
AS-MQ1_1V0-z12004 999 mV
AS-LU2_1V0-z12004 997 mV
AS-LU3_1V0-z12004 998 mV
AS-MQ2_1V0-z12004 1000 mV
AS-MQ3_1V0-z12004 1000 mV
AS-PMB_1V1-z12006 1102 mV
I2C Slave Revision 68

```

### show chassis environment fpc (MX240 Router)

```

user@host> show chassis environment fpc
FPC 1 status:
State Online
Temperature Intake 34 degrees C / 93 degrees F
Temperature Exhaust A 39 degrees C / 102 degrees F
Temperature Exhaust B 53 degrees C / 127 degrees F

```

```

Temperature I3 0 TSensor 51 degrees C / 123 degrees F
Temperature I3 0 Chip 54 degrees C / 129 degrees F
Temperature I3 1 TSensor 50 degrees C / 122 degrees F
Temperature I3 1 Chip 53 degrees C / 127 degrees F
Temperature I3 2 TSensor 48 degrees C / 118 degrees F
Temperature I3 2 Chip 51 degrees C / 123 degrees F
Temperature I3 3 TSensor 45 degrees C / 113 degrees F
Temperature I3 3 Chip 48 degrees C / 118 degrees F
Temperature IA 0 TSensor 45 degrees C / 113 degrees F
Temperature IA 0 Chip 45 degrees C / 113 degrees F
Temperature IA 1 TSensor 45 degrees C / 113 degrees F
Temperature IA 1 Chip 49 degrees C / 120 degrees F
Power
 1.5 V 1492 mV
 2.5 V 2507 mV
 3.3 V 3306 mV
 1.8 V PFE 0 1801 mV
 1.8 V PFE 1 1804 mV
 1.8 V PFE 2 1798 mV
 1.8 V PFE 3 1798 mV
 1.2 V PFE 0 1169 mV
 1.2 V PFE 1 1189 mV
 1.2 V PFE 2 1182 mV
 1.2 V PFE 3 1176 mV
I2C Slave Revision 42
FPC 2 status:
State Online
Temperature Intake 33 degrees C / 91 degrees F
Temperature Exhaust A 41 degrees C / 105 degrees F
Temperature Exhaust B 53 degrees C / 127 degrees F
Temperature I3 0 TSensor 53 degrees C / 127 degrees F
Temperature I3 0 Chip 58 degrees C / 136 degrees F
Temperature I3 1 TSensor 52 degrees C / 125 degrees F
Temperature I3 1 Chip 56 degrees C / 132 degrees F
Temperature I3 2 TSensor 50 degrees C / 122 degrees F
Temperature I3 2 Chip 52 degrees C / 125 degrees F
Temperature I3 3 TSensor 46 degrees C / 114 degrees F
Temperature I3 3 Chip 49 degrees C / 120 degrees F
Temperature IA 0 TSensor 51 degrees C / 123 degrees F
Temperature IA 0 Chip 49 degrees C / 120 degrees F
Temperature IA 1 TSensor 48 degrees C / 118 degrees F
Temperature IA 1 Chip 53 degrees C / 127 degrees F
Power
 1.5 V 1492 mV
 2.5 V 2445 mV
 3.3 V 3293 mV
 1.8 V PFE 0 1827 mV
 1.8 V PFE 1 1775 mV
 1.8 V PFE 2 1788 mV
 1.8 V PFE 3 1798 mV
 1.2 V PFE 0 1250 mV
 1.2 V PFE 1 1234 mV
 1.2 V PFE 2 1231 mV
 1.2 V PFE 3 1192 mV
I2C Slave Revision 42

```

#### show chassis environment fpc (MX480 Router)

```

user@host> show chassis environment fpc
FPC 1 status:
State Online

```

```

Temperature Intake 36 degrees C / 96 degrees F
Temperature Exhaust A 41 degrees C / 105 degrees F
Temperature Exhaust B 55 degrees C / 131 degrees F
Temperature I3 0 TSensor 55 degrees C / 131 degrees F
Temperature I3 0 Chip 57 degrees C / 134 degrees F
Temperature I3 1 TSensor 53 degrees C / 127 degrees F
Temperature I3 1 Chip 53 degrees C / 127 degrees F
Temperature I3 2 TSensor 52 degrees C / 125 degrees F
Temperature I3 2 Chip 49 degrees C / 120 degrees F
Temperature I3 3 TSensor 47 degrees C / 116 degrees F
Temperature I3 3 Chip 47 degrees C / 116 degrees F
Temperature IA 0 TSensor 54 degrees C / 129 degrees F
Temperature IA 0 Chip 58 degrees C / 136 degrees F
Temperature IA 1 TSensor 48 degrees C / 118 degrees F
Temperature IA 1 Chip 53 degrees C / 127 degrees F
Power
 1.5 V 1479 mV
 2.5 V 2542 mV
 3.3 V 3319 mV
 1.8 V PFE 0 1811 mV
 1.8 V PFE 1 1804 mV
 1.8 V PFE 2 1804 mV
 1.8 V PFE 3 1814 mV
 1.2 V PFE 0 1192 mV
 1.2 V PFE 1 1202 mV
 1.2 V PFE 2 1205 mV
 1.2 V PFE 3 1189 mV
I2C Slave Revision 40

```

#### show chassis environment fpc (MX960 Router)

```

user@host> show chassis environment fpc
FPC 5 status:
State Online
Temperature Intake 27 degrees C / 80 degrees F
Temperature Exhaust A 34 degrees C / 93 degrees F
Temperature Exhaust B 40 degrees C / 104 degrees F
Temperature I3 0 TSensor 39 degrees C / 102 degrees F
Temperature I3 0 Chip 41 degrees C / 105 degrees F
Temperature I3 1 TSensor 38 degrees C / 100 degrees F
Temperature I3 1 Chip 37 degrees C / 98 degrees F
Temperature I3 2 TSensor 37 degrees C / 98 degrees F
Temperature I3 2 Chip 34 degrees C / 93 degrees F
Temperature I3 3 TSensor 32 degrees C / 89 degrees F
Temperature I3 3 Chip 33 degrees C / 91 degrees F
Temperature IA 0 TSensor 39 degrees C / 102 degrees F
Temperature IA 0 Chip 44 degrees C / 111 degrees F
Temperature IA 1 TSensor 36 degrees C / 96 degrees F
Temperature IA 1 Chip 44 degrees C / 111 degrees F
Power
 1.5 V 1479 mV
 2.5 V 2523 mV
 3.3 V 3254 mV
 1.8 V PFE 0 1798 mV
 1.8 V PFE 1 1798 mV
 1.8 V PFE 2 1807 mV
 1.8 V PFE 3 1791 mV
 1.2 V PFE 0 1173 mV
 1.2 V PFE 1 1179 mV
 1.2 V PFE 2 1179 mV
 1.2 V PFE 3 1185 mV

```

```

I2C Slave Revision 6
FPC 6 status:
State Online
Temperature Intake 25 degrees C / 77 degrees F
Temperature Exhaust A 38 degrees C / 100 degrees F
Temperature Exhaust B 38 degrees C / 100 degrees F
Temperature I3 0 TSensor 40 degrees C / 104 degrees F
Temperature I3 0 Chip 40 degrees C / 104 degrees F
Temperature I3 1 TSensor 40 degrees C / 104 degrees F
Temperature I3 1 Chip 38 degrees C / 100 degrees F
Temperature I3 2 TSensor 37 degrees C / 98 degrees F
Temperature I3 2 Chip 32 degrees C / 89 degrees F
Temperature I3 3 TSensor 34 degrees C / 93 degrees F
Temperature I3 3 Chip 33 degrees C / 91 degrees F
Temperature IA 0 TSensor 45 degrees C / 113 degrees F
Temperature IA 0 Chip 47 degrees C / 116 degrees F
Temperature IA 1 TSensor 37 degrees C / 98 degrees F
Temperature IA 1 Chip 42 degrees C / 107 degrees F
Power
 1.5 V 1485 mV
 2.5 V 2510 mV
 3.3 V 3332 mV
 1.8 V PFE 0 1801 mV
 1.8 V PFE 1 1814 mV
 1.8 V PFE 2 1804 mV
 1.8 V PFE 3 1820 mV
 1.2 V PFE 0 1192 mV
 1.2 V PFE 1 1189 mV
 1.2 V PFE 2 1202 mV
 1.2 V PFE 3 1156 mV
I2C Slave Revision 40

```

#### show chassis environment fpc (MX480 Router with 100-Gigabit Ethernet CFP)

```

user@host> show chassis environment fpc
FPC 0 status:
State Online
Temperature Intake 32 degrees C / 89 degrees F
Temperature Exhaust A 39 degrees C / 102 degrees F
Temperature Exhaust B 37 degrees C / 98 degrees F
Temperature QX 0 TSen 44 degrees C / 111 degrees F
Temperature QX 0 Chip 48 degrees C / 118 degrees F
Temperature LU 0 TCAM TSen 44 degrees C / 111 degrees F
Temperature LU 0 TCAM Chip 47 degrees C / 116 degrees F
Temperature LU 0 TSen 44 degrees C / 111 degrees F
Temperature LU 0 Chip 48 degrees C / 118 degrees F
Temperature MQ 0 TSen 44 degrees C / 111 degrees F
Temperature MQ 0 Chip 47 degrees C / 116 degrees F
Power
 MPC-BIAS3V3-z12105 3297 mV
 MPC-VDD3V3-z12105 3306 mV
 MPC-VDD2V5-z12105 2498 mV
 MPC-TCAM_1V0-z12004 999 mV
 MPC-AVDD1V0-z12006 999 mV
 MPC-VDD1V8-z12006 1796 mV
 MPC-PCIE_1V0-z12006 1002 mV
 MPC-LU0_1V0-z12004 997 mV
 MPC-MQ0_1V0-z12004 995 mV
 MPC-VDD_1V5-z12004 1496 mV
 MPC-PMB_1V1-z12006 1094 mV
 MPC-9VA-BMR453 9054 mV

```

```

MPC-9VB-BMR453 9037 mV
MPC-PMB_1V2-z12106 1191 mV
MPC-QXM0_1V0-z12006 1000 mV
I2C Slave Revision 66
FPC 1 status:
State Online
Temperature Intake 35 degrees C / 95 degrees F
Temperature Exhaust A 50 degrees C / 122 degrees F
Temperature Exhaust B 56 degrees C / 132 degrees F
Temperature LU 0 TSen 46 degrees C / 114 degrees F
Temperature LU 0 Chip 59 degrees C / 138 degrees F
Temperature LU 1 TSen 46 degrees C / 114 degrees F
Temperature LU 1 Chip 45 degrees C / 113 degrees F
Temperature LU 2 TSen 46 degrees C / 114 degrees F
Temperature LU 2 Chip 60 degrees C / 140 degrees F
Temperature LU 3 TSen 46 degrees C / 114 degrees F
Temperature LU 3 Chip 71 degrees C / 159 degrees F
Temperature XM 0 TSen 46 degrees C / 114 degrees F
Temperature XM 0 Chip -18 degrees C / 0 degrees F
Temperature XF 0 TSen 46 degrees C / 114 degrees F
Temperature XF 0 Chip 76 degrees C / 168 degrees F
Power
MPC-BIAS3V3-z12105 3292 mV
MPC-VDD3V3-z16100 3303 mV
MPC-VDD2V5-z16100 2501 mV
MPC-VDD1V8-z12004 1801 mV
MPC-AVDD1V0-z12006 996 mV
MPC-VDD1V2-z16100 1199 mV
MPC-VDD1V5A-z12004 1493 mV
MPC-VDD1V5B-z12004 1498 mV
MPC-XF_0V9-z12006 996 mV
MPC-PCIE_1V0-z16100 1000 mV
MPC-LU0_1V0-z12004 994 mV
MPC-LU1_1V0-z12004 994 mV
MPC-LU2_1V0-z12004 992 mV
MPC-LU3_1V0-z12004 993 mV
MPC-12VA-BMR453 12003 mV
MPC-12VB-BMR453 12043 mV
MPC-PMB_1V1-z12006 1091 mV
MPC-PMB_1V2-z12106 1196 mV
MPC-XM_0V9-vt273m 899 mV
I2C Slave Revision 106

```

### show chassis environment fpc (MX240, MX480, MX960 with Application Services Modular Line Card)

```

user@host>show chassis environment fpc 1
FPC 1 status:
State Online
Temperature Intake 36 degrees C / 96 degrees F
Temperature Exhaust A 39 degrees C / 102 degrees F
Temperature LU TSen 52 degrees C / 125 degrees F
Temperature LU Chip 54 degrees C / 129 degrees F
Temperature XM TSen 52 degrees C / 125 degrees F
Temperature XM Chip 60 degrees C / 140 degrees F
Temperature PCIE TSen 52 degrees C / 125 degrees F
Temperature PCIE Chip 69 degrees C / 156 degrees F
Power
MPC-BIAS3V3-z12106 3302 mV
MPC-VDD3V3-z16100 3325 mV
MPC-AVDD1V0-z16100 1007 mV
MPC-PCIE_1V0-z16100 904 mV

```

```

MPC-LU0_1V0-z12004 996 mV
MPC-VDD_1V5-z12004 1498 mV
MPC-12VA-BMR453 11733 mV
MPC-12VB-BMR453 11728 mV
MPC-XM_0V9-vt273m 900 mV
I2C Slave Revision 81

```

### show chassis environment fpc (T320, T640, and T1600 Routers)

```

user@host> show chassis environment fpc
FPC 0 status:
 State Online
 Temperature Top 42 degrees C / 107 degrees F
 Temperature Bottom 36 degrees C / 96 degrees F
 Temperature MMB1 39 degrees C / 102 degrees F
 Power:
 1.8 V 1959 mV
 2.5 V 2495 mV
 3.3 V 3344 mV
 5.0 V 5047 mV
 1.8 V bias 1787 mV
 3.3 V bias 3291 mV
 5.0 V bias 4998 mV
 8.0 V bias 7343 mV
 BUS Revision 40
FPC 1 status:
 State Online
 Temperature Top 42 degrees C / 107 degrees F
 Temperature Bottom 39 degrees C / 102 degrees F
 Temperature MMB1 40 degrees C / 104 degrees F
 Power:
 1.8 V 1956 mV
 2.5 V 2498 mV
 3.3 V 3340 mV
 5.0 V 5023 mV
 1.8 V bias 1782 mV
 3.3 V bias 3277 mV
 5.0 V bias 4989 mV
 8.0 V bias 7289 mV
 BUS Revision 40
FPC 2 status:
 State Online
 Temperature Top 43 degrees C / 109 degrees F
 Temperature Bottom 39 degrees C / 102 degrees F
 Temperature MMB1 41 degrees C / 105 degrees F
 Power:
 1.8 V 1963 mV
 2.5 V 2503 mV
 3.3 V 3340 mV
 5.0 V 5042 mV
 1.8 V bias 1797 mV
 3.3 V bias 3311 mV
 5.0 V bias 5013 mV
 8.0 V bias 7221 mV
 BUS Revision 40

```

### show chassis environment fpc (T4000 Router)

```

user@host> show chassis environment fpc
FPC 0 status:
 State Online

```



|                       |                              |
|-----------------------|------------------------------|
| Fan Intake            | 34 degrees C / 93 degrees F  |
| Fan Exhaust           | 48 degrees C / 118 degrees F |
| PMB                   | 47 degrees C / 116 degrees F |
| LMB0                  | 50 degrees C / 122 degrees F |
| LMB1                  | 41 degrees C / 105 degrees F |
| LMB2                  | 35 degrees C / 95 degrees F  |
| PFE1 LU2              | 46 degrees C / 114 degrees F |
| PFE1 LU0              | 41 degrees C / 105 degrees F |
| PFE0 LU0              | 57 degrees C / 134 degrees F |
| XF1                   | 47 degrees C / 116 degrees F |
| XF0                   | 52 degrees C / 125 degrees F |
| XM1                   | 41 degrees C / 105 degrees F |
| XM0                   | 50 degrees C / 122 degrees F |
| PFE0 LU1              | 56 degrees C / 132 degrees F |
| PFE0 LU2              | 45 degrees C / 113 degrees F |
| PFE1 LU1              | 37 degrees C / 98 degrees F  |
| Power 1               |                              |
| 1.0 V                 | 991 mV                       |
| 1.2 V bias            | 1195 mV                      |
| 1.8 V                 | 1788 mV                      |
| 2.5 V                 | 2483 mV                      |
| 3.3 V                 | 3289 mV                      |
| 3.3 V bias            | 3299 mV                      |
| 12.0 V A              | 10608 mV                     |
| 12.0 V B              | 10637 mV                     |
| Power 2               |                              |
| 0.9 V                 | 881 mV                       |
| 0.9 V PFE0            | 916 mV                       |
| 0.9 V PFE1            | 903 mV                       |
| 1.0 V PFE0            | 1012 mV                      |
| 1.0 V PFE1            | 1002 mV                      |
| 1.1 V                 | 1095 mV                      |
| 1.5 V_0               | 1494 mV                      |
| 1.5 V_1               | 1479 mV                      |
| Power 3               |                              |
| 1.0 V PFE0            | 1000 mV                      |
| 1.0 V PFE1            | 1002 mV                      |
| 1.0 V PFE0 *          | 995 mV                       |
| 1.0 V PFE1 *          | 995 mV                       |
| 1.8 V PFE 0           | 1788 mV                      |
| 1.8 V PFE 1           | 1789 mV                      |
| 2.5 V                 | 2482 mV                      |
| 12.0 V                | 11614 mV                     |
| Power 4               |                              |
| 1.0 V PFE0 LU0        | 1003 mV                      |
| 1.0 V PFE1 LU0        | 1003 mV                      |
| 1.0 V PFE1 LU2        | 1004 mV                      |
| 1.0 V PFE0 LU0 *      | 995 mV                       |
| 1.0 V PFE1 LU0 *      | 998 mV                       |
| 1.0 V PFE1 LU2 *      | 996 mV                       |
| 12.0 V                | 11643 mV                     |
| 12.0 V C              | 11711 mV                     |
| Power (Base/PMB/MMB)  |                              |
| LMB0 VDD2V5           | 2488 mV                      |
| LMB0 VDD1V8           | 1788 mV                      |
| LMB0 VDD1V5           | 1496 mV                      |
| LMB0 PFE0 LU0 AVDD1V0 | 1002 mV                      |
| LMB0 PFE0 LU0 VDD1V0  | 1000 mV                      |
| LMB0 VDD12V0          | 10752 mV                     |
| LMB1 VDD2V5           | 2472 mV                      |
| LMB1 VDD1V8           | 1792 mV                      |

```

LMB1 VDD1V5 1480 mV
LMB1 PFE0 LU2 AVDD1V0 994 mV
LMB1 PFE0 LU2 VDD1V0 1002 mV
LMB1 VDD12V0 10800 mV
LMB2 VDD2V5 2472 mV
LMB2 VDD1V8 1792 mV
LMB2 VDD1V5 1486 mV
LMB2 PFE1 LU1 AVDD1V0 996 mV
LMB2 PFE1 LU1 VDD1V0 998 mV
LMB2 VDD12V0 10704 mV
PMB 1.05v 1049 mV
PMB 1.5v 1500 mV
PMB 2.5v 2500 mV
PMB 3.3v 3299 mV
Bus Revision 113
FPC 3 status:
State Online
Fan Intake 37 degrees C / 98 degrees F
Fan Exhaust 51 degrees C / 123 degrees F
PMB 43 degrees C / 109 degrees F
LMB0 57 degrees C / 134 degrees F
LMB1 54 degrees C / 129 degrees F
LMB2 38 degrees C / 100 degrees F
PFE1 LU2 63 degrees C / 145 degrees F
PFE1 LU0 45 degrees C / 113 degrees F
PFE0 LU0 69 degrees C / 156 degrees F
XF1 62 degrees C / 143 degrees F
XF0 63 degrees C / 145 degrees F
XM1 43 degrees C / 109 degrees F
XM0 67 degrees C / 152 degrees F
PFE0 LU1 63 degrees C / 145 degrees F
PFE0 LU2 66 degrees C / 150 degrees F
PFE1 LU1 41 degrees C / 105 degrees F
Power 1
 1.0 V 1002 mV
 1.2 V bias 1201 mV
 1.8 V 1785 mV
 2.5 V 2485 mV
 3.3 V 3288 mV
 3.3 V bias 3285 mV
 12.0 V A 10412 mV
 12.0 V B 10515 mV
Power 2
 0.9 V 882 mV
 0.9 V PFE0 920 mV
 0.9 V PFE1 905 mV
 1.0 V PFE0 1015 mV
 1.0 V PFE1 1001 mV
 1.1 V 1094 mV
 1.5 V_0 1495 mV
 1.5 V_1 1478 mV
Power 3
 0.92 V PFE1 998 mV
 1.0 V PFE0 997 mV
 1.0 V PFE0 * 992 mV
 1.0 V PFE1 * 991 mV
 1.8 V PFE 0 1780 mV
 1.8 V PFE 1 1797 mV
 2.5 V 2492 mV
 12.0 V 11604 mV
Power 4

```

```

1.0 V PFE0 LU0 1003 mV
1.0 V PFE1 LU0 1004 mV
1.0 V PFE1 LU2 1003 mV
1.0 V PFE0 LU0 * 1000 mV
1.0 V PFE1 LU0 * 1001 mV
1.0 V PFE1 LU2 * 1003 mV
12.0 V 11653 mV
12.0 V C 11672 mV
Power (Base/PMB/MMB)
LMB0 VDD2V5 2512 mV
LMB0 VDD1V8 1790 mV
LMB0 VDD1V5 1500 mV
LMB0 PFE0 LU0 AVDD1V0 1004 mV
LMB0 PFE0 LU0 VDD1V0 1002 mV
LMB0 VDD12V0 10608 mV
LMB1 VDD2V5 2472 mV
LMB1 VDD1V8 1788 mV
LMB1 VDD1V5 1480 mV
LMB1 PFE0 LU2 AVDD1V0 1000 mV
LMB1 PFE0 LU2 VDD1V0 1004 mV
LMB1 VDD12V0 10672 mV
LMB2 VDD2V5 2488 mV
LMB2 VDD1V8 1798 mV
LMB2 VDD1V5 1494 mV
LMB2 PFE1 LU1 AVDD1V0 1000 mV
LMB2 PFE1 LU1 VDD1V0 1004 mV
LMB2 VDD12V0 10528 mV
PMB 1.05v 1050 mV
PMB 1.5v 1500 mV
PMB 2.5v 2499 mV
PMB 3.3v 3299 mV
Bus Revision 113
FPC 5 status:
State Online
Temperature Top 39 degrees C / 102 degrees F
Temperature Bottom 38 degrees C / 100 degrees F
Power
1.8 V 1804 mV
1.8 V bias 1802 mV
3.3 V 3294 mV
3.3 V bias 3277 mV
5.0 V bias 5008 mV
5.0 V TOP 5067 mV
8.0 V bias 6642 mV
Power (Base/PMB/MMB)
1.2 V 1202 mV
1.5 V 1504 mV
5.0 V BOT 5079 mV
12.0 V TOP Base 11848 mV
12.0 V BOT Base 11780 mV
1.1 V PMB 1111 mV
1.2 V PMB 1189 mV
1.5 V PMB 1494 mV
1.8 V PMB 1819 mV
2.5 V PMB 2503 mV
3.3 V PMB 3294 mV
5.0 V PMB 5035 mV
12.0 V PMB 11788 mV
0.75 MMB TOP 766 mV
1.5 V MMB TOP 1484 mV
1.8 V MMB TOP 1772 mV

```

```

2.5 V MMB TOP 2485 mV
1.2 V MMB TOP 1137 mV
5.0 V MMB TOP 4946 mV
12.0 V MMB TOP 11772 mV
3.3 V MMB TOP 3289 mV
0.75 MMB BOT 759 mV
1.5 V MMB BOT 1482 mV
1.8 V MMB BOT 1792 mV
2.5 V MMB BOT 2490 mV
1.2 V MMB BOT 1145 mV
5.0 V MMB BOT 4922 mV
12.0 V MMB BOT 11625 mV
3.3 V MMB BOT 3282 mV
APS 00 2495 mV
APS 01 3308 mV
APS 02 3301 mV
5.0 V PIC 0 4967 mV
APS 10 2512 mV
APS 11 3316 mV
APS 12 3304 mV
5.0 V PIC 1 5081 mV
Bus Revision 49
FPC 6 status:
State Online
Fan Intake 34 degrees C / 93 degrees F
Fan Exhaust 49 degrees C / 120 degrees F
PMB 40 degrees C / 104 degrees F
LMB0 60 degrees C / 140 degrees F
LMB1 58 degrees C / 136 degrees F
LMB2 40 degrees C / 104 degrees F
PFE1 LU2 69 degrees C / 156 degrees F
PFE1 LU0 45 degrees C / 113 degrees F
PFE0 LU0 71 degrees C / 159 degrees F
XF1 58 degrees C / 136 degrees F
XF0 65 degrees C / 149 degrees F
XM1 40 degrees C / 104 degrees F
XM0 66 degrees C / 150 degrees F
PFE0 LU1 69 degrees C / 156 degrees F
PFE0 LU2 68 degrees C / 154 degrees F
PFE1 LU1 42 degrees C / 107 degrees F
Power 1
1.0 V 998 mV
1.2 V bias 1191 mV
1.8 V 1781 mV
2.5 V 2487 mV
3.3 V 3302 mV
3.3 V bias 3300 mV
12.0 V A 10388 mV
12.0 V B 10388 mV
Power 2
0.9 V 902 mV
0.9 V PFE0 921 mV
0.9 V PFE1 907 mV
1.0 V PFE0 996 mV
1.0 V PFE1 974 mV
1.1 V 1095 mV
1.5 V_0 1495 mV
1.5 V_1 1478 mV
Power 3
1.0 V PFE0 997 mV
1.0 V PFE1 998 mV

```

```

1.0 V PFE0 * 993 mV
1.0 V PFE1 * 991 mV
1.8 V PFE 0 1796 mV
1.8 V PFE 1 1789 mV
2.5 V 2465 mV
12.0 V 11609 mV
Power 4
1.0 V PFE0 LU0 1003 mV
1.0 V PFE1 LU0 1006 mV
1.0 V PFE1 LU2 1002 mV
1.0 V PFE0 LU0 * 1000 mV
1.0 V PFE1 LU0 * 998 mV
1.0 V PFE1 LU2 * 998 mV
12.0 V 11638 mV
12.0 V C 11702 mV
Power (Base/PMB/MMB)
LMB0 VDD2V5 2484 mV
LMB0 VDD1V8 1780 mV
LMB0 VDD1V5 1496 mV
LMB0 PFE0 LU0 AVDD1V0 998 mV
LMB0 PFE0 LU0 VDD1V0 1004 mV
LMB0 VDD12V0 10528 mV
LMB1 VDD2V5 2472 mV
LMB1 VDD1V8 1776 mV
LMB1 VDD1V5 1474 mV
LMB1 PFE0 LU2 AVDD1V0 994 mV
LMB1 PFE0 LU2 VDD1V0 1004 mV
LMB1 VDD12V0 10544 mV
LMB2 VDD2V5 2476 mV
LMB2 VDD1V8 1790 mV
LMB2 VDD1V5 1492 mV
LMB2 PFE1 LU1 AVDD1V0 996 mV
LMB2 PFE1 LU1 VDD1V0 1010 mV
LMB2 VDD12V0 10528 mV
PMB 1.05v 1050 mV
PMB 1.5v 1499 mV
PMB 2.5v 2500 mV
PMB 3.3v 3300 mV
Bus Revision 80

```

#### show chassis environment fpc lcc (TX Matrix Router)

```

user@host> show chassis environment fpc lcc 0
lcc0-re0:

```

##### FPC 1 status:

```

State Online
Temperature Top 30 degrees C / 86 degrees F
Temperature Bottom 25 degrees C / 77 degrees F
Temperature MMB0 Absent
Temperature MMB1 27 degrees C / 80 degrees F
Power:
1.8 V 1813 mV
2.5 V 2504 mV
3.3 V 3338 mV
5.0 V 5037 mV
1.8 V bias 1797 mV
3.3 V bias 3301 mV
5.0 V bias 5013 mV
8.0 V bias 7345 mV
BUS Revision 40

```

```

FPC 2 status:
State Online
Temperature Top 37 degrees C / 98 degrees F
Temperature Bottom 26 degrees C / 78 degrees F
Temperature MMB0 32 degrees C / 89 degrees F
Temperature MMB1 27 degrees C / 80 degrees F
Power:
 1.8 V 1791 mV
 2.5 V 2517 mV
 3.3 V 3308 mV
 5.0 V 5052 mV
 1.8 V bias 1797 mV
 3.3 V bias 3289 mV
 5.0 V bias 4991 mV
 8.0 V bias 7477 mV
BUS Revision 40

```

#### show chassis environment fpc lcc (TX Matrix Plus Router)

```

user@host> show chassis environment fpc lcc 0
lcc0-re0:

```

```

FPC 1 status:
State Online
Temperature Top 46 degrees C / 114 degrees F
Temperature Bottom 47 degrees C / 116 degrees F
Power
 1.8 V 1788 mV
 1.8 V bias 1787 mV
 3.3 V 3321 mV
 3.3 V bias 3306 mV
 5.0 V bias 5018 mV
 5.0 V TOP 5037 mV
 8.0 V bias 7223 mV
Power (Base/PMB/MMB)
 1.2 V 1205 mV
 1.5 V 1503 mV
 5.0 V BOT 5084 mV
 12.0 V TOP Base 11775 mV
 12.0 V BOT Base 11794 mV
 1.1 V PMB 1108 mV
 1.2 V PMB 1196 mV
 1.5 V PMB 1499 mV
 1.8 V PMB 1811 mV
 2.5 V PMB 2515 mV
 3.3 V PMB 3318 mV
 5.0 V PMB 5030 mV
 12.0 V PMB 11832 mV
 0.75 MMB TOP 752 mV
 1.5 V MMB TOP 1489 mV
 1.8 V MMB TOP 1782 mV
 2.5 V MMB TOP 2498 mV
 1.2 V MMB TOP 1155 mV
 5.0 V MMB TOP 4902 mV
 12.0 V MMB TOP 11721 mV
 3.3 V MMB TOP 3316 mV
 0.75 MMB BOT 754 mV
 1.5 V MMB BOT 1482 mV
 1.8 V MMB BOT 1758 mV
 2.5 V MMB BOT 2488 mV
 1.2 V MMB BOT 1157 mV

```

|                |          |
|----------------|----------|
| 5.0 V MMB BOT  | 4962 mV  |
| 12.0 V MMB BOT | 11691 mV |
| 3.3 V MMB BOT  | 3308 mV  |
| APS 00         | 1484 mV  |
| APS 01         | 2503 mV  |
| APS 02         | 3313 mV  |
| 5.0 V PIC 0    | 5025 mV  |
| APS 10         | 1501 mV  |
| APS 11         | 2466 mV  |
| APS 12         | 3311 mV  |
| 5.0 V PIC 1    | 5081 mV  |
| Bus Revision   | 49       |

### show chassis environment fpc (QFX Series and OCX Series)

```

user@switch> show chassis environment fpc 0
FPC 0 status:
 State Online
 Temperature 42 degrees C / 107 degrees F

```

### show chassis environment fpc interconnect-device (QFabric Systems)

```

user@switch> show chassis environment fpc interconnect-device interconnect1 0
FC 0 FPC 0 status:
 State Online
 Left Intake Temperature 24 degrees C / 75 degrees F
 Right Intake Temperature 24 degrees C / 75 degrees F
 Left Exhaust Temperature 27 degrees C / 80 degrees F
 Right Exhaust Temperature 27 degrees C / 80 degrees F
 Power
 BIAS 3V3 3330 mV
 VDD 3V3 3300 mV
 VDD 2V5 2502 mV
 VDD 1V5 1496 mV
 VDD 1V2 1194 mV
 VDD 1V0 1000 mV
 SW0 VDD 1V0 1020 mV
 SW0 CVDD 1V025 1032 mV
 SW1 VDD 1V0 1022 mV
 SW1 CVDD 1V025 1030 mV
 VDD 12V0 DIV3_33 3414 mV

```

### show chassis environment fpc 0 (PTX5000 Packet Transport Router)

```

user@host> show chassis environment fpc 0
FPC 0 status:
 State Online
 PMB Temperature 35 degrees C / 95 degrees F
 Intake Temperature 33 degrees C / 91 degrees F
 Exhaust A Temperature 51 degrees C / 123 degrees F
 Exhaust B Temperature 43 degrees C / 109 degrees F
 TL0 Temperature 48 degrees C / 118 degrees F
 TQ0 Temperature 53 degrees C / 127 degrees F
 TL1 Temperature 56 degrees C / 132 degrees F
 TQ1 Temperature 58 degrees C / 136 degrees F
 TL2 Temperature 55 degrees C / 131 degrees F
 TQ2 Temperature 57 degrees C / 134 degrees F
 TL3 Temperature 59 degrees C / 138 degrees F
 TQ3 Temperature 59 degrees C / 138 degrees F
 Power
 PMB 1.05v 1049 mV
 PMB 1.5v 1500 mV

```

|      |       |         |
|------|-------|---------|
| PMB  | 2.5v  | 2500 mV |
| PMB  | 3.3v  | 3299 mV |
| PFE0 | 1.5v  | 1500 mV |
| PFE0 | 1.0v  | 999 mV  |
| TQ0  | 0.9v  | 900 mV  |
| TL0  | 0.9v  | 900 mV  |
| PFE1 | 1.5v  | 1499 mV |
| PFE1 | 1.0v  | 999 mV  |
| TQ1  | 0.9v  | 899 mV  |
| TL1  | 0.9v  | 900 mV  |
| PFE2 | 1.5v  | 1500 mV |
| PFE2 | 1.0v  | 1000 mV |
| TQ2  | 0.9v  | 900 mV  |
| TL2  | 0.9v  | 900 mV  |
| PFE3 | 1.5v  | 1499 mV |
| PFE3 | 1.0v  | 1000 mV |
| TQ3  | 0.9v  | 900 mV  |
| TL3  | 0.9v  | 900 mV  |
| Bias | 3.3v  | 3327 mV |
| FPC  | 3.3v  | 3300 mV |
| FPC  | 2.5v  | 2500 mV |
| SAM  | 0.9v  | 900 mV  |
| A    | 12.0v | 2014 mV |
| B    | 12.0v | 2030 mV |

#### show chassis environment fpc 07 (PTX5000 Packet Transport Router with FPC2-PTX-PIA)

```
user@host> show chassis environment fpc 07
```

```
FPC 7 status:
```

| State                 | Online                       |
|-----------------------|------------------------------|
| PMB TEMPO Temperature | 32 degrees C / 89 degrees F  |
| PMB TEMP1 Temperature | 28 degrees C / 82 degrees F  |
| PMB CPU Temperature   | 46 degrees C / 114 degrees F |
| Intake Temperature    | 35 degrees C / 95 degrees F  |
| Exhaust A Temperature | 55 degrees C / 131 degrees F |
| Exhaust B Temperature | 54 degrees C / 129 degrees F |
| TL5 Temperature       | 59 degrees C / 138 degrees F |
| TQ5 Temperature       | 57 degrees C / 134 degrees F |
| TL6 Temperature       | 57 degrees C / 134 degrees F |
| TQ6 Temperature       | 51 degrees C / 123 degrees F |
| TL1 Temperature       | 76 degrees C / 168 degrees F |
| TQ1 Temperature       | 58 degrees C / 136 degrees F |
| TL2 Temperature       | 75 degrees C / 167 degrees F |
| TQ2 Temperature       | 57 degrees C / 134 degrees F |
| TL4 Temperature       | 52 degrees C / 125 degrees F |
| TQ4 Temperature       | 66 degrees C / 150 degrees F |
| TL7 Temperature       | 52 degrees C / 125 degrees F |
| TQ7 Temperature       | 60 degrees C / 140 degrees F |
| TL0 Temperature       | 72 degrees C / 161 degrees F |
| TQ0 Temperature       | 73 degrees C / 163 degrees F |
| TL3 Temperature       | 64 degrees C / 147 degrees F |
| TQ3 Temperature       | 70 degrees C / 158 degrees F |
| Power                 |                              |
| PMB 1.05v             | 1049 mV                      |
| PMB 3.3v              | 3299 mV                      |
| PMB 1.1v-a            | 1100 mV                      |
| PMB 1.5v              | 1499 mV                      |
| PMB 1.1v-b            | 1100 mV                      |
| Base 3.3v             | 3300 mV                      |
| FPC Base 2.5v         | 2499 mV                      |
| TL1 0.9v              | 897 mV                       |



|           |      |         |
|-----------|------|---------|
| TQ1       | 0.9v | 897 mV  |
| PFE1      | 1.0v | 999 mV  |
| PFE1      | 1.5v | 1499 mV |
| TL2       | 0.9v | 897 mV  |
| TQ2       | 0.9v | 897 mV  |
| PFE2      | 1.0v | 999 mV  |
| PFE2      | 1.5v | 1499 mV |
| FPC Base  | 1.0v | 1000 mV |
| FPC Base  | 1.2v | 1199 mV |
| TL5       | 0.9v | 898 mV  |
| TQ5       | 0.9v | 898 mV  |
| PFE5      | 1.0v | 1000 mV |
| PFE5      | 1.5v | 1500 mV |
| TL6       | 0.9v | 897 mV  |
| TQ6       | 0.9v | 897 mV  |
| PFE6      | 1.0v | 1000 mV |
| PFE6      | 1.5v | 1499 mV |
| Mezz Base | 2.5v | 2500 mV |
| TL0       | 0.9v | 896 mV  |
| TQ0       | 0.9v | 896 mV  |
| PFE0      | 1.0v | 999 mV  |
| PFE0      | 1.5v | 1499 mV |

#### show chassis environment FPC 1 (MX Routers with Media Services Blade [MSB])

```
user@switch> show chassis environment fpc 1
```

```
FPC 1 status:
```

|                       |                              |
|-----------------------|------------------------------|
| State                 | Online                       |
| Temperature Intake    | 36 degrees C / 96 degrees F  |
| Temperature Exhaust A | 39 degrees C / 102 degrees F |
| Temperature LU TSen   | 52 degrees C / 125 degrees F |
| Temperature LU Chip   | 54 degrees C / 129 degrees F |
| Temperature XM TSen   | 52 degrees C / 125 degrees F |
| Temperature XM Chip   | 60 degrees C / 140 degrees F |
| Temperature PCIe TSen | 52 degrees C / 125 degrees F |
| Temperature PCIe Chip | 69 degrees C / 156 degrees F |
| Power                 |                              |
| MPC-BIAS3V3-z12106    | 3302 mV                      |
| MPC-VDD3V3-z16100     | 3325 mV                      |
| MPC-AVDD1V0-z16100    | 1007 mV                      |
| MPC-PCIE_1V0-z16100   | 904 mV                       |
| MPC-LU0_1V0-z12004    | 996 mV                       |
| MPC-VDD_1V5-z12004    | 1498 mV                      |
| MPC-12VA-BMR453       | 11733 mV                     |
| MPC-12VB-BMR453       | 11728 mV                     |
| MPC-XM_0V9-vt273m     | 900 mV                       |
| I2C Slave Revision    | 81                           |

## show chassis environment pem

---

|                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                           | <a href="#">Syntax on page 682</a><br><a href="#">Syntax (ACX4000 Router) on page 682</a><br><a href="#">Syntax (TX Matrix Routers) on page 682</a><br><a href="#">Syntax (TX Matrix Plus Routers) on page 682</a><br><a href="#">Syntax (MX Series Router) on page 682</a><br><a href="#">Syntax (MX104 3D Universal Edge Routers) on page 682</a><br><a href="#">Syntax (QFX Series) on page 682</a><br><a href="#">Syntax (OCX Series) on page 682</a> |
| <b>Syntax</b>                                   | show chassis environment pem<br><slot>                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Syntax (ACX4000 Router)</b>                  | show chassis environment pem                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Syntax (TX Matrix Routers)</b>               | show chassis environment pem<br><lcc number   scc><br><slot>                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Syntax (TX Matrix Plus Routers)</b>          | show chassis environment pem<br><lcc number   sfc number><br><slot>                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Syntax (MX Series Router)</b>                | show chassis environment pem<br><slot><br><all-members><br><local><br><member member-id>                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Syntax (MX104 3D Universal Edge Routers)</b> | show chassis environment pem<br><slot>                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Syntax (QFX Series)</b>                      | show chassis environment pem<br><slot (interconnect-device name slot )   (node-device name)>                                                                                                                                                                                                                                                                                                                                                              |
| <b>Syntax (OCX Series)</b>                      | show chassis environment pem <slot>                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Release Information</b>                      | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS 11.3 for the QFX Series.<br>Command introduced in Junos OS 12.3R2 for EX Series.<br>Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                          |
| <b>Description</b>                              | Display Power Entry Module (PEM) environmental status information.                                                                                                                                                                                                                                                                                                                                                                                        |



**NOTE:** The new high-capacity (4100W) enhanced DC PEM on MX960 routers includes a new design that can condition the input voltage. This results in the output voltage differing from the input voltage. The earlier generation of DC PEMs coupled the input power directly to the output, thereby making it safe to assume that the output voltage was equal to the input voltage.

- Options** **none**—Display environmental information about both PEMs. For the TX Matrix router, display environmental information about the PEMs, the TX Matrix router, and its attached T640 routers. For the TX Matrix Plus router, display environmental information about the PEMs, the TX Matrix Plus router, and its attached routers.
- all-members**—(MX Series routers only) (Optional) Display environmental information about the PEMs in all the member routers of the Virtual Chassis configuration.
- interconnect-device *name***—(QFabric systems only) (Optional) Display chassis environmental information about the PEMs in the Interconnect device.
- lcc *number***—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.  
Replace *number* with the following values depending on the LCC configuration:
- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
  - 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
  - 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
  - 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- local**—(MX Series routers only) (Optional) Display environmental information about the PEM in the local Virtual Chassis member.
- member *member-id***—(MX Series routers only) (Optional) Display environmental information about the PEM in the specified member of the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.
- node-device *name***—(QFabric systems only) (Optional) Display chassis environmental information about the PEMs in the Node device.
- scc**—(TX Matrix routers only) (Optional) Display environmental information about the PEM in the TX Matrix router (switch-card chassis).
- sfc**—(TX Matrix Plus routers only) (Optional) Display environmental information about the PEM in the TX Matrix Plus router (or switch-fabric chassis).

**slot** —(Optional) Display environmental information about an individual PEM. Replace **slot** with 0 or 1.

**Required Privilege Level** view

**Related Documentation** • [show chassis hardware on page 758](#)

**List of Sample Output** [show chassis environment pem \(M40e Router\) on page 685](#)  
[show chassis environment pem \(M120 Router\) on page 685](#)  
[show chassis environment pem \(M160 Router\) on page 686](#)  
[show chassis environment pem \(M320 Router\) on page 686](#)  
[show chassis environment pem \(MX104 Router\) on page 686](#)  
[show chassis environment pem \(MX240 Router\) on page 686](#)  
[show chassis environment pem \(MX480 Router\) on page 687](#)  
[show chassis environment pem \(MX960 Router\) on page 687](#)  
[show chassis environment pem \(T320 Router\) on page 687](#)  
[show chassis environment pem \(T640 Router\) on page 687](#)  
[show chassis environment pem \(T4000 Router\) on page 687](#)  
[show chassis environment pem \(T640/T1600/T4000 Routers With Six-Input DC Power Supply\) on page 688](#)  
[show chassis environment pem lcc \(TX Matrix Routing Matrix\) on page 688](#)  
[show chassis environment pem scc \(TX Matrix Routing Matrix\) on page 689](#)  
[show chassis environment pem sfc \(TX Matrix Plus Routing Matrix\) on page 689](#)  
[show chassis environment pem lcc \(TX Matrix Plus Routing Matrix\) on page 689](#)  
[show chassis environment pem node-device \(QFabric System\) on page 690](#)  
[show chassis environment pem \(QFX Series and OCX Series\) on page 690](#)  
[show chassis environment pem interconnect-device \(QFabric System\) on page 690](#)

**Output Fields** [Table 50 on page 684](#) lists the output fields for the **show chassis environment pem** command. Output fields are listed in the approximate order in which they appear.

**Table 50: show chassis environment pem Output Fields**

| Field Name             | Field Description                                    |
|------------------------|------------------------------------------------------|
| PEM <i>slot</i> status | Number of the PEM slot.                              |
| State                  | Status of the PEM.                                   |
| Temperature            | Temperature of the air flowing past the PEM.         |
| AC Input               | Status of the AC input for the specified component   |
| AC Output              | Status of the AC output for the specified component. |
| DC input               | Status of the DC input for the specified component.  |
| DC output              | Status of the DC output for the specified component. |

Table 50: show chassis environment pem Output Fields (*continued*)

| Field Name        | Field Description                                                                                                                                                                                                                        |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Load</b>       | (Not available on M40e or M160 routers) Information about the load on supply, in percentage of rated current being used.                                                                                                                 |
| <b>Voltage</b>    | (M120, M160, M320, MX240, MX480, MX960, T640, T1600, TX Matrix, and TX Matrix Plus routers only) Information about voltage supplied to the PEM.<br><br>(MX104 routers only) Information about voltage supplied by the PEM to the system. |
| <b>Current</b>    | (MX240, MX480, MX960, T640, T1600, TX Matrix, and TX Matrix Plus routers only) Information about the PEM current.                                                                                                                        |
| <b>Power</b>      | (MX240, MX480, MX960, T640, T1600, TX Matrix, and TX Matrix Plus routers only) Information about the PEM power.                                                                                                                          |
| <b>SCG/CB/SIB</b> | (T640, T1600, TX Matrix, and TX Matrix Plus routers only) SONET Clock Generator/Control Board/Switch Interface Board.                                                                                                                    |
| <b>FAN</b>        | (T640, T1600, and T4000 routers with six-input DC power supply only) Information about the DC output to the fan.                                                                                                                         |

## Sample Output

### show chassis environment pem (M40e Router)

```

user@host> show chassis environment pem
PEM 0 status:
 State Online
 Temperature OK
 AC input OK
 DC output OK

```

### show chassis environment pem (M120 Router)

```

user@host> show chassis environment pem
PEM 0 status:
 State Online
 Temperature OK
 DC Input: OK
 DC Output: OK
 Load Less than 20 percent
 Voltage:
 48.0 V input 52864 mV
 48.0 V fan supply 41655 mV
 3.3 V 3399 mV
PEM 1 status:
 State Online
 Temperature OK
 DC Input: OK
 DC Output: OK
 Load Less than 20 percent
 Voltage:
 48.0 V input 54537 mV
 48.0 V fan supply 42910 mV
 3.3 V 3506 mV

```

**show chassis environment pem (M160 Router)**

```

user@host> show chassis environment pem
PEM 0 status:
 State Online
 Temperature OK
 DC input OK
 DC output OK
 Load Less than 20 percent
 Voltage:
 48.0 V input 54833 mV
 48.0 V fan supply 50549 mV
 8.0 V bias 8239 mV
 5.0 V bias 5006 mV

```

**show chassis environment pem (M320 Router)**

```

user@host> show chassis environment pem
PEM 2 status:
 State Online
 Temperature OK
 DC input OK
 Load Less than 40 percent
 48.0 V input 51853 mV
 48.0 V fan supply 48877 mV
 8.0 V bias 8449 mV
 5.0 V bias 4998 mV
PEM 3 status:
 State Online
 Temperature OK
 DC input OK
 Load Less than 40 percent
 48.0 V input 51717 mV
 48.0 V fan supply 49076 mV
 8.0 V bias 8442 mV
 5.0 V bias 4998 mV

```

**show chassis environment pem (MX104 Router)**

```

user@host> show chassis environment pem
PEM 0 status:
 State Online
 Temperature OK
 DC Output: OK
 Voltage:
 12.0 V output 12281 mV
 3.3 V output 3353 mV
PEM 1 status:
 State Empty

```

**show chassis environment pem (MX240 Router)**

```

user@host> show chassis environment pem
PEM 0 status:
 State Online
 Temperature OK
 DC Output Voltage(V) Current(A) Power(W) Load(%)
 51 4 204 12
PEM 1 status:
 State Online
 Temperature OK

```

| DC Output | Voltage(V) | Current(A) | Power(W) | Load(%) |
|-----------|------------|------------|----------|---------|
|           | 51         | 4          | 204      | 12      |

#### show chassis environment pem (MX480 Router)

```
user@host> show chassis environment pem
PEM 0 status:
 State Online
 Temperature OK
 DC Input: OK
 DC Output Voltage(V) Current(A) Power(W) Load(%)
 51 4 204 12
PEM 1 status:
 State Online
 Temperature OK
 DC Input: OK
 DC Output Voltage(V) Current(A) Power(W) Load(%)
 51 4 204 12
```

#### show chassis environment pem (MX960 Router)

```
user@host> show chassis environment pem
PEM 2 status:
 State Present
PEM 3 status:
 State Online
 Temperature OK
 DC Output Voltage(V) Current(A) Power(W) Load(%)
 51 4 204 12
```

#### show chassis environment pem (T320 Router)

```
user@host> show chassis environment pem
PEM 0 status:
 State Online
 Temperature OK
 DC input: OK
```

#### show chassis environment pem (T640 Router)

```
user@host> show chassis environment pem
PEM 0 status:
 State Online
 Temperature 22 degrees C / 71 degrees F
 AC input: OK
 DC output:
 Voltage Current Power Load
 FPC 0 56875 606 34 4
 FPC 1 57016 525 29 3
 FPC 2 0 0 0 0
 FPC 3 0 0 0 0
 FPC 4 0 0 0 0
 FPC 5 0 0 0 0
 FPC 6 57158 1581 90 12
 FPC 7 0 0 0 0
 SCG/CB/SIB 56750 1125 63 5
```

#### show chassis environment pem (T4000 Router)

```
user@host> show chassis environment pem
PEM 0 status:
 State Online
 Temperature 33 degrees C / 91 degrees F
```

|            |            |            |          |         |
|------------|------------|------------|----------|---------|
| DC Input:  | OK         |            |          |         |
|            | Voltage(V) | Current(A) | Power(W) | Load(%) |
| INPUT 0    | 54.625     | 9.812      | 535      | 22      |
| INPUT 1    | 54.625     | 10.250     | 559      | 23      |
| INPUT 2    | 55.125     | 0.125      | 6        | 0       |
| INPUT 3    | 54.500     | 10.062     | 548      | 22      |
| INPUT 4    | 54.750     | 9.375      | 513      | 21      |
| INPUT 5    | 54.750     | 10.187     | 557      | 23      |
| DC Output  | Voltage(V) | Current(A) | Power(W) | Load(%) |
| FPC 0      | 55.750     | 10.125     | 564      | 37      |
| FPC 1      | 51.625     | 0.000      | 0        | 0       |
| FPC 2      | 52.000     | 0.000      | 0        | 0       |
| FPC 3      | 55.062     | 10.437     | 574      | 38      |
| FPC 4      | 52.125     | 0.000      | 0        | 0       |
| FPC 5      | 55.000     | 9.375      | 515      | 34      |
| FPC 6      | 55.187     | 9.687      | 534      | 35      |
| FPC 7      | 51.437     | 0.000      | 0        | 0       |
| SCG/CB/SIB | 55.375     | 15.750     | 872      | 35      |
| FAN        | 54.562     | 14.750     | 804      | 42      |

#### show chassis environment pem (T640/T1600/T4000 Routers With Six-Input DC Power Supply)

```

user@host> show chassis environment pem
PEM 1 status:
 State Online
 Temperature 36 degrees C / 96 degrees F
 DC Input: OK
 Voltage(V) Current(A) Power(W) Load(%)
INPUT 0 0.000 0.000 0 0
INPUT 1 54.875 3.812 209 27
INPUT 2 55.375 3.937 218 29
INPUT 3 54.625 3.750 204 27
INPUT 4 55.125 3.375 186 24
INPUT 5 55.125 3.375 186 24
DC Output Voltage(V) Current(A) Power(W) Load(%)
FPC 0 52.312 0.000 0 0
FPC 1 52.687 0.000 0 0
FPC 2 52.812 0.000 0 0
FPC 3 55.812 7.062 394 52
FPC 4 52.625 0.000 0 0
FPC 5 52.625 0.000 0 0
FPC 6 52.750 0.000 0 0
FPC 7 52.750 0.000 0 0
SCG/CB/SIB 55.937 11.937 667 55
FAN 55.812 4.937 275 36

```

#### show chassis environment pem lcc (TX Matrix Routing Matrix)

```

user@host> show chassis environment pem 0 lcc 0
lcc0-re0:

```

```

PEM 0 status:
 State Present
 Temperature 27 degrees C / 80 degrees F
 DC input: Check
 DC output: Voltage Current Power Load
FPC 0 0 0 0 0
FPC 1 0 0 0 0
FPC 2 0 0 0 0
FPC 3 0 0 0 0
FPC 4 0 0 0 0

```



|            |   |   |   |   |
|------------|---|---|---|---|
| FPC 5      | 0 | 0 | 0 | 0 |
| FPC 6      | 0 | 0 | 0 | 0 |
| FPC 7      | 0 | 0 | 0 | 0 |
| SCG/CB/SIB | 0 | 0 | 0 | 0 |

### show chassis environment pem scc (TX Matrix Routing Matrix)

```
user@host> show chassis environment pem scc
scc-re0:
```

```

PEM 1 status:
State Online
Temperature 24 degrees C / 75 degrees F
DC input: OK
DC output: Voltage Current Power Load
SIB 0 0 0 0 0
SIB 1 0 0 0 0
SIB 2 0 0 0 0
SIB 3 56550 0 0 0
SIB 4 55958 6912 386 51
```

### show chassis environment pem sfc (TX Matrix Plus Routing Matrix)

```
user@host> show chassis environment pem sfc 0
sfc0-re0:
```

```

PEM 0 status:
State Online
Temperature 35 degrees C / 95 degrees F
DC Input: OK
DC Output Voltage Current Power Load
Channel 0 53820 14140 761 59
Channel 1 53550 12720 681 53
Channel 2 53840 12930 696 54
Channel 3 53690 14990 804 63
Channel 4 53620 15070 808 63
Channel 5 53900 14820 798 62
Channel 6 54120 5020 271 21
```

### show chassis environment pem lcc (TX Matrix Plus Routing Matrix)

```
user@host> show chassis environment lcc 0
```

```
lcc0-re1:
```

```

PEM 0 status:
State Online
Temperature 38 degrees C / 100 degrees F
DC Input: OK
DC Output Voltage Current Power Load
FPC 0 0 0 0 0
FPC 1 0 0 0 0
FPC 2 0 0 0 0
FPC 3 0 0 0 0
FPC 4 56408 7575 427 56
FPC 5 0 0 0 0
FPC 6 56266 7956 447 59
FPC 7 56283 6100 343 45
SCG/CB/SIB 55916 8950 500 41
PEM 1 status:
State Present
Temperature 35 degrees C / 95 degrees F
```

|            |         |         |       |      |
|------------|---------|---------|-------|------|
| DC Input:  | Check   |         |       |      |
| DC Output  | Voltage | Current | Power | Load |
| FPC 0      | 0       | 0       | 0     | 0    |
| FPC 1      | 0       | 0       | 0     | 0    |
| FPC 2      | 0       | 0       | 0     | 0    |
| FPC 3      | 0       | 0       | 0     | 0    |
| FPC 4      | 0       | 0       | 0     | 0    |
| FPC 5      | 0       | 0       | 0     | 0    |
| FPC 6      | 0       | 0       | 0     | 0    |
| FPC 7      | 0       | 0       | 0     | 0    |
| SCG/CB/SIB | 0       | 0       | 0     | 0    |

#### show chassis environment pem node-device (QFabric System)

```

user@switch> show chassis environment pem node-device node1
FPC 0 PEM 0 status:
 State Check
 Airflow Front to Back
 Temperature OK
 AC Input: OK
 DC Output Voltage(V) Current(A) Power(W) Load(%)
 12 10 120 18
FPC 0 PEM 1 status:
 State Online
 Airflow Back to Front
 Temperature OK
 AC Input: OK
 DC Output Voltage(V) Current(A) Power(W) Load(%)
 11 10 110 17

```

#### show chassis environment pem (QFX Series and OCX Series)

```

user@switch> show chassis environment pem
FPC 0 PEM 1 status:
 State Online
 Airflow Front to Back
 Temperature OK
 AC Input: OK
 DC Output Voltage(V) Current(A) Power(W) Load(%)
 12 17 204 31

```

#### show chassis environment pem interconnect-device (QFabric System)

```

user@switch> show chassis environment pem interconnect-device IC11
IC1 PEM 1 status:
 State Online
 Airflow Front to Back
 Temperature OK
 AC Input: OK
 DC Output Voltage(V) Current(A) Power(W) Load(%)
 12 18 216 33

```

## show chassis environment routing-engine

|                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                                               | <a href="#">Syntax on page 691</a><br><a href="#">Syntax (TX Matrix Routers) on page 691</a><br><a href="#">Syntax (TX Matrix Plus Routers) on page 691</a><br><a href="#">Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers) on page 691</a><br><a href="#">Syntax (MX Series Routers) on page 691</a><br><a href="#">Syntax (QFX Series) on page 691</a><br><a href="#">Syntax (OCX Series) on page 691</a>                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Syntax</b>                                                       | show chassis environment routing-engine<br><slot>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Syntax (TX Matrix Routers)</b>                                   | show chassis environment routing-engine<br><lcc number   scc><br><slot>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Syntax (TX Matrix Plus Routers)</b>                              | show chassis environment routing-engine<br><lcc number   sfc number><br><slot>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers)</b> | show chassis environment routing-engine<br><slot>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Syntax (MX Series Routers)</b>                                   | show chassis environment routing-engine<br><slot><br><all-members><br><local><br><member member-id>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Syntax (QFX Series)</b>                                          | show chassis environment routing-engine<br>interconnect-device <i>name</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Syntax (OCX Series)</b>                                          | show chassis environment routing-engine                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Release Information</b>                                          | <p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p><b>sfc</b> option introduced for the TX Matrix Plus router in Junos OS Release 9.6.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 12.1 for the PTX Series Packet Transport Routers.</p> <p>Command introduced in Junos OS Release 12.1 for the T4000 Core Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> |
| <b>Description</b>                                                  | Display Routing Engine environmental status information.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

- Options** **none**—Display environmental information about all Routing Engines. For a TX Matrix router, display environmental information about all Routing Engines on the TX Matrix router and its attached T640 routers. For a TX Matrix Plus router, display environmental information about all Routing Engines on the TX Matrix Plus router and its attached routers.
- all-members**—(MX Series routers only) (Optional) Display environmental information about the Routing Engines in all member routers in the Virtual Chassis configuration.
- interconnect-device *name***—(QFabric systems only) (Optional) Display environmental information about the Routing Engines for the Interconnect device.
- lcc *number***—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.  
Replace *number* with the following values depending on the LCC configuration:
- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
  - 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
  - 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
  - 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- local**—(MX Series routers only) (Optional) Display environmental information about the Routing Engines in the local Virtual Chassis member.
- member *member-id***—(MX Series routers only) (Optional) Display environmental information about the Routing Engines in the specified member in the Virtual Chassis configuration. Replace *member-id* with the value of 0 or 1.
- scc**—(TX Matrix router only) (Optional) Display environmental information about the Routing Engine in the TX Matrix router (switch-card chassis).
- sfc**—(TX Matrix Plus router only) (Optional) Display environmental information about the Routing Engine in the TX Matrix Plus router (or switch-fabric chassis).
- slot**—(Optional) Display environmental information about an individual Routing Engine. On M10i, M20, M40e, M120, M160, M320, MX Series, MX104 routers, MX2010 routers, MX2020 routers, and T Series routers, replace *slot* with 0 or 1. On M5, M7i, M10, and M40 routers and on the J Series router, replace *slot* with 0. On EX3200 and EX4200 standalone switches, replace *slot* with 0. On EX4200 switches in a Virtual Chassis configuration and on EX8208 and EX8216 switches, replace *slot* with 0 or 1. On the QFX3500 switch, there is only one Routing Engine, so you do not need to specify the slot number. On PTX Series Packet Transport Routers, replace *slot* with 0 or 1.

**Required Privilege Level** view

- Related Documentation**
- [request chassis routing-engine master on page 461](#)
  - [show chassis routing-engine on page 982](#)

- List of Sample Output**
- [show chassis environment routing-engine \(Nonredundant\) on page 693](#)
  - [show chassis environment routing-engine \(Redundant\) on page 693](#)
  - [show chassis environment routing-engine \(MX104 Router\) on page 694](#)
  - [show chassis environment routing-engine \(MX2010 Router\) on page 694](#)
  - [show chassis environment routing-engine \(MX2020 Router\) on page 694](#)
  - [show chassis environment routing-engine \(TX Matrix Plus Router\) on page 694](#)
  - [show chassis environment routing-engine \(T4000 Core Router\) on page 695](#)
  - [show chassis environment routing-engine \(QFX Series and OCX Series\) on page 695](#)
  - [show chassis environment routing-engine interconnect-device \(QFabric System\) on page 695](#)
  - [show chassis environment routing-engine \(PTX5000 Packet Transport Router\) on page 695](#)

- Output Fields**
- Table 51 on page 693 lists the output fields for the **show chassis environment routing-engine** command. Output fields are listed in the approximate order in which they appear.

**Table 51: show chassis environment routing-engine Output Fields**

| Field Name                        | Field Description                                                                                                                                                                                                                                                                           |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Routing engine <i>slot</i> status | Number of the Routing Engine slot: 0 or 1.                                                                                                                                                                                                                                                  |
| State                             | Status of the Routing Engine: <ul style="list-style-type: none"> <li>• <b>Online Master</b>—Routing Engine is online, operating as Master.</li> <li>• <b>Online Standby</b>—Routing Engine is online, operating as Standby.</li> <li>• <b>Offline</b>—Routing Engine is offline.</li> </ul> |
| Temperature                       | Temperature of the air flowing past the Routing Engine.                                                                                                                                                                                                                                     |
| CPU Temperature                   | (PTX Series and T4000 Core Routers only) Temperature of the air flowing past the Routing Engine CPU.                                                                                                                                                                                        |

## Sample Output

### show chassis environment routing-engine (Nonredundant)

```
user@host> show chassis environment routing-engine
Routing Engine 0 status:
 State Online Master
 Temperature 27 degrees C / 80 degrees
```

### show chassis environment routing-engine (Redundant)

```
user@host> show chassis environment routing-engine
Route Engine 0 status:
 State Online Master
 Temperature: 26 degrees C / 78 degrees F
Route Engine 1 status:
```

```

State: Online Standby
Temperature: 26 degrees C / 78 degrees F

```

#### show chassis environment routing-engine (MX104 Router)

```

user@ host >show chassis environment routing-engine
Routing Engine 0 status:
 State Online Master
 Temperature 34 degrees C / 93 degrees F
 CPU Temperature 43 degrees C / 109 degrees F
Routing Engine 1 status:
 State Online Standby
 Temperature 33 degrees C / 91 degrees F
 CPU Temperature 39 degrees C / 102 degrees F

```

#### show chassis environment routing-engine (MX2010 Router)

```

user@host> show chassis environment routing-engine
Routing Engine 0 status:
 State Online Master
 Temperature 37 degrees C / 98 degrees F
 CPU Temperature 37 degrees C / 98 degrees F
Routing Engine 1 status:
 State Online Standby
 Temperature 35 degrees C / 95 degrees F
 CPU Temperature 34 degrees C / 93 degrees F

```

#### show chassis environment routing-engine (MX2020 Router)

```

user@host> show chassis environment routing-engine
Routing Engine 0 status:
 State Online Master
 Temperature 35 degrees C / 95 degrees F
 CPU Temperature 34 degrees C / 93 degrees F
Routing Engine 1 status:
 State Online Standby
 Temperature 44 degrees C / 111 degrees F
 CPU Temperature 43 degrees C / 109 degrees F

```

#### show chassis environment routing-engine (TX Matrix Plus Router)

```

user@host> show chassis environment routing-engine
sfc0-re0:

Routing Engine 0 status:
 State Online Master
 Temperature 26 degrees C / 78 degrees F
Routing Engine 1 status:
 State Online Standby
 Temperature 28 degrees C / 82 degrees F

lcc0-re0:

Routing Engine 0 status:
 State Online Master
 Temperature 30 degrees C / 86 degrees F
Routing Engine 1 status:
 State Online Standby
 Temperature 29 degrees C / 84 degrees F

```

**show chassis environment routing-engine (T4000 Core Router)**

```

user@host> show chassis environment routing-engine
Routing Engine 0 status:
 State Online Master
 Temperature 33 degrees C / 91 degrees F
 CPU Temperature 50 degrees C / 122 degrees F
Routing Engine 1 status:
 State Online Standby
 Temperature 33 degrees C / 91 degrees F
 CPU Temperature 46 degrees C / 114 degrees F

```

**show chassis environment routing-engine (QFX Series and OCX Series)**

```

user@switch> show chassis environment routing-engine
Routing Engine 0 status:
 State Online Master
 Temperature 42 degrees C / 107 degrees F

```

**show chassis environment routing-engine interconnect-device (QFabric System)**

```

user@switch> show chassis environment routing-engine interconnect-device interconnect1
routing-engine interconnect-device interconnect1
Routing Engine 0 status:
 State Online Standby
 Temperature 52 degrees C / 125 degrees F
Routing Engine 1 status:
 State Online Master
 Temperature 57 degrees C / 134 degrees F

```

**show chassis environment routing-engine (PTX5000 Packet Transport Router)**

```

user@switch> show chassis environment routing-engine
Routing Engine 0 status:
 State Online Master
 Temperature 55 degrees C / 131 degrees F
 CPU Temperature 66 degrees C / 150 degrees F
Routing Engine 1 status:
 State Online Standby
 Temperature 52 degrees C / 125 degrees F
 CPU Temperature 64 degrees C / 147 degrees F

```

## show chassis fan

---

|                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                                              | <a href="#">Syntax on page 696</a><br><a href="#">Syntax (ACX4000 Series Router) on page 696</a><br><a href="#">Syntax (MX Series Router) on page 696</a><br><a href="#">Syntax (T Series Routers) on page 696</a><br><a href="#">Syntax (MX104, MX2010, and MX2020 3D Universal Edge Router) on page 696</a><br><a href="#">Syntax (QFX Series) on page 696</a><br><a href="#">Syntax (OCX Series) on page 696</a><br><a href="#">Syntax (TX Matrix Router) on page 696</a><br><a href="#">Syntax (TX Matrix Plus Router) on page 696</a>                                                                                                                                                                                                                      |
| <b>Syntax</b>                                                      | show chassis fan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Syntax (ACX4000 Series Router)</b>                              | show chassis fan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Syntax (MX Series Router)</b>                                   | show chassis fan<br><all-members><br><local><br><member <i>member-id</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Syntax (T Series Routers)</b>                                   | show chassis fan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Syntax (MX104, MX2010, and MX2020 3D Universal Edge Router)</b> | show chassis fan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Syntax (QFX Series)</b>                                         | show chassis fan<br><interconnect-device <i>name</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Syntax (OCX Series)</b>                                         | show chassis fan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Syntax (TX Matrix Router)</b>                                   | show chassis fan<br><lcc <i>number</i>   scc>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Syntax (TX Matrix Plus Router)</b>                              | show chassis fan<br><lcc <i>number</i>   sfc <i>number</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Release Information</b>                                         | Command introduced in Junos OS Release 10.0 on MX Series 3D Universal Edge Routers, M120 routers, and M320 routers, T320 routers, T640 routers, T1600 routers, TX Matrix Routers, and TX Matrix Plus routers.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 11.4 for EX Series switches.<br>Command introduced in Junos OS Release 12.3 for PTX5000 Packet Transport Routers.<br>Command introduced in Junos OS Release 12.1 for T4000 routers.<br>Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.<br>Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.<br>Command introduced in Junos OS Release 12.3 for ACX Series Routers. |



Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.  
 Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

**Description** (T Series routers, TX Matrix routers, TX Matrix Plus routers, M120 routers, M320 routers, MX104 routers, MX2010 routers, MX2020 routers, MX Series 3D Universal Edge Routers, QFX3008-I Interconnect devices, QFX Series, OCX Series, EX Series switches, and PTX Series Packet Transport Routers only) Show information about the fan tray and fans.

**Options** **all-members**—(MX Series routers only) (Optional) Display information about the fan tray and fans for all members of the Virtual Chassis configuration.

**local**—(MX Series routers only) (Optional) Display information about the fan tray and fans for the local Virtual Chassis member.

**member *member-id***—(MX Series routers only) (Optional) Display information about the fan tray and fans for the specified member of the Virtual Chassis configuration. For an MX Series Virtual Chassis, replace *member-id* variable with a value 0 or 1.

**interconnect-device *name***—(QFX3000-G QFabric systems only) (Optional) Display information about the fan tray and fans for the specified QFX3008-I Interconnect device.

**lcc *number***—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display information about the fan tray and fans for the specified T640 router (line-card chassis) that is connected to a TX Matrix router. On a TX Matrix Plus router, display information about the fan tray and fans for the specified router (line-card chassis) that is connected to a TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**scc**—(TX Matrix routers only) (Optional) Display information about the fan tray and fans for the TX Matrix router (switch-card chassis).

**sfc *number***—(TX Matrix Plus routers only) (Optional) Display information about the fan tray and fans for the TX Matrix Plus router (switch-fabric chassis). Replace *number* variable with 0.

**Required Privilege Level** view

**List of Sample Output** [show chassis fan on page 699](#)

[show chassis fan \(QFabric Systems\) on page 699](#)  
[show chassis fan \(EX Series Switches\) on page 700](#)  
[show chassis fan \(T320 Router\) on page 701](#)  
[show chassis fan \(T640 Router\) on page 701](#)  
[show chassis fan \(T1600 Router\) on page 701](#)  
[show chassis fan \(T4000 Core Router\) on page 702](#)  
[show chassis fan \(TX Matrix Router\) on page 702](#)  
[show chassis fan \(TX Matrix Plus Router\) on page 703](#)  
[show chassis fan \(TX Matrix Plus Router with 3D SIBs\) on page 704](#)  
[show chassis fan \(PTX5000 Packet Transport Router\) on page 706](#)  
[show chassis fan \(MX104 Router\) on page 707](#)  
[show chassis fan \(MX2010 Router\) on page 707](#)  
[show chassis fan \(MX2020 Router\) on page 707](#)  
[show chassis fan \(ACX4000 Router\) on page 708](#)  
[show chassis fan \(QFX5100 Switch and OCX Series\) on page 708](#)

**Output Fields** Table 52 on page 698 lists the output fields for the **show chassis fan** command. Output fields are listed in the approximate order in which they appear.

**Table 52: show chassis fan Output Fields**

| Field Name         | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Item</b>        | Fan item identifier.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Status</b>      | Status of the fan: <ul style="list-style-type: none"> <li>• <b>OK</b>—Fan is running properly and within the normal range.</li> <li>• <b>Check</b>—Fan is in <b>Check</b> state because of some fault or alarm condition.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                         |
| <b>RPM</b>         | (T Series routers, TX Matrix routers, TX Matrix Plus routers, MX Series 3D Universal Edge Routers, QFX3108 Interconnect devices, and EX Series switches only) Fan speed in revolutions per minute (RPM).                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>% RPM</b>       | (MX2010 routers, MX2020 routers, and PTX Series Packet Transport Routers only) Percentage of the fan speed being used.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Measurement</b> | (T Series routers, TX Matrix routers, TX Matrix Plus routers, MX Series 3D Universal Edge Routers, QFX3108 Interconnect devices, and EX Series switches only) Fan speed status based on different chassis cooling requirements: <ul style="list-style-type: none"> <li>• Spinning at high speed</li> <li>• Spinning at intermediate speed</li> <li>• Spinning at normal speed</li> <li>• Spinning at low speed (except EX Series switches)</li> </ul> (MX2010 routers, MX2020 routers, and PTX Series Packet Transport Routers only) Fan speed in revolutions per minute (RPM) for each fan in the fan tray. |

## Sample Output

### show chassis fan

```
user@host> show chassis fan
```

| Item              | Status | RPM  | Measurement              |
|-------------------|--------|------|--------------------------|
| Top Tray Fan 1    | OK     | 3790 | Spinning at normal speed |
| Top Tray Fan 2    | OK     | 3769 | Spinning at normal speed |
| Top Tray Fan 3    | OK     | 3769 | Spinning at normal speed |
| Top Tray Fan 4    | OK     | 3790 | Spinning at normal speed |
| Top Tray Fan 5    | OK     | 3790 | Spinning at normal speed |
| Top Tray Fan 6    | OK     | 3769 | Spinning at normal speed |
| Top Tray Fan 7    | OK     | 3790 | Spinning at normal speed |
| Top Tray Fan 8    | OK     | 3769 | Spinning at normal speed |
| Top Tray Fan 9    | OK     | 3769 | Spinning at normal speed |
| Top Tray Fan 10   | OK     | 3790 | Spinning at normal speed |
| Top Tray Fan 11   | OK     | 3790 | Spinning at normal speed |
| Top Tray Fan 12   | OK     | 3769 | Spinning at normal speed |
| Bottom Tray Fan 1 | OK     | 2880 | Spinning at normal speed |
| Bottom Tray Fan 2 | OK     | 2912 | Spinning at normal speed |
| Bottom Tray Fan 3 | OK     | 2928 | Spinning at normal speed |
| Bottom Tray Fan 4 | OK     | 2896 | Spinning at normal speed |
| Bottom Tray Fan 5 | OK     | 2896 | Spinning at normal speed |
| Bottom Tray Fan 6 | OK     | 2928 | Spinning at normal speed |

### show chassis fan (QFabric Systems)

```
user@host> show chassis fan interconnect-device interconnect1
```

| Item                | Status | RPM   | Measurement              |
|---------------------|--------|-------|--------------------------|
| TFT 0 Fan 0         | OK     | 2849  | Spinning at normal speed |
| TFT 0 Fan 1         | OK     | 2821  | Spinning at normal speed |
| TFT 0 Fan 2         | OK     | 2735  | Spinning at normal speed |
| TFT 0 Fan 3         | OK     | 2815  | Spinning at normal speed |
| TFT 0 Fan 4         | OK     | 2828  | Spinning at normal speed |
| TFT 0 Fan 5         | OK     | 2863  | Spinning at normal speed |
| BFT 1 Fan 0         | OK     | 2941  | Spinning at normal speed |
| BFT 1 Fan 1         | OK     | 3008  | Spinning at normal speed |
| BFT 1 Fan 2         | OK     | 3073  | Spinning at normal speed |
| BFT 1 Fan 3         | OK     | 2925  | Spinning at normal speed |
| BFT 1 Fan 4         | OK     | 2863  | Spinning at normal speed |
| BFT 1 Fan 5         | OK     | 2933  | Spinning at normal speed |
| SFT 0 Fan 0 Rotor 0 | OK     | 15472 | Spinning at normal speed |
| SFT 0 Fan 0 Rotor 1 | OK     | 14477 | Spinning at normal speed |
| SFT 0 Fan 1 Rotor 0 | OK     | 15561 | Spinning at normal speed |
| SFT 0 Fan 1 Rotor 1 | OK     | 14210 | Spinning at normal speed |
| SFT 0 Fan 2 Rotor 0 | OK     | 16167 | Spinning at normal speed |
| SFT 0 Fan 2 Rotor 1 | OK     | 14248 | Spinning at normal speed |
| SFT 0 Fan 3 Rotor 0 | OK     | 16463 | Spinning at normal speed |
| SFT 0 Fan 3 Rotor 1 | OK     | 14099 | Spinning at normal speed |
| SFT 1 Fan 0 Rotor 0 | OK     | 15083 | Spinning at normal speed |
| SFT 1 Fan 0 Rotor 1 | OK     | 13533 | Spinning at normal speed |
| SFT 1 Fan 1 Rotor 0 | OK     | 16071 | Spinning at normal speed |
| SFT 1 Fan 1 Rotor 1 | OK     | 14400 | Spinning at normal speed |
| SFT 1 Fan 2 Rotor 0 | OK     | 15517 | Spinning at normal speed |
| SFT 1 Fan 2 Rotor 1 | OK     | 14210 | Spinning at normal speed |
| SFT 1 Fan 3 Rotor 0 | OK     | 16413 | Spinning at normal speed |
| SFT 1 Fan 3 Rotor 1 | OK     | 14400 | Spinning at normal speed |
| SFT 2 Fan 0 Rotor 0 | OK     | 15297 | Spinning at normal speed |
| SFT 2 Fan 0 Rotor 1 | OK     | 14634 | Spinning at normal speed |

```

SFT 2 Fan 1 Rotor 0 OK 15561 Spinning at normal speed
SFT 2 Fan 1 Rotor 1 OK 14285 Spinning at normal speed
SFT 2 Fan 2 Rotor 0 OK 15835 Spinning at normal speed
SFT 2 Fan 2 Rotor 1 OK 14400 Spinning at normal speed
SFT 2 Fan 3 Rotor 0 OK 15789 Spinning at normal speed
SFT 2 Fan 3 Rotor 1 OK 14323 Spinning at normal speed
SFT 3 Fan 0 Rotor 0 OK 16314 Spinning at normal speed
SFT 3 Fan 0 Rotor 1 OK 14876 Spinning at normal speed
SFT 3 Fan 1 Rotor 0 OK 15835 Spinning at normal speed
SFT 3 Fan 1 Rotor 1 OK 14323 Spinning at normal speed
SFT 3 Fan 2 Rotor 0 OK 16265 Spinning at normal speed
SFT 3 Fan 2 Rotor 1 OK 14594 Spinning at normal speed
SFT 3 Fan 3 Rotor 0 OK 16071 Spinning at normal speed
SFT 3 Fan 3 Rotor 1 OK 14323 Spinning at normal speed
SFT 4 Fan 0 Rotor 0 OK 15652 Spinning at normal speed
SFT 4 Fan 0 Rotor 1 OK 14438 Spinning at normal speed
SFT 4 Fan 1 Rotor 0 OK 16167 Spinning at normal speed
SFT 4 Fan 1 Rotor 1 OK 14555 Spinning at normal speed
SFT 4 Fan 2 Rotor 0 OK 16023 Spinning at normal speed
SFT 4 Fan 2 Rotor 1 OK 14361 Spinning at normal speed
SFT 4 Fan 3 Rotor 0 OK 16216 Spinning at normal speed
SFT 4 Fan 3 Rotor 1 OK 14438 Spinning at normal speed
SFT 5 Fan 0 Rotor 0 OK 15297 Spinning at normal speed
SFT 5 Fan 0 Rotor 1 OK 14173 Spinning at normal speed
SFT 5 Fan 1 Rotor 0 OK 15472 Spinning at normal speed
SFT 5 Fan 1 Rotor 1 OK 13846 Spinning at normal speed
SFT 5 Fan 2 Rotor 0 OK 15340 Spinning at normal speed
SFT 5 Fan 2 Rotor 1 OK 13917 Spinning at normal speed
SFT 5 Fan 3 Rotor 0 OK 15835 Spinning at normal speed
SFT 5 Fan 3 Rotor 1 OK 13917 Spinning at normal speed
SFT 6 Fan 0 Rotor 0 OK 15743 Spinning at normal speed
SFT 6 Fan 0 Rotor 1 OK 14594 Spinning at normal speed
SFT 6 Fan 1 Rotor 0 OK 16167 Spinning at normal speed
SFT 6 Fan 1 Rotor 1 OK 14634 Spinning at normal speed
SFT 6 Fan 2 Rotor 0 OK 16167 Spinning at normal speed
SFT 6 Fan 2 Rotor 1 OK 14516 Spinning at normal speed
SFT 6 Fan 3 Rotor 0 OK 16666 Spinning at normal speed
SFT 6 Fan 3 Rotor 1 OK 14438 Spinning at normal speed
SFT 7 Fan 0 Rotor 0 OK 15517 Spinning at normal speed
SFT 7 Fan 0 Rotor 1 OK 14438 Spinning at normal speed
SFT 7 Fan 1 Rotor 0 OK 15517 Spinning at normal speed
SFT 7 Fan 1 Rotor 1 OK 14361 Spinning at normal speed
SFT 7 Fan 2 Rotor 0 OK 16167 Spinning at normal speed
SFT 7 Fan 2 Rotor 1 OK 14555 Spinning at normal speed
SFT 7 Fan 3 Rotor 0 OK 15697 Spinning at normal speed
SFT 7 Fan 3 Rotor 1 OK 14361 Spinning at normal speed

```

### show chassis fan (EX Series Switches)

```
user@host> show chassis fan
```

| Item  | Status | RPM  | Measurement              |
|-------|--------|------|--------------------------|
| Fan 1 | OK     | 3477 | Spinning at normal speed |
| Fan 2 | OK     | 3477 | Spinning at normal speed |
| Fan 3 | OK     | 3479 | Spinning at normal speed |
| Fan 4 | OK     | 3508 | Spinning at normal speed |
| Fan 5 | OK     | 3517 | Spinning at normal speed |
| Fan 6 | OK     | 3531 | Spinning at normal speed |
| Fan 7 | OK     | 3439 | Spinning at normal speed |
| Fan 8 | OK     | 3424 | Spinning at normal speed |
| Fan 9 | OK     | 3413 | Spinning at normal speed |

|        |    |      |                          |
|--------|----|------|--------------------------|
| Fan 10 | OK | 3439 | Spinning at normal speed |
| Fan 11 | OK | 3446 | Spinning at normal speed |
| Fan 12 | OK | 3432 | Spinning at normal speed |

#### show chassis fan (T320 Router)

```
user@host> show chassis fan
```

| Item                    | Status | RPM  | Measurement              |
|-------------------------|--------|------|--------------------------|
| Top Left Front fan      | OK     | 2850 | Spinning at normal speed |
| Top Left Middle fan     | OK     | 2820 | Spinning at normal speed |
| Top Left Rear fan       | OK     | 2970 | Spinning at normal speed |
| Top Right Front fan     | OK     | 2790 | Spinning at normal speed |
| Top Right Middle fan    | OK     | 2640 | Spinning at normal speed |
| Top Right Rear fan      | OK     | 2790 | Spinning at normal speed |
| Bottom Left Front fan   | OK     | 2520 | Spinning at normal speed |
| Bottom Left Middle fan  | OK     | 2610 | Spinning at normal speed |
| Bottom Left Rear fan    | OK     | 2550 | Spinning at normal speed |
| Bottom Right Front fan  | OK     | 2610 | Spinning at normal speed |
| Bottom Right Middle fan | OK     | 2880 | Spinning at normal speed |
| Bottom Right Rear fan   | OK     | 2790 | Spinning at normal speed |
| Rear Tray Top fan       | OK     | 2130 | Spinning at normal speed |
| Rear Tray Second fan    | OK     | 2190 | Spinning at normal speed |
| Rear Tray Middle fan    | OK     | 2250 | Spinning at normal speed |
| Rear Tray Fourth fan    | OK     | 2220 | Spinning at normal speed |
| Rear Tray Bottom fan    | OK     | 2280 | Spinning at normal speed |

#### show chassis fan (T640 Router)

```
user@host> show chassis fan
```

| Item                    | Status | RPM  | Measurement              |
|-------------------------|--------|------|--------------------------|
| Top Left Front fan      | OK     | 3420 | Spinning at normal speed |
| Top Left Middle fan     | OK     | 3420 | Spinning at normal speed |
| Top Left Rear fan       | OK     | 3420 | Spinning at normal speed |
| Top Right Front fan     | OK     | 3420 | Spinning at normal speed |
| Top Right Middle fan    | OK     | 3420 | Spinning at normal speed |
| Top Right Rear fan      | OK     | 3450 | Spinning at normal speed |
| Bottom Left Front fan   | OK     | 3390 | Spinning at normal speed |
| Bottom Left Middle fan  | OK     | 3420 | Spinning at normal speed |
| Bottom Left Rear fan    | OK     | 3390 | Spinning at normal speed |
| Bottom Right Front fan  | OK     | 3390 | Spinning at normal speed |
| Bottom Right Middle fan | OK     | 3390 | Spinning at normal speed |
| Bottom Right Rear fan   | OK     | 3390 | Spinning at normal speed |
| Rear Tray Top fan       | OK     | 5220 | Spinning at normal speed |
| Rear Tray Second fan    | OK     | 5220 | Spinning at normal speed |
| Rear Tray Third fan     | OK     | 5220 | Spinning at normal speed |
| Rear Tray Fourth fan    | OK     | 5220 | Spinning at normal speed |
| Rear Tray Fifth fan     | OK     | 5220 | Spinning at normal speed |
| Rear Tray Sixth fan     | OK     | 5220 | Spinning at normal speed |
| Rear Tray Seventh fan   | OK     | 5220 | Spinning at normal speed |
| Rear Tray Bottom fan    | OK     | 5220 | Spinning at normal speed |

#### show chassis fan (T1600 Router)

```
user@host> show chassis fan
```

| Item                | Status | RPM  | Measurement              |
|---------------------|--------|------|--------------------------|
| Top Left Front fan  | OK     | 3420 | Spinning at normal speed |
| Top Left Middle fan | OK     | 3420 | Spinning at normal speed |
| Top Left Rear fan   | OK     | 3450 | Spinning at normal speed |
| Top Right Front fan | OK     | 3420 | Spinning at normal speed |

|                         |    |      |                          |
|-------------------------|----|------|--------------------------|
| Top Right Middle fan    | OK | 3420 | Spinning at normal speed |
| Top Right Rear fan      | OK | 3390 | Spinning at normal speed |
| Bottom Left Front fan   | OK | 3420 | Spinning at normal speed |
| Bottom Left Middle fan  | OK | 3420 | Spinning at normal speed |
| Bottom Left Rear fan    | OK | 3390 | Spinning at normal speed |
| Bottom Right Front fan  | OK | 3390 | Spinning at normal speed |
| Bottom Right Middle fan | OK | 3420 | Spinning at normal speed |
| Bottom Right Rear fan   | OK | 3390 | Spinning at normal speed |
| Rear Tray Top fan       | OK | 5190 | Spinning at normal speed |
| Rear Tray Second fan    | OK | 5190 | Spinning at normal speed |
| Rear Tray Third fan     | OK | 5190 | Spinning at normal speed |
| Rear Tray Fourth fan    | OK | 5190 | Spinning at normal speed |
| Rear Tray Fifth fan     | OK | 5190 | Spinning at normal speed |
| Rear Tray Sixth fan     | OK | 5190 | Spinning at normal speed |
| Rear Tray Seventh fan   | OK | 5190 | Spinning at normal speed |
| Rear Tray Bottom fan    | OK | 5190 | Spinning at normal speed |

### show chassis fan (T4000 Core Router)

```
user@host> show chassis fan
```

| Item                    | Status | RPM   | Measurement            |
|-------------------------|--------|-------|------------------------|
| Top Left Front fan      | OK     | 5190  | Spinning at high speed |
| Top Left Middle fan     | OK     | 5220  | Spinning at high speed |
| Top Left Rear fan       | OK     | 5190  | Spinning at high speed |
| Top Right Front fan     | OK     | 5160  | Spinning at high speed |
| Top Right Middle fan    | OK     | 5190  | Spinning at high speed |
| Top Right Rear fan      | OK     | 5160  | Spinning at high speed |
| Bottom Left Front fan   | OK     | 6030  | Spinning at high speed |
| Bottom Left Middle fan  | OK     | 6090  | Spinning at high speed |
| Bottom Left Rear fan    | OK     | 6090  | Spinning at high speed |
| Bottom Right Front fan  | OK     | 6030  | Spinning at high speed |
| Bottom Right Middle fan | OK     | 6060  | Spinning at high speed |
| Bottom Right Rear fan   | OK     | 6060  | Spinning at high speed |
| Rear Tray Top fan       | OK     | 10000 | Spinning at high speed |
| Rear Tray Second fan    | OK     | 10000 | Spinning at high speed |
| Rear Tray Third fan     | OK     | 10000 | Spinning at high speed |
| Rear Tray Fourth fan    | OK     | 10000 | Spinning at high speed |
| Rear Tray Fifth fan     | OK     | 10000 | Spinning at high speed |
| Rear Tray Sixth fan     | OK     | 10000 | Spinning at high speed |
| Rear Tray Seventh fan   | OK     | 10000 | Spinning at high speed |
| Rear Tray Bottom fan    | OK     | 10000 | Spinning at high speed |

### show chassis fan (TX Matrix Router)

```
user@host> show chassis fan
scc-re0:
```

| Item                    | Status | RPM  | Measurement              |
|-------------------------|--------|------|--------------------------|
| Top Left Front fan      | OK     | 3420 | Spinning at normal speed |
| Top Left Middle fan     | OK     | 3390 | Spinning at normal speed |
| Top Left Rear fan       | OK     | 3420 | Spinning at normal speed |
| Top Right Front fan     | OK     | 3390 | Spinning at normal speed |
| Top Right Middle fan    | OK     | 3420 | Spinning at normal speed |
| Top Right Rear fan      | OK     | 3390 | Spinning at normal speed |
| Bottom Left Front fan   | OK     | 3420 | Spinning at normal speed |
| Bottom Left Middle fan  | OK     | 3450 | Spinning at normal speed |
| Bottom Left Rear fan    | OK     | 3420 | Spinning at normal speed |
| Bottom Right Front fan  | OK     | 3420 | Spinning at normal speed |
| Bottom Right Middle fan | OK     | 3420 | Spinning at normal speed |
| Bottom Right Rear fan   | OK     | 3420 | Spinning at normal speed |

|                       |    |      |                          |
|-----------------------|----|------|--------------------------|
| Rear Tray Top fan     | OK | 3420 | Spinning at normal speed |
| Rear Tray Second fan  | OK | 5190 | Spinning at normal speed |
| Rear Tray Third fan   | OK | 5190 | Spinning at normal speed |
| Rear Tray Fourth fan  | OK | 5190 | Spinning at normal speed |
| Rear Tray Fifth fan   | OK | 3420 | Spinning at normal speed |
| Rear Tray Sixth fan   | OK | 3420 | Spinning at normal speed |
| Rear Tray Seventh fan | OK | 3420 | Spinning at normal speed |
| Rear Tray Bottom fan  | OK | 3420 | Spinning at normal speed |

```
lcc2-re0:
```

| Item                    | Status | RPM  | Measurement              |
|-------------------------|--------|------|--------------------------|
| Top Left Front fan      | OK     | 3420 | Spinning at normal speed |
| Top Left Middle fan     | OK     | 3420 | Spinning at normal speed |
| Top Left Rear fan       | OK     | 3450 | Spinning at normal speed |
| Top Right Front fan     | OK     | 3420 | Spinning at normal speed |
| Top Right Middle fan    | OK     | 3450 | Spinning at normal speed |
| Top Right Rear fan      | OK     | 3360 | Spinning at normal speed |
| Bottom Left Front fan   | OK     | 3420 | Spinning at normal speed |
| Bottom Left Middle fan  | OK     | 3480 | Spinning at normal speed |
| Bottom Left Rear fan    | OK     | 3420 | Spinning at normal speed |
| Bottom Right Front fan  | OK     | 3420 | Spinning at normal speed |
| Bottom Right Middle fan | OK     | 3390 | Spinning at normal speed |
| Bottom Right Rear fan   | OK     | 3420 | Spinning at normal speed |
| Rear Tray Top fan       | OK     | 3420 | Spinning at normal speed |
| Rear Tray Second fan    | OK     | 3420 | Spinning at normal speed |
| Rear Tray Third fan     | OK     | 3420 | Spinning at normal speed |
| Rear Tray Fourth fan    | OK     | 3420 | Spinning at normal speed |
| Rear Tray Fifth fan     | OK     | 3420 | Spinning at normal speed |
| Rear Tray Sixth fan     | OK     | 3420 | Spinning at normal speed |
| Rear Tray Seventh fan   | OK     | 3420 | Spinning at normal speed |
| Rear Tray Bottom fan    | OK     | 3420 | Spinning at normal speed |

#### show chassis fan (TX Matrix Plus Router)

```
user@host> show chassis fan
```

```
sfc0-re0:
```

| Item             | Status | RPM  | Measurement              |
|------------------|--------|------|--------------------------|
| Fan Tray 0 Fan 1 | OK     | 4350 | Spinning at normal speed |
| Fan Tray 0 Fan 2 | OK     | 4380 | Spinning at normal speed |
| Fan Tray 0 Fan 3 | OK     | 4410 | Spinning at normal speed |
| Fan Tray 0 Fan 4 | OK     | 4380 | Spinning at normal speed |
| Fan Tray 0 Fan 5 | OK     | 4350 | Spinning at normal speed |
| Fan Tray 0 Fan 6 | OK     | 4380 | Spinning at normal speed |
| Fan Tray 1 Fan 1 | OK     | 4410 | Spinning at normal speed |
| Fan Tray 1 Fan 2 | OK     | 4380 | Spinning at normal speed |
| Fan Tray 1 Fan 3 | OK     | 4410 | Spinning at normal speed |
| Fan Tray 1 Fan 4 | OK     | 4380 | Spinning at normal speed |
| Fan Tray 1 Fan 5 | OK     | 4410 | Spinning at normal speed |
| Fan Tray 1 Fan 6 | OK     | 4410 | Spinning at normal speed |
| Fan Tray 2 Fan 1 | OK     | 4380 | Spinning at normal speed |
| Fan Tray 2 Fan 2 | OK     | 4380 | Spinning at normal speed |
| Fan Tray 2 Fan 3 | OK     | 4380 | Spinning at normal speed |
| Fan Tray 2 Fan 4 | OK     | 4410 | Spinning at normal speed |
| Fan Tray 2 Fan 5 | OK     | 4380 | Spinning at normal speed |
| Fan Tray 2 Fan 6 | OK     | 4410 | Spinning at normal speed |
| Fan Tray 2 Fan 7 | OK     | 4410 | Spinning at normal speed |
| Fan Tray 2 Fan 8 | OK     | 4380 | Spinning at normal speed |
| Fan Tray 2 Fan 9 | OK     | 4380 | Spinning at normal speed |
| Fan Tray 3 Fan 1 | OK     | 4350 | Spinning at normal speed |

```

Fan Tray 3 Fan 2 OK 4380 Spinning at normal speed
Fan Tray 3 Fan 3 OK 4410 Spinning at normal speed
Fan Tray 3 Fan 4 OK 4440 Spinning at normal speed
Fan Tray 3 Fan 5 OK 4380 Spinning at normal speed
Fan Tray 3 Fan 6 OK 4410 Spinning at normal speed
Fan Tray 3 Fan 7 OK 4410 Spinning at normal speed
Fan Tray 3 Fan 8 OK 4380 Spinning at normal speed
Fan Tray 3 Fan 9 OK 4410 Spinning at normal speed
Fan Tray 4 Fan 1 OK 4410 Spinning at normal speed
Fan Tray 4 Fan 2 OK 4410 Spinning at normal speed
Fan Tray 4 Fan 3 OK 4380 Spinning at normal speed
Fan Tray 4 Fan 4 OK 4380 Spinning at normal speed
Fan Tray 4 Fan 5 OK 4410 Spinning at normal speed
Fan Tray 4 Fan 6 OK 4410 Spinning at normal speed
Fan Tray 4 Fan 7 OK 4410 Spinning at normal speed
Fan Tray 4 Fan 8 OK 4410 Spinning at normal speed
Fan Tray 4 Fan 9 OK 4410 Spinning at normal speed
Fan Tray 5 Fan 1 OK 4350 Spinning at normal speed
Fan Tray 5 Fan 2 OK 4380 Spinning at normal speed
Fan Tray 5 Fan 3 OK 4380 Spinning at normal speed
Fan Tray 5 Fan 4 OK 4350 Spinning at normal speed
Fan Tray 5 Fan 5 OK 4380 Spinning at normal speed
Fan Tray 5 Fan 6 OK 4410 Spinning at normal speed
Fan Tray 5 Fan 7 OK 4410 Spinning at normal speed
Fan Tray 5 Fan 8 OK 4380 Spinning at normal speed
Fan Tray 5 Fan 9 OK 4410 Spinning at normal speed

```

```
lcc0-re0:
```

```

Item Status RPM Measurement
Top Left Front fan OK 3420 Spinning at normal speed
Top Left Middle fan OK 3420 Spinning at normal speed
Top Left Rear fan OK 3420 Spinning at normal speed
Top Right Front fan OK 3450 Spinning at normal speed
Top Right Middle fan OK 3420 Spinning at normal speed
Top Right Rear fan OK 3420 Spinning at normal speed
Bottom Left Front fan OK 3420 Spinning at normal speed
Bottom Left Middle fan OK 3420 Spinning at normal speed
Bottom Left Rear fan OK 3390 Spinning at normal speed
Bottom Right Front fan OK 3420 Spinning at normal speed
Bottom Right Middle fan OK 3390 Spinning at normal speed
Bottom Right Rear fan OK 3390 Spinning at normal speed
Rear Tray Top fan OK 7050 Spinning at normal speed
Rear Tray Second fan OK 7050 Spinning at normal speed
Rear Tray Third fan OK 7050 Spinning at normal speed
Rear Tray Fourth fan OK 7050 Spinning at normal speed
Rear Tray Fifth fan OK 7050 Spinning at normal speed
Rear Tray Sixth fan OK 7050 Spinning at normal speed
Rear Tray Seventh fan OK 7050 Spinning at normal speed
Rear Tray Bottom fan OK 7050 Spinning at normal speed

```

#### show chassis fan (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis fan
sfc0-re0:
```

```

Item Status RPM Measurement
Fan Tray 0 Fan 1 OK 4830 Spinning at normal speed
Fan Tray 0 Fan 2 OK 4860 Spinning at normal speed
Fan Tray 0 Fan 3 OK 4830 Spinning at normal speed
Fan Tray 0 Fan 4 OK 4800 Spinning at normal speed

```



|                  |       |      |                          |
|------------------|-------|------|--------------------------|
| Fan Tray 0 Fan 5 | OK    | 4830 | Spinning at normal speed |
| Fan Tray 0 Fan 6 | OK    | 4770 | Spinning at normal speed |
| Fan Tray 1 Fan 1 | OK    | 4800 | Spinning at normal speed |
| Fan Tray 1 Fan 2 | OK    | 4770 | Spinning at normal speed |
| Fan Tray 1 Fan 3 | OK    | 4800 | Spinning at normal speed |
| Fan Tray 1 Fan 4 | OK    | 4770 | Spinning at normal speed |
| Fan Tray 1 Fan 5 | OK    | 4770 | Spinning at normal speed |
| Fan Tray 1 Fan 6 | OK    | 4800 | Spinning at normal speed |
| Fan Tray 2 Fan 1 | OK    | 4800 | Spinning at normal speed |
| Fan Tray 2 Fan 2 | OK    | 4800 | Spinning at normal speed |
| Fan Tray 2 Fan 3 | OK    | 4830 | Spinning at normal speed |
| Fan Tray 2 Fan 4 | OK    | 4830 | Spinning at normal speed |
| Fan Tray 2 Fan 5 | OK    | 4830 | Spinning at normal speed |
| Fan Tray 2 Fan 6 | OK    | 4830 | Spinning at normal speed |
| Fan Tray 2 Fan 7 | OK    | 4800 | Spinning at normal speed |
| Fan Tray 2 Fan 8 | OK    | 4830 | Spinning at normal speed |
| Fan Tray 2 Fan 9 | OK    | 4800 | Spinning at normal speed |
| Fan Tray 3 Fan 1 | OK    | 4860 | Spinning at normal speed |
| Fan Tray 3 Fan 2 | OK    | 4860 | Spinning at normal speed |
| Fan Tray 3 Fan 3 | OK    | 4800 | Spinning at normal speed |
| Fan Tray 3 Fan 4 | OK    | 4830 | Spinning at normal speed |
| Fan Tray 3 Fan 5 | OK    | 4830 | Spinning at normal speed |
| Fan Tray 3 Fan 6 | OK    | 4830 | Spinning at normal speed |
| Fan Tray 3 Fan 7 | OK    | 4830 | Spinning at normal speed |
| Fan Tray 3 Fan 8 | OK    | 4800 | Spinning at normal speed |
| Fan Tray 3 Fan 9 | OK    | 4800 | Spinning at normal speed |
| Fan Tray 4 Fan 1 | OK    | 4830 | Spinning at normal speed |
| Fan Tray 4 Fan 2 | OK    | 4830 | Spinning at normal speed |
| Fan Tray 4 Fan 3 | OK    | 4830 | Spinning at normal speed |
| Fan Tray 4 Fan 4 | OK    | 4830 | Spinning at normal speed |
| Fan Tray 4 Fan 5 | OK    | 4830 | Spinning at normal speed |
| Fan Tray 4 Fan 6 | OK    | 4860 | Spinning at normal speed |
| Fan Tray 4 Fan 7 | OK    | 4800 | Spinning at normal speed |
| Fan Tray 4 Fan 8 | OK    | 4860 | Spinning at normal speed |
| Fan Tray 4 Fan 9 | OK    | 4770 | Spinning at normal speed |
| Fan Tray 5 Fan 1 | OK    | 4830 | Spinning at normal speed |
| Fan Tray 5 Fan 2 | OK    | 4830 | Spinning at normal speed |
| Fan Tray 5 Fan 3 | OK    | 4830 | Spinning at normal speed |
| Fan Tray 5 Fan 4 | OK    | 4800 | Spinning at normal speed |
| Fan Tray 5 Fan 5 | OK    | 4800 | Spinning at normal speed |
| Fan Tray 5 Fan 6 | OK    | 4800 | Spinning at normal speed |
| Fan Tray 5 Fan 7 | OK    | 4830 | Spinning at normal speed |
| Fan Tray 5 Fan 8 | OK    | 4830 | Spinning at normal speed |
| Fan Tray 5 Fan 9 | Check | 2010 |                          |

1cc0-re0:

| Item                    | Status | RPM  | Measurement              |
|-------------------------|--------|------|--------------------------|
| Top Left Front fan      | OK     | 3420 | Spinning at normal speed |
| Top Left Middle fan     | OK     | 3390 | Spinning at normal speed |
| Top Left Rear fan       | OK     | 3390 | Spinning at normal speed |
| Top Right Front fan     | OK     | 3420 | Spinning at normal speed |
| Top Right Middle fan    | OK     | 3420 | Spinning at normal speed |
| Top Right Rear fan      | OK     | 3450 | Spinning at normal speed |
| Bottom Left Front fan   | OK     | 3420 | Spinning at normal speed |
| Bottom Left Middle fan  | OK     | 3390 | Spinning at normal speed |
| Bottom Left Rear fan    | OK     | 3420 | Spinning at normal speed |
| Bottom Right Front fan  | OK     | 3420 | Spinning at normal speed |
| Bottom Right Middle fan | OK     | 3390 | Spinning at normal speed |
| Bottom Right Rear fan   | OK     | 3420 | Spinning at normal speed |
| Rear Tray fan 1 (Top)   | OK     | 7740 | Spinning at normal speed |

|                           |    |      |                          |
|---------------------------|----|------|--------------------------|
| Rear Tray fan 2           | OK | 7740 | Spinning at normal speed |
| Rear Tray fan 3           | OK | 7740 | Spinning at normal speed |
| Rear Tray fan 4           | OK | 7740 | Spinning at normal speed |
| Rear Tray fan 5           | OK | 7740 | Spinning at normal speed |
| Rear Tray fan 6           | OK | 7740 | Spinning at normal speed |
| Rear Tray fan 7           | OK | 7740 | Spinning at normal speed |
| Rear Tray fan 8           | OK | 7740 | Spinning at normal speed |
| Rear Tray fan 9           | OK | 7740 | Spinning at normal speed |
| Rear Tray fan 10          | OK | 7740 | Spinning at normal speed |
| Rear Tray fan 11          | OK | 7740 | Spinning at normal speed |
| Rear Tray fan 12          | OK | 7740 | Spinning at normal speed |
| Rear Tray fan 13          | OK | 7740 | Spinning at normal speed |
| Rear Tray fan 14          | OK | 7740 | Spinning at normal speed |
| Rear Tray fan 15          | OK | 7740 | Spinning at normal speed |
| Rear Tray fan 16 (Bottom) | OK | 7740 | Spinning at normal speed |

```
1cc2-re0:
```

| Item                      | Status | RPM  | Measurement              |
|---------------------------|--------|------|--------------------------|
| Top Left Front fan        | OK     | 3420 | Spinning at normal speed |
| Top Left Middle fan       | OK     | 3390 | Spinning at normal speed |
| Top Left Rear fan         | OK     | 3420 | Spinning at normal speed |
| Top Right Front fan       | OK     | 3420 | Spinning at normal speed |
| Top Right Middle fan      | OK     | 3420 | Spinning at normal speed |
| Top Right Rear fan        | OK     | 3450 | Spinning at normal speed |
| Bottom Left Front fan     | OK     | 3420 | Spinning at normal speed |
| Bottom Left Middle fan    | OK     | 3390 | Spinning at normal speed |
| Bottom Left Rear fan      | OK     | 3420 | Spinning at normal speed |
| Bottom Right Front fan    | OK     | 3420 | Spinning at normal speed |
| Bottom Right Middle fan   | OK     | 3390 | Spinning at normal speed |
| Bottom Right Rear fan     | OK     | 3420 | Spinning at normal speed |
| Rear Tray fan 1 (Top)     | OK     | 7740 | Spinning at normal speed |
| Rear Tray fan 2           | OK     | 7740 | Spinning at normal speed |
| Rear Tray fan 3           | OK     | 7740 | Spinning at normal speed |
| Rear Tray fan 4           | OK     | 7740 | Spinning at normal speed |
| Rear Tray fan 5           | OK     | 7740 | Spinning at normal speed |
| Rear Tray fan 6           | OK     | 7740 | Spinning at normal speed |
| Rear Tray fan 7           | OK     | 7740 | Spinning at normal speed |
| Rear Tray fan 8           | OK     | 7740 | Spinning at normal speed |
| Rear Tray fan 9           | OK     | 7740 | Spinning at normal speed |
| Rear Tray fan 10          | OK     | 7740 | Spinning at normal speed |
| Rear Tray fan 11          | OK     | 7740 | Spinning at normal speed |
| Rear Tray fan 12          | OK     | 7740 | Spinning at normal speed |
| Rear Tray fan 13          | OK     | 7740 | Spinning at normal speed |
| Rear Tray fan 14          | OK     | 7740 | Spinning at normal speed |
| Rear Tray fan 15          | OK     | 7740 | Spinning at normal speed |
| Rear Tray fan 16 (Bottom) | OK     | 7740 | Spinning at normal speed |

#### show chassis fan (PTX5000 Packet Transport Router)

```
user@host> show chassis fan
user@host> show chassis fan
```

| Item             | Status | % RPM | Measurement |
|------------------|--------|-------|-------------|
| Fan Tray 0 Fan 1 | OK     | 29%   | 2700 RPM    |
| Fan Tray 0 Fan 2 | OK     | 29%   | 2700 RPM    |
| Fan Tray 0 Fan 3 | OK     | 29%   | 2742 RPM    |
| Fan Tray 0 Fan 4 | OK     | 29%   | 2700 RPM    |
| Fan Tray 0 Fan 5 | OK     | 30%   | 2828 RPM    |
| Fan Tray 0 Fan 6 | OK     | 30%   | 2828 RPM    |
| Fan Tray 0 Fan 7 | OK     | 29%   | 2700 RPM    |
| Fan Tray 0 Fan 8 | OK     | 30%   | 2785 RPM    |

|                   |    |     |          |
|-------------------|----|-----|----------|
| Fan Tray 0 Fan 9  | OK | 30% | 2828 RPM |
| Fan Tray 0 Fan 10 | OK | 30% | 2828 RPM |
| Fan Tray 0 Fan 11 | OK | 30% | 2785 RPM |
| Fan Tray 0 Fan 12 | OK | 30% | 2828 RPM |
| Fan Tray 0 Fan 13 | OK | 31% | 2871 RPM |
| Fan Tray 0 Fan 14 | OK | 30% | 2828 RPM |
| Fan Tray 1 Fan 1  | OK | 42% | 3033 RPM |
| Fan Tray 1 Fan 2  | OK | 42% | 3066 RPM |
| Fan Tray 1 Fan 3  | OK | 43% | 3099 RPM |
| Fan Tray 1 Fan 4  | OK | 43% | 3166 RPM |
| Fan Tray 1 Fan 5  | OK | 45% | 3266 RPM |
| Fan Tray 1 Fan 6  | OK | 43% | 3133 RPM |
| Fan Tray 2 Fan 1  | OK | 29% | 2099 RPM |
| Fan Tray 2 Fan 2  | OK | 30% | 2199 RPM |
| Fan Tray 2 Fan 3  | OK | 30% | 2166 RPM |
| Fan Tray 2 Fan 4  | OK | 33% | 2399 RPM |
| Fan Tray 2 Fan 5  | OK | 29% | 2133 RPM |
| Fan Tray 2 Fan 6  | OK | 32% | 2366 RPM |

#### show chassis fan (MX104 Router)

```
user@host > show chassis fan
```

| Item  | Status | RPM  | Measurement              |
|-------|--------|------|--------------------------|
| Fan 1 | OK     | 5640 | Spinning at normal speed |
| Fan 2 | OK     | 5640 | Spinning at normal speed |
| Fan 3 | OK     | 5760 | Spinning at normal speed |
| Fan 4 | OK     | 5640 | Spinning at normal speed |
| Fan 5 | OK     | 5640 | Spinning at normal speed |

#### show chassis fan (MX2010 Router)

```
user@host > show chassis fan
```

| Item             | Status | % RPM | Measurement |
|------------------|--------|-------|-------------|
| Fan Tray 0 Fan 1 | OK     | 37%   | 3360 RPM    |
| Fan Tray 0 Fan 2 | OK     | 38%   | 3480 RPM    |
| Fan Tray 0 Fan 3 | OK     | 37%   | 3360 RPM    |
| Fan Tray 0 Fan 4 | OK     | 37%   | 3360 RPM    |
| Fan Tray 0 Fan 5 | OK     | 38%   | 3480 RPM    |
| Fan Tray 0 Fan 6 | OK     | 37%   | 3360 RPM    |
| Fan Tray 1 Fan 1 | OK     | 38%   | 3480 RPM    |
| Fan Tray 1 Fan 2 | OK     | 40%   | 3600 RPM    |
| Fan Tray 1 Fan 3 | OK     | 38%   | 3480 RPM    |
| Fan Tray 1 Fan 4 | OK     | 38%   | 3480 RPM    |
| Fan Tray 1 Fan 5 | OK     | 38%   | 3480 RPM    |
| Fan Tray 1 Fan 6 | OK     | 38%   | 3480 RPM    |
| Fan Tray 2 Fan 1 | OK     | 38%   | 3480 RPM    |
| Fan Tray 2 Fan 2 | OK     | 41%   | 3720 RPM    |
| Fan Tray 2 Fan 3 | OK     | 38%   | 3480 RPM    |
| Fan Tray 2 Fan 4 | OK     | 38%   | 3480 RPM    |
| Fan Tray 2 Fan 5 | OK     | 38%   | 3480 RPM    |
| Fan Tray 2 Fan 6 | OK     | 38%   | 3480 RPM    |
| Fan Tray 3 Fan 1 | OK     | 38%   | 3480 RPM    |
| Fan Tray 3 Fan 2 | OK     | 40%   | 3600 RPM    |
| Fan Tray 3 Fan 3 | OK     | 40%   | 3600 RPM    |
| Fan Tray 3 Fan 4 | OK     | 40%   | 3600 RPM    |
| Fan Tray 3 Fan 5 | OK     | 40%   | 3600 RPM    |
| Fan Tray 3 Fan 6 | OK     | 38%   | 3480 RPM    |

#### show chassis fan (MX2020 Router)

```
user@host > show chassis fan
```

| Item             | Status | % RPM | Measurement |
|------------------|--------|-------|-------------|
| Fan Tray 0 Fan 1 | OK     | 37%   | 3360 RPM    |
| Fan Tray 0 Fan 2 | OK     | 37%   | 3360 RPM    |
| Fan Tray 0 Fan 3 | OK     | 36%   | 3240 RPM    |
| Fan Tray 0 Fan 4 | OK     | 37%   | 3360 RPM    |
| Fan Tray 0 Fan 5 | OK     | 37%   | 3360 RPM    |
| Fan Tray 0 Fan 6 | OK     | 37%   | 3360 RPM    |
| Fan Tray 1 Fan 1 | OK     | 37%   | 3360 RPM    |
| Fan Tray 1 Fan 2 | OK     | 37%   | 3360 RPM    |
| Fan Tray 1 Fan 3 | OK     | 37%   | 3360 RPM    |
| Fan Tray 1 Fan 4 | OK     | 37%   | 3360 RPM    |
| Fan Tray 1 Fan 5 | OK     | 37%   | 3360 RPM    |
| Fan Tray 1 Fan 6 | OK     | 36%   | 3240 RPM    |
| Fan Tray 2 Fan 1 | OK     | 37%   | 3360 RPM    |
| Fan Tray 2 Fan 2 | OK     | 37%   | 3360 RPM    |
| Fan Tray 2 Fan 3 | OK     | 37%   | 3360 RPM    |
| Fan Tray 2 Fan 4 | OK     | 37%   | 3360 RPM    |
| Fan Tray 2 Fan 5 | OK     | 37%   | 3360 RPM    |
| Fan Tray 2 Fan 6 | OK     | 38%   | 3480 RPM    |
| Fan Tray 3 Fan 1 | OK     | 38%   | 3480 RPM    |
| Fan Tray 3 Fan 2 | OK     | 38%   | 3480 RPM    |
| Fan Tray 3 Fan 3 | OK     | 38%   | 3480 RPM    |
| Fan Tray 3 Fan 4 | OK     | 37%   | 3360 RPM    |
| Fan Tray 3 Fan 5 | OK     | 37%   | 3360 RPM    |
| Fan Tray 3 Fan 6 | OK     | 37%   | 3360 RPM    |

#### show chassis fan (ACX4000 Router)

```
user@host > show chassis fan
```

| Item  | Status | RPM  | Measurement              |
|-------|--------|------|--------------------------|
| Fan 1 | OK     | 4140 | Spinning at normal speed |
| Fan 2 | OK     | 4200 | Spinning at normal speed |

#### show chassis fan (QFX5100 Switch and OCX Series)

```
user@switch > show chassis fan
```

| Item               | Status | RPM  | Measurement              |
|--------------------|--------|------|--------------------------|
| FPC 0 Tray 0 Fan 0 | OK     | 6428 | Spinning at normal speed |
| FPC 0 Tray 0 Fan 1 | OK     | 5515 | Spinning at normal speed |
| FPC 0 Tray 1 Fan 0 | OK     | 6360 | Spinning at normal speed |
| FPC 0 Tray 1 Fan 1 | OK     | 5532 | Spinning at normal speed |

## show chassis firmware

|                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                                               | <a href="#">Syntax on page 709</a><br><a href="#">Syntax (TX Matrix Routers) on page 709</a><br><a href="#">Syntax (TX Matrix Plus Routers) on page 709</a><br><a href="#">Syntax (MX Series Routers) on page 709</a><br><a href="#">Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers) on page 709</a><br><a href="#">Syntax (QFX Series) on page 709</a><br><a href="#">Syntax (OCX Series) on page 709</a><br><a href="#">Syntax (ACX Series Universal Access Routers) on page 709</a><br><a href="#">Syntax (EX Series Switches) on page 709</a>                     |
| <b>Syntax</b>                                                       | show chassis firmware                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Syntax (TX Matrix Routers)</b>                                   | show chassis firmware<br><lcc <i>number</i>   scc>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Syntax (TX Matrix Plus Routers)</b>                              | show chassis firmware<br><lcc <i>number</i>   sfc <i>number</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Syntax (MX Series Routers)</b>                                   | show chassis firmware<br><all-members><br><local><br><member <i>member-id</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers)</b> | show chassis firmware                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Syntax (QFX Series)</b>                                          | show chassis firmware<br>interconnect-device <i>name</i><br>node-device <i>name</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Syntax (OCX Series)</b>                                          | show chassis firmware                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Syntax (ACX Series Universal Access Routers)</b>                 | show chassis firmware                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Syntax (EX Series Switches)</b>                                  | show chassis firmware<br><detail>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Release Information</b>                                          | <p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.4 for EX Series switches.</p> <p><b>sfc</b> option introduced for the TX Matrix Plus router in Junos OS Release 9.6.</p> <p>Command introduced for EX8200 switches in Junos OS Release 10.2 for EX Series switches.</p> <p>Command introduced in Junos OS Release 11.1 for QFX Series.</p> <p>Command introduced in Junos OS Release 12.2 for ACX Series Universal Access Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.</p> |

Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.  
Command introduced in Junos OS Release 12.3 for ACX4000 Universal Access Routers.  
Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.  
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

**Description** On routers and switches, display the version levels of the firmware running on the System Control Board (SCB), Switching and Forwarding Module (SFM), System and Switch Board (SSB), Forwarding Engine Board (FEB), Flexible PIC Concentrators (FPCs), and Routing Engines. On a TX Matrix Plus router, display the version levels of the firmware running on the FPCs and the Switch Processor Mezzanine Board (SPMBs).

On EX2200, EX3200, and EX4200 switches, QFX Series, OCX Series, display the version levels of the firmware running on the switch. On an EX8208 switch, display the version levels of the firmware running on the Switch Fabric and Routing Engine (SRE) modules and on the line cards (shown as FPCs). On an EX8216 switch, display the version levels of the firmware running on the Routing Engine (RE) modules and on the line cards (shown as FPCs).

**Options** **none**—Display the version levels of the firmware running. For an EX4200 switch that is a member of a Virtual Chassis, display version levels for all members. For a TX Matrix router, display version levels for the firmware on the TX Matrix router and on all the T640 routers connected to the TX Matrix router. For a TX Matrix Plus router, display version levels for the firmware on the TX Matrix Plus router and on all the routers connected to the TX Matrix Plus router.

**all-members**—(MX Series routers only) (Optional) Display the version levels of the firmware running for all members of the Virtual Chassis configuration.

**interconnect-device *name***—(QFabric systems) (Optional) Display the version levels of the firmware running on the Interconnect device.

**lcc *number***—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display version levels for the firmware on a specified T640 router (line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, display the version levels for the firmware on a specified router (line-card chassis) that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(MX Series routers only) (Optional) Display the version levels of the firmware running for the local Virtual Chassis member.

**member *member-id***—(MX Series routers only) (Optional) Display the version levels of the firmware running for the specified member of the Virtual Chassis configuration. Replace ***member-id*** with a value of 0 or 1.

**node-device**—(QFabric systems only) (Optional) Display the version levels of the firmware running on the Node device.

**scc**—(TX Matrix router only) (Optional) Display version levels for the firmware on the TX Matrix router (switch-card chassis).

**sfc *number***—(TX Matrix Plus router only) (Optional) Display version levels for the firmware on the TX Matrix Plus router (or switch-fabric chassis). Replace ***number*** with 0.

**detail**—(EX3200, EX3300, EX4200, and EX4500 standalone and Virtual Chassis member switches only) (Optional) Display version levels of the firmware running on the switch for its programmable hardware components.

**Required Privilege Level** view

**Related Documentation** • *Upgrading the HSM Firmware*

**List of Sample Output**

- [show chassis firmware \(M10 Router\) on page 712](#)
- [show chassis firmware \(M20 Router\) on page 712](#)
- [show chassis firmware \(M40 Router\) on page 713](#)
- [show chassis firmware \(M120 Router\) on page 713](#)
- [show chassis firmware \(M160 Router\) on page 713](#)
- [show chassis firmware \(MX104 Router\) on page 713](#)
- [show chassis firmware \(MX240 Router\) on page 713](#)
- [show chassis firmware \(MX480 Router\) on page 714](#)
- [show chassis firmware \(MX960 Router\) on page 714](#)
- [show chassis firmware \(MX2010 Router\) on page 714](#)
- [show chassis firmware \(MX2020 Router\) on page 714](#)
- [show chassis firmware \(MX240, MX480, MX960 Router with Application Services Modular Line Card\) on page 715](#)
- [show chassis firmware \(EX4200 Switch\) on page 715](#)
- [show chassis firmware \(EX8200 Switch\) on page 715](#)
- [show chassis firmware \(EX9200 Switch\) on page 716](#)
- [show chassis firmware lcc \(TX Matrix Router\) on page 716](#)
- [show chassis firmware scc \(TX Matrix Router\) on page 716](#)
- [show chassis firmware \(TX Matrix Plus Router\) on page 716](#)
- [show chassis firmware lcc \(TX Matrix Plus Router\) on page 718](#)
- [show chassis firmware sfc \(TX Matrix Plus Router\) on page 718](#)
- [show chassis firmware \(QFX Series and OCX Series\) on page 718](#)
- [show chassis firmware interconnect-device \(QFabric System\) on page 719](#)
- [show chassis firmware \(ACX2000 Universal Access Router\) on page 719](#)
- [show chassis firmware detail \(EX3300 Switch\) on page 719](#)
- [show chassis firmware \(MX Routers with Media Services Blade \[MSB\]\) on page 719](#)

**Output Fields** Table 53 on page 712 lists the output fields for the **show chassis firmware** command. Output fields are listed in the approximate order in which they appear.

**Table 53: show chassis firmware Output Fields**

| Field Name                | Field Description                                                                                                                                                                                          |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Part</b>               | (MX Series, MX2010, and MX2020 routers) Chassis part name.                                                                                                                                                 |
| <b>Type</b>               | (MX Series, MX2010, and MX2020 routers) Type of firmware: On routers: <b>ROM</b> or <b>O/S</b> . On switches: <b>uboot</b> or <b>loader</b> .                                                              |
| <b>Version</b>            | (MX Series, MX2010, and MX2020 routers) Version of firmware running on the chassis part.                                                                                                                   |
| <b>FPC</b>                | ( <i>detail</i> option only) Number of FPC.<br>For a standalone switch, the value is 0.<br>For a Virtual Chassis configuration, value in the range of 0-9; refers to the member ID assigned to the switch. |
| <b>AFEB</b>               | (MX104 routers) Version of the compact Forwarding Engine Board.                                                                                                                                            |
| <b>Boot</b>               | ( <i>detail</i> option only) Version of the SYSPLD.                                                                                                                                                        |
| <b>PoE</b>                | ( <i>detail</i> option only) Version of the PoE firmware.                                                                                                                                                  |
| <b>PFE-&lt;number&gt;</b> | ( <i>detail</i> option only) Version of the PFE used in the switch.                                                                                                                                        |
| <b>PHY-</b>               | ( <i>detail</i> option only) Version of the physical layer device (PHY) used in the switch.                                                                                                                |
| <b>microcode</b>          | ( <i>detail</i> option only) Microcode of the physical layer devices (PHY) used in the switch.                                                                                                             |
| <b>uboot</b>              | ( <i>detail</i> option only) Version of the u-boot used in the switch.                                                                                                                                     |
| <b>loader</b>             | ( <i>detail</i> option only) Version of the loader used in the switch.                                                                                                                                     |

## Sample Output

### show chassis firmware (M10 Router)

```

user@host> show chassis firmware
Part Type Version
Forwarding engine board ROM Juniper ROM Monitor Version 4.1b2
O/S Version 4.1I1 by tlim on 2000-04-24 11:27

```

### show chassis firmware (M20 Router)

```

user@host> show chassis firmware
Part Type Version
System switch board ROM Juniper ROM Monitor Version 3.4b26
O/S Version 3.4I16 by smackie on 2000-02-29 2
FPC 1 ROM Juniper ROM Monitor Version 3.0b1

```



|       |     |                                           |
|-------|-----|-------------------------------------------|
|       | O/S | Version 3.4I4 by smackie on 2000-02-25 21 |
| FPC 2 | ROM | Juniper ROM Monitor Version 3.0b1         |
|       | O/S | Version 3.4I4 by smackie on 2000-02-25 21 |

#### show chassis firmware (M40 Router)

```
user@host> show chassis firmware
```

| Part                 | Type | Version                                   |
|----------------------|------|-------------------------------------------|
| System control board | ROM  | Juniper ROM Monitor Version 2.0i126Copyri |
|                      | O/S  | Version 2.0i1 by root on Thu Jul 23 00:51 |
| FPC 5                | ROM  | Juniper ROM Monitor Version 2.0i49Copyrig |
|                      | O/S  | Version 2.0i1 by root on Thu Jul 23 00:59 |

#### show chassis firmware (M120 Router)

```
user@host> show chassis firmware
```

|       |     |                                             |
|-------|-----|---------------------------------------------|
| FPC 2 | ROM | Juniper ROM Monitor Version 8.0b29          |
|       | O/S | Version 8.2B1 by builder on 2006-10-18 16:2 |
| FPC 3 | ROM | Juniper ROM Monitor Version 8.0b29          |
|       | O/S | Version 8.2B1 by builder on 2006-10-18 16:2 |
| FPC 4 | ROM | Juniper ROM Monitor Version 8.0b29          |
|       | O/S | Version 8.2B1 by builder on 2006-10-18 16:2 |
| FEB 3 | ROM | Juniper ROM Monitor Version 8.0b29          |
|       | O/S | Version 8.2B1 by builder on 2006-10-18 16:1 |
| FEB 4 | ROM | Juniper ROM Monitor Version 8.0b29          |
|       | O/S | Version 8.2B1 by builder on 2006-10-18 16:1 |

#### show chassis firmware (M160 Router)

```
user@host> show chassis firmware
```

| Part  | Type | Version                                   |
|-------|------|-------------------------------------------|
| SFM 0 | ROM  | Juniper ROM Monitor Version 4.0b2         |
|       | O/S  | Version 4.0I1 by tlim on 2000-02-29 11:50 |
| SFM 1 | ROM  | Juniper ROM Monitor Version 4.0b2         |
|       | O/S  | Version 4.0I1 by tlim on 2000-02-29 11:50 |
| FPC 0 | ROM  | Juniper ROM Monitor Version 4.0b2         |
|       | O/S  | Version 4.0I1 by tlim on 2000-02-29 11:56 |
| FPC 1 | ROM  | Juniper ROM Monitor Version 4.0b2         |
|       | O/S  | Version 4.0I1 by tlim on 2000-02-29 11:56 |
| FPC 2 | ROM  | Juniper ROM Monitor Version 4.0b3         |
|       | O/S  | Version 4.0I1 by tlim on 2000-02-29 11:56 |

#### show chassis firmware (MX104 Router)

```
user@host > show chassis firmware
```

| Part  | Type | Version                                     |
|-------|------|---------------------------------------------|
| FPC 0 | ROM  | Juniper ROM Monitor Version 13.1b24         |
|       | O/S  | Version 13.2-20130514.1 by builder on 2013- |
| FPC 1 | ROM  | Juniper ROM Monitor Version 13.1b24         |
|       | O/S  | Version 13.2-20130514.1 by builder on 2013- |
| FPC 2 | ROM  | Juniper ROM Monitor Version 13.1b24         |
|       | O/S  | Version 13.2-20130514.1 by builder on 2013- |
| AFEB  | ROM  | Juniper ROM Monitor Version 13.1b24         |
|       | O/S  | Version 13.2-20130514.1 by builder on 2013- |

#### show chassis firmware (MX240 Router)

```
user@host> show chassis firmware
```

| Part  | Type | Version                                     |
|-------|------|---------------------------------------------|
| FPC 1 | ROM  | Juniper ROM Monitor Version 8.3b1           |
|       | O/S  | Version 9.0-20080103.0 by builder on 2008-0 |

|       |     |                                             |
|-------|-----|---------------------------------------------|
| FPC 2 | ROM | Juniper ROM Monitor Version 8.3b1           |
|       | O/S | Version 9.0-20080103.0 by builder on 2008-0 |

#### show chassis firmware (MX480 Router)

```
user@host> show chassis firmware
```

| Part  | Type | Version                                     |
|-------|------|---------------------------------------------|
| FPC 1 | ROM  | Juniper ROM Monitor Version 8.3b1           |
|       | O/S  | Version 9.0-20070916.3 by builder on 2007-0 |

#### show chassis firmware (MX960 Router)

```
user@host> show chassis firmware
```

| Part  | Type | Version                                     |
|-------|------|---------------------------------------------|
| FPC 4 | ROM  | Juniper ROM Monitor Version 8.0b8           |
|       | O/S  | Version 8.2I59 by artem on 2006-10-31 19:22 |
| FPC 7 | ROM  | Juniper ROM Monitor Version 8.2b1           |
|       | O/S  | Version 8.2-20061026.1 by builder on 2006-1 |

#### show chassis firmware (MX2010 Router)

```
user@host> show chassis firmware
```

| Part   | Type | Version                                     |
|--------|------|---------------------------------------------|
| FPC 0  | ROM  | Juniper ROM Monitor Version 12.3b1          |
|        | O/S  | Version 12.3-20121220.0 by builder on 2012- |
| FPC 1  | ROM  | Juniper ROM Monitor Version 10.1b3          |
|        | O/S  | Version 12.3-20121220.0 by builder on 2012- |
| FPC 2  | ROM  | Juniper ROM Monitor Version 10.1b3          |
|        | O/S  | Version 12.3-20121220.0 by builder on 2012- |
| FPC 3  | ROM  | Juniper ROM Monitor Version 10.1b3          |
|        | O/S  | Version 12.3-20121220.0 by builder on 2012- |
| FPC 4  | ROM  | Juniper ROM Monitor Version 10.0b39         |
|        | O/S  | Version 12.3-20121220.0 by builder on 2012- |
| FPC 5  | ROM  | Juniper ROM Monitor Version 10.0b39         |
|        | O/S  | Version 12.3-20121220.0 by builder on 2012- |
| FPC 6  | ROM  | Juniper ROM Monitor Version 10.4b1          |
|        | O/S  | Version 12.3-20121220.0 by builder on 2012- |
| FPC 7  | ROM  | Juniper ROM Monitor Version 10.1b3          |
|        | O/S  | Version 12.3-20121220.0 by builder on 2012- |
| FPC 8  | ROM  | Juniper ROM Monitor Version 10.4b1          |
|        | O/S  | Version 12.3-20121220.0 by builder on 2012- |
| FPC 9  | ROM  | Juniper ROM Monitor Version 10.4b1          |
|        | O/S  | Version 12.3-20121220.0 by builder on 2012- |
| SPMB 0 | ROM  | Juniper ROM Monitor Version 12.1b1          |
|        | O/S  | Version 12.3-20121220.0 by builder on 2012- |
| SPMB 1 | ROM  | Juniper ROM Monitor Version 12.1b1          |
|        | O/S  | Version 12.3-20121220.0 by builder on 2012- |

#### show chassis firmware (MX2020 Router)

```
user@host> show chassis firmware
```

| Part  | Type | Version                                     |
|-------|------|---------------------------------------------|
| FPC 0 | ROM  | Juniper ROM Monitor Version 10.0b39         |
|       | O/S  | Version 12.3-20130415.0 by builder on 2013- |
| FPC 1 | ROM  | Juniper ROM Monitor Version 10.0b39         |
|       | O/S  | Version 12.3-20130415.0 by builder on 2013- |
| FPC 2 | ROM  | Juniper ROM Monitor Version 10.0b39         |
|       | O/S  | Version 12.3-20130415.0 by builder on 2013- |
| FPC 3 | ROM  | Juniper ROM Monitor Version 10.0b39         |
|       | O/S  | Version 12.3-20130415.0 by builder on 2013- |
| FPC 4 | ROM  | Juniper ROM Monitor Version 10.0b39         |
|       | O/S  | Version 12.3-20130415.0 by builder on 2013- |

|        |     |                                             |
|--------|-----|---------------------------------------------|
| FPC 5  | ROM | Juniper ROM Monitor Version 10.0b39         |
|        | O/S | Version 12.3-20130415.0 by builder on 2013- |
| FPC 6  | ROM | Juniper ROM Monitor Version 10.0b39         |
|        | O/S | Version 12.3-20130415.0 by builder on 2013- |
| FPC 7  | ROM | Juniper ROM Monitor Version 10.0b39         |
|        | O/S | Version 12.3-20130415.0 by builder on 2013- |
| FPC 8  | ROM | Juniper ROM Monitor Version 10.0b39         |
|        | O/S | Version 12.3-20130415.0 by builder on 2013- |
| FPC 9  | ROM | Juniper ROM Monitor Version 10.0b39         |
|        | O/S | Version 12.3-20130415.0 by builder on 2013- |
| FPC 10 | ROM | Juniper ROM Monitor Version 10.0b39         |
|        | O/S | Version 12.3-20130415.0 by builder on 2013- |
| FPC 11 | ROM | Juniper ROM Monitor Version 10.0b39         |
|        | O/S | Version 12.3-20130415.0 by builder on 2013- |
| FPC 12 | ROM | Juniper ROM Monitor Version 10.0b39         |
|        | O/S | Version 12.3-20130415.0 by builder on 2013- |
| FPC 13 | ROM | Juniper ROM Monitor Version 10.0b39         |
|        | O/S | Version 12.3-20130415.0 by builder on 2013- |
| FPC 14 | ROM | Juniper ROM Monitor Version 10.0b39         |
|        | O/S | Version 12.3-20130415.0 by builder on 2013- |
| FPC 15 | ROM | Juniper ROM Monitor Version 10.0b39         |
|        | O/S | Version 12.3-20130415.0 by builder on 2013- |
| FPC 16 | ROM | Juniper ROM Monitor Version 10.0b39         |
|        | O/S | Version 12.3-20130415.0 by builder on 2013- |
| FPC 17 | ROM | Juniper ROM Monitor Version 10.0b39         |
|        | O/S | Version 12.3-20130415.0 by builder on 2013- |
| FPC 18 | ROM | Juniper ROM Monitor Version 10.0b39         |
|        | O/S | Version 12.3-20130415.0 by builder on 2013- |
| FPC 19 | ROM | Juniper ROM Monitor Version 10.0b39         |
|        | O/S | Version 12.3-20130415.0 by builder on 2013- |
| SPMB 0 | ROM | Juniper ROM Monitor Version 12.1b1          |
|        | O/S | Version 12.3-20130415.0 by builder on 2013- |
| SPMB 1 | ROM | Juniper ROM Monitor Version 12.1b1          |
|        | O/S | Version 12.3-20130415.0 by builder on 2013- |

#### show chassis firmware (MX240, MX480, MX960 Router with Application Services Modular Line Card)

```
user@host> show chassis firmware
```

| Part  | Type | Version                                     |
|-------|------|---------------------------------------------|
| FPC 1 | ROM  | Juniper ROM Monitor Version 12.1b1          |
|       | O/S  | Version 12.2I21 by manish on 2012-06-19 17: |

#### show chassis firmware (EX4200 Switch)

```
user@switch> show chassis firmware
```

| Part  | Type   | Version                                     |
|-------|--------|---------------------------------------------|
| FPC 0 | uboot  | U-Boot 1.1.6 (Feb 6 2008 - 11:27:42)        |
|       | loader | FreeBSD/PowerPC U-Boot bootstrap loader 2.1 |
| FPC 1 | uboot  | U-Boot 1.1.6 (Feb 6 2008 - 11:27:42)        |
|       | loader | FreeBSD/PowerPC U-Boot bootstrap loader 2.1 |
| FPC 2 | uboot  | U-Boot 1.1.6 (Feb 6 2008 - 11:27:42)        |
|       | loader | FreeBSD/PowerPC U-Boot bootstrap loader 2.1 |

#### show chassis firmware (EX8200 Switch)

```
user@switch> show chassis firmware
```

| Part  | Type   | Version                                     |
|-------|--------|---------------------------------------------|
| FPC 0 | U-Boot | U-Boot 1.1.6 (Mar 25 2009 - 06:13:12) 2.4.0 |
|       | loader | FreeBSD/PowerPC U-Boot bootstrap loader 2.2 |

|                  |                  |                                                                                            |
|------------------|------------------|--------------------------------------------------------------------------------------------|
| FPC 3            | U-Boot<br>Loader | U-Boot 1.1.6 (Dec 4 2009 - 13:17:34) 3.1.0<br>FreeBSD/PowerPC U-Boot bootstrap loader 2.2  |
| FPC 5            | U-Boot<br>Loader | U-Boot 1.1.6 (Mar 25 2009 - 06:13:12) 2.4.0<br>FreeBSD/PowerPC U-Boot bootstrap loader 2.2 |
| FPC 7            | U-Boot<br>Loader | U-Boot 1.1.6 (Feb 6 2009 - 05:31:46) 2.4.0<br>FreeBSD/PowerPC U-Boot bootstrap loader 2.2  |
| Routing Engine 0 | U-Boot<br>Loader | U-Boot 1.1.6 (Mar 25 2009 - 06:13:12) 2.4.0<br>FreeBSD/PowerPC U-Boot bootstrap loader 2.2 |
| Routing Engine 1 | U-Boot<br>Loader | U-Boot 1.1.6 (Mar 25 2009 - 06:13:12) 2.4.0<br>FreeBSD/PowerPC U-Boot bootstrap loader 2.2 |

#### show chassis firmware (EX9200 Switch)

```
user@switch> show chassis firmware
Part Type Version
FPC 2 ROM Juniper ROM Monitor Version 11.4b2
 O/S Version 14.1I20140312_0741_bavig by bavig o
FPC 3 ROM Juniper ROM Monitor Version 10.4b1
 O/S Version 14.1I20140312_0741_bavig by bavig o
```

#### show chassis firmware lcc (TX Matrix Router)

```
user@host> show chassis firmware lcc 0
lcc0-re0:

Part Type Version
FPC 1 ROM Juniper ROM Monitor Version 6.4b18
 O/S Version 7.0-20040804.0 by builder on 2004-0
FPC 2 ROM Juniper ROM Monitor Version 6.4b20
 O/S Version 7.0-20040804.0 by builder on 2004-0
SPMB 0 ROM Juniper ROM Monitor Version 6.4b18
 O/S Version 7.0-20040804.0 by builder on 2004-0
```

#### show chassis firmware scc (TX Matrix Router)

```
user@host> show chassis firmware scc
scc-re0:

Part Type Version
SPMB 0 ROM Juniper ROM Monitor Version 6.4b18
 O/S Version 7.0-20040804.0 by builder on 2004-0
```

#### show chassis firmware (TX Matrix Plus Router)

```
user@host> show chassis firmware
sfc0-re0:

Part Type Version
Global FPC 4
Global FPC 6
Global FPC 7
Global FPC 12
Global FPC 14
Global FPC 15
Global FPC 20
Global FPC 21
Global FPC 22
Global FPC 23
Global FPC 24
Global FPC 25
```

```

Global FPC 26
Global FPC 28
Global FPC 29
Global FPC 31
SPMB 0 ROM Juniper ROM Monitor Version 9.5b1
 O/S Version 9.6-20090507.0 by builder on 2009-0
SPMB 1 ROM Juniper ROM Monitor Version 9.5b1
 O/S Version 9.6-20090507.0 by builder on 2009-0

```

#### lcc0-re1:

```

Part Type Version
FPC 4 ROM Juniper ROM Monitor Version 9.0b2
 O/S Version 9.6-20090507.0 by builder on 2009-0
FPC 6 ROM Juniper ROM Monitor Version 9.0b2
 O/S Version 9.6-20090507.0 by builder on 2009-0
FPC 7 ROM Juniper ROM Monitor Version 9.0b2
 O/S Version 9.6-20090507.0 by builder on 2009-0
SPMB 0 ROM Juniper ROM Monitor Version 9.5b1
 O/S Version 9.6-20090507.0 by builder on 2009-0
SPMB 1 ROM Juniper ROM Monitor Version 9.5b1
 O/S Version 9.6-20090507.0 by builder on 2009-0

```

#### lcc1-re1:

```

Part Type Version
FPC 4 ROM Juniper ROM Monitor Version 9.0b2
 O/S Version 9.6-20090507.0 by builder on 2009-0
FPC 6 ROM Juniper ROM Monitor Version 9.0b2
 O/S Version 9.6-20090507.0 by builder on 2009-0
FPC 7 ROM Juniper ROM Monitor Version 9.0b2
 O/S Version 9.6-20090507.0 by builder on 2009-0
SPMB 0 ROM Juniper ROM Monitor Version 9.5b1
 O/S Version 9.6-20090507.0 by builder on 2009-0
SPMB 1 ROM Juniper ROM Monitor Version 9.5b1
 O/S Version 9.6-20090507.0 by builder on 2009-0

```

#### lcc2-re1:

```

Part Type Version
FPC 4 ROM Juniper ROM Monitor Version 9.0b2
 O/S Version 9.6-20090507.0 by builder on 2009-0
FPC 5 ROM Juniper ROM Monitor Version 9.0b2
 O/S Version 9.6-20090507.0 by builder on 2009-0
FPC 6 ROM Juniper ROM Monitor Version 9.0b2
 O/S Version 9.6-20090507.0 by builder on 2009-0
FPC 7 ROM Juniper ROM Monitor Version 7.5b4
 O/S Version 9.6-20090507.0 by builder on 2009-0
SPMB 0 ROM Juniper ROM Monitor Version 9.5b1
 O/S Version 9.6-20090507.0 by builder on 2009-0
SPMB 1 ROM Juniper ROM Monitor Version 9.5b1
 O/S Version 9.6-20090507.0 by builder on 2009-0

```

#### lcc3-re1:

```

Part Type Version
FPC 0 ROM Juniper ROM Monitor Version 9.0b2
 O/S Version 9.6-20090507.0 by builder on 2009-0
FPC 1 ROM Juniper ROM Monitor Version 9.0b2
 O/S Version 9.6-20090507.0 by builder on 2009-0
FPC 2 ROM Juniper ROM Monitor Version 9.0b2

```

|        |     |                                             |
|--------|-----|---------------------------------------------|
|        | O/S | Version 9.6-20090507.0 by builder on 2009-0 |
| FPC 4  | ROM | Juniper ROM Monitor Version 7.5b4           |
|        | O/S | Version 9.6-20090507.0 by builder on 2009-0 |
| FPC 5  | ROM | Juniper ROM Monitor Version 9.0b2           |
|        | O/S | Version 9.6-20090507.0 by builder on 2009-0 |
| FPC 7  | ROM | Juniper ROM Monitor Version 9.0b2           |
|        | O/S | Version 9.6-20090507.0 by builder on 2009-0 |
| SPMB 0 | ROM | Juniper ROM Monitor Version 9.5b1           |
|        | O/S | Version 9.6-20090507.0 by builder on 2009-0 |
| SPMB 1 | ROM | Juniper ROM Monitor Version 9.5b1           |
|        | O/S | Version 9.6-20090507.0 by builder on 2009-0 |

#### show chassis firmware lcc (TX Matrix Plus Router)

```
user@host> show chassis firmware lcc 0
lcc0-re1:
```

| Part   | Type | Version                                     |
|--------|------|---------------------------------------------|
| FPC 4  | ROM  | Juniper ROM Monitor Version 9.0b2           |
|        | O/S  | Version 9.6-20090507.0 by builder on 2009-0 |
| FPC 6  | ROM  | Juniper ROM Monitor Version 9.0b2           |
|        | O/S  | Version 9.6-20090507.0 by builder on 2009-0 |
| FPC 7  | ROM  | Juniper ROM Monitor Version 9.0b2           |
|        | O/S  | Version 9.6-20090507.0 by builder on 2009-0 |
| SPMB 0 | ROM  | Juniper ROM Monitor Version 9.5b1           |
|        | O/S  | Version 9.6-20090507.0 by builder on 2009-0 |
| SPMB 1 | ROM  | Juniper ROM Monitor Version 9.5b1           |
|        | O/S  | Version 9.6-20090507.0 by builder on 2009-0 |

#### show chassis firmware sfc (TX Matrix Plus Router)

```
user@host> show chassis firmware sfc 0
sfc0-re0:
```

| Part          | Type | Version                                     |
|---------------|------|---------------------------------------------|
| Global FPC 4  |      |                                             |
| Global FPC 6  |      |                                             |
| Global FPC 7  |      |                                             |
| Global FPC 12 |      |                                             |
| Global FPC 14 |      |                                             |
| Global FPC 15 |      |                                             |
| Global FPC 20 |      |                                             |
| Global FPC 21 |      |                                             |
| Global FPC 22 |      |                                             |
| Global FPC 23 |      |                                             |
| Global FPC 24 |      |                                             |
| Global FPC 25 |      |                                             |
| Global FPC 26 |      |                                             |
| Global FPC 28 |      |                                             |
| Global FPC 29 |      |                                             |
| Global FPC 31 |      |                                             |
| SPMB 0        | ROM  | Juniper ROM Monitor Version 9.5b1           |
|               | O/S  | Version 9.6-20090507.0 by builder on 2009-0 |
| SPMB 1        | ROM  | Juniper ROM Monitor Version 9.5b1           |
|               | O/S  | Version 9.6-20090507.0 by builder on 2009-0 |

#### show chassis firmware (QFX Series and OCX Series)

```
user@switch> show chassis firmware
Part Type Version
FPC 0
```

|                  |                  |                                                                                         |
|------------------|------------------|-----------------------------------------------------------------------------------------|
| Routing Engine 0 | U-Boot<br>Loader | U-Boot 1.1.6 (Sep 15 2010 - 02:11:11) 1.0.5<br>FreeBSD/MIPS U-Boot bootstrap loader 0.1 |
|------------------|------------------|-----------------------------------------------------------------------------------------|

#### show chassis firmware interconnect-device (QFabric System)

```
user@switch> show chassis firmware interconnect-device interconnect1
```

| Part             | Type             | Version                                                                                 |
|------------------|------------------|-----------------------------------------------------------------------------------------|
| Routing Engine 0 | U-Boot<br>Loader | U-Boot 1.1.6 (May 10 2011 - 04:52:59) 1.1.1<br>FreeBSD/MIPS U-Boot bootstrap loader 0.1 |
| Routing Engine 1 | U-Boot<br>Loader | U-Boot 1.1.6 (May 10 2011 - 04:52:59) 1.1.1<br>FreeBSD/MIPS U-Boot bootstrap loader 0.1 |

#### show chassis firmware (ACX2000 Universal Access Router)

```
user@switch> show chassis firmware
```

| Part | Type | Version                                     |
|------|------|---------------------------------------------|
| FPC  | O/S  | Version 12.2I13 by jisjoy on 2012-05-29 06: |
| FEB  | O/S  | Version 12.2I13 by jisjoy on 2012-05-29 06: |

#### show chassis firmware detail (EX3300 Switch)

```
user@switch> show chassis firmware detail
```

|               |                                       |       |
|---------------|---------------------------------------|-------|
| FPC 0         |                                       |       |
| Boot SYSPLD   | 3                                     |       |
| PoE firmware  | 4.1.6                                 |       |
| PFE-0         | 3                                     |       |
| PFE-1         | 3                                     |       |
| PHY           |                                       |       |
| microcode     | 0x514                                 |       |
| Boot Firmware |                                       |       |
| uboot         | U-Boot 1.1.6 (Aug 21 2011 - 01:45:26) | 1.0.0 |
| loader        | FreeBSD/arm U-Boot loader             | 1.0   |

#### show chassis firmware (MX Routers with Media Services Blade [MSB])

```
user@switch> show chassis firmware
```

| Part  | Type | Version                                     |
|-------|------|---------------------------------------------|
| FPC 1 | ROM  | Juniper ROM Monitor Version 12.1b1          |
|       | O/S  | Version 12.2I21 by manish on 2012-06-19 17: |

## show chassis fpc

---

|                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                                               | <a href="#">Syntax on page 720</a><br><a href="#">Syntax (EX Series Switches) on page 720</a><br><a href="#">Syntax (T4000 Routers) on page 720</a><br><a href="#">Syntax (TX Matrix and TX Matrix Plus Routers) on page 720</a><br><a href="#">Syntax (MX Series Routers and EX Series switches) on page 720</a><br><a href="#">Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers) on page 720</a><br><a href="#">Syntax (QFX Series) on page 720</a><br><a href="#">Syntax (OCX Series) on page 720</a><br><a href="#">Syntax (PTX Series Packet Transport Routers) on page 720</a><br><a href="#">Syntax (ACX Series Universal Access Routers) on page 721</a> |
| <b>Syntax</b>                                                       | <code>show chassis fpc</code><br><code>&lt;detail &lt;slot&gt;&gt;   &lt;pic-status &lt;slot&gt;&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Syntax (EX Series Switches)</b>                                  | <code>show chassis fpc</code><br><code>&lt;detail &lt;fpc-slot&gt;&gt;   &lt;pic-status &lt;fpc-slot&gt;&gt;</code><br><code>&lt;fpc-slot&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Syntax (T4000 Routers)</b>                                       | <code>show chassis fpc</code><br><code>&lt;detail &lt;fpc-slot&gt;&gt;</code><br><code>&lt;pic-status &lt;fpc-slot&gt;&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Syntax (TX Matrix and TX Matrix Plus Routers)</b>                | <code>show chassis fpc</code><br><code>&lt;detail &lt;fpc-slot&gt;&gt;   &lt;pic-status &lt;fpc-slot&gt;&gt;</code><br><code>&lt;slot&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Syntax (MX Series Routers and EX Series switches)</b>            | <code>show chassis fpc</code><br><code>&lt;detail &lt;slot&gt;&gt;   &lt;pic-status &lt;slot&gt;&gt;</code><br><code>&lt;all-members&gt;</code><br><code>&lt;local&gt;</code><br><code>&lt;member <i>member-id</i>&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers)</b> | <code>show chassis fpc</code><br><code>&lt;slot&gt; detail   &lt;detail &lt;slot&gt;&gt;   &lt;pic-status &lt;slot&gt;&gt;</code><br><code>&lt;fpc-slot&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Syntax (QFX Series)</b>                                          | <code>show chassis fpc</code><br><code>&lt;detail&gt;</code><br><code>&lt;interconnect-device <i>name</i> &lt;fpc-slot fpc-slot&gt;&gt;</code><br><code>&lt;node-device <i>name</i>&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Syntax (OCX Series)</b>                                          | <code>show chassis fpc</code><br><code>&lt;detail&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Syntax (PTX Series Packet Transport Routers)</b>                 | <code>show chassis fpc</code><br><code>&lt;detail &lt;fpc-slot&gt;&gt;   &lt;pic-status &lt;fpc-slot&gt;&gt;</code><br><code>&lt;fpc-slot&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |



|                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax (ACX Series Universal Access Routers)</b> | <code>show chassis fpc</code><br><code>&lt;detail &lt;fpc-slot&gt;&gt;   &lt;pic-status &lt;fpc-slot&gt;&gt;</code><br><code>&lt;fpc-slot&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Release Information</b>                          | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br>Command introduced in Junos OS Release 11.1 for QFX Series.<br>Command introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers.<br>Command introduced in Junos OS Release 12.2 for ACX Series Universal Access Routers.<br>Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.<br>Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.<br>Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>                                  | Display status information about the installed Flexible PIC Concentrators (FPCs) and PICs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Options</b>                                      | <b>none</b> —Display status information for all FPCs. On a TX Matrix router, display status information for all FPCs on the attached T640 routers in the routing matrix. On a TX Matrix Plus router, display status information for all FPCs on the attached routers in the routing matrix.                                                                                                                                                                                                                                                                                                                                                                                                                     |



**NOTE:** In EX8200 switches, line cards initialize Packet Forwarding Engine during startup. If an error occurs during hardware initialization, the FPCs with bad hardware parts power down after transferring the debug information to the Routing Engine. The Routing Engine marks the FPC offline, logs the error in system log messages (/var/log/messages), and generates an alarm to inform the user.

See the following sample output:

```
user@host> show chassis fpc
```

|                 | Temp | CPU Utilization (%) | Memory         |
|-----------------|------|---------------------|----------------|
| Utilization (%) |      |                     |                |
| Slot State      | (C)  | Total               | Interrupt      |
| Buffer          |      |                     | DRAM (MB) Heap |
| 0 Empty         |      |                     |                |
| 1 Empty         |      |                     |                |
| 2 Empty         |      |                     |                |
| 3 Empty         |      |                     |                |
| 4 Empty         |      |                     |                |
| 5 Offline       | ---  | Hard FPC error---   |                |
| 6 Empty         |      |                     |                |
| 7 Online        | 26   | 4                   | 0              |
| 32              |      |                     | 1024 0         |

The following sample output shows the alarm raised for the failed FPCs.

```
user@host > show chassis alarms
```

4 alarms currently active

| Alarm time              | Class | Description                          |
|-------------------------|-------|--------------------------------------|
| 2011-03-24 00:52:51 UTC | Major | FPC 5 Hard errors                    |
| 2011-03-24 00:52:31 UTC | Major | Fan Tray Failure                     |
| 2011-03-24 00:52:31 UTC | Major | Fan Tray Failure                     |
| 2011-03-24 00:51:26 UTC | Minor | Loss of communication with Backup RE |



**NOTE:** On T4000 routers, when you include the enhanced-mode statement at the [edit chassis network-services] hierarchy level and reboot the system, only the T4000 Type 5 FPCs present on the router become online while the remaining FPCs are offline, and FPC misconfiguration alarms are generated. The show chassis alarm command output displays FPC misconfiguration (FPC *fpc-slot* misconfig) as the reason for the generation the alarms.

The following sample output shows the FPC status after the enhanced-mode statement is configured on the T4000 router. The T4000 Type 5 FPC present in slot 5 becomes online while the remaining FPCs are offline.

```
user@host> show chassis fpc
```

|                 | Temp | CPU Utilization (%)     | Memory         |
|-----------------|------|-------------------------|----------------|
| Utilization (%) |      |                         |                |
| Slot State      | (C)  | Total                   | Interrupt      |
| Buffer          |      |                         | DRAM (MB) Heap |
| 0 offline       | ---  | FPC misconfiguration--- |                |
| 1 offline       | ---  | FPC misconfiguration--- |                |
| 2 offline       | ---  | FPC misconfiguration--- |                |
| 3 Empty         |      |                         |                |
| 4 Empty         |      |                         |                |
| 5 Online        | 66   | 50                      | 0              |
| 27              |      |                         | 2816 29        |

The following sample output shows FPC misconfiguration alarms.

```
user@host > show chassis alarms
```

3 alarms currently active

| Alarm time              | Class | Description     |
|-------------------------|-------|-----------------|
| 2011-03-24 00:52:51 PST | Major | FPC 1 misconfig |
| 2011-03-24 00:52:31 PST | Major | FPC 2 misconfig |
| 2011-03-24 00:52:31 PST | Major | FPC 3 misconfig |

**detail**—(Optional) Display detailed status information for all FPCs or for the FPC in the specified slot (see *fpc-slot* or *slot*).

**all-members**—(MX Series routers and EX Series switches only) (Optional) Display status information for all FPCs on all members of the Virtual Chassis configuration.

**interconnect-device name**—(QFabric systems only) (Optional) Display status information for all FPCs on the Interconnect device.

**fpc-slot**—(Optional) FPC slot number:

- (TX Matrix and TX Matrix Plus router only)—On a TX Matrix router, if you specify the number of the T640 router (line-card chassis) by using the **lcc number** option (the recommended method), replace *fpc-slot* with a value from 0 through 7. Otherwise, replace *fpc-slot* with a value from 0 through 31. Likewise, on a TX Matrix Plus router, if you specify the number of the specified router (line-card chassis) by using the **lcc number** option (the recommended method), replace *fpc-slot* with

a value from 0 through 7. Otherwise, replace *fpc-slot* with a value from 0 through 31. For example, the following commands have the same result:

```
user@host> show chassis fpc detail 1 lcc 1
user@host> show chassis fpc detail 9
```

- M120 router—Replace *fpc-slot* with a value from 0 through 5.
- MX80 router—Replace *fpc-slot* with a value from 0 through 1.
- MX104 router—Replace *fpc-slot* with a value from 0 through 2.
- MX240 router—Replace *fpc-slot* with a value from 0 through 2.
- MX480 router—Replace *fpc-slot* with a value from 0 through 5.
- MX-960 router—Replace *fpc-slot* with a value from 0 through 11.
- MX2010 router—Replace *fpc-slot-number* with a value from 0 through 9.
- MX2020 router—Replace *fpc-slot-number* with a value from 0 through 19.
- Other routers—Replace *fpc-slot* with a value from 0 through 7.
- EX Series switches:
  - EX3200 switches and EX4200 standalone switches—Replace *fpc-slot* with 0.
  - EX4200 switches in a Virtual Chassis configuration—Replace *fpc-slot* with a value from 0 through 9.
  - EX6210 switches—Replace *fpc-slot* with a value from 0 through 9.
  - EX8208 switches—Replace *fpc-slot* with a value from 0 through 7.
  - EX8216 switches—Replace *fpc-slot* with a value from 0 through 15.
- QFX Series:
  - QFXSeries and OCX Series switches—Replace *fpc-slot* with 0.
  - QFabric systems—Replace *fpc-slot* with 0 through 31 on the Interconnect device.
- PTX Series Packet Transport Routers:
  - PTX5000 Packet Transport Router—Replace *fpc-slot* with a value from 0 through 7.
- ACX Series Universal Access Routers:
  - ACX1000 and ACX2000 Universal Access Routers—Replace *fpc-slot* with 0.

**local**—(MX Series routers and EX Series switches only) (Optional) Display status information for all FPCs on the local Virtual Chassis member.

**member *member-id***—(MX Series routers and EX Series switches only) (Optional) Display status information for all FPCs on the specified member of the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

**node-device *name***—(QFabric systems only) (Optional) Display status information for each Node device. Each Node device is equivalent to an FPC.

**pic-status**—(Optional) Display status information for all PICs or for the PIC in the specified slot (see *fpc-slot*).



**NOTE:** On T1600 routers, Type 4 FPCs with ASICs based on the SL2.0 chipset do not support the 10-Gigabit Ethernet LAN/WAN PIC with SFP+ (10x10GE [LAN/WAN] SFPP). If you issue the `show chassis fpc` command with the `pic-status` option, the CLI displays the string “Not Supported” for 10x10GE (LAN/WAN) SFPP PICs installed on such FPCs. The following is a sample output:

```
user@host> show chassis fpc pic-status
Slot 0 Online E2-FPC Type 1
 PIC 0 Online 1x G/E SFP, 1000 BASE
 PIC 1 Online Adaptive Services-II
 PIC 2 Online 1x G/E IQ, 1000 BASE
 PIC 3 Online 1x G/E IQ, 1000 BASE
Slot 1 Online FPC Type 3-ES
 PIC 0 Present UNUSED- Not Supported
Slot 2 Online FPC Type 4-ES
 PIC 0 Offline 4x OC-192 SONET XFP
 PIC 1 Present 10x10GE(LAN/WAN) SFPP- Not Supported
<<<<<<
Slot 4 Offline FPC Type 1-ES
Slot 5 Offline FPC Type 2-ES
Slot 6 Online E2-FPC Type 3
 PIC 0 Online 1x OC-192 SONET XFP
 PIC 1 Online 4x OC-48 SONET
 PIC 2 Online 4x OC-48 SONET
 PIC 3 Online MultiServices 500
Slot 7 Online FPC Type 4-ES
 PIC 0 Online 4x 10GE (LAN/WAN) XFP
 PIC 1 Online 4x 10GE (LAN/WAN) XFP
```

In addition, an entry is logged in the system log messages (/var/log/messages) that the PIC is not supported. The following is a sample message logged in the system log:

```
Apr 5 08:47:36 router1 chassisd[2770]: CHASSISD_UNSUPPORTED_PIC:
 PIC 1 in FPC 2 (type 763, version 257) is not supported
```

If you see this issue, contact Juniper Networks Technical Assistance Center (JTAC) for a possible fix. For more information about this issue and a possible solution, see [PSN-2010-03-696](https://www.juniper.net/psn/2010-03-696).



**NOTE:** When there is a double-bit ECC error in a network processor's memory, the Channelized OC3/STM1 (Multi-Rate) Circuit Emulation MIC with SFP or Channelized E1/T1 Circuit Emulation MIC is switched to the offline state.

```
user@host> show chassis fpc pic-status
Slot 1 Online MPC Type 2 3D Q
PIC 0 Offline 1xC0C12/4xC0C3 CH-CE- ECC error detected
```

**lcc *number***—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**Required Privilege Level** view

- Related Documentation**
- [request chassis fpc on page 453](#)
  - *show chassis fpc-feb-connectivity*
  - *show chassis fabric fpcs*
  - *Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online*
  - *MX960 Flexible PIC Concentrator Description*
  - *ACX2000 and ACX2100 Routers Hardware and CLI Terminology Mapping*
  - *enhanced-mode*

- List of Sample Output**
- [show chassis fpc \(EX6210 Switch\) on page 730](#)
  - [show chassis fpc \(M10 Router\) on page 730](#)
  - [show chassis fpc \(M20 Router\) on page 730](#)
  - [show chassis fpc detail \(M Series Routers\) on page 730](#)
  - [show chassis fpc detail \(MX80 Router\) on page 731](#)
  - [show chassis fpc \(MX104 Router\) on page 731](#)
  - [show chassis fpc detail \(MX104 Router\) on page 731](#)
  - [show chassis fpc pic-status \(MX104 Router\) on page 732](#)

[show chassis fpc \(MX240 Router\) on page 732](#)  
[show chassis fpc \(EX Series Switch\) on page 732](#)  
[show chassis fpc detail \(EX9200 Switch\) on page 732](#)  
[show chassis fpc \(MX480 Router\) on page 732](#)  
[show chassis fpc \(MX480 Router with 100-Gigabit Ethernet CFP\) on page 733](#)  
[show chassis fpc pic-status \(MX480 Router with 100-Gigabit Ethernet CFP\) on page 733](#)  
[show chassis fpc pic-status \(EX Series Switch\) on page 733](#)  
[show chassis fpc \(MX480 Router with MPC4E\) on page 733](#)  
[show chassis fpc detail \(MX480 Router with MPC4E\) on page 734](#)  
[show chassis fpc \(MX480 Router with MPC4E\) on page 734](#)  
[show chassis fpc detail \(MX480 Router with MPC4E\) on page 734](#)  
[show chassis fpc \(MX960 Router\) on page 735](#)  
[show chassis fpc \(MX960 Router with MPC5EQ\) on page 735](#)  
[show chassis fpc detail \(MX960 Router with MPC5EQ\) on page 735](#)  
[show chassis fpc pic-status \(MX960 Router with MPC5EQ\) on page 737](#)  
[show chassis fpc \(MX240, MX480, MX960 Routers with Application Services Modular Line Card\) on page 738](#)  
[show chassis fpc \(MX240, MX480, MX960 with Application Services Modular Line Card\) on page 738](#)  
[show chassis fpc \(MX2010 Routers\) on page 738](#)  
[show chassis fpc \(MX2020 Routers\) on page 738](#)  
[show chassis fpc \(MX2020 Router with MPC4E\) on page 739](#)  
[show chassis fpc detail \(MX2020 Router with MPC4E\) on page 739](#)  
[show chassis fpc \(MX2020 Router with MPC5EQ and MPC6E\) on page 740](#)  
[show chassis fpc detail \(MX2020 Router with MPC5EQ and MPC6E\) on page 740](#)  
[show chassis fpc pic-status \(MX2020 Router with MPC5EQ and MPC6E\) on page 742](#)  
[show chassis fpc detail \(MX Series Routers\) on page 743](#)  
[show chassis fpc detail \(EX Series Switches\) on page 743](#)  
[show chassis fpc \(Hardware Not Supported\) on page 743](#)  
[show chassis fpc detail \(Hardware Not Supported\) on page 744](#)  
[show chassis fpc pic-status on page 744](#)  
[show chassis fpc pic-status \(M Series Routers\) on page 744](#)  
[show chassis fpc pic-status \(M120 Router\) on page 745](#)  
[show chassis fpc pic-status \(MX240, MX480, and MX960 Routers with Application Services Modular Line Card\) on page 745](#)  
[show chassis fpc lcc \(TX Matrix Router\) on page 745](#)  
[show chassis fpc pic-status \(TX Matrix Router\) on page 745](#)  
[show chassis fpc pic-status lcc \(TX Matrix Router\) on page 746](#)  
[show chassis fpc \(TX Matrix Plus Router\) on page 746](#)  
[show chassis fpc lcc \(TX Matrix Plus Router\) on page 747](#)  
[show chassis fpc detail \(TX Matrix Plus Router\) on page 747](#)  
[show chassis fpc pic-status \(TX Matrix Plus Router\) on page 749](#)  
[show chassis fpc \(T1600 Router\) on page 750](#)  
[show chassis fpc detail \(T1600 Router\) on page 750](#)  
[show chassis fpc <fpc-slot> \(EX Series Switch\) on page 751](#)  
[show chassis fpc slot \(T1600 Router\) on page 751](#)  
[show chassis fpc pic-status \(T1600 Router\) on page 751](#)  
[show chassis fpc \(T4000 Router\) on page 752](#)  
[show chassis fpc detail \(T4000 Router\) on page 752](#)

[show chassis fpc pic-status \(T4000 Router\) on page 753](#)  
[show chassis fpc \(QFX Series and OCX Series\) on page 753](#)  
[show chassis fpc detail \(QFX3500 Switches\) on page 753](#)  
[show chassis fpc pic-status \(QFX3500 Switches\) on page 753](#)  
[show chassis fpc interconnect-device \(QFabric System\) on page 753](#)  
[show chassis fpc interconnect-device \(QFabric System\) on page 754](#)  
[show chassis fpc interconnect-device detail \(QFabric System\) on page 754](#)  
[show chassis fpc pic-status interconnect-device \(QFabric System\) on page 754](#)  
[show chassis fpc pic-status node-device \(QFabric System\) on page 755](#)  
[show chassis fpc \(PTX5000 Packet Transport Router\) on page 755](#)  
[show chassis fpc detail \(PTX5000 Packet Transport Router\) on page 755](#)  
[show chassis fpc pic-status \(PTX5000 Packet Transport Router\) on page 756](#)  
[show chassis fpc \(ACX2000 Universal Access Router\) on page 756](#)  
[show chassis fpc 0 \(ACX2000 Universal Access Router\) on page 756](#)  
[show chassis fpc detail \(ACX2000 Universal Access Router\) on page 756](#)  
[show chassis fpc pic-status \(ACX2000 Universal Access Router\) on page 757](#)  
[show chassis FPC 1 \(MX Routers with Media Services Blade \[MSB\]\) on page 757](#)  
[show chassis FPC 1 detail \(MX Routers with Media Services Blade \[MSB\]\) on page 757](#)

**Output Fields** Table 54 on page 728 lists the output fields for the **show chassis fpc** command. Output fields are listed in the approximate order in which they appear.

**Table 54: show chassis fpc Output Fields**

| Field Name                     | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Level of Output          |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| <b>Slot or Slot State</b>      | Slot number and state. The state can be one of the following conditions: <ul style="list-style-type: none"> <li>• <b>Dead</b>—Held in reset because of errors.</li> <li>• <b>Diag</b>—Slot is being ignored while the FPC is running diagnostics.</li> <li>• <b>Dormant</b>—Held in reset.</li> <li>• <b>Empty</b>—No FPC is present.</li> <li>• <b>Offline</b>—(PTX Series Packet Transport Routers only) One of the following two states is displayed:               <ul style="list-style-type: none"> <li>• <b>FPC offlined due to unreachable destinations</b></li> <li>• <b>FPC Offlined due to degraded FPC action</b></li> </ul> </li> <li>• <b>Online</b>—FPC is online and running.</li> <li>• <b>Present</b>—FPC is detected by the chassis daemon but either is not supported by the current version of Junos OS or is inserted in the wrong slot. The output also states either <b>Hardware Not Supported</b> or <b>Hardware Not In Right Slot</b>. The FPC is coming up but not yet online.</li> <li>• <b>Probed</b>—Probe is complete; awaiting restart of the Packet Forwarding Engine.</li> <li>• <b>Probe-wait</b>—Waiting to be probed.</li> </ul> | all levels               |
| <b>Logical slot</b>            | Slot number.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | all levels               |
| <b>Temp (C) or Temperature</b> | Temperature of the air passing by the FPC, in degrees Celsius or in both Celsius and Fahrenheit.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | all levels<br>all levels |



Table 54: show chassis fpc Output Fields (*continued*)

| Field Name                           | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Level of Output |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| <b>Temperature (PTX Series)</b>      | On PTX Series Packet Transport Routers, temperature details are provided in degrees Celsius and Fahrenheit. Output includes: <ul style="list-style-type: none"> <li>• Temperature (PMB)—Temperature of the air passing by the Processor Mezzanine Board (PMB) at the bottom of the FPC.</li> <li>• Temperature (Intake)—Temperature of the air flowing into the chassis.</li> <li>• Temperature (Exhaust)—Exhaust temperatures for multiple zones (Exhaust A and Exhaust B).</li> <li>• Temperature (TLn)—Temperature of the specified Lookup ASIC (TL) of the packet forwarding engine on the FPC.</li> <li>• Temperature (TQn)—Temperature of the specified Queuing and Memory Interface ASIC (TQ) of the packet forwarding engine on the FPC.</li> </ul> | <b>detail</b>   |
| <b>Total CPU Utilization (%)</b>     | Total percentage of CPU being used by the FPC's processor.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | all levels      |
| <b>Interrupt CPU Utilization (%)</b> | Of the total CPU being used by the FPC's processor, the percentage being used for interrupts.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | none specified  |
| <b>Memory DRAM (MB)</b>              | Total DRAM, in megabytes, available to the FPC's processor.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | none specified  |
| <b>Heap Utilization (%)</b>          | Percentage of heap space (dynamic memory) being used by the FPC's processor. If this number exceeds 80 percent, there may be a software problem (memory leak).<br><br><b>NOTE:</b> On MX Series routers and EX Series switches in a broadband edge environment, heap utilization levels higher than 70 percent can affect unified ISSU, router stability, or scaling capability.                                                                                                                                                                                                                                                                                                                                                                            | none specified  |
| <b>Buffer Utilization (%)</b>        | Percentage of buffer space being used by the FPC's processor for buffering internal messages.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | none specified  |
| <b>Total CPU DRAM</b>                | Amount of DRAM available to the FPC's CPU.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>detail</b>   |
| <b>Total RLDRAM</b>                  | Amount of reduced latency dynamic random access memory (RLDRAM) available to the FPC CPU.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>detail</b>   |
| <b>Total DDR DRAM</b>                | Amount of double data rate dynamic random access memory (DDR DRAM) available to the FPC CPU.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>detail</b>   |
| <b>Total SRAM</b>                    | Amount of static RAM (SRAM) used by the FPC's CPU.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>detail</b>   |
| <b>Total SDRAM</b>                   | Total amount of memory used for storing packets and notifications.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>detail</b>   |
| <b>I/O Manager ASICs information</b> | I/O Manager version number, manufacturer, and part number.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>detail</b>   |
| <b>Start time</b>                    | Time when the Routing Engine detected that the FPC was running.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>detail</b>   |

Table 54: show chassis fpc Output Fields (*continued*)

| Field Name | Field Description                                                                                                   | Level of Output |
|------------|---------------------------------------------------------------------------------------------------------------------|-----------------|
| Uptime     | How long the Routing Engine has been connected to the FPC and, therefore, how long the FPC has been up and running. | detail          |
| PIC type   | (pic-status output only) Type of PIC.                                                                               | none specified  |

## Sample Output

### show chassis fpc (EX6210 Switch)

```

user@switch> show chassis fpc

```

| Slot | State  | Temp (C) | CPU Utilization (%) Total | Interrupt | Memory DRAM (MB) | Utilization (%) Heap | Buffer |
|------|--------|----------|---------------------------|-----------|------------------|----------------------|--------|
| 0    | Empty  |          |                           |           |                  |                      |        |
| 1    | Online | 7        | 5                         | 0         | 1024             | 0                    | 32     |
| 2    | Empty  |          |                           |           |                  |                      |        |
| 3    | Empty  |          |                           |           |                  |                      |        |
| 4    | Online | 25       | 17                        | 2         | 2048             | 0                    | 30     |
| 5    | Online | 25       | 3                         | 0         | 2048             | 0                    | 24     |
| 6    | Online | 6        | 5                         | 0         | 1024             | 0                    | 32     |
| 7    | Empty  |          |                           |           |                  |                      |        |
| 8    | Empty  |          |                           |           |                  |                      |        |
| 9    | Online | 8        | 7                         | 0         | 1024             | 0                    | 32     |

### show chassis fpc (M10 Router)

```

user@host> show chassis fpc
FPC status:

```

| Slot | State  | Temp (C) |
|------|--------|----------|
| 0    | Online | 27       |
| 1    | Online | 28       |

### show chassis fpc (M20 Router)

```

user@host> show chassis fpc
FPC status:

```

| Slot | State  | Temp (C) | CPU Utilization (%) Total | Interrupt | Memory DRAM (MB) | Utilization (%) Heap | Buffer |
|------|--------|----------|---------------------------|-----------|------------------|----------------------|--------|
| 0    | Empty  | 0        | 0                         | 0         | 0                | 0                    | 0      |
| 1    | Online | 38       | 0                         | 0         | 8                | 0                    | 4      |
| 2    | Online | 35       | 0                         | 0         | 8                | 0                    | 3      |
| 3    | Empty  | 0        | 0                         | 0         | 0                | 0                    | 0      |

### show chassis fpc detail (M Series Routers)

```

user@host> show chassis fpc detail 1
Slot 1 information:
State Online
Temperature 48 degrees C
Total CPU DRAM 32 MB
Total SRAM 4 MB
Total SDRAM 256 MB
I/O Manager ASICs information Version 2.0, Foundry IBM, Part number 0
I/O Manager ASICs information Version 2.0, Foundry IBM, Part number 0

```

```

Start time 2000-02-08 02:18:49 UTC
Uptime 14 hours, 41 minutes, 41 seconds

```

### show chassis fpc detail (MX80 Router)

```

user@host> show chassis fpc detail
Slot 0 information:
 State Online
 Temperature 47 degrees C / 116 degrees F
 Total CPU DRAM 1024 MB
 Total SRAM 331 MB
 Total SDRAM 1280 MB
 Start time 2010-02-08 12:25:33 PST
 Uptime 2 hours, 13 minutes, 19 seconds
Slot 1 information:
 State Online
 Temperature 47 degrees C / 116 degrees F
 Total CPU DRAM 1024 MB
 Total SRAM 331 MB
 Total SDRAM 1280 MB
 Start time 2010-02-08 12:25:33 PST
 Uptime 2 hours, 13 minutes, 19 seconds

```

### show chassis fpc (MX104 Router)

```

user@host> show chassis fpc
Temp CPU Utilization (%) Memory Utilization (%)
Slot State (C) Total Interrupt DRAM (MB) Heap Buffer
0 Online 32 15 5 2048 22 13
1 Online 32 15 5 2048 22 13
2 Online 32 15 5 2048 22 13

```

### show chassis fpc detail (MX104 Router)

```

user@host> show chassis fpc detail
Slot 0 information:
 State Online
 Temperature 32 (C)
 Total CPU DRAM 2048 MB
 Total SRAM 403 MB
 Total SDRAM 1316 MB
 Start time 2013-05-23 14:39:18 IST
 Uptime 1 hour, 20 minutes, 22 seconds
Slot 1 information:
 State Online
 Temperature 32 (C)
 Total CPU DRAM 2048 MB
 Total SRAM 403 MB
 Total SDRAM 1316 MB
 Start time 2013-05-23 14:39:18 IST
 Uptime 1 hour, 20 minutes, 22 seconds
Slot 2 information:
 State Online
 Temperature 32 (C)
 Total CPU DRAM 2048 MB
 Total SRAM 403 MB
 Total SDRAM 1316 MB
 Start time 2013-05-23 14:39:18 IST
 Uptime 1 hour, 20 minutes, 22 seconds

```

**show chassis fpc pic-status (MX104 Router)**

```

user@host> show chassis fpc pic-status
Slot 0 Online
Slot 1 Online
 PIC 0 Online 10x 1GE(LAN) -E SFP
 PIC 1 Online 10x 1GE(LAN) -E SFP
Slot 2 Online
 PIC 0 Online 4x 10GE(LAN) SFP+

```

**show chassis fpc (MX240 Router)**

```

user@host> show chassis fpc

```

| Slot | State  | Temp (C) | CPU Utilization (%) | Memory DRAM (MB) | Utilization (%) |
|------|--------|----------|---------------------|------------------|-----------------|
|      |        |          | Total Interrupt     | Heap             | Buffer          |
| 0    | Empty  |          |                     |                  |                 |
| 1    | Online | 34       | 6 0                 | 1024 18          | 30              |
| 2    | Online | 33       | 9 0                 | 1024 24          | 30              |

**show chassis fpc (EX Series Switch)**

```

user@host> show chassis fpc

```

| Slot | State  | Temp (C) | CPU Utilization (%) | Memory DRAM (MB) | Utilization (%) |
|------|--------|----------|---------------------|------------------|-----------------|
|      |        |          | Total Interrupt     | Heap             | Buffer          |
| 0    | Empty  |          |                     |                  |                 |
| 1    | Online | 41       | 13 0                | 2048 19          | 14              |
| 2    | Online | 42       | 12 0                | 2048 19          | 14              |

**show chassis fpc detail (EX9200 Switch)**

```

user@switch> show chassis fpc detail
Slot 2 information:
 State Online
 Temperature 37
 Total CPU DRAM 2048 MB
 Total RLDRAM 331 MB
 Total DDR DRAM 1536 MB
 Start time: 2014-03-12 15:35:28 UTC
 Uptime: 1 hour, 4 minutes, 29 seconds
 Max Power Consumption 239 Watts
Slot 3 information:
 State Online
 Temperature 39
 Total CPU DRAM 2048 MB
 Total RLDRAM 1036 MB
 Total DDR DRAM 6656 MB
 Start time: 2014-03-12 15:00:18 UTC
 Uptime: 1 hour, 39 minutes, 39 seconds
 Max Power Consumption 520 Watts

```

**show chassis fpc (MX480 Router)**

```

user@host> show chassis fpc

```

| Slot | State  | Temp (C) | CPU Utilization (%) | Memory DRAM (MB) | Utilization (%) |
|------|--------|----------|---------------------|------------------|-----------------|
|      |        |          | Total Interrupt     | Heap             | Buffer          |
| 0    | Empty  |          |                     |                  |                 |
| 1    | Online | 36       | 9 0                 | 1024 17          | 57              |
| 2    | Empty  |          |                     |                  |                 |
| 3    | Empty  |          |                     |                  |                 |
| 4    | Empty  |          |                     |                  |                 |
| 5    | Empty  |          |                     |                  |                 |

**show chassis fpc (MX480 Router with 100-Gigabit Ethernet CFP)**

```

user@host> show chassis fpc

```

| Slot | State  | Temp (C) | CPU Utilization (%) | Memory Interrupt | Utilization (%) | DRAM (MB) | Heap | Buffer |
|------|--------|----------|---------------------|------------------|-----------------|-----------|------|--------|
| 0    | Online | 33       | 4                   | 0                |                 | 2048      | 10   | 13     |
| 1    | Online | 36       | 7                   | 0                |                 | 2048      | 16   | 13     |
| 2    | Online | 29       | 6                   | 0                |                 | 1024      | 27   | 29     |
| 3    | Online | 33       | 0                   | 0                |                 | 0         | 0    | 0      |
| 4    | Online | 36       | 7                   | 0                |                 | 2048      | 19   | 13     |
| 5    | Online | 34       | 31                  | 11               |                 | 2048      | 14   | 13     |

**show chassis fpc pic-status (MX480 Router with 100-Gigabit Ethernet CFP)**

```

user@host> show chassis fpc pic-status

```

| Slot   | PIC   | State  | Module            |
|--------|-------|--------|-------------------|
| Slot 1 |       | Online | MPC Type 3        |
|        | PIC 2 | Online | 1X100GE CFP       |
| Slot 2 |       | Online | DPCE 40x 1GE R EQ |
|        | PIC 0 | Online | 10x 1GE(LAN) EQ   |
|        | PIC 1 | Online | 10x 1GE(LAN) EQ   |
|        | PIC 2 | Online | 10x 1GE(LAN) EQ   |
|        | PIC 3 | Online | 10x 1GE(LAN) EQ   |
| Slot 3 |       | Online | MPC Type 3        |
|        | PIC 0 | Online | 1X100GE CFP       |
|        | PIC 2 | Online | 1X100GE CFP       |
| Slot 4 |       | Online | MPC Type 3        |
|        | PIC 0 | Online | 1X100GE CFP       |
|        | PIC 2 | Online | 1X100GE CFP       |
| Slot 5 |       | Online | MPC Type 2 3D EQ  |
|        | PIC 0 | Online | 2x 10GE XFP       |
|        | PIC 1 | Online | 2x 10GE XFP       |
|        | PIC 2 | Online | 10x 1GE(LAN) SFP  |
|        | PIC 3 | Online | 10x 1GE(LAN) SFP  |

**show chassis fpc pic-status (EX Series Switch)**

```

user@host> show chassis fpc pic-status

```

| Slot   | PIC   | State  | Module            |
|--------|-------|--------|-------------------|
| Slot 1 |       | Online | EX9200 32x10G SFP |
|        | PIC 0 | Online | 8X10GE SFPP       |
|        | PIC 1 | Online | 8X10GE SFPP       |
|        | PIC 2 | Online | 8X10GE SFPP       |
|        | PIC 3 | Online | 8X10GE SFPP       |
| Slot 2 |       | Online | EX9200 32x10G SFP |
|        | PIC 0 | Online | 8X10GE SFPP       |
|        | PIC 1 | Online | 8X10GE SFPP       |
|        | PIC 2 | Online | 8X10GE SFPP       |
|        | PIC 3 | Online | 8X10GE SFPP       |

**show chassis fpc (MX480 Router with MPC4E)**

```

user@host> show chassis fpc

```

| Slot | State  | Temp (C) | CPU Utilization (%) | Memory Interrupt | Utilization (%) | DRAM (MB) | Heap | Buffer |
|------|--------|----------|---------------------|------------------|-----------------|-----------|------|--------|
| 0    | Empty  |          |                     |                  |                 |           |      |        |
| 1    | Empty  |          |                     |                  |                 |           |      |        |
| 2    | Online |          | 38                  | 7                | 0               | 2048      | 19   | 14     |
| 3    | Online |          | 39                  | 8                | 0               | 2048      | 18   | 14     |
| 4    | Online |          | 39                  | 7                | 0               | 2048      | 17   | 14     |
| 5    | Empty  |          |                     |                  |                 |           |      |        |

**show chassis fpc detail (MX480 Router with MPC4E)**

```

user@host> show chassis fpc detail
Slot 2 information:
 State Online
 Temperature 38
 Total CPU DRAM 2048 MB
 Total RLDRAM 1036 MB
 Total DDR DRAM 11264 MB
 Start time: 2013-02-18 05:06:57 PST
 Uptime: 17 hours, 41 minutes, 9 seconds
 Max Power Consumption 610 Watts
Slot 3 information:
 State Online
 Temperature 38
 Total CPU DRAM 2048 MB
 Total RLDRAM 1036 MB
 Total DDR DRAM 11264 MB
 Start time: 2013-02-18 05:07:00 PST
 Uptime: 17 hours, 41 minutes, 6 seconds
 Max Power Consumption 610 Watts
Slot 4 information:
 State Diagnostics
 Temperature 37
 Total CPU DRAM 0 MB
 Total RLDRAM 0 MB
 Total DDR DRAM 0 MB
 Max Power Consumption 520 Watts

```

**show chassis fpc (MX480 Router with MPC4E)**

```

user@host> show chassis fpc

```

| Slot | State  | Temp (C) | CPU Utilization (%) | Memory Utilization (%) | DRAM (MB) | Heap | Buffer |
|------|--------|----------|---------------------|------------------------|-----------|------|--------|
| 0    | Empty  |          |                     |                        |           |      |        |
| 1    | Empty  |          |                     |                        |           |      |        |
| 2    | Online | 38       | 7                   | 0                      | 2048      | 19   | 14     |
| 3    | Online | 39       | 8                   | 0                      | 2048      | 18   | 14     |
| 4    | Online | 39       | 7                   | 0                      | 2048      | 17   | 14     |
| 5    | Empty  |          |                     |                        |           |      |        |

**show chassis fpc detail (MX480 Router with MPC4E)**

```

user@host> show chassis fpc detail
Slot 2 information:
 State Online
 Temperature 38
 Total CPU DRAM 2048 MB
 Total RLDRAM 1036 MB
 Total DDR DRAM 11264 MB
 Start time: 2013-02-18 05:06:57 PST
 Uptime: 17 hours, 41 minutes, 9 seconds
 Max Power Consumption 610 Watts
Slot 3 information:
 State Online
 Temperature 38
 Total CPU DRAM 2048 MB
 Total RLDRAM 1036 MB
 Total DDR DRAM 11264 MB
 Start time: 2013-02-18 05:07:00 PST
 Uptime: 17 hours, 41 minutes, 6 seconds

```

```

Max Power Consumption 610 Watts
Slot 4 information:
State Diagnostics
Temperature 37
Total CPU DRAM 0 MB
Total RLD RAM 0 MB
Total DDR DRAM 0 MB
Max Power Consumption 520 Watts

```

#### show chassis fpc (MX960 Router)

```

user@host> show chassis fpc

```

| Slot | State  | Temp (C) | Total | CPU Utilization (%)<br>Interrupt | Memory<br>DRAM (MB) | Heap | Utilization (%)<br>Buffer |
|------|--------|----------|-------|----------------------------------|---------------------|------|---------------------------|
| 0    | Empty  |          |       |                                  |                     |      |                           |
| 1    | Empty  |          |       |                                  |                     |      |                           |
| 2    | Empty  |          |       |                                  |                     |      |                           |
| 3    | Online | 25       | 19    | 0                                | 1024                | 15   | 57                        |
| 4    | Empty  |          |       |                                  |                     |      |                           |
| 5    | Online | 26       | 27    | 0                                | 1024                | 15   | 57                        |
| 6    | Empty  |          |       |                                  |                     |      |                           |
| 7    | Empty  |          |       |                                  |                     |      |                           |
| 8    | Empty  |          |       |                                  |                     |      |                           |
| 9    | Empty  |          |       |                                  |                     |      |                           |
| 10   | Empty  |          |       |                                  |                     |      |                           |
| 11   | Empty  |          |       |                                  |                     |      |                           |

#### show chassis fpc (MX960 Router with MPC5EQ)

```

user@host> show chassis fpc

```

| Slot | State  | Temp (C) | Total | CPU Utilization (%)<br>Interrupt | Memory<br>DRAM (MB) | Heap | Utilization (%)<br>Buffer |
|------|--------|----------|-------|----------------------------------|---------------------|------|---------------------------|
| 0    | Online | 38       | 16    | 0                                | 3584                | 7    | 13                        |
| 1    | Online | 31       | 15    | 0                                | 2048                | 17   | 13                        |
| 2    | Empty  |          |       |                                  |                     |      |                           |
| 3    | Online | 31       | 14    | 0                                | 2048                | 20   | 13                        |
| 4    | Online | 34       | 16    | 0                                | 3584                | 7    | 13                        |
| 5    | Online | 34       | 16    | 0                                | 3584                | 7    | 13                        |
| 6    | Empty  |          |       |                                  |                     |      |                           |
| 7    | Online | 32       | 9     | 0                                | 2048                | 18   | 14                        |
| 8    | Online | 36       | 19    | 0                                | 3584                | 7    | 13                        |
| 9    | Online | 31       | 9     | 0                                | 2048                | 13   | 13                        |
| 10   | Online | 35       | 14    | 0                                | 3584                | 7    | 13                        |
| 11   | Online | 33       | 11    | 0                                | 2048                | 18   | 14                        |

#### show chassis fpc detail (MX960 Router with MPC5EQ)

```

user@host> show chassis fpc detail
Slot 0 information:
State Online
Temperature 38
Total CPU DRAM 3584 MB
Total XR2 291 MB
Total DDR DRAM 24960 MB
Start time: 2014-04-22 10:01:46 PDT
Uptime: 1 hour, 23 minutes, 40 seconds
Max Power Consumption 607 Watts
Slot 1 information:
State Online
Temperature 31
Total CPU DRAM 2048 MB
Total RLD RAM 1036 MB

```

```

Total DDR DRAM 6656 MB
Start time: 2014-04-22 10:01:50 PDT
Uptime: 1 hour, 23 minutes, 36 seconds
Max Power Consumption 520 Watts
Slot 3 information:
State Online
Temperature 31
Total CPU DRAM 2048 MB
Total RLD RAM 1324 MB
Total DDR DRAM 5120 MB
Start time: 2014-04-22 10:01:50 PDT
Uptime: 1 hour, 23 minutes, 36 seconds
Max Power Consumption 440 Watts
Slot 4 information:
State Online
Temperature 34
Total CPU DRAM 3584 MB
Total XR2 291 MB
Total DDR DRAM 24960 MB
Start time: 2014-04-22 10:01:54 PDT
Uptime: 1 hour, 23 minutes, 32 seconds
Max Power Consumption 607 Watts
Slot 5 information:
State Online
Temperature 34
Total CPU DRAM 3584 MB
Total XR2 291 MB
Total DDR DRAM 24960 MB
Start time: 2014-04-22 10:01:56 PDT
Uptime: 1 hour, 23 minutes, 30 seconds
Max Power Consumption 607 Watts
Slot 7 information:
State Online
Temperature 32
Total CPU DRAM 2048 MB
Total RLD RAM 1036 MB
Total DDR DRAM 11264 MB
Start time: 2014-04-22 10:02:02 PDT
Uptime: 1 hour, 23 minutes, 24 seconds
Max Power Consumption 608 Watts
Slot 8 information:
State Online
Temperature 36
Total CPU DRAM 3584 MB
Total XR2 291 MB
Total DDR DRAM 24960 MB
Start time: 2014-04-22 10:02:07 PDT
Uptime: 1 hour, 23 minutes, 19 seconds
Max Power Consumption 607 Watts
Slot 9 information:
State Online
Temperature 31
Total CPU DRAM 2048 MB
Total RLD RAM 734 MB
Total DDR DRAM 3108 MB
Start time: 2014-04-22 10:02:05 PDT
Uptime: 1 hour, 23 minutes, 21 seconds
Max Power Consumption 368 Watts
Slot 10 information:
State Online
Temperature 35

```



```

Total CPU DRAM 3584 MB
Total XR2 291 MB
Total DDR DRAM 24960 MB
Start time: 2014-04-22 10:02:11 PDT
Uptime: 1 hour, 23 minutes, 15 seconds
Max Power Consumption 607 Watts
Slot 11 information:
State Online
Temperature 33
Total CPU DRAM 2048 MB
Total RLDRAM 1036 MB
Total DDR DRAM 11264 MB
Start time: 2014-04-22 10:02:16 PDT
Uptime: 1 hour, 23 minutes, 10 seconds
Max Power Consumption 608 Watts

```

### show chassis fpc pic-status(MX960 Router with MPC5EQ)

```

user@host> show chassis fpc pic-status
Slot 0 Online MPC5E 3D Q 2CGE+4XGE
PIC 0 Online 2X10GE SFPP OTN
PIC 1 Online 1X100GE CFP2 OTN
PIC 2 Online 2X10GE SFPP OTN
PIC 3 Online 1X100GE CFP2 OTN
Slot 1 Online MPCE Type 3 3D
PIC 0 Online 10X10GE SFPP
PIC 2 Online 1X100GE CXP
Slot 3 Online MPC 3D 16x 10GE
PIC 0 Online 4x 10GE(LAN) SFP+
PIC 1 Online 4x 10GE(LAN) SFP+
PIC 2 Online 4x 10GE(LAN) SFP+
PIC 3 Online 4x 10GE(LAN) SFP+
Slot 4 Online MPC5E 3D Q 2CGE+4XGE
PIC 0 Online 2X10GE SFPP OTN
PIC 1 Online 1X100GE CFP2 OTN
PIC 2 Online 2X10GE SFPP OTN
PIC 3 Online 1X100GE CFP2 OTN
Slot 5 Online MPC5E 3D Q 2CGE+4XGE
PIC 0 Online 2X10GE SFPP OTN
PIC 1 Online 1X100GE CFP2 OTN
PIC 2 Online 2X10GE SFPP OTN
PIC 3 Online 1X100GE CFP2 OTN
Slot 7 Online MPC4E 3D 2CGE+8XGE
PIC 0 Online 4x10GE SFPP
PIC 1 Online 1X100GE CFP
PIC 2 Online 4x10GE SFPP
PIC 3 Online 1X100GE CFP
Slot 8 Online MPC5E 3D Q 24XGE+6XLGE
PIC 0 Offline 12X10GE SFPP OTN
PIC 1 Offline 12X10GE SFPP OTN
PIC 2 Online 3X40GE QSFPP
PIC 3 Online 3X40GE QSFPP
Slot 9 Online MPCE Type 2 3D P
PIC 0 Online 2x 10GE XFP
PIC 1 Online 2x 10GE XFP
Slot 10 Online MPC5E 3D Q 24XGE+6XLGE
PIC 0 Online 12X10GE SFPP
PIC 1 Online 12X10GE SFPP
PIC 2 Offline 3X40GE QSFPP
PIC 3 Offline 3X40GE QSFPP

```

```

Slot 11 Online MPC4E 3D 2CGE+8XGE
PIC 0 Online 4x10GE SFPP
PIC 1 Online 1X100GE CFP
PIC 2 Online 4x10GE SFPP
PIC 3 Online 1X100GE CFP

```

#### show chassis fpc (MX240, MX480, MX960 Routers with Application Services Modular Line Card)

```

user@host> show chassis fpc 1
 Temp CPU Utilization (%) Memory Utilization (%)
Slot State (C) Total Interrupt DRAM (MB) Heap Buffer
 1 Online 34 5 0 3072 5 13

```

#### show chassis fpc (MX240, MX480, MX960 with Application Services Modular Line Card)

```

user@host> show chassis fpc 1 detail
Slot 1 information:
State Online
Temperature 34
Total CPU DRAM 3072 MB
Total RLDRAM 259 MB
Total DDR DRAM 4864 MB
Start time: 2012-06-19 10:51:43 PDT
Uptime: 16 minutes, 48 seconds
Max Power Consumption 550 Watts

```

#### show chassis fpc (MX2010 Routers)

```

user@host> show chassis fpc
 Temp CPU Utilization (%) Memory Utilization (%)
Slot State (C) Total Interrupt DRAM (MB) Heap Buffer
 0 Online 34 9 0 2048 18 13
 1 Online 32 9 0 2048 15 13
 2 Empty
 3 Empty
 4 Empty
 5 Empty
 6 Empty
 7 Empty
 8 Online 31 13 0 2048 11 13
 9 Online 33 10 0 2048 18 13

```

#### show chassis fpc (MX2020 Routers)

```

user@host> show chassis fpc
 Temp CPU Utilization (%) Memory Utilization (%)
Slot State (C) Total Interrupt DRAM (MB) Heap Buffer
 0 Online 10 12 0 2048 18 13
 1 Online 8 9 0 2048 18 13
 2 Online 7 9 0 2048 18 13
 3 Online 8 10 0 2048 18 13
 4 Online 9 10 0 2048 18 13
 5 Online 8 9 0 2048 18 13
 6 Online 8 10 0 2048 18 13
 7 Online 9 9 0 2048 18 13
 8 Online 9 10 0 2048 18 13
 9 Online 10 9 0 2048 18 13
 10 Online 16 8 0 2048 18 13
 11 Online 11 10 0 2048 18 13
 12 Online 10 10 0 2048 18 13
 13 Online 11 9 0 2048 18 13

```

|    |        |    |    |   |      |    |    |
|----|--------|----|----|---|------|----|----|
| 14 | Online | 12 | 10 | 0 | 2048 | 18 | 13 |
| 15 | Online | 13 | 9  | 0 | 2048 | 18 | 13 |
| 16 | Online | 13 | 9  | 0 | 2048 | 18 | 13 |
| 17 | Online | 12 | 9  | 0 | 2048 | 18 | 13 |
| 18 | Online | 12 | 8  | 0 | 2048 | 18 | 13 |
| 19 | Online | 14 | 10 | 0 | 2048 | 18 | 13 |

#### show chassis fpc (MX2020 Router with MPC4E)

```

user@host> show chassis fpc

```

| Slot | State  | Temp (C) | CPU Utilization (%) | Memory Interrupt | Utilization (%) | DRAM (MB) | Heap | Buffer |
|------|--------|----------|---------------------|------------------|-----------------|-----------|------|--------|
| 0    | Online | 33       | 12                  |                  | 2               | 2048      | 11   | 13     |
| 1    | Empty  |          |                     |                  |                 |           |      |        |
| 2    | Empty  |          |                     |                  |                 |           |      |        |
| 3    | Empty  |          |                     |                  |                 |           |      |        |
| 4    | Empty  |          |                     |                  |                 |           |      |        |
| 5    | Empty  |          |                     |                  |                 |           |      |        |
| 6    | Empty  |          |                     |                  |                 |           |      |        |
| 7    | Empty  |          |                     |                  |                 |           |      |        |
| 8    | Empty  |          |                     |                  |                 |           |      |        |
| 9    | Online | 31       | 10                  | 0                |                 | 2048      | 11   | 13     |
| 10   | Online | 32       | 7                   | 0                |                 | 2048      | 14   | 13     |
| 11   | Empty  |          |                     |                  |                 |           |      |        |
| 12   | Empty  |          |                     |                  |                 |           |      |        |
| 13   | Empty  |          |                     |                  |                 |           |      |        |
| 14   | Online | 28       | 12                  | 0                |                 | 2048      | 15   | 14     |
| 15   | Empty  |          |                     |                  |                 |           |      |        |
| 16   | Empty  |          |                     |                  |                 |           |      |        |
| 17   | Empty  |          |                     |                  |                 |           |      |        |
| 18   | Empty  |          |                     |                  |                 |           |      |        |
| 19   | Online | 38       | 8                   | 0                |                 | 2048      | 18   | 13     |

#### show chassis fpc detail (MX2020 Router with MPC4E)

```

user@host> show chassis fpc detail

```

Slot 0 information:

|                       |                                         |
|-----------------------|-----------------------------------------|
| State                 | Online                                  |
| Temperature           | 34                                      |
| Total CPU DRAM        | 2048 MB                                 |
| Total RLD RAM         | 806 MB                                  |
| Total DDR DRAM        | 2632 MB                                 |
| Start time:           | 2013-02-17 08:17:35 PST                 |
| Uptime:               | 1 day, 14 hours, 50 minutes, 39 seconds |
| Max Power Consumption | 368 Watts                               |

Slot 9 information:

|                       |                                         |
|-----------------------|-----------------------------------------|
| State                 | Online                                  |
| Temperature           | 32                                      |
| Total CPU DRAM        | 2048 MB                                 |
| Total RLD RAM         | 806 MB                                  |
| Total DDR DRAM        | 2632 MB                                 |
| Start time:           | 2013-02-17 08:17:43 PST                 |
| Uptime:               | 1 day, 14 hours, 50 minutes, 31 seconds |
| Max Power Consumption | 368 Watts                               |

Slot 10 information:

|                |                         |
|----------------|-------------------------|
| State          | Online                  |
| Temperature    | 37                      |
| Total CPU DRAM | 2048 MB                 |
| Total RLD RAM  | 1036 MB                 |
| Total DDR DRAM | 6656 MB                 |
| Start time:    | 2013-02-17 08:17:54 PST |

```

Uptime: 1 day, 14 hours, 50 minutes, 20 seconds
Max Power Consumption 520 Watts
Slot 14 information:
 State Online
 Temperature 32
 Total CPU DRAM 2048 MB
 Total RLDRAM 1036 MB
 Total DDR DRAM 11264 MB
 Start time: 2013-02-17 08:18:01 PST
 Uptime: 1 day, 14 hours, 50 minutes, 13 seconds
 Max Power Consumption 610 Watts
Slot 19 information:
 State Online
 Temperature 38
 Total CPU DRAM 2048 MB
 Total RLDRAM 1324 MB
 Total DDR DRAM 5120 MB
 Start time: 2013-02-17 08:18:08 PST
 Uptime: 1 day, 14 hours, 50 minutes, 6 seconds
 Max Power Consumption 440 Watts

```

#### show chassis fpc (MX2020 Router with MPC5EQ and MPC6E)

```

user@host> show chassis fpc

```

| Slot | State  | Temp (C) | CPU Utilization (%) |           | Memory DRAM (MB) | Utilization (%) |        |
|------|--------|----------|---------------------|-----------|------------------|-----------------|--------|
|      |        |          | Total               | Interrupt |                  | Heap            | Buffer |
| 0    | Online | 31       | 20                  | 0         | 3584             | 7               | 13     |
| 1    | Online | 28       | 19                  | 0         | 2048             | 17              | 13     |
| 2    | Online | 27       | 10                  | 0         | 2048             | 18              | 14     |
| 3    | Online | 26       | 10                  | 0         | 2048             | 13              | 13     |
| 4    | Online | 29       | 19                  | 0         | 3584             | 7               | 13     |
| 5    | Online | 28       | 68                  | 0         | 2048             | 20              | 13     |
| 6    | Empty  |          |                     |           |                  |                 |        |
| 7    | Empty  |          |                     |           |                  |                 |        |
| 8    | Empty  |          |                     |           |                  |                 |        |
| 9    | Online | 36       | 19                  | 0         | 3584             | 10              | 13     |
| 10   | Online | 37       | 26                  | 0         | 3584             | 10              | 13     |
| 11   | Empty  |          |                     |           |                  |                 |        |
| 12   | Empty  |          |                     |           |                  |                 |        |
| 13   | Empty  |          |                     |           |                  |                 |        |
| 14   | Empty  |          |                     |           |                  |                 |        |
| 15   | Empty  |          |                     |           |                  |                 |        |
| 16   | Empty  |          |                     |           |                  |                 |        |
| 17   | Online | 28       | 43                  | 0         | 3584             | 10              | 13     |
| 18   | Online | 29       | 19                  | 0         | 3584             | 7               | 13     |
| 19   | Online | 31       | 19                  | 0         | 3584             | 7               | 13     |

#### show chassis fpc detail (MX2020 Router with MPCEQ and MPC6E)

```

user@host> show chassis fpc detail
Slot 0 information:
 State Online
 Temperature 31
 Total CPU DRAM 3584 MB
 Total XR2 291 MB
 Total DDR DRAM 24960 MB
 Start time: 2014-04-22 23:33:19 PDT
 Uptime: 6 minutes, 24 seconds
 Max Power Consumption 607 Watts
Slot 1 information:

```

```

State Online
Temperature 28
Total CPU DRAM 2048 MB
Total RLDRAM 1036 MB
Total DDR DRAM 6656 MB
Start time: 2014-04-22 23:33:24 PDT
Uptime: 6 minutes, 19 seconds
Max Power Consumption 520 Watts
Slot 2 information:
State Online
Temperature 27
Total CPU DRAM 2048 MB
Total RLDRAM 1036 MB
Total DDR DRAM 11264 MB
Start time: 2014-04-22 23:33:34 PDT
Uptime: 6 minutes, 9 seconds
Max Power Consumption 608 Watts
Slot 3 information:
State Online
Temperature 26
Total CPU DRAM 2048 MB
Total RLDRAM 734 MB
Total DDR DRAM 3108 MB
Start time: 2014-04-22 23:33:39 PDT
Uptime: 6 minutes, 4 seconds
Max Power Consumption 368 Watts
Slot 4 information:
State Online
Temperature 29
Total CPU DRAM 3584 MB
Total XR2 291 MB
Total DDR DRAM 24960 MB
Start time: 2014-04-22 23:33:51 PDT
Uptime: 5 minutes, 52 seconds
Max Power Consumption 607 Watts
Slot 5 information:
State Online
Temperature 28
Total CPU DRAM 2048 MB
Total RLDRAM 1324 MB
Total DDR DRAM 5120 MB
Start time: 2014-04-22 23:33:57 PDT
Uptime: 5 minutes, 46 seconds
Max Power Consumption 440 Watts
Slot 9 information:
State Online
Temperature 25
Total CPU DRAM 3584 MB
Total XR2 518 MB
Total DDR DRAM 49920 MB
Start time: 2014-04-22 23:31:20 PDT
Uptime: 8 minutes, 23 seconds
Max Power Consumption 1130 Watts
Slot 10 information:
State Online
Temperature 32
Total CPU DRAM 3584 MB
Total XR2 518 MB
Total DDR DRAM 49920 MB
Start time: 2014-04-22 23:31:25 PDT
Uptime: 8 minutes, 18 seconds

```

```

Max Power Consumption 1130 Watts
Slot 17 information:
 State Online
 Temperature 25
 Total CPU DRAM 3584 MB
 Total XR2 518 MB
 Total DDR DRAM 49920 MB
 Start time: 2014-04-22 23:31:29 PDT
 Uptime: 8 minutes, 14 seconds
 Max Power Consumption 1130 Watts
Slot 18 information:
 State Online
 Temperature 29
 Total CPU DRAM 3584 MB
 Total XR2 291 MB
 Total DDR DRAM 24960 MB
 Start time: 2014-04-22 23:34:11 PDT
 Uptime: 5 minutes, 32 seconds
 Max Power Consumption 607 Watts
Slot 19 information:
 State Online
 Temperature 32
 Total CPU DRAM 3584 MB
 Total XR2 291 MB
 Total DDR DRAM 24960 MB
 Start time: 2014-04-22 23:34:20 PDT
 Uptime: 5 minutes, 23 seconds
 Max Power Consumption 607 Watts

```

#### show chassis fpc pic-status (MX2020 Router with MPC5EQ and MPC6E)

```

user@host> show chassis fpc pic-status
Slot 0 Online MPC5E 3D Q 24XGE+6XLGE
 PIC 0 Online 12X10GE SFPP OTN
 PIC 1 Online 12X10GE SFPP OTN
 PIC 2 Offline 3X40GE QSFP
 PIC 3 Offline 3X40GE QSFP
Slot 1 Online MPCE Type 3 3D
 PIC 0 Online 10X10GE SFPP
 PIC 2 Online 1X100GE CXP
Slot 2 Online MPC4E 3D 2CGE+8XGE
 PIC 0 Online 4x10GE SFPP
 PIC 1 Online 1X100GE CFP
 PIC 2 Online 4x10GE SFPP
 PIC 3 Online 1X100GE CFP
Slot 3 Online MPCE Type 2 3D P
 PIC 0 Online 2x 10GE XFP
 PIC 1 Online 2x 10GE XFP
Slot 4 Online MPC5E 3D Q 2CGE+4XGE
 PIC 0 Online 2X10GE SFPP OTN
 PIC 1 Online 1X100GE CFP2 OTN
 PIC 2 Online 2X10GE SFPP OTN
 PIC 3 Online 1X100GE CFP2 OTN
Slot 5 Online MPC 3D 16x 10GE
 PIC 0 Online 4x 10GE(LAN) SFP+
 PIC 1 Online 4x 10GE(LAN) SFP+
 PIC 2 Online 4x 10GE(LAN) SFP+
 PIC 3 Online 4x 10GE(LAN) SFP+
Slot 9 Online MPC6E 3D
 PIC 0 Online 2X100GE CFP2 OTN
 PIC 1 Online 2X100GE CFP2 OTN

```

```

Slot 10 Online MPC6E 3D
PIC 0 Online 24X10GE SFPP OTN
PIC 1 Online 4X100GE CXP
Slot 17 Online MPC6E 3D
PIC 0 Online 24X10GE SFPP
PIC 1 Online 4X100GE CXP
Slot 18 Online MPC5E 3D Q 24XGE+6XLGE
PIC 0 Offline 12X10GE SFPP OTN
PIC 1 Offline 12X10GE SFPP OTN
PIC 2 Online 3X40GE QSFPP
PIC 3 Online 3X40GE QSFPP
Slot 19 Online MPC5E 3D Q 24XGE+6XLGE
PIC 0 Online 12X10GE SFPP OTN
PIC 1 Offline 12X10GE SFPP OTN
PIC 2 Offline 3X40GE QSFPP
PIC 3 Online 3X40GE QSFPP

```

### show chassis fpc detail (MX Series Routers)

```

user@host> show chassis fpc detail 2
Slot 0 information:
State Online
Temperature 36 degrees C / 96 degrees F
Total CPU DRAM 1024 MB
Total RDRAM 256 MB
Total DDR DRAM 4096 MB
Start time: 2009-08-11 21:20:30 PDT
Uptime: 2 hours, 8 minutes, 50 seconds
Max Power Consumption 335 Watts

```

### show chassis fpc detail (EX Series Switches)

```

user@host> show chassis fpc detail 2
Slot 1 information:
State Online
Temperature 41
Total CPU DRAM 2048 MB
Total RDRAM 1036 MB
Total DDR DRAM 11264 MB
Start time: 2013-04-02 00:04:52 PDT
Uptime: 7 days, 9 hours, 47 minutes, 46 seconds
Max Power Consumption 610 Watts
Slot 2 information:
State Online
Temperature 41
Total CPU DRAM 2048 MB
Total RDRAM 1036 MB
Total DDR DRAM 11264 MB
Start time: 2013-04-02 00:04:56 PDT
Uptime: 7 days, 9 hours, 47 minutes, 42 seconds
Max Power Consumption 610 Watts

```

### show chassis fpc (Hardware Not Supported)

```

user@host> show chassis fpc
show chassis fpc

```

| Slot | State   | Temp (C) | CPU Utilization (%)        | Interrupt | Memory DRAM (MB) | Utilization (%) | Heap | Buffer |
|------|---------|----------|----------------------------|-----------|------------------|-----------------|------|--------|
| 0    | Online  | -----    | CPU less FPC               | -----     |                  |                 |      |        |
| 1    | Present | -----    | Hardware Not In Right Slot | -----     |                  |                 |      |        |
| 2    | Online  | 0        | 0                          | 0         | 0                | 0               | 0    | 0      |
| 3    | Present | -----    | Hardware Not Supported     | -----     |                  |                 |      |        |

```

4 Empty
5 Empty
6 Online 0 0 0 0 0

```

### show chassis fpc detail (Hardware Not Supported)

```

user@host> show chassis fpc detail
Slot 0 information:
 State Online
 Total CPU DRAM ---- CPU less FPC ----
 Start time 2006-07-07 03:21:00 UTC
 Uptime 27 minutes, 51 seconds
Slot 1 information:
 State Present
 Reason --- Hardware Not In Right Slot ---
Slot 2 information:
 State Online
 Total CPU DRAM 32 MB
 Start time 2006-07-07 03:20:59 UTC
 Uptime 27 minutes, 52 seconds
Slot 3 information:
 State Present
 Reason --- Hardware Not Supported ---
 Total CPU DRAM 0 MB
Slot 6 information:
 State Online
 Total CPU DRAM 32 MB
 Start time 2006-07-07 03:21:01 UTC
 Uptime 27 minutes, 50 seconds

```

### show chassis fpc pic-status

```

user@host> show chassis fpc pic-status
Slot 0 Online
 PIC 1 1x OC-12 ATM, MM
 PIC 2 1x OC-12 ATM, MM
 PIC 3 1x OC-12 ATM, MM
Slot 1 Online
 PIC 0 1x OC-48 SONET, SMIR
Slot 2 Online
 PIC 0 1x OC-192 SONET, SMSR

```

### show chassis fpc pic-status (M Series Routers)

```

user@host> show chassis fpc pic-status
Slot 1 Online FPC Type 1
 PIC 0 Present 2x OC-3 ATM, MM- Hardware Error
 PIC 1 Online 4x OC-3 SONET, SMIR
Slot 2 Online E-FPC Type 2
 PIC 0 Online 4x G/E, 1000 BASE-SX
 PIC 1 Online 2x G/E SFP, 1000 BASE
 PIC 3 Online 1x Tunnel
Slot 3 Online E-FPC Type 1
 PIC 0 Online 1x G/E IQ, 1000 BASE
 PIC 2 Online 1x G/E SFP, 1000 BASE
Slot 4 Online E-FPC Type 2
 PIC 0 Online 4x G/E SFP, 1000 BASE
 PIC 1 Online 4x G/E SFP, 1000 BASE
 PIC 2 Online 4x G/E SFP, 1000 BASE
 PIC 3 Online 4x G/E SFP, 1000 BASE

```



```
Slot 5 Online FPC Type 2
...
```

### show chassis fpc pic-status (M120 Router)

```
user@host> show chassis fpc pic-status
Slot 1 Online M120 CFPC 10GE
 PIC 0 Online 1x 10GE(LAN/WAN) XFP
Slot 3 Online M120 FPC Type 2 (proto)
 PIC 0 Online 2x G/E IQ, 1000 BASE
 PIC 1 Online 4x OC-3 SONET, SMIR
 PIC 2 Online 2x G/E IQ, 1000 BASE
 PIC 3 Online 8x 1GE(LAN), IQ2
Slot 4 Online M120 FPC Type 3 (proto)
 PIC 0 Online 10x 1GE(LAN), 1000 BASE
Slot 5 Online M120 FPC Type 1 (proto)
 PIC 0 Present 1x G/E, 1000 BASE-LX- Not Supported
 PIC 1 Online 1x CHOC3 IQ SONET, SMLR
 PIC 2 Online 4x CHDS3 IQ
 PIC 3 Online 1x G/E SFP, 1000 BASE
```

### show chassis fpc pic-status (MX240, MX480, and MX960 Routers with Application Services Modular Line Card)

In the following output **Slot 1** and **Slot 5** are the Application Services Modular Carrier Cards (AS MCC), **PIC 0** is the Application Services Modular Storage Card (AS MSC), and **PIC 2** is the Application Services Modular Processing Card (AS MXC).

```
user@host> show chassis fpc pic-status
Slot 2 Online MPC Type 1 3D Q
 Slot 1 Online AS-MCC
 PIC 0 Online AS-MSC
 PIC 2 Online AS-MXC
Slot 4 Offline MPC 3D 16x 10GE
Slot 5 Offline AS-MCC
```

### show chassis fpc lcc (TX Matrix Router)

```
user@host> show chassis fpc lcc 0
lcc0-re0:

Slot State Temp CPU Utilization (%) Memory Utilization (%)
 (C) Total Interrupt DRAM (MB) Heap Buffer
0 Empty
1 Online 27 2 0 256 8 44
2 Online 27 3 0 256 15 44
3 Empty
4 Empty
5 Empty
6 Empty
7 Empty
```

### show chassis fpc pic-status (TX Matrix Router)

```
user@host> show chassis fpc pic-status
lcc0-re0:

Slot 0 Online FPC Type 3
 PIC 0 Online 1x OC-192 SM SR1
 PIC 1 Online 1x OC-192 SM SR2
 PIC 2 Online 1x OC-192 SM SR1
 PIC 3 Online 1x Tunnel
```

```

Slot 1 Online FPC Type 2
PIC 0 Online 1x OC-48 SONET, SMSR
PIC 1 Online 1x OC-48 SONET, SMSR

```

```
lcc1-re0:
```

```
lcc2-re0:
```

```

Slot 1 Online FPC Type 3
PIC 0 Online 1x OC-192 SM SR1
Slot 5 Online FPC Type 2
PIC 0 Online 1x OC-48 SONET, SMSR
PIC 1 Online 2x G/E, 1000 BASE-LX
PIC 2 Online 2x G/E, 1000 BASE-LX
PIC 3 Online 1x OC-48 SONET, SMSR

```

```
lcc3-re0:
```

#### show chassis fpc pic-status lcc (TX Matrix Router)

```

user@host> show chassis fpc pic-status lcc 0
lcc0-re0:

```

```

Slot 0 Online FPC Type 3
PIC 0 Online 1x OC-192 SM SR2
Slot 1 Online FPC Type 2
PIC 0 Online 2x OC-12 ATM2 IQ, MM
PIC 1 Online 1x OC-48 SONET, SMSR
PIC 2 Online 1x OC-48 SONET, SMSR
PIC 3 Online 4x G/E, 1000 BASE-SX

```

#### show chassis fpc (TX Matrix Plus Router)

```

user@host> show chassis fpc
lcc0-re0:

```

| Slot | State  | Temp<br>(C) | CPU Utilization (%) |           | Memory<br>DRAM (MB) | Utilization (%) |        |
|------|--------|-------------|---------------------|-----------|---------------------|-----------------|--------|
|      |        |             | Total               | Interrupt |                     | Heap            | Buffer |
| 0    | Empty  |             |                     |           |                     |                 |        |
| 1    | Online | 38          | 4                   | 0         | 2048                | 3               | 24     |
| 2    | Online | 43          | 8                   | 0         | 2048                | 6               | 24     |
| 3    | Empty  |             |                     |           |                     |                 |        |
| 4    | Online | 43          | 6                   | 0         | 2048                | 6               | 24     |
| 5    | Empty  |             |                     |           |                     |                 |        |
| 6    | Online | 42          | 13                  | 0         | 2048                | 6               | 24     |
| 7    | Online | 45          | 7                   | 0         | 2048                | 3               | 24     |

```
lcc2-re0:
```

| Slot | State  | Temp<br>(C) | CPU Utilization (%) |           | Memory<br>DRAM (MB) | Utilization (%) |        |
|------|--------|-------------|---------------------|-----------|---------------------|-----------------|--------|
|      |        |             | Total               | Interrupt |                     | Heap            | Buffer |
| 0    | Online | 42          | 10                  | 0         | 2048                | 6               | 24     |
| 1    | Empty  |             |                     |           |                     |                 |        |
| 2    | Online | 42          | 11                  | 0         | 2048                | 6               | 24     |
| 3    | Online | 40          | 5                   | 0         | 2048                | 3               | 24     |
| 4    | Online | 33          | 26                  | 0         | 1024                | 8               | 49     |
| 5    | Empty  |             |                     |           |                     |                 |        |
| 6    | Online | 43          | 8                   | 0         | 2048                | 6               | 24     |
| 7    | Online | 46          | 6                   | 0         | 2048                | 3               | 24     |

lcc3-re0:

| Slot | State  | Temp<br>(C) | CPU<br>Total | Utilization (%)<br>Interrupt | Memory<br>DRAM (MB) | Utilization (%)<br>Heap | Utilization (%)<br>Buffer |
|------|--------|-------------|--------------|------------------------------|---------------------|-------------------------|---------------------------|
| 0    | Empty  |             |              |                              |                     |                         |                           |
| 1    | Empty  |             |              |                              |                     |                         |                           |
| 2    | Online | 39          | 30           | 0                            | 2048                | 7                       | 24                        |
| 3    | Empty  |             |              |                              |                     |                         |                           |
| 4    | Online | 41          | 8            | 0                            | 2048                | 6                       | 24                        |
| 5    | Online | 41          | 12           | 0                            | 2048                | 6                       | 24                        |
| 6    | Online | 40          | 8            | 0                            | 2048                | 6                       | 24                        |
| 7    | Online | 42          | 4            | 0                            | 2048                | 3                       | 24                        |

**show chassis fpc lcc (TX Matrix Plus Router)**

user@host&gt; show chassis fpc lcc 0

lcc0-re0:

| Slot | State  | Temp<br>(C) | CPU<br>Total | Utilization (%)<br>Interrupt | Memory<br>DRAM (MB) | Utilization (%)<br>Heap | Utilization (%)<br>Buffer |
|------|--------|-------------|--------------|------------------------------|---------------------|-------------------------|---------------------------|
| 0    | Empty  |             |              |                              |                     |                         |                           |
| 1    | Online | 38          | 4            | 0                            | 2048                | 3                       | 24                        |
| 2    | Online | 43          | 8            | 0                            | 2048                | 6                       | 24                        |
| 3    | Empty  |             |              |                              |                     |                         |                           |
| 4    | Online | 43          | 6            | 0                            | 2048                | 6                       | 24                        |
| 5    | Empty  |             |              |                              |                     |                         |                           |
| 6    | Online | 42          | 14           | 0                            | 2048                | 6                       | 24                        |
| 7    | Online | 45          | 6            | 0                            | 2048                | 3                       | 24                        |

**show chassis fpc detail (TX Matrix Plus Router)**

user@host&gt; show chassis fpc details

lcc0-re0:

Slot 1 information:

```

State Online
Temperature 38 degrees C / 100 degrees F
Total CPU DRAM 2048 MB
Total SRAM 64 MB
Total SDRAM 1280 MB
Start time 2010-10-04 20:06:22 PDT
Uptime 1 hour, 32 minutes, 51 seconds

```

Slot 2 information:

```

State Online
Temperature 43 degrees C / 109 degrees F
Total CPU DRAM 2048 MB
Total SRAM 128 MB
Total SDRAM 2560 MB
Start time 2010-10-04 20:06:37 PDT
Uptime 1 hour, 32 minutes, 36 seconds

```

Slot 4 information:

```

State Online
Temperature 43 degrees C / 109 degrees F
Total CPU DRAM 2048 MB
Total SRAM 128 MB
Total SDRAM 2560 MB
Start time 2010-10-04 20:06:40 PDT
Uptime 1 hour, 32 minutes, 33 seconds

```

Slot 6 information:

```

State Online
Temperature 42 degrees C / 107 degrees F
Total CPU DRAM 2048 MB
Total SRAM 128 MB
Total SDRAM 2560 MB
Start time 2010-10-04 20:06:42 PDT
Uptime 1 hour, 32 minutes, 31 seconds

```

Slot 7 information:

```

State Online
Temperature 45 degrees C / 113 degrees F
Total CPU DRAM 2048 MB
Total SRAM 64 MB
Total SDRAM 1280 MB
Start time 2010-10-04 20:06:43 PDT
Uptime 1 hour, 32 minutes, 30 seconds

```

lcc2-re0:

-----  
Slot 0 information:

```

State Online
Temperature 42 degrees C / 107 degrees F
Total CPU DRAM 2048 MB
Total SRAM 128 MB
Total SDRAM 2560 MB
Start time 2010-10-04 20:06:35 PDT
Uptime 1 hour, 32 minutes, 38 seconds

```

Slot 2 information:

```

State Online
Temperature 42 degrees C / 107 degrees F
Total CPU DRAM 2048 MB
Total SRAM 128 MB
Total SDRAM 2560 MB
Start time 2010-10-04 20:06:37 PDT
Uptime 1 hour, 32 minutes, 36 seconds

```

Slot 3 information:

```

State Online
Temperature 40 degrees C / 104 degrees F
Total CPU DRAM 2048 MB
Total SRAM 64 MB
Total SDRAM 1280 MB
Start time 2010-10-04 20:06:28 PDT
Uptime 1 hour, 32 minutes, 45 seconds

```

Slot 4 information:

```

State Online
Temperature 33 degrees C / 91 degrees F
Total CPU DRAM 1024 MB
Total SRAM 64 MB
Total SDRAM 1280 MB
Start time 2010-10-04 20:08:03 PDT
Uptime 1 hour, 31 minutes, 10 seconds

```

Slot 6 information:

```

State Online
Temperature 43 degrees C / 109 degrees F
Total CPU DRAM 2048 MB
Total SRAM 128 MB
Total SDRAM 2560 MB
Start time 2010-10-04 20:06:44 PDT
Uptime 1 hour, 32 minutes, 29 seconds

```

Slot 7 information:

```

State Online
Temperature 46 degrees C / 114 degrees F

```

```

Total CPU DRAM 2048 MB
Total SRAM 64 MB
Total SDRAM 1280 MB
Start time 2010-10-04 20:06:46 PDT
Uptime 1 hour, 32 minutes, 27 seconds

```

```
lcc3-re0:
```

```

Slot 2 information:
```

```

State Online
Temperature 38 degrees C / 100 degrees F
Total CPU DRAM 2048 MB
Total SRAM 128 MB
Total SDRAM 2560 MB
Start time 2010-10-04 20:17:31 PDT
Uptime 1 hour, 21 minutes, 42 seconds

```

```
Slot 4 information:
```

```

State Online
Temperature 41 degrees C / 105 degrees F
Total CPU DRAM 2048 MB
Total SRAM 128 MB
Total SDRAM 2560 MB
Start time 2010-10-04 20:17:34 PDT
Uptime 1 hour, 21 minutes, 39 seconds

```

```
Slot 5 information:
```

```

State Online
Temperature 41 degrees C / 105 degrees F
Total CPU DRAM 2048 MB
Total SRAM 128 MB
Total SDRAM 2560 MB
Start time 2010-10-04 20:17:36 PDT
Uptime 1 hour, 21 minutes, 37 seconds

```

```
Slot 6 information:
```

```

State Online
Temperature 40 degrees C / 104 degrees F
Total CPU DRAM 2048 MB
Total SRAM 128 MB
Total SDRAM 2560 MB
Start time 2010-10-04 20:17:39 PDT
Uptime 1 hour, 21 minutes, 34 seconds

```

```
Slot 7 information:
```

```

State Online
Temperature 42 degrees C / 107 degrees F
Total CPU DRAM 2048 MB
Total SRAM 64 MB
Total SDRAM 1280 MB
Start time 2010-10-04 20:17:41 PDT
Uptime 1 hour, 21 minutes, 32 seconds

```

### show chassis fpc pic-status (TX Matrix Plus Router)

```
user@host> show chassis fpc pic-status
```

```
lcc0-re0:
```

```

Slot 1 Online FPC Type 2-ES
PIC 0 Online 8x 1GE(LAN), IQ2
Slot 2 Online FPC Type 4-ES
PIC 0 Online 4x 10GE (LAN/WAN) XFP
Slot 4 Online FPC Type 4-ES
PIC 0 Online 4x 10GE (LAN/WAN) XFP

```

```

Slot 6 Online FPC Type 4-ES
 PIC 0 Online 4x 10GE (LAN/WAN) XFP
 PIC 1 Online 4x 10GE (LAN/WAN) XFP
Slot 7 Online FPC Type 3-ES
 PIC 0 Online 10x 1GE(LAN), 1000 BASE
 PIC 2 Online 1x OC-192 SM SR2
 PIC 3 Online 10x 1GE(LAN), 1000 BASE

```

lcc2-re0:

```

Slot 0 Online FPC Type 4-ES
 PIC 0 Online 4x 10GE (LAN/WAN) XFP
Slot 2 Online FPC Type 4-ES
 PIC 0 Online 4x 10GE (LAN/WAN) XFP
 PIC 1 Online 4x 10GE (LAN/WAN) XFP
Slot 3 Online FPC Type 2-ES
 PIC 0 Online 8x 1GE(LAN), IQ2
Slot 4 Online FPC Type 4
 PIC 0 Online 10x10GE(LAN/WAN) SFPP
Slot 6 Online FPC Type 4-ES
 PIC 0 Online 4x OC-192 SONET XFP
Slot 7 Online FPC Type 3-ES
 PIC 0 Online 10x 1GE(LAN), 1000 BASE
 PIC 1 Offline 1x 10GE(LAN/WAN) IQ2E
 PIC 2 Online 1x OC-192 SM SR2
 PIC 3 Online 1x Tunnel

```

lcc3-re0:

```

Slot 2 Online FPC Type 4-ES
 PIC 0 Online 10x10GE(LAN/WAN) SFPP
Slot 4 Online FPC Type 4-ES
 PIC 0 Online 4x OC-192 SONET XFP
Slot 5 Online FPC Type 4-ES
 PIC 0 Online 4x OC-192 SONET XFP
 PIC 1 Online 4x 10GE (LAN/WAN) XFP
Slot 6 Online FPC Type 4-ES
 PIC 1 Online 4x 10GE (LAN/WAN) XFP
Slot 7 Online FPC Type 3-ES
 PIC 0 Online 10x 1GE(LAN), 1000 BASE
 PIC 1 Online 8x 1GE(TYPE3), IQ2E
 PIC 2 Online 4x OC-48 SONET

```

### show chassis fpc (T1600 Router)

```

user@host> show chassis fpc

```

| Slot | State  | Temp<br>(C) | CPU Utilization (%) |           | Memory<br>DRAM (MB) | Utilization (%) |        |
|------|--------|-------------|---------------------|-----------|---------------------|-----------------|--------|
|      |        |             | Total               | Interrupt |                     | Heap            | Buffer |
| 0    | Empty  |             |                     |           |                     |                 |        |
| 1    | Empty  |             |                     |           |                     |                 |        |
| 2    | Online | 49          | 3                   | 0         | 2048                | 3               | 24     |
| 3    | Online | 46          | 6                   | 0         | 2048                | 6               | 24     |
| 4    | Empty  |             |                     |           |                     |                 |        |
| 5    | Online | 46          | 5                   | 0         | 2048                | 3               | 24     |
| 6    | Empty  |             |                     |           |                     |                 |        |
| 7    | Online | 44          | 8                   | 0         | 1024                | 7               | 49     |

### show chassis fpc detail (T1600 Router)

```

user@host> show chassis fpc detail

```

```

show chassis fpc detail
Slot 2 information:
 State Online
 Temperature 49 degrees C / 120 degrees F
 Total CPU DRAM 2048 MB
 Total SRAM 64 MB
 Total SDRAM 1280 MB
 Start time 2010-10-04 21:12:52 PDT
 Uptime 32 minutes, 9 seconds
Slot 3 information:
 State Online
 Temperature 47 degrees C / 116 degrees F
 Total CPU DRAM 2048 MB
 Total SRAM 128 MB
 Total SDRAM 2560 MB
 Start time 2010-10-04 21:13:06 PDT
 Uptime 31 minutes, 55 seconds
Slot 5 information:
 State Online
 Temperature 46 degrees C / 114 degrees F
 Total CPU DRAM 2048 MB
 Total SRAM 64 MB
 Total SDRAM 1280 MB
 Start time 2010-10-04 21:12:56 PDT
 Uptime 32 minutes, 5 seconds
Slot 7 information:
 State Online
 Temperature 44 degrees C / 111 degrees F
 Total CPU DRAM 1024 MB
 Total SRAM 64 MB
 Total SDRAM 1280 MB
 Start time 2010-10-04 21:14:34 PDT
 Uptime 30 minutes, 27 seconds

```

### show chassis fpc <fpc-slot> (EX Series Switch)

```
user@host> show chassis fpc 2
```

| Slot | State  | Temp (C) | CPU Utilization (%) | Memory DRAM (MB) | Utilization (%) |
|------|--------|----------|---------------------|------------------|-----------------|
|      |        |          | Total Interrupt     | Heap             | Buffer          |
| 2    | Online | 40       | 12 0                | 2048 19          | 14              |

### show chassis fpc slot (T1600 Router)

```
user@host> show chassis fpc slot 2
```

| Slot | State  | Temp (C) | CPU Utilization (%) | Memory DRAM (MB) | Utilization (%) |
|------|--------|----------|---------------------|------------------|-----------------|
|      |        |          | Total Interrupt     | Heap             | Buffer          |
| 2    | Online | 49       | 3 0                 | 2048 3           | 24              |

### show chassis fpc pic-status (T1600 Router)

```
user@host> show chassis fpc pic-status
```

```

Slot 2 Online FPC Type 1-ES
PIC 0 Online Load Type 1
PIC 1 Online 4x 1GE(LAN), IQ2E
PIC 3 Online 1x OC-12-3 SFP
Slot 3 Online FPC Type 4-ES
PIC 0 Online 4x 10GE (LAN/WAN) XFP
PIC 1 Online 4x OC-192 SONET XFP

```

```

Slot 5 Online FPC Type 2-ES
PIC 0 Online Load Type 2
PIC 1 Online 8x 1GE(LAN), IQ2E
PIC 2 Online 8x 1GE(LAN), IQ2E
PIC 3 Online 1x OC-48-12-3 SFP
Slot 7 Online FPC Type 4
PIC 0 Online 4x 10GE (LAN/WAN) XFP

```

### show chassis fpc (T4000 Router)

```
user@host> show chassis fpc
```

| Slot | State  | Temp (C) | CPU Utilization (%) | Memory Utilization (%) |
|------|--------|----------|---------------------|------------------------|
|      |        |          | Total Interrupt     | DRAM (MB) Heap Buffer  |
| 0    | Online | 48       | 15 0                | 2816 21 27             |
| 1    | Empty  |          |                     |                        |
| 2    | Empty  |          |                     |                        |
| 3    | Online | 51       | 15 0                | 2816 21 27             |
| 4    | Empty  |          |                     |                        |
| 5    | Online | 39       | 8 0                 | 2048 6 23              |
| 6    | Online | 49       | 15 0                | 2816 21 27             |
| 7    | Empty  |          |                     |                        |

### show chassis fpc detail (T4000 Router)

```
user@host> show chassis fpc detail
```

```
Slot 0 information:
```

```

State Online
Temperature 48 degrees C / 118 degrees F
Total CPU DRAM 2816 MB
Total SRAM 1554 MB
Total SDRAM 10752 MB
Start time 2012-02-09 22:56:25 PST
Uptime 2 hours, 40 minutes, 52 seconds

```

```
Slot 3 information:
```

```

State Online
Temperature 51 degrees C / 123 degrees F
Total CPU DRAM 2816 MB
Total SRAM 1554 MB
Total SDRAM 10752 MB
Start time 2012-02-09 22:56:22 PST
Uptime 2 hours, 40 minutes, 55 seconds

```

```
Slot 5 information:
```

```

State Online
Temperature 39 degrees C / 102 degrees F
Total CPU DRAM 2048 MB
Total SRAM 128 MB
Total SDRAM 2560 MB
Start time 2012-02-09 22:51:27 PST
Uptime 2 hours, 45 minutes, 50 seconds

```

```
Slot 6 information:
```

```

State Online
Temperature 49 degrees C / 120 degrees F
Total CPU DRAM 2816 MB
Total SRAM 1554 MB
Total SDRAM 10752 MB
Start time 2012-02-09 22:56:29 PST
Uptime 2 hours, 40 minutes, 48 seconds

```



**show chassis fpc pic-status (T4000 Router)**

```

user@host> show chassis fpc pic-status
Slot 0 Online FPC Type 5-3D
 PIC 0 Online 12x10GE (LAN/WAN) SFPP
 PIC 1 Online 12x10GE (LAN/WAN) SFPP
Slot 3 Online FPC Type 5-3D
 PIC 0 Online 1x100GE
 PIC 1 Online 12x10GE (LAN/WAN) SFPP
Slot 5 Online FPC Type 4-ES
 PIC 0 Online 100GE
 PIC 1 Online 100GE CFP
Slot 6 Online FPC Type 5-3D
 PIC 0 Online 12x10GE (LAN/WAN) SFPP
 PIC 1 Online 12x10GE (LAN/WAN) SFPP

```

**show chassis fpc (QFX Series and OCX Series)**

```

user@switch> show chassis fpc
Temp CPU Utilization (%) Memory Utilization (%)
Slot State (C) Total Interrupt DRAM (MB) Heap Buffer
0 Online 26 2 0 2820 0 49

```

**show chassis fpc detail (QFX3500 Switches)**

```

user@switch> show chassis fpc detail
Slot 0 information:
State Online
Temperature 28 degrees C / 82 degrees F
Total CPU DRAM 2820 MB
Total SRAM 0 MB
Total SDRAM 0 MB
Start time 2010-09-20 01:34:13 PDT
Uptime 3 days, 3 hours, 31 minutes, 48 seconds

```

**show chassis fpc pic-status (QFX3500 Switches)**

```

user@switch> show chassis fpc pic-status
Slot 0 Online QFX 48x10G 4x40G Switch
 PIC 0 Online 48x 10G-SFP+
 PIC 1 Online 15x 10G-SFP+

```

**show chassis fpc interconnect-device (QFabric System)**

```

user@switch> show chassis fpc interconnect-device interconnect1
FPC status:
Temp
Slot State (C)
0 Online 0
1 Online 0
2 Online 0
3 Online 0
4 Online 0
5 Online 0
6 Online 0
7 Online 0
8 Online 0
9 Online 0
10 Online 0
11 Online 0
12 Online 0

```

```

13 Online 0
14 Online 0
15 Online 0

```

### show chassis fpc interconnect-device (QFabric System)

```

user@switch> show chassis fpc interconnect-device interconnect1 3
FPC status:

Slot State Temp
 (C)
3 Online 0

```

### show chassis fpc interconnect-device detail (QFabric System)

```

user@switch> show chassis fpc interconnect-device interconnect1 3 detail
Slot 3 information:
State Online
Temperature 0 degrees C / 32 degrees F
Start time 2011-08-18 10:45:04 PDT
Uptime 1 minute, 49 seconds

```

### show chassis fpc pic-status interconnect-device (QFabric System)

```

user@switch> show chassis fpc pic-status interconnect-device interconnect1
Slot 0 Online QFX 16-port QSFP+ Front Card
PIC 0 Online 16x 40G-QSFP+
PIC 1 Online 16x 40G-GE
Slot 1 Online QFX 16-port QSFP+ Front Card
PIC 0 Online 16x 40G-QSFP+
PIC 1 Online 16x 40G-GE
Slot 2 Online QFX 16-port QSFP+ Front Card
PIC 0 Online 16x 40G-QSFP+
PIC 1 Online 16x 40G-GE
Slot 3 Online QFX 16-port QSFP+ Front Card
PIC 0 Online 16x 40G-QSFP+
PIC 1 Online 16x 40G-GE
Slot 4 Online QFX 16-port QSFP+ Front Card
PIC 0 Online 16x 40G-QSFP+
PIC 1 Online 16x 40G-GE
Slot 5 Online QFX 16-port QSFP+ Front Card
PIC 0 Online 16x 40G-QSFP+
PIC 1 Online 16x 40G-GE
Slot 6 Online QFX 16-port QSFP+ Front Card
PIC 0 Online 16x 40G-QSFP+
PIC 1 Online 16x 40G-GE
Slot 7 Online QFX 16-port QSFP+ Front Card
PIC 0 Online 16x 40G-QSFP+
PIC 1 Online 16x 40G-GE
Slot 8 Online QFX Fabric Rear Card
PIC 0 Online 16x 40G-GE
Slot 9 Online QFX Fabric Rear Card
PIC 0 Online 16x 40G-GE
Slot 10 Online QFX Fabric Rear Card
PIC 0 Online 16x 40G-GE
Slot 11 Online QFX Fabric Rear Card
PIC 0 Online 16x 40G-GE
Slot 12 Online QFX Fabric Rear Card
PIC 0 Online 16x 40G-GE
Slot 13 Online QFX Fabric Rear Card
PIC 0 Online 16x 40G-GE
Slot 14 Online QFX Fabric Rear Card
PIC 0 Online 16x 40G-GE

```

```
Slot 15 Online QFX Fabric Rear Card
PIC 0 Online 16x 40G-GE
```

### show chassis fpc pic-status node-device (QFabric System)

```
user@switch> show chassis fpc pic-status node-device node1
Slot node1 Online QFX 48x10G 4x40G Switch
PIC 0 Online 48x 10G-SFP+
PIC 1 Online 4x 40G-QSFP+
```

### show chassis fpc (PTX5000 Packet Transport Router)

```
user@host> show chassis fpc
```

| Slot | State  | Temp (C) | CPU Utilization (%) Total | Interrupt | Memory DRAM (MB) | Utilization (%) Heap | Buffer |
|------|--------|----------|---------------------------|-----------|------------------|----------------------|--------|
| 0    | Empty  |          |                           |           |                  |                      |        |
| 1    | Empty  |          |                           |           |                  |                      |        |
| 2    | Online | 50       | 6                         | 0         | 2816             | 5                    | 27     |
| 3    | Empty  |          |                           |           |                  |                      |        |
| 4    | Empty  |          |                           |           |                  |                      |        |
| 5    | Online | 48       | 9                         | 0         | 2816             | 5                    | 27     |
| 6    | Empty  |          |                           |           |                  |                      |        |
| 7    | Online | 49       | 8                         | 0         | 2816             | 5                    | 27     |

### show chassis fpc detail (PTX5000 Packet Transport Router)

```
user@host> show chassis fpc detail
```

Slot 2 information:

|                |                                          |
|----------------|------------------------------------------|
| State          | Online                                   |
| Temperature    | 35 degrees C / 95 degrees F (PMB)        |
| Temperature    | 35 degrees C / 95 degrees F (Intake)     |
| Temperature    | 50 degrees C / 122 degrees F (Exhaust A) |
| Temperature    | 54 degrees C / 129 degrees F (Exhaust B) |
| Temperature    | 54 degrees C / 129 degrees F (TL0)       |
| Temperature    | 52 degrees C / 125 degrees F (TQ0)       |
| Temperature    | 61 degrees C / 141 degrees F (TL1)       |
| Temperature    | 58 degrees C / 136 degrees F (TQ1)       |
| Temperature    | 57 degrees C / 134 degrees F (TL2)       |
| Temperature    | 58 degrees C / 136 degrees F (TQ2)       |
| Temperature    | 62 degrees C / 143 degrees F (TL3)       |
| Temperature    | 61 degrees C / 141 degrees F (TQ3)       |
| Total CPU DRAM | 2816 MB                                  |
| Total SRAM     | 0 MB                                     |
| Total SDRAM    | 0 MB                                     |
| Start time     | 2012-01-12 12:05:42 PST                  |
| Uptime         | 3 hours, 14 minutes, 7 seconds           |

Slot 5 information:

|                |                                          |
|----------------|------------------------------------------|
| State          | Online                                   |
| Temperature    | 35 degrees C / 95 degrees F (PMB)        |
| Temperature    | 34 degrees C / 93 degrees F (Intake)     |
| Temperature    | 48 degrees C / 118 degrees F (Exhaust A) |
| Temperature    | 53 degrees C / 127 degrees F (Exhaust B) |
| Temperature    | 54 degrees C / 129 degrees F (TL0)       |
| Temperature    | 52 degrees C / 125 degrees F (TQ0)       |
| Temperature    | 69 degrees C / 156 degrees F (TL1)       |
| Temperature    | 56 degrees C / 132 degrees F (TQ1)       |
| Temperature    | 54 degrees C / 129 degrees F (TL2)       |
| Temperature    | 56 degrees C / 132 degrees F (TQ2)       |
| Temperature    | 59 degrees C / 138 degrees F (TL3)       |
| Temperature    | 60 degrees C / 140 degrees F (TQ3)       |
| Total CPU DRAM | 2816 MB                                  |

```

Total SRAM 0 MB
Total SDRAM 0 MB
Start time 2012-01-12 12:05:43 PST
Uptime 3 hours, 14 minutes, 6 seconds
Slot 7 information:
State Online
Temperature 35 degrees C / 95 degrees F (PMB)
Temperature 33 degrees C / 91 degrees F (Intake)
Temperature 50 degrees C / 122 degrees F (Exhaust A)
Temperature 55 degrees C / 131 degrees F (Exhaust B)
Temperature 56 degrees C / 132 degrees F (TL0)
Temperature 56 degrees C / 132 degrees F (TQ0)
Temperature 61 degrees C / 141 degrees F (TL1)
Temperature 57 degrees C / 134 degrees F (TQ1)
Temperature 55 degrees C / 131 degrees F (TL2)
Temperature 59 degrees C / 138 degrees F (TQ2)
Temperature 62 degrees C / 143 degrees F (TL3)
Temperature 62 degrees C / 143 degrees F (TQ3)
Total CPU DRAM 2816 MB
Total SRAM 0 MB
Total SDRAM 0 MB
Start time 2012-01-12 12:05:44 PST
Uptime 3 hours, 14 minutes, 5 seconds

```

#### show chassis fpc pic-status (PTX5000 Packet Transport Router)

```

user@host> show chassis fpc pic-status
Slot 2 Online FPC
PIC 0 Online 24x 10GE(LAN) SFP+
PIC 1 Online 24x 10GE(LAN) SFP+
Slot 5 Online FPC
PIC 0 Online 24x 10GE(LAN) SFP+
PIC 1 Online 2x 40GE CFP
Slot 7 Online FPC
PIC 0 Online 24x 10GE(LAN) SFP+
PIC 1 Online 2x 40GE CFP

```

#### show chassis fpc (ACX2000 Universal Access Router)

```

user@host> show chassis fpc

```

| Slot | State  | Temp (C) | CPU Utilization (%) | Memory (MB) | Utilization (%) |
|------|--------|----------|---------------------|-------------|-----------------|
|      |        |          | Total               | DRAM        | Heap            |
| 0    | Online | 61       | 17                  | 512         | 21              |

#### show chassis fpc 0 (ACX2000 Universal Access Router)

```

user@host> show chassis fpc 0

```

| Slot | State  | Temp (C) | CPU Utilization (%) | Memory (MB) | Utilization (%) |
|------|--------|----------|---------------------|-------------|-----------------|
|      |        |          | Total               | DRAM        | Heap            |
| 0    | Online | 61       | 17                  | 512         | 21              |

#### show chassis fpc detail (ACX2000 Universal Access Router)

```

user@host> show chassis fpc detail
Slot 0 information:
State Online
Temperature 61 degrees C / 141 degrees F
Total CPU DRAM 512 MB
Start time 2012-05-29 02:52:06 PDT
Uptime 27 minutes, 17 seconds

```

**show chassis fpc pic-status (ACX2000 Universal Access Router)**

```

user@host> show chassis fpc pic-status
Slot 0 Online
 PIC 0 Online 16x CHE1T1, RJ48
 PIC 1 Online 8x 1GE(LAN) RJ45
 PIC 2 Online 2x 1GE(LAN) SFP
 PIC 3 Online 2x 10GE(LAN) SFP+

```

**show chassis FPC 1 (MX Routers with Media Services Blade [MSB])**

```

user@switch> show chassis fpc 1

```

| Slot | State  | Temp<br>(C) | CPU Utilization (%)<br>Total | Interrupt | Memory<br>DRAM (MB) | Utilization (%)<br>Heap | Buffer |
|------|--------|-------------|------------------------------|-----------|---------------------|-------------------------|--------|
| 1    | Online | 34          | 5                            | 0         | 3072                | 5                       | 13     |

**show chassis FPC 1 detail (MX Routers with Media Services Blade [MSB])**

```

user@switch> show chassis fpc 1 detail
Slot 1 information:
 State Online
 Temperature 34
 Total CPU DRAM 3072 MB
 Total RLDRAM 259 MB
 Total DDR DRAM 4864 MB
 Start time: 2012-06-19 10:51:43 PDT
 Uptime: 16 minutes, 48 seconds
 Max Power Consumption 550 Watts

```

## show chassis hardware

---

|                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                     | <a href="#">Syntax on page 758</a><br><a href="#">Syntax (EX Series) on page 758</a><br><a href="#">Syntax (T4000 Router) on page 758</a><br><a href="#">Syntax (TX Matrix Router) on page 758</a><br><a href="#">Syntax (TX Matrix Plus Router) on page 758</a><br><a href="#">Syntax (MX Series Routers) on page 758</a><br><a href="#">Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers) on page 758</a><br><a href="#">Syntax (QFX Series) on page 759</a><br><a href="#">Syntax (OCX Series) on page 759</a><br><a href="#">Syntax (PTX Series Packet Transport Routers) on page 759</a><br><a href="#">Syntax (ACX Series Universal Access Routers) on page 759</a> |
| <b>Syntax</b>                             | <b>show chassis hardware</b><br><detail   extensive><br><clei-models><br><models>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Syntax (EX Series)</b>                 | <b>show chassis hardware</b><br><clei-models><br><detail   extensive><br><models>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Syntax (T4000 Router)</b>              | <b>show chassis hardware</b><br><clei-models><br><detail   extensive><br><models>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Syntax (TX Matrix Router)</b>          | <b>show chassis hardware</b><br><clei-models><br><detail   extensive><br><models><br><lcc <i>number</i>   scc>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Syntax (TX Matrix Plus Router)</b>     | <b>show chassis hardware</b><br><clei-models><br><detail   extensive><br><models><br><lcc <i>number</i>   sfc <i>number</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Syntax (MX Series Routers)</b>         | <b>show chassis hardware</b><br><detail   extensive><br><clei-models><br><models><br><all-members><br><local><br><member <i>member-id</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Syntax (MX104, MX2010, and MX2020)</b> | <b>show chassis hardware</b><br><clei-models><br><detail   extensive>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

|                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>3D Universal Edge Routers)</b>                   | <models>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Syntax (QFX Series)</b>                          | show chassis hardware<br><detail   extensive><br><clei-models><br><interconnect-device <i>name</i> ><br><node-device <i>name</i> ><br><models>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Syntax (OCX Series)</b>                          | show chassis hardware<br><detail   extensive><br><clei-models><br><models>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Syntax (PTX Series Packet Transport Routers)</b> | show chassis hardware<br><detail   extensive><br><clei-models><br><models>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Syntax (ACX Series Universal Access Routers)</b> | show chassis hardware<br><detail   extensive><br><clei-models><br><models>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Release Information</b>                          | <p>Command introduced before Junos OS Release 7.4.</p> <p><b>models</b> option introduced in Junos OS Release 8.2.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p><b>sfc</b> option introduced for the TX Matrix Plus router in Junos OS Release 9.6.</p> <p>Command introduced in Junos OS Release 11.1 for QFX Series.</p> <p>Command introduced in Junos OS Release 12.1X48 for PTX Series Packet Transport Routers.</p> <p>Command introduced in Junos OS Release 12.2 for ACX Series Universal Access Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> |
| <b>Description</b>                                  | <p>Display a list of all Flexible PIC Concentrators (FPCs) and PICs installed in the router or switch chassis, including the hardware version level and serial number.</p> <p>In the EX Series switch command output, FPC refers to the following:</p> <ul style="list-style-type: none"> <li>On EX2200 switches, EX3200 switches, EX4200 standalone switches, and EX4500 switches—Refers to the switch; FPC <i>number</i> is always 0.</li> <li>On EX4200 switches in a Virtual Chassis configuration—Refers to the member of a Virtual Chassis; FPC <i>number</i> equals the member ID, from 0 through 9.</li> <li>On EX8208 and EX8216 switches—Refers to a line card; FPC <i>number</i> equals the slot number for the line card.</li> </ul> <p>On QFX3500, QFX5100, and OCX Series standalone switches, both the FPC and FPC <i>number</i> are always 0.</p>                                                 |

On T4000 Type 5 FPCs, there are no **top temperature sensor** or **bottom temperature sensor** parameters. Instead, **fan intake temperature sensor** and **fan exhaust temperature sensors** parameters are displayed.

Starting from Junos OS Release 11.4, the output of the **show chassis hardware models** operational mode command displays the enhanced midplanes FRU model numbers (CHAS-BP3-MX240-S, CHAS-BP3-MX480-S or CHAS-BP3-MX960-S) based on the router. Prior to release 11.4, the FRU model numbers are left blank when the router has enhanced midplanes. Note that the enhanced midplanes are introduced through the Junos OS Release 13.3, but can be supported on all Junos OS releases.

Starting with Junos OS Release 14.1, the output of the **show chassis hardware detail | extensive | clei-models | models** operational mode command displays the new DC power supply module (PSM) and power distribution unit (PDU) that are added to provide power to the high-density FPC (FPC2-PTX-P1A) and other components in a PTX5000 Packet Transport Router.

**Options** **none**—Display information about hardware. For a TX Matrix router, display information about the TX Matrix router and its attached T640 routers. For a TX Matrix Plus router, display information about the TX Matrix Plus router and its attached routers.

**clei-models**—(Optional) Display Common Language Equipment Identifier (CLEI) barcode and model number for orderable field-replaceable units (FRUs).

**detail**—(Optional) Include RAM and disk information in output.

**extensive**—(Optional) Display ID EEPROM information.

**all-members**—(MX Series routers only) (Optional) Display hardware-specific information for all the members of the Virtual Chassis configuration.

**interconnect-device *name***—(QFabric systems only) (Optional) Display hardware-specific information for the Interconnect device.

**lcc *number***—(TX Matrix routers and TX Matrix Plus router only) (Optional) On a TX Matrix router, display hardware information for a specified T640 router (line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, display hardware information for a specified router (line-card chassis) that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.



**local**—(MX Series routers only) (Optional) Display hardware-specific information for the local Virtual Chassis members.

**member *member-id***—(MX Series routers and EX Series switches) (Optional) Display hardware-specific information for the specified member of the Virtual Chassis configuration. Replace *member-id* variable with a value 0 or 1.

**models**—(Optional) Display model numbers and part numbers for orderable FRUs and, for components that use ID EEPROM format v2, the CLEI code.

**node-device *name***—(QFabric systems only) (Optional) Display hardware-specific information for the Node device.

**scc**—(TX Matrix router only) (Optional) Display hardware information for the TX Matrix router (switch-card chassis).

**sfc *number***—(TX Matrix Plus router only) (Optional) Display hardware information for the TX Matrix Plus router (switch-fabric chassis). Replace *number* variable with 0.

**Additional Information** The **show chassis hardware detail** command now displays DIMM information for the following Routing Engines:

**Table 55: Routing Engines Displaying DIMM Information**

| Routing Engines             | Routers                         |
|-----------------------------|---------------------------------|
| RE-S-1800x2 and RE-S-1800x4 | MX240, MX480, and MX960 routers |
| RE-A-1800x2                 | M120 and M320 routers           |

In Junos OS Release 11.4 and later, the output for the **show chassis hardware models** operational mode command for MX Series routers display the enhanced midplanes FRU model numbers—CHAS-BP3-MX240-S, CHAS-BP3-MX480-S, or CHAS-BP3-MX960-S—based on the router. In releases before Junos OS Release 11.4, the FRU model numbers are left blank when the router has enhanced midplanes. Note that the enhanced midplanes are introduced through Junos OS Release 13.3, but can be supported on all Junos OS releases.

**Required Privilege Level** view

**Related Documentation**

- [show chassis power](#)

**List of Sample Output**

- [show chassis hardware \(EX8216 Switch\) on page 767](#)
- [show chassis hardware clei-models \(EX8216 Switch\) on page 768](#)
- [show chassis hardware clei-models \(T1600 Router\) on page 769](#)
- [show chassis hardware detail \(EX4200 Switch\) on page 770](#)
- [show chassis hardware \(EX4300 Switch\) on page 770](#)
- [show chassis hardware models \(EX4500 Switch\) on page 770](#)
- [show chassis hardware detail \(EX9200 Switch\) on page 770](#)
- [show chassis hardware \(J6350 Router\) on page 771](#)

[show chassis hardware \(J6300 Router\) on page 771](#)  
[show chassis hardware \(M7i Router\) on page 772](#)  
[show chassis hardware \(M10 Router\) on page 772](#)  
[show chassis hardware models \(M10 Router\) on page 773](#)  
[show chassis hardware \(M20 Router\) on page 773](#)  
[show chassis hardware models \(M20 Router\) on page 774](#)  
[show chassis hardware \(M40 Router\) on page 774](#)  
[show chassis hardware \(M40e Router\) on page 775](#)  
[show chassis hardware \(M120 Router\) on page 775](#)  
[show chassis hardware detail \(M120 Router\) on page 776](#)  
[show chassis hardware models \(M120 Router\) on page 777](#)  
[show chassis hardware \(M160 Router\) on page 778](#)  
[show chassis hardware models \(M160 Router\) on page 778](#)  
[show chassis hardware detail \(M160 Router\) on page 779](#)  
[show chassis hardware \(M320 Router\) on page 780](#)  
[show chassis hardware models \(M320 Router\) on page 781](#)  
[show chassis hardware \(MX5 Router\) on page 782](#)  
[show chassis hardware \(MX10 Router\) on page 782](#)  
[show chassis hardware \(MX40 Router\) on page 783](#)  
[show chassis hardware \(Fixed MX80 Router\) on page 783](#)  
[show chassis hardware \(Modular MX80 Router\) on page 784](#)  
[show chassis hardware \(MX104 Router\) on page 784](#)  
[show chassis hardware detail \(MX104 Router\) on page 785](#)  
[show chassis hardware extensive \(MX104 Router\) on page 786](#)  
[show chassis hardware models \(MX104 Router\) on page 789](#)  
[show chassis hardware clei-models \(MX104 Router\) on page 789](#)  
[show chassis hardware \(MX240 Router\) on page 789](#)  
[show chassis hardware detail \(MX 240 Router with Routing Engine Displaying DIMM information\) on page 790](#)  
[show chassis hardware \(MX240 Router with Enhanced MX SCB\) on page 790](#)  
[show chassis hardware \(MX480 Router\) on page 791](#)  
[show chassis hardware \(MX480 Router with Enhanced MX SCB\) on page 792](#)  
[show chassis hardware \(MX480 Routers with MPC5E and built-in OTN PIC\) on page 792](#)  
[show chassis hardware detail \(MX480 Routers with MPC5E and built-in OTN PIC\) on page 793](#)  
[show chassis hardware extensive \(MX480 Routers with MPC5E and built-in OTN PIC\) on page 795](#)  
[show chassis hardware \(MX960 Router\) on page 798](#)  
[show chassis hardware \(MX960 Router with Bidirectional Optics\) on page 798](#)  
[show chassis hardware \(MX960 Router with Enhanced MX SCB\) on page 799](#)  
[show chassis hardware models \(MX960 Router with Enhanced MX SCB\) on page 801](#)  
[show chassis hardware \(MX960 Router with MPC5EQ\) on page 801](#)  
[show chassis hardware detail \(MX960 Router\) on page 804](#)  
[show chassis hardware detail \(MX960 Router with MPC5EQ\) on page 805](#)  
[show chassis hardware extensive \(MX960 Router with MPC5EQ\) on page 808](#)  
[show chassis hardware models \(MX960 Router with MPC5EQ\) on page 816](#)  
[show chassis hardware clei-models \(MX960 Router with MPC5EQ\) on page 817](#)  
[show chassis hardware \(MX2010 Router\) on page 817](#)  
[show chassis hardware detail \(MX2010 Router\) on page 820](#)

[show chassis hardware extensive \(MX2010 Router\) on page 824](#)  
[show chassis hardware models \(MX2010 Router\) on page 830](#)  
[show chassis hardware clei-models \(MX2010 Routers\) on page 830](#)  
[show chassis hardware \(MX2010 Routers with MPC6E and OTN MIC\) on page 831](#)  
[show chassis hardware detail \(MX2010 Routers with MPC6E and OTN MIC\) on page 833](#)  
[show chassis hardware extensive \(MX2010 Routers with MPC6E and OTN MIC\) on page 835](#)  
[show chassis hardware \(MX2020 Router\) on page 840](#)  
[show chassis hardware detail \(MX2020 Router\) on page 848](#)  
[show chassis hardware models \(MX2020 Router\) on page 857](#)  
[show chassis hardware clei-models \(MX2020 Router\) on page 858](#)  
[show chassis hardware \(MX2020 Router with MPC5EQ and MPC6E\) on page 860](#)  
[show chassis hardware detail \(MX2020 Router with MPC5EQ and MPC6E\) on page 864](#)  
[show chassis hardware extensive \(MX2020 Router with MPC5EQ and MPC6E\) on page 866](#)  
[show chassis hardware models \(MX2020 Routers with MPC5EQ and MPC6E\) on page 871](#)  
[show chassis hardware clei-models \(MX2020 Router with MPC5EQ and MPC6E\) on page 873](#)  
[show chassis hardware \(MX Series routers with ATM MIC\) on page 874](#)  
[show chassis hardware \(MX240, MX480, MX960 routers with Application Services Modular Line Card\) on page 874](#)  
[show chassis hardware extensive \(MX240, MX480, MX960 routers with Application Services Modular Line Card\) on page 875](#)  
[show chassis hardware \(MX480 Router with MPC4E\) on page 876](#)  
[show chassis hardware \(MX2020 Router with MPC4E\) on page 876](#)  
[show chassis hardware \(MX5, MX10, MX40, MX80, MX240, MX480, and MX960 routers with Enhanced 20-port Gigabit Ethernet MIC\) on page 878](#)  
[show chassis hardware models \(MX5, MX10, MX40, MX80, MX240, MX480, and MX960 routers with Enhanced 20-port Gigabit Ethernet MIC\) on page 879](#)  
[show chassis hardware \(T320 Router\) on page 879](#)  
[show chassis hardware \(T640 Router\) on page 880](#)  
[show chassis hardware models \(T640 Router\) on page 881](#)  
[show chassis hardware extensive \(T640 Router\) on page 881](#)  
[show chassis hardware \(T4000 Router\) on page 882](#)  
[show chassis hardware \(T4000 Router with 16 GB line card chassis \(LCC\) Routing Engine\) on page 884](#)  
[show chassis hardware \(T4000 Router with LSR FPC\) on page 885](#)  
[show chassis hardware clei-models \(T4000 Router\) on page 885](#)  
[show chassis hardware detail \(T4000 Router\) on page 885](#)  
[show chassis hardware models \(T4000 Router\) on page 887](#)  
[show chassis hardware lcc \(TX Matrix Router\) on page 888](#)  
[show chassis hardware scc \(TX Matrix Router\) on page 889](#)  
[show chassis hardware \(T1600 Router\) on page 889](#)  
[show chassis hardware \(TX Matrix Plus Router\) on page 891](#)  
[show chassis hardware sfc \(TX Matrix Plus Router\) on page 896](#)  
[show chassis hardware extensive \(TX Matrix Plus Router\) on page 898](#)  
[show chassis hardware clei-models \(TX Matrix Plus Router\) on page 899](#)  
[show chassis hardware detail \(TX Matrix Plus Router\) on page 901](#)

[show chassis hardware models \(TX Matrix Plus Router\) on page 903](#)  
[show chassis hardware \(TX Matrix Plus router with 3D SIBs\) on page 906](#)  
[show chassis hardware clei-models \(TX Matrix Plus router with 3D SIBs\) on page 909](#)  
[show chassis hardware detail \(TX Matrix Plus router with 3D SIBs\) on page 913](#)  
[show chassis hardware lcc \(TX Matrix Plus router with 3D SIBs\) on page 916](#)  
[show chassis hardware sfc \(TX Matrix Plus router with 3D SIBs\) on page 917](#)  
[show chassis hardware \(16-Port 10-Gigabit Ethernet MPC with SFP+ Optics \[MX Series Routers\]\) on page 919](#)  
[show chassis hardware \(MPC3E \[MX Series Routers\]\) on page 919](#)  
[show chassis hardware \(QFX3500 Switches\) on page 920](#)  
[show chassis hardware detail \(QFX3500 Switches\) on page 921](#)  
[show chassis hardware models \(QFX3500 Switches\) on page 922](#)  
[show chassis hardware clei-models \(QFX3500 Switches\) on page 922](#)  
[show chassis hardware clei-models \(QFX5100 Switches\) on page 922](#)  
[show chassis hardware interconnect-device \(QFabric Systems\) on page 922](#)  
[show chassis hardware node-device \(QFabric Systems\) on page 923](#)  
[show chassis hardware \(PTX5000 Packet Transport Router\) on page 923](#)  
[show chassis hardware \(PTX5000 Packet Transport Router with FPC2-PTX-P1A\) on page 924](#)  
[show chassis hardware clei-models \(PTX5000 Packet Transport Router\) on page 925](#)  
[show chassis hardware clei-models \(PTX5000 Packet Transport Router with FPC2-PTX-P1A\) on page 925](#)  
[show chassis hardware detail \(PTX5000 Packet Transport Router\) on page 925](#)  
[show chassis hardware detail \(PTX5000 Packet Transport Router with FPC2-PTX-P1A\) on page 927](#)  
[show chassis hardware models \(PTX5000 Packet Transport Router\) on page 927](#)  
[show chassis hardware models \(PTX5000 Packet Transport Router with FPC2-PTX-P1A\) on page 928](#)  
[show chassis hardware extensive \(PTX5000 Packet Transport Router\) on page 928](#)  
[show chassis hardware \(MX Routers with Media Services Blade \[MSB\]\) on page 929](#)  
[show chassis hardware extensive \(MX Routers with Media Services Blade \[MSB\]\) on page 929](#)  
[show chassis hardware \(QFX3500 Switch running Enhanced Layer 2 Software\) on page 931](#)  
[show chassis hardware \(QFX5100 Switch running Enhanced Layer 2 Software\) on page 931](#)

**Output Fields** [Table 56 on page 765](#) lists the output fields for the **show chassis hardware** command. Output fields are listed in the approximate order in which they appear.

Table 56: show chassis hardware Output Fields

| Field Name           | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Level of Output |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| <b>Item</b>          | <p>Chassis component:</p> <ul style="list-style-type: none"> <li>(EX Series switches)—Information about the chassis, Routing Engine (SRE and Routing Engine modules in EX8200 switches), power supplies, fan trays, and LCD panel. Also displays information about Flexible PIC Concentrators (FPCs) and associated Physical Interface Cards (PICs). Information about the backplane, midplane, and SIBs (SF modules) is displayed for EX8200 switches. See <i>EX Series Switches Hardware and CLI Terminology Mapping</i>.</li> <li>(MX Series routers and EX Series switches)—Information about the backplane, Routing Engine, Power Entry Modules (PEMs), and fan trays. Also displays information about Flexible PIC Concentrators (FPCs) and associated Physical Interface Cards (PICs), Modular Port Concentrators (MPCs) and associated Modular Interface Cards (MICs), or Dense Port Concentrators (DPCs). MX80 routers have a single Routing Engine and a built-in Packet Forwarding Engine that attaches directly to MICs. The Packet Forwarding Engine has two “pseudo” FPCs (FPC 0 and FPC1). MX80 routers also have a Forwarding Engine Board (FEB). MX104 routers have a built-in Packet forwarding Engine and a Forwarding Engine Board (FEB). The Packet Forwarding Engine of the MX104 router has three “pseudo” FPCs (FPC0, FPC1, and FPC2).</li> <li>(M Series routers, except for the M320 router)—Information about the backplane; power supplies; fan trays; Routing Engine; maxicab (the connection between the Routing Engine and the backplane, for the M40 router only); SCB, SSB, SFM, or FEB; MCS and PCG (for the M160 router only); each FPC and PIC; and each fan, blower, and impeller.</li> <li>(M120, M320, and T Series routers)—Information about the backplane, power supplies, fan trays, midplane, FPM (craft interface), CIP, PEM, SCG, CB, FPC, PIC, SFP, SPMB, and SIB.</li> <li>(QFX Series)—Information about the chassis, Pseudo CB, Routing Engine, power supplies, fan trays, Interconnect devices, and Node devices. Also displays information about Flexible PIC Concentrators (FPCs) and associated Physical Interface Cards (PICs).</li> <li>(PTX Series)—Information about the chassis, midplane, craft interface (FPM), power distribution units (PDUs) and Power Supply Modules (PSMs), Centralized Clock Generators (CCGs), Routing Engines, Control Boards (CBs) and Switch Processor Mezzanine Boards (SPMBs), Flexible PIC Concentrators (FPCs), PICs, Switch Interface Boards (SIBs), and fan trays (vertical and horizontal).</li> <li>(MX2010 and MX2020 routers)—Information about the chassis, midplane, craft interface (FPM), power midplane (PMP), Power Supply Modules (PSMs), Power Distribution Modules (PDMs), Routing Engines, Control Boards (CBs) and Switch Processor Mezzanine Boards (SPMBs), Switch Fabric Boards (SFBs), Flexible PIC Concentrators (FPCs), PICs, adapter cards (ADCs) and fan trays.</li> </ul> | All levels      |
| <b>Version</b>       | Revision level of the chassis component.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | All levels      |
| <b>Part number</b>   | Part number of the chassis component.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | All levels      |
| <b>Serial number</b> | Serial number of the chassis component. The serial number of the backplane is also the serial number of the router chassis. Use this serial number when you need to contact Juniper Networks Customer Support about the router or switch chassis.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | All levels      |

Table 56: show chassis hardware Output Fields (*continued*)

| Field Name                    | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Level of Output  |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| <b>Assb ID or Assembly ID</b> | ( <b>extensive</b> keyword only) Identification number that describes the FRU hardware.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>extensive</b> |
| <b>Assembly Version</b>       | ( <b>extensive</b> keyword only) Version number of the FRU hardware.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>extensive</b> |
| <b>Assembly Flags</b>         | ( <b>extensive</b> keyword only) Flags.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>extensive</b> |
| <b>FRU model number</b>       | ( <b>clei-models</b> , <b>extensive</b> , and <b>models</b> keyword only) Model number of the FRU hardware component.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | none specified   |
| <b>CLEI code</b>              | ( <b>clei-models</b> and <b>extensive</b> keyword only) Common Language Equipment Identifier code. This value is displayed only for hardware components that use ID EEPROM format v2. This value is not displayed for components that use ID EEPROM format v1.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | none specified   |
| <b>EEPROM Version</b>         | ID EEPROM version used by the hardware component: <b>0x00</b> (version 0), <b>0x01</b> (version 1), or <b>0x02</b> (version 2).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>extensive</b> |
| <b>Description</b>            | <p>Brief description of the hardware item:</p> <ul style="list-style-type: none"> <li>Type of power supply.</li> <li>Type of PIC. If the PIC type is not supported on the current software release, the output states <b>Hardware Not Supported</b>.</li> <li>Type of FPC: <b>FPC Type 1</b>, <b>FPC Type 2</b>, <b>FPC Type 3</b>, <b>FPC Type 4</b>, or <b>FPC TypeOC192</b>.</li> </ul> <p>On EX Series switches, a brief description of the FPC.</p> <p>On the J Series routers, the FPC type corresponds to the Physical Interface Module (PIM). The following list shows the PIM abbreviation in the output and the corresponding PIM name.</p> <ul style="list-style-type: none"> <li><b>2x FE</b>—Either two built-in Fast Ethernet interfaces (fixed PIM) or dual-port Fast Ethernet PIM</li> <li><b>4x FE</b>—4-port Fast Ethernet ePIM</li> <li><b>1x GE Copper</b>—Copper Gigabit Ethernet ePIM (one 10-Mbps, 100-Mbps, or 1000-Mbps port)</li> <li><b>1x GE SFP</b>—SFP Gigabit Ethernet ePIM (one fiber port)</li> <li><b>4x GE Base PIC</b>—Four built-in Gigabit Ethernet ports on a J4350 or J6350 chassis (fixed PIM)</li> <li><b>2x Serial</b>—Dual-port serial PIM</li> <li><b>2x T1</b>—Dual-port T1 PIM</li> <li><b>2x E1</b>—Dual-port E1 PIM</li> <li><b>2x CTIE1</b>—Dual-port channelized T1/E1 PIM</li> <li><b>1x T3</b>—T3 PIM (one port)</li> <li><b>1x E3</b>—E3 PIM (one port)</li> <li><b>4x BRI S/T</b>—4-port ISDN BRI S/T PIM</li> <li><b>4x BRI U</b>—4-port ISDN BRI U PIM</li> <li><b>1x ADSL Annex A</b>—ADSL 2/2+ Annex A PIM (one port, for POTS)</li> <li><b>1x ADSL Annex B</b>—ADSL 2/2+ Annex B PIM (one port, for ISDN)</li> </ul> | All levels       |

Table 56: show chassis hardware Output Fields (*continued*)

| Field Name | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Level of Output |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
|            | <ul style="list-style-type: none"> <li>• <b>2xSHDSL (ATM)</b>—G SHDSL PIM (2-port two-wire module or 1-port four-wire module)</li> <li>• <b>1x TGM550</b>—TGM550 Telephony Gateway Module (Avaya VoIP gateway module with one console port, two analog <b>LINE</b> ports, and two analog <b>TRUNK</b> ports)</li> <li>• <b>1x DS1 TIM510</b>—TIM510 E1/T1 Telephony Interface Module (Avaya VoIP media module with one E1 or T1 trunk termination port and ISDN PRI backup)</li> <li>• <b>4x FXS, 4x FXO, TIM514</b>—TIM514 Analog Telephony Interface Module (Avaya VoIP media module with four analog <b>LINE</b> ports and four analog <b>TRUNK</b> ports)</li> <li>• <b>4x BRI TIM521</b>—TIM521 BRI Telephony Interface Module (Avaya VoIP media module with four ISDN BRI ports)</li> <li>• <b>Crypto Accelerator Module</b>—For enhanced performance of cryptographic algorithms used in IP Security (IPsec) services</li> <li>• <b>MPC M 16x10GE</b>—16-port 10-Gigabit Module Port Concentrator that supports SFP+ optical transceivers. (Not on EX Series switches.)</li> <li>• For hosts, the Routing Engine type.</li> <li>• For small form-factor pluggable transceiver (SFP) modules, the type of fiber: <b>LX</b>, <b>SX</b>, <b>LH</b>, or <b>T</b>.</li> <li>• LCD description for EX Series switches (except EX2200 switches).</li> <li>• <b>MPC2</b>—1-port MPC2 that supports two separate slots for MICs.</li> <li>• <b>MPC3E</b>—1-port MPC3E that supports two separate slots for MICs (MIC-3D-1X100GE-CFP and MIC-3D-20GE-SFP) on MX960, MX480, and MX240 routers. The MPC3E maps one MIC to one PIC (1 MIC, 1 PIC), which differs from the mapping of legacy MPCs.</li> <li>• 100GBASE-LR4, pluggable CFP optics</li> <li>• Supports the Enhanced MX Switch Control Board with fabric redundancy and existing SCBs without fabric redundancy.</li> <li>• Interoperates with existing MX Series line cards, including Flexible Port Concentrators (FPC), Dense Port Concentrators (DPCs), and Modular Port Concentrators (MPCs).</li> <li>• <b>MPC4E</b>—Fixed configuration MPC4E that is available in two flavors: MPC4E-3D-32XGE-SFP and MPC4E-3D-2CGE-8XGE on MX2020, MX960, MX480, and MX240 routers.</li> <li>• LCD description for MX Series routers</li> </ul> |                 |

## Sample Output

### show chassis hardware (EX8216 Switch)

```

user@host> show chassis hardware
Hardware inventory:
Item Version Part number Serial number Description
Chassis REV 06 710-016845 CY0109220035 EX8216
Midplane REV 06 710-016845 BA0909120112 EX8216-MP
CB 0 REV 22 710-020771 AX0109197723 EX8216-RE320
CB 1 REV 22 710-020771 AX0109197726 EX8216-RE320
 Routing Engine 1 BUILTIN BUILTIN RE-EX8216
FPC 3 REV 19 710-020683 BC0109083125 EX8200-48F

```



|                 |        |            |              |                       |
|-----------------|--------|------------|--------------|-----------------------|
| CPU             | REV 13 | 710-020598 | BF0109144549 | EX8200-CPU            |
| FPC 4           | REV 17 | 710-020683 | BC0108500127 | EX8200-48F            |
| CPU             | REV 10 | 710-020598 | BF0108460510 | EX8200-CPU            |
| PIC 0           |        | BUILTIN    | BUILTIN      | 48x 100 Base-QFX/1000 |
| Base-X          |        |            |              |                       |
| Xcvr 1          | REV 01 | 740-011613 | PE70V89      | SFP-SX                |
| Xcvr 11         | REV 01 | 740-011613 | PE70YCE      | SFP-SX                |
| Xcvr 12         | REV 01 | 740-011613 | PE70VSH      | SFP-SX                |
| Xcvr 13         | REV 01 | 740-011613 | E08C02063    | SFP-SX                |
| Xcvr 14         | REV 01 | 740-011613 | PE70VKU      | SFP-SX                |
| Xcvr 15         | REV 01 | 740-011613 | E08E03372    | SFP-SX                |
| Xcvr 21         | REV 01 | 740-011613 | PE70VAD      | SFP-SX                |
| Xcvr 22         | REV 01 | 740-011613 | E08E01228    | SFP-SX                |
| Xcvr 23         | REV 01 | 740-011613 | PE70VSL      | SFP-SX                |
| Xcvr 24         | REV 01 | 740-011613 | E08E03409    | SFP-SX                |
| Xcvr 25         | REV 01 | 740-011613 | PE70VL4      | SFP-SX                |
| Xcvr 26         | REV 01 | 740-011613 | PDQ4L2Z      | SFP-SX                |
| Xcvr 27         | REV 01 | 740-011613 | PE70WFK      | SFP-SX                |
| Xcvr 28         | REV 01 | 740-011782 | PBD2B5U      | SFP-SX                |
| Xcvr 29         | REV 01 | 740-011613 | PE70UQX      | SFP-SX                |
| Xcvr 30         | REV 01 | 740-011613 | PE70VL5      | SFP-SX                |
| Xcvr 31         | REV 01 | 740-011613 | PE70V0F      | SFP-SX                |
| Xcvr 32         | REV 01 | 740-011613 | E08C02052    | SFP-SX                |
| Xcvr 33         | REV 01 | 740-011613 | E08C02197    | SFP-SX                |
| Xcvr 34         | REV 01 | 740-011613 | PE70V0L      | SFP-SX                |
| Xcvr 35         | REV 01 | 740-011613 | E08E03390    | SFP-SX                |
| Xcvr 36         | REV 01 | 740-011613 | PDQ4VL9      | SFP-SX                |
| Xcvr 37         | REV 01 | 740-011613 | E08E03370    | SFP-SX                |
| Xcvr 38         | REV 01 | 740-011613 | E08E03362    | SFP-SX                |
| Xcvr 39         | REV 01 | 740-011613 | E08C02065    | SFP-SX                |
| Xcvr 40         | REV 01 | 740-011613 | E08E03405    | SFP-SX                |
| Xcvr 41         | REV 01 | 740-011613 | E08E03411    | SFP-SX                |
| Xcvr 43         | REV 01 | 740-011613 | E08C02171    | SFP-SX                |
| Xcvr 45         | REV 01 | 740-011613 | E08E03410    | SFP-SX                |
| FPC 13          | REV 16 | 710-016837 | BB0109051344 | EX8200-8XS            |
| CPU             |        |            |              |                       |
| SIB 0           | REV 10 | 710-021613 | AY0109166244 | EX8216-SF320          |
| SIB 1           | REV 10 | 710-021613 | AY0109166357 | EX8216-SF320          |
| SIB 2           | REV 10 | 710-021613 | AY0109166362 | EX8216-SF320          |
| SIB 3           | REV 10 | 710-021613 | AY0109166338 | EX8216-SF320          |
| SIB 4           | REV 10 | 710-021613 | AY0109166350 | EX8216-SF320          |
| SIB 5           | REV 10 | 710-021613 | AY0109166365 | EX8216-SF320          |
| SIB 6           | REV 10 | 710-021613 | AY0109166361 | EX8216-SF320          |
| SIB 7           | REV 10 | 710-021613 | AY0109166399 | EX8216-SF320          |
| PSU 0           | REV 17 | 740-021466 | BG0709170003 | EX8200-AC2K           |
| PSU 1           | REV 17 | 740-021466 | BG0709170004 | EX8200-AC2K           |
| PSU 2           | REV 17 | 740-021466 | BG0709170020 | EX8200-AC2K           |
| PSU 3           | REV 17 | 740-021466 | BG0709170017 | EX8200-AC2K           |
| PSU 4           | REV 17 | 740-021466 | BG0709170008 | EX8200-AC2K           |
| PSU 5           | REV 17 | 740-021466 | BG0709170018 | EX8200-AC2K           |
| Top Fan Tray    |        |            |              |                       |
| FTC 0           | REV 4  | 760-022620 | CX1209140212 | EX8216-FT             |
| FTC 1           | REV 4  | 760-022620 | CX1209140212 | EX8216-FT             |
| Bottom Fan Tray |        |            |              |                       |
| FTC 0           | REV 4  | 760-022620 | CX1209140211 | EX8216-FT             |
| FTC 1           | REV 4  | 760-022620 | CX1209140211 | EX8216-FT             |
| LCD 0           | REV 04 | 710-025742 | CE0109186919 | EX8200 LCD            |

### show chassis hardware clei-models (EX8216 Switch)

```
user@host> show chassis hardware clei-models
```



## Hardware inventory:

| Item            | Version | Part number | CLEI code  | FRU model number |
|-----------------|---------|-------------|------------|------------------|
| Midplane        | REV 08  | 710-016845  |            |                  |
| PSU 0           | REV 05  | 740-023002  | COUPAEAEAA | EX8200-PWR-AC3KR |
| PSU 1           | REV 05  | 740-023002  | COUPAEAEAA | EX8200-PWR-AC3KR |
| PSU 2           | REV 05  | 740-023002  | COUPAEAEAA | EX8200-PWR-AC3KR |
| PSU 3           | REV 05  | 740-023002  | COUPAEAEAA | EX8200-PWR-AC3KR |
| PSU 4           | REV 05  | 740-023002  | COUPAEAEAA | EX8200-PWR-AC3KR |
| PSU 5           | REV 05  | 740-023002  | COUPAEAEAA | EX8200-PWR-AC3KR |
| Top Fan Tray    |         |             |            |                  |
| Bottom Fan Tray |         |             |            |                  |

## show chassis hardware clei-models (T1600 Router)

user@host&gt; show chassis hardware clei-models

## Hardware inventory:

| Item             | Version | Part number | CLEI code  | FRU model number      |
|------------------|---------|-------------|------------|-----------------------|
| Midplane         | REV 03  | 710-005608  |            | CHAS-BP-T640-S        |
| FPM Display      | REV 05  | 710-002897  |            | CRAFT-T640-S          |
| CIP              | REV 06  | 710-002895  |            | CIP-L-T640-S          |
| PEM 0            | Rev 07  | 740-017906  | IPUPAC7KTA | PWR-T1600-3-80-DC-S   |
| PEM 1            | Rev 18  | 740-002595  |            | PWR-T-DC-S            |
| SCG 0            | REV 15  | 710-003423  |            | SCG-T-S               |
| Routing Engine 0 | REV 08  | 740-014082  |            | RE-A-2000-4096-S      |
| Routing Engine 1 | REV 07  | 740-014082  |            | RE-A-2000-4096-S      |
| CB 0             | REV 05  | 710-007655  |            | CB-T-S                |
| CB 1             | REV 03  | 710-017707  |            | CB-T-S                |
| FPC 0            | REV 07  | 710-013558  |            | T640-FPC2-E2          |
| PIC 0            | REV 01  | 750-010618  |            | PB-4GE-SFP            |
| PIC 1            | REV 06  | 750-001900  |            | PB-10C48-SON-SMSR     |
| PIC 2            | REV 14  | 750-001901  |            | PB-40C12-SON-SMIR     |
| PIC 3            | REV 07  | 750-001900  |            | PB-10C48-SON-SMSR     |
| FPC 1            | REV 06  | 710-013553  |            | T640-FPC1-E2          |
| PIC 0            | REV 08  | 750-001072  |            | P-1GE-SX              |
| PIC 1            | REV 10  | 750-012266  |            | PB-4GE-TYPE1-SFP-IQ2  |
| PIC 2            | REV 22  | 750-005634  |            | PB-1CHOC12SMIR-QPP    |
| FPC 2            |         |             |            |                       |
| PIC 0            | REV 16  | 750-007141  |            | PC-10GE-SFP           |
| PIC 1            | REV 06  | 750-015217  |            | PC-8GE-TYPE3-SFP-IQ2  |
| PIC 2            | REV 05  | 750-004695  |            | PC-TUNNEL             |
| PIC 3            | REV 17  | 750-009553  |            | PC-40C48-SON-SFP      |
| FPC 3            | REV 01  | 710-010154  |            | T640-FPC3-E           |
| PIC 0            | REV 07  | 750-012793  |            | PC-1XGE-TYPE3-XFP-IQ2 |
| PIC 1            | REV 25  | 750-007141  |            | PC-10GE-SFP           |
| PIC 2            | REV 17  | 750-009553  |            | PC-40C48-SON-SFP      |
| PIC 3            | REV 32  | 750-003700  |            | PC-10C192-SON-VSR     |
| FPC 4            | REV 16  | 710-013037  |            | T1600-FPC4-ES         |
| PIC 1            | REV 06  | 750-034781  |            | PD-1CE-CFP            |
| FPC 5            | REV 02  | 710-013037  |            | T1600-FPC4-ES         |
| PIC 0            | REV 16  | 750-012518  |            | PD-40C192-SON-XFP     |
| PIC 1            | REV 01  | 750-010850  |            | PD-10C768-SON-SR      |
| FPC 6            | REV 14  | 710-013037  |            | T1600-FPC4-ES         |
| PIC 0            | REV 11  | 750-017405  |            | PD-4XGE-XFP           |
| PIC 1            | REV 13  | 750-017405  |            | PD-4XGE-XFP           |
| FPC 7            | REV 09  | 710-007529  |            | T640-FPC3             |
| PIC 0            | REV 10  | 750-012793  |            | PC-1XGE-TYPE3-XFP-IQ2 |
| PIC 1            | REV 01  | 750-015217  |            | PC-8GE-TYPE3-SFP-IQ2  |
| PIC 2            | REV 01  | 750-015217  |            | PC-8GE-TYPE3-SFP-IQ2  |
| PIC 3            | REV 15  | 750-009450  |            | PC-10C192-SON-SR2     |
| SIB 0            | REV 07  | 710-013074  |            | SIB-I-T1600-S         |
| SIB 1            | REV 07  | 710-013074  |            | SIB-I-T1600-S         |

|            |        |            |                    |
|------------|--------|------------|--------------------|
| SIB 2      | REV 07 | 710-013074 | SIB-I-T1600-S      |
| SIB 3      | REV 07 | 710-013074 | SIB-I-T1600-S      |
| SIB 4      | REV 07 | 710-013074 | SIB-I-T1600-S      |
| Fan Tray 0 |        |            | FANTRAY-T-S        |
| Fan Tray 1 |        |            | FANTRAY-T-S        |
| Fan Tray 2 |        |            | FAN-REAR-TX-T640-S |

#### show chassis hardware detail (EX4200 Switch)

```
user@host> show chassis hardware detail
Hardware inventory:
```

| Item             | Version | Part number | Serial number | Description            |
|------------------|---------|-------------|---------------|------------------------|
| Chassis          |         |             | BM0208327733  | EX4200-24T             |
| Routing Engine 0 | REV 11  | 750-021256  | BM0208327733  | EX4200-24T, 8 POE      |
| Routing Engine 0 |         |             | BM0208327733  | EX4200-24T, 8 POE      |
| FPC 0            | REV 11  | 750-021256  | BM0208327733  | EX4200-24T, 8 POE      |
| CPU              |         | BUILTIN     | BUILTIN       | FPC CPU                |
| PIC 0            |         | BUILTIN     | BUILTIN       | 24x 10/100/1000 Base-T |
| PIC 1            | REV 03B | 711-021270  | AR0208162285  | 4x GE SFP              |
| BRD              | REV 08  | 711-021264  | AK0208328289  | EX4200-24T, 8 POE      |
| Power Supply 0   | REV 03  | 740-020957  | AT0508346354  | PS 320W AC             |
| Fan Tray         |         |             |               | Fan Tray               |

#### show chassis hardware (EX4300 Switch)

```
user@host> show chassis hardware
Hardware inventory:
```

| Item             | Version | Part number | Serial number | Description             |
|------------------|---------|-------------|---------------|-------------------------|
| Chassis          |         |             | PD3713160055  | EX4300-48P              |
| Routing Engine 0 | REV 04  | 650-044930  | PD3713160055  | EX4300-48P              |
| FPC 0            | REV 04  | 650-044930  | PD3713160055  | EX4300-48P              |
| CPU              |         | BUILTIN     | BUILTIN       | FPC CPU                 |
| PIC 0            | REV 04  | BUILTIN     | BUILTIN       | 48x 10/100/1000 Base-T  |
| PIC 1            | REV 04  | BUILTIN     | BUILTIN       | 4x 40GE                 |
| Power Supply 0   | REV 01  | 740-046871  | 1EDA3090026   | JPSU-1100-AC-AFO-A      |
| Fan Tray 0 (AFO) |         |             |               | Fan Module, Airflow Out |
| Fan Tray 1 (AFO) |         |             |               | Fan Module, Airflow Out |

#### show chassis hardware models (EX4500 Switch)

```
user@host> show chassis hardware models
Hardware inventory:
```

| Item             | Version | Part number | Serial number | FRU model number  |
|------------------|---------|-------------|---------------|-------------------|
| Routing Engine 0 | REV 01  | 750-035700  | GG0210271867  | EX4500-40F-FB-C   |
| FPC 0            | REV 01  | 750-035700  | GG0210271867  | EX4500-40F-FB-C   |
| PIC 0            |         | BUILTIN     | BUILTIN       | EX4500-40F-FB-C   |
| Power Supply 1   | REV 01  | 740-029654  | H884FS00JC09  | EX4500-PWR1-AC-FB |

#### show chassis hardware detail (EX9200 Switch)

```
user@switch> show chassis hardware
Hardware inventory:
```

| Item      | Version | Part number | Serial number | Description            |
|-----------|---------|-------------|---------------|------------------------|
| Chassis   |         |             | JN111DA44RFB  | EX9208                 |
| Midplane  | REV 05  | 710-017414  | TS2912        | EX9208-BP              |
| FPM Board | REV 02  | 710-017254  | XN1804        | Front Panel Display    |
| PEM 0     | Rev 01  | 740-022697  | QCS0906C033   | PS 1.2-1.7kW; 100-240V |
| AC in     |         |             |               |                        |
| PEM 1     | Rev 01  | 740-022697  | QCS0906C095   | PS 1.2-1.7kW; 100-240V |

```

AC in
Routing Engine 0 REV 08 740-031116 9009122883 RE-S-EX9200-1800X4
CB 0 REV 16 750-031391 CAAW4391 EX9200-SCBEF
PC 0 REV 07 750-049612 CABJ9312 EX9200 40x1G Copper
CPU REV 04 711-038484 CABH8268 MPCE PMB 2G
MIC 0 REV 02 750-049607 CABT9623 40x 1GE RJ45
PIC 0 BUILTIN BUILTIN 10x 1GE RJ45
PIC 1 BUILTIN BUILTIN 10x 1GE RJ45
PIC 2 BUILTIN BUILTIN 10x 1GE RJ45
PIC 3 BUILTIN BUILTIN 10x 1GE RJ45
FPC 1 REV 10 710-013699 CAAN3529 EX9200-40x1G-SFP
CPU REV 04 711-038484 CAAL7608 MPCE PMB 2G
MIC 0 REV 26 750-028392 CAAS5151 20x 1GE SFP
PIC 0 BUILTIN BUILTIN 10x 1GE SFP
PIC 1 BUILTIN BUILTIN 10x 1GE SFP
MIC 1 REV 26 750-028392 CAAC8006 20x 1GE SFP
PIC 2 BUILTIN BUILTIN 10x 1GE SFP
Xcvr 8 REV 01 740-011613 E08L03674 SFP-SX
Xcvr 9 REV 01 740-011613 E08M00243 SFP-SX
PIC 3 BUILTIN BUILTIN 10x 1GE SFP
FPC 3 REV 10 710-013699 CAAR5261 EX9200-40x1G-SFP
CPU REV 04 711-038484 CAAS2118 MPCE PMB 2G
MIC 0 REV 26 750-028392 CAAS5067 20x 1GE SFP
PIC 0 BUILTIN BUILTIN 10x 1GE SFP
Xcvr 2 REV 01 740-031851 PNA7L8U SFP-SX
Xcvr 3 REV 02 740-011613 AM0943SEKGZ SFP-SX
Xcvr 4 REV 02 740-011613 AM0943SEJZ9 SFP-SX
PIC 1 BUILTIN BUILTIN 10x 1GE SFP
MIC 1 REV 26 750-028392 CAAS5132 20x 1GE SFP
PIC 2 BUILTIN BUILTIN 10x 1GE SFP
Xcvr 4 REV 01 740-011613 E08D02625 SFP-SX
Xcvr 9 REV 02 740-011613 PJH4RD9 SFP-SX
PIC 3 BUILTIN BUILTIN 10x 1GE SFP
Xcvr 0 REV 01 740-011613 AM0813S8YME SFP-SX
Fan Tray Left Fan Tray

```

### show chassis hardware (J6350 Router)

```

user@host> show chassis hardware
Hardware inventory:
Item Version Part number Serial number Description
Chassis JN1090E07ADB JSR6350
Midplane REV 03 710-014593 NP1265
System IO REV 01 710-016210 NN9950 JX350 System IO
Crypto Module Crypto Acceleration
Routing Engine REV 08 710-015273 NM6509 RE-J6350-3400
ad0 248 MB 256MB CKS 00102006C24A00000039 Compact
Flash
FPC 0 FPC
PIC 0 4x GE Base PIC
FPC 1 REV 06 750-010355 AI07030023 FPC
PIC 0 2x T1
FPC 3 REV 06 750-011148 AJ06520151 FPC
PIC 0 2x E1
FPC 6 REV 06 750-013492 NC4170 FPC
PIC 0 4x FE
Power Supply 0

```

### show chassis hardware (J6300 Router)

```

user@host> show chassis hardware

```

## Hardware inventory:

| Item           | Version   | Part number | Serial number | Description        |
|----------------|-----------|-------------|---------------|--------------------|
| Chassis        |           |             | JN000164AB    | J6300              |
| Midplane       | REV 02.04 | 710-010001  | CORE99570     |                    |
| System IO      | REV 02.00 | 710-010003  | CORE100848    | System IO board    |
| Routing Engine | RevX2.6   | 750-010006  | IWGS40735390  | RE-J.3             |
| FPC 0          |           |             |               | FPC                |
| PIC 0          |           |             |               | 2x FE              |
| FPC 1          | RevX2.0   | 750-011380  | N3960005      | FPC                |
| PIC 0          |           |             |               | 1xADSL pic Annex A |
| FPC 2          | RevX2.0   | 750-011380  | N3960002      | FPC                |
| PIC 0          |           |             |               | 1xADSL pic Annex B |
| FPC 3          | REV 03    | 750-010354  | N0780028      | FPC                |
| PIC 0          |           |             |               | 1x T3              |

## show chassis hardware (M7i Router)

```
user@host> show chassis hardware
```

## Hardware inventory:

| Item           | Version | Part number | Serial number | Description             |
|----------------|---------|-------------|---------------|-------------------------|
| Chassis        |         |             | 31959         | M7i                     |
| Midplane       | REV 02  | 710-008761  | CA0209        | M7i Midplane            |
| Power Supply 0 | Rev 04  | 740-008537  | PD10272       | AC Power Supply         |
| Routing Engine | REV 01  | 740-008846  | 1000396803    | RE-5.0                  |
| CFEB           | REV 02  | 750-009492  | CA0166        | Internet Processor IIv1 |
| FPC 0          |         |             |               | E-FPC                   |
| PIC 0          | REV 04  | 750-003163  | HJ6416        | 1x G/E, 1000 BASE-SX    |
| PIC 1          | REV 04  | 750-003163  | HJ6423        | 1x G/E, 1000 BASE-SX    |
| PIC 2          | REV 04  | 750-003163  | HJ6421        | 1x G/E, 1000 BASE-SX    |
| PIC 3          | REV 02  | 750-003163  | HJ0425        | 1x G/E, 1000 BASE-SX    |
| FPC 1          |         |             |               | E-FPC                   |
| PIC 2          | REV 01  | 750-009487  | HM2275        | ASP - Integrated        |
| PIC 3          | REV 01  | 750-009098  | CA0142        | 2x F/E, 100 BASE-TX     |

## Hardware inventory:

| Item           | Version | Part number | Serial number | Description           |
|----------------|---------|-------------|---------------|-----------------------|
| Chassis        |         |             | B1157         | M7i                   |
| Midplane       | REV 05  | 710-008761  | DM0840        | M7i Midplane          |
| Power Supply 0 | Rev 08  | 740-008537  | TE53755       | AC Power Supply       |
| Routing Engine | REV 07  | 740-011202  | 1000736567    | RE-850                |
| CFEB           | REV 09  | 750-010463  | DK6952        | Internet Processor II |
| FPC 0          |         |             |               | E-FPC                 |
| PIC 0          | REV 12  | 750-012838  | DL7993        | 4x 1GE(LAN), IQ2      |
| Xcvr 0         | REV 01  | 740-011614  | PD94TDJ       | SFP-LX10              |
| Xcvr 1         | REV 01  | 740-011615  | PAD5EER       | UNSUPPORTED           |
| Xcvr 2         | REV 01  | 740-011614  | PD94THU       | SFP-LX10              |
| Xcvr 3         |         | NON-JNPR    | PDC2E7A       | SFP-LX10              |
| PIC 1          | REV 03  | 750-023116  | JT0203        | 4x CHSTM1 SDH CE SFP  |
| Xcvr 0         | REV 01  | 740-012434  | AGT063832PS   | SFP-SR                |
| Xcvr 1         | REV 01  | 740-012434  | AGT063832LY   | SFP-SR                |
| Xcvr 3         | REV 01  | 740-016064  | C06J19018     | SFP-LR                |
| PIC 2          | REV 15  | 750-014895  | DM5757        | MultiServices 100     |
| PIC 3          | REV 01  | 750-025390  | JW9448        | 12x T1/E1 CE          |
| FPC 1          |         |             |               | E-FPC                 |
| PIC 2          |         | BUILTIN     | BUILTIN       | 1x Tunnel             |
| PIC 3          | REV 09  | 750-009099  | DM0899        | 1x G/E, 1000 BASE     |
| Xcvr 0         | REV 01  | 740-012434  | AGT07150HGJ   | UNSUPPORTED           |
| Fan Tray       |         |             |               | Rear Fan Tray         |

## show chassis hardware (M10 Router)

```
user@host> show chassis hardware
```

## Hardware inventory:

| Item           | Version | Part number | Serial number    | Description           |
|----------------|---------|-------------|------------------|-----------------------|
| Chassis        |         |             | 1122             | M10                   |
| Midplane       | REV 1.1 | 710-001950  | S/N AC6626       |                       |
| Power supply A | Rev 01  | 740-002497  | S/N LC36095      | AC                    |
| Power supply B | Rev 01  | 740-002497  | S/N LC36100      | AC                    |
| Display        | REV 1.2 | 710-001995  | S/N AC6656       |                       |
| Host           |         |             | 18000005dfb3fb01 | teknor                |
| FEB            | REV 01  | 710-001948  | S/N AC6632       | Internet Processor II |
| FPC 0          |         |             |                  |                       |
| PIC 0          | REV 08  | 750-001072  | S/N AB2485       | 1x G/E, 1000 BASE-SX  |
| PIC 1          | REV 01  | 750-000613  | S/N AA1048       | 1x OC-12 SONET, SMIR  |
| FPC 1          |         |             |                  |                       |
| Fan Tray 0     |         |             |                  | FANTRAY-M10I-S        |
| Fan Tray 1     |         |             |                  | FANTRAY-M10I-S        |

## show chassis hardware models (M10 Router)

user@host&gt; show chassis hardware models

## Hardware inventory:

| Item             | Version | Part number | CLEI code | FRU model number  |
|------------------|---------|-------------|-----------|-------------------|
| Midplane         | REV 04  | 710-008920  |           | CHAS-MP-M10i-S    |
| Power Supply 0   | Rev 06  | 740-008537  |           | PWR-M10i-M7i-AC-S |
| Power Supply 1   | Rev 06  | 740-008537  |           | PWR-M10i-M7i-AC-S |
| HCM 0            | REV 03  | 710-010580  |           | HCM-M10i-S        |
| HCM 1            | REV 03  | 710-010580  |           | HCM-M10i-S        |
| Routing Engine 0 | REV 09  | 740-009459  |           | RE-400-256-S      |
| CFEB 0           | REV 05  | 750-010465  |           | FEB-M10i-M7i-S    |
| FPC 0            |         |             |           |                   |
| PIC 0            | REV 10  | 750-002971  |           | PE-40C3-SON-MM    |
| PIC 1            | REV 11  | 750-002992  |           | PE-4FE-TX         |
| PIC 2            | REV 03  | 750-002977  |           | PE-20C3-ATM-MM    |
| PIC 3            | REV 08  | 750-005724  |           | PE-20C3-ATM2-MM   |
| FPC 1            |         |             |           |                   |
| PIC 2            | REV 12  | 750-008425  |           | PE-AS             |
| PIC 3            | REV 13  | 750-005636  |           | PE-4CHDS3-QPP     |
| Fan Tray 0       |         |             |           | FANTRAY-M10I-S    |
| Fan Tray 1       |         |             |           | FANTRAY-M10I-S    |

## show chassis hardware (M20 Router)

user@host&gt; show chassis hardware

## Hardware inventory:

| Item           | Version | Part number | Serial number    | Description           |
|----------------|---------|-------------|------------------|-----------------------|
| Chassis        |         |             | 20033            | M20                   |
| Backplane      | REV 07  | 710-001517  | S/N AA7940       |                       |
| Power supply B | Rev 01  | 740-001465  | S/N 000001       | AC                    |
| Display        | REV 02  | 710-001519  | S/N AA9704       |                       |
| Host 0         |         |             | 98000004f8f27501 | teknor                |
| SSB slot 0     | REV 01  | 710-001951  | S/N AD5905       | Internet Processor II |
| SSRAM bank 0   | REV 01  | 710-001385  | S00480           | 2 MB                  |
| SSRAM bank 1   | REV 01  | 710-001385  | S00490           | 2 MB                  |
| SSRAM bank 2   | REV 01  | 710-001385  | S001:?           | 2 MB                  |
| SSRAM bank 3   | REV 01  | 710-001385  | S00483           | 2 MB                  |
| SSB slot 1     | N/A     | N/A         | N/A              | Backup                |
| FPC 1          | REV 01  | 710-001292  | S/N AB7528       |                       |
| SSRAM          | REV 01  | 710-000077  | S/N 304209       | 1 MB                  |
| SDRAM bank 0   | REV 01  | 710-000099  | S/N 000603       | 64 MB                 |
| SDRAM bank 1   | REV 01  | 710-000099  | S/N 000414       | 64 MB                 |
| PIC 0          | REV 03  | 750-000612  | S/N AB8433       | 2x OC-3 ATM, MM       |
| PIC 1          | REV 01  | 750-000616  | S/N AA1168       | 1x OC-12 ATM, MM      |

|              |        |            |            |                       |
|--------------|--------|------------|------------|-----------------------|
| PIC 2        | REV 01 | 750-000613 | S/N AA1008 | 1x OC-12 SONET, SMIR  |
| PIC 3        | REV 01 | 750-002501 | S/N AD5810 | 4x E3                 |
| FPC 2        | REV 01 | 710-001292 | S/N AC0119 |                       |
| SSRAM        | REV 01 | 710-000077 | S/N 503241 | 1 MB                  |
| SDRAM bank 0 | REV 01 | 710-000099 | S/N 306835 | 64 MB                 |
| SDRAM bank 1 | REV 01 | 710-000099 | S/N 306832 | 64 MB                 |
| Fan Tray 0   |        |            |            | Front Upper Fan Tray  |
| Fan Tray 1   |        |            |            | Front Middle Fan Tray |
| Fan Tray 2   |        |            |            | Front Bottom Fan Tray |
| Fan Tray 3   |        |            |            | Rear Fan Tray         |

### show chassis hardware models (M20 Router)

```
user@host> show chassis hardware models
```

Hardware inventory:

| Item             | Version | Part number | CLEI code | FRU model number |
|------------------|---------|-------------|-----------|------------------|
| Backplane        | REV 03  | 710-002334  |           | CHAS-MP-M20-S    |
| Power Supply A   | REV 06  | 740-001465  |           | PWR-M20-AC-S     |
| Display          | REV 04  | 710-001519  |           | CRAFT-M20-S      |
| Routing Engine 0 | REV 06  | 740-003239  |           | RE-333-768-S     |
| Routing Engine 1 | REV 06  | 740-003239  |           | RE-333-768-S     |
| SSB 0            | REV 02  | 710-001951  |           | SSB-E-M20        |
| SSB 1            | N/A     | N/A         |           |                  |
| FPC 0            | REV 03  | 710-003308  |           | FPC-E            |
| PIC 0            | REV 08  | 750-002303  |           | P-4FE-TX         |
| PIC 1            | REV 07  | 750-004745  |           | P-2MCDS3         |
| PIC 2            | REV 03  | 750-002965  |           | PE-4CHDS3        |
| FPC 1            | REV 03  | 710-003308  |           | FPC-E            |
| PIC 0            | REV 03  | 750-002914  |           | P-20C3-ATM-MM    |
| Fan Tray 0       |         |             |           | FANTRAY-F-M20-S  |
| Fan Tray 1       |         |             |           | FANTRAY-F-M20-S  |
| Fan Tray 2       |         |             |           | FANTRAY-F-M20-S  |
| Fan Tray 3       |         |             |           | FANTRAY-R-M20-S  |

### show chassis hardware (M40 Router)

```
user@host> show chassis hardware
```

Hardware inventory:

| Item           | Version | Part number | Serial number | Description          |
|----------------|---------|-------------|---------------|----------------------|
| Backplane      | REV 02  | 710-000073  | S/N AA0053    |                      |
| Power supply A | Rev 2   | 740-000235  | S/N 000042    | DC                   |
| Maxicab        | REV X1  | 710-000229  | S/N AA0139    |                      |
| Minicab        | REV X1  | 710-000482  | S/N AA0201    |                      |
| Display        | REV 06  | 710-000150  | S/N AA0905    |                      |
| Host           |         |             |               | cpv5000              |
| SCB            | REV X1  | 710-000075  | S/N AA0158    | Internet Processor I |
| SSRAM bank 0   | REV 02  | 710-000077  | S/N AA2267    | 1 MB                 |
| SSRAM bank 1   | REV 02  | 710-000077  | S/N AA2270    | 1 MB                 |
| SSRAM bank 2   | REV 02  | 710-000077  | S/N AA2269    | 1 MB                 |
| SSRAM bank 3   | REV 02  | 710-000077  | S/N AA2268    | 1 MB                 |
| FPC 0          | REV 01  | 710-000175  | S/N AA0048    |                      |
| SSRAM          | REV 01  | 710-000077  | S/N AA2333    | 1 MB                 |
| SDRAM bank 0   | REV 01  | 710-000099  | S/N AA2332    | 64 MB                |
| SDRAM bank 1   | REV X1  | 710-000099  | S/N AA2337    | 64 MB                |
| PIC 0          | REV 04  | 750-000613  | S/N aa0343    | 1x OC-12 SONET, SMIR |
| PIC 1          | REV 04  | 750-000613  | S/N AA0379    | 1x OC-12 SONET, SMIR |
| PIC 2          | REV 04  | 750-000613  | S/N AA0377    | 1x OC-12 SONET, SMIR |
| PIC 3          | REV 04  | 750-000613  | S/N AA0378    | 1x Tunnel            |
| FPC 2          | REV 01  | 710-000175  | S/N AA0042    |                      |
| SSRAM          | REV 02  | 710-000077  | S/N AA2288    | 1 MB                 |
| SDRAM bank 0   | REV 01  | 710-000099  | S/N AA2331    | 64 MB                |

|              |        |            |            |                      |
|--------------|--------|------------|------------|----------------------|
| SDRAM bank 1 | REV 01 | 710-000099 | S/N AA2330 | 64 MB                |
| PIC 0        | REV X1 | 750-000603 | S/N AA0143 | 4x OC-3 SONET, SMIR  |
| PIC 1        | REV X1 | 750-000615 | S/N AA0149 | 4x OC-3 SONET, MM    |
| PIC 2        | REV X1 | 750-000611 | S/N AA0148 | 4x OC-3 SONET, MM    |
| PIC 3        | REV 04 | 750-000613 | S/N AA0330 | 1x OC-12 SONET, SMIR |
| FPC 4        | REV 01 | 710-000175 | S/N AA0050 |                      |
| SSRAM        | REV 01 | 710-000077 | S/N AA2327 | 1 MB                 |
| SDRAM bank 0 | REV 01 | 710-000099 | S/N AA2329 | 64 MB                |
| SDRAM bank 1 | REV 01 | 710-000099 | S/N AA2328 | 64 MB                |
| PIC 0        | REV 04 | 750-000613 | S/N AA0320 | 1x OC-12 SONET, SMIR |
| PIC 2        | REV 05 | 750-000616 | S/N AA1341 | 1x OC-12 ATM, MM     |
| PIC 3        | REV 08 | 750-001072 | S/N AB2462 | 1x G/E, 1000 BASE-SX |
| FPC 5        | REV 10 | 710-000175 | S/N AA7663 |                      |
| SSRAM        | REV 01 | 710-000077 | S/N 501590 | 1 MB                 |
| SDRAM bank 0 | REV 01 | 710-000099 | S/N 300949 | 64 MB                |
| SDRAM bank 1 | REV 01 | 710-000099 | S/N 300868 | 64 MB                |
| PIC 1        | REV 01 | 750-001323 | S/N AB1670 | 1x Tunnel            |

### show chassis hardware (M40e Router)

```
user@host> show chassis hardware
```

Hardware inventory:

| Item        | Version | Part number | Serial number    | Description           |
|-------------|---------|-------------|------------------|-----------------------|
| Chassis     |         |             |                  | m40e                  |
| Midplane    | REV 01  | 710-005071  | AX3671           |                       |
| FPM CMB     | REV 03  | 710-001642  | AR9074           |                       |
| FPM Display | REV 03  | 710-001647  | AR7331           |                       |
| CIP         | REV 04  | 710-002649  | BB4449           |                       |
| PEM 0       | Rev 01  | 740-003787  | MC12364          | Power Entry Module    |
| PEM 1       | Rev 01  | 740-003787  | MC12383          | Power Entry Module    |
| PCG 0       | REV 07  | 710-001568  | AG1332           |                       |
| PCG 1       | REV 07  | 710-001568  | AR3789           |                       |
| Host 0      |         |             | 3e000007c8176601 | Present               |
| MCS 0       | REV 11  | 710-001226  | AN5813           |                       |
| SFM 0 SPP   | REV 07  | 710-001228  | AG4676           |                       |
| SFM 0 SPR   | REV 05  | 710-002189  | AE4735           | Internet Processor II |
| SFM 1 SPP   | REV 07  | 710-001228  | AP1347           |                       |
| SFM 1 SPR   | REV 05  | 710-002189  | BE0063           | Internet Processor II |
| FPC 0       | REV 01  | 710-011725  | BE0669           | M40e-EP-FPC Type 1    |
| CPU         | REV 01  | 710-004600  | BD9504           |                       |
| PIC 0       | REV 03  | 750-003737  | AY3991           | 4x G/E, 1000 BASE-SX  |
| FPC 1       | REV 01  | 710-005197  | BD9842           | M40e-FPC Type 2       |
| CPU         | REV 01  | 710-004600  | BB4869           |                       |
| PIC 0       | REV 07  | 750-001900  | AR8278           | 1x OC-48 SONET, SMSR  |
| FPC 2       | REV 02  | 710-005197  | BD9824           | M40e-FPC Type 2       |
| CPU         | REV 01  | 710-004600  | BD9531           |                       |
| PIC 0       | REV 03  | 750-003737  | AY3986           | 4x G/E, 1000 BASE-SX  |
| FPC 4       | REV 02  | 710-005078  | BE0664           | M40e-FPC Type 1       |
| CPU         | REV 01  | 710-004600  | BD9559           |                       |
| PIC 0       | REV 03  | 750-001894  | AG7963           | 1x G/E, 1000 BASE-SX  |
| PIC 2       | REV 01  | 750-002575  | AF2472           | 4x OC-3 SONET, SMIR   |
| FPC 6       | REV 02  | 710-005078  | BE0652           | M40e-FPC Type 1       |
| CPU         | REV 01  | 710-004600  | BD9607           |                       |
| PIC 0       | REV 02  | 750-002911  | AN2286           | 4x F/E, 100 BASE-TX   |
| PIC 2       | REV 01  | 750-002577  | AP6345           | 4x OC-3 SONET, MM     |

### show chassis hardware (M120 Router)

```
user@host> show chassis hardware
```

Hardware inventory:

| Item | Version | Part number | Serial number | Description |
|------|---------|-------------|---------------|-------------|
|------|---------|-------------|---------------|-------------|

|                  |                                |            |              |                         |
|------------------|--------------------------------|------------|--------------|-------------------------|
| Chassis          |                                |            | JN000054AC   | M120                    |
| Midplane         | REV 01                         | 710-013667 | RB4170       | M120 Midplane           |
| FPM Board        | REV 02                         | 710-011407 | CJ9186       | M120 FPM Board          |
| FPM Display      | REV 02                         | 710-011405 | CJ9173       | M120 FPM Display        |
| FPM CIP          | REV 02                         | 710-011410 | CJ9221       | M120 FPM CIP            |
| PEM 0            | Rev 05                         | 740-011936 | RM28320      | AC Power Entry Module   |
| PEM 1            | Rev 05                         | 740-011936 | RM28321      | AC Power Entry Module   |
| Routing Engine 0 | REV 03                         | 740-014080 | 1000642883   | RE-A-1000               |
| CB 0             | REV 03                         | 710-011403 | CM8346       | M120 Control Board      |
| CB 1             | REV 06                         | 710-011403 | CP6728       | M120 Control Board      |
| FPC 1            | REV 02                         | 710-015908 | CP6925       | M120 CFPC 10GE          |
| PIC 0            |                                | BUILTIN    | BUILTIN      | 1x 10GE(LAN/WAN) XFP    |
| Xcvr 0           | REV 01                         | 740-014279 | 62E204N00007 | XFP-10G-LR              |
| FPC 3            | REV 03                         | 710-011393 | CJ9234       | M120 FPC Type 2         |
| PIC 0            | REV 16                         | 750-008155 | NB5229       | 2x G/E IQ, 1000 BASE    |
| Xcvr 0           | REV 01                         | 740-011613 | P9F15JB      | SFP-SX                  |
| Xcvr 1           | REV 01                         | 740-007326 | P4Q0R9G      | SFP-SX                  |
| PIC 1            | REV 09                         | 750-007745 | CG4360       | 4x OC-3 SONET, SMIR     |
| PIC 2            | REV 16                         | 750-008155 | ND7787       | 2x G/E IQ, 1000 BASE    |
| Xcvr 0           | REV 01                         | 740-011613 | P9F12AS      | SFP-SX                  |
| Xcvr 1           | REV 01                         | 740-011613 | P9F1ALU      | SFP-SX                  |
| PIC 3            | REV 07                         | 750-011800 | JW1284       | 8x 1GE(LAN), IQ2        |
| Xcvr 0           | REV 01                         | 740-011613 | P9F1AM6      | SFP-SX                  |
| Xcvr 6           | REV 01                         | 740-011613 | P9F16NN      | SFP-SX                  |
| Xcvr 7           | REV 01                         | 740-011782 | P8C29Y7      | SFP-SX                  |
| Board B          | REV 02                         | 710-011395 | CN3754       | M120 FPC Mezz           |
| FPC 4            | REV 02                         | 710-011398 | CP6741       | M120 FPC Type 3         |
| PIC 0            | REV 16                         | 750-007141 | NB2855       | 10x 1GE(LAN), 1000 BASE |
| Xcvr 0           | REV 01                         | 740-011782 | P922A1F      | SFP-SX                  |
| Xcvr 1           | REV 01                         | 740-011782 | P922A16      | SFP-SX                  |
| Xcvr 2           | REV 01                         | 740-011782 | P922A0U      | SFP-SX                  |
| Xcvr 3           | REV 01                         | 740-011782 | P9229UZ      | SFP-SX                  |
| Xcvr 4           | REV 01                         | 740-009029 | P11JXWP      | SFP-LX                  |
| Xcvr 6           | REV 01                         | 740-011613 | P9F1ALW      | SFP-SX                  |
| FPC 5            | REV 01                         | 710-011388 | CJ9088       | M120 FPC Type 1         |
| PIC 0            | *** Hardware Not Supported *** |            |              |                         |
| PIC 1            | REV 05                         | 750-012052 | NB0410       | 1x CHOC3 IQ SONET, SMLR |
| PIC 2            | REV 01                         | 750-013167 | CM3824       | 4x CHDS3 IQ             |
| PIC 3            | REV 01                         | 750-010240 | CB5366       | 1x G/E SFP, 1000 BASE   |
| Board B          | REV 01                         | 710-011390 | CJ9103       | M120 FPC Mezz Board     |
| FEB 3            | REV 04                         | 710-011663 | CP6673       | M120 FEB                |
| FEB 4            | REV 04                         | 710-011663 | CJ9368       | M120 FEB                |
| FEB 5            | REV 04                         | 710-011663 | CJ9386       | M120 FEB                |
| Fan Tray 0       |                                |            |              | Front Top Fan Tray      |
| Fan Tray 1       |                                |            |              | Front Bottom Fan Tray   |
| Fan Tray 2       |                                |            |              | Rear Top Fan Tray       |
| Fan Tray 3       |                                |            |              | Rear Bottom Fan Tray    |

### show chassis hardware detail (M120 Router)

```
user@host> show chassis hardware detail
```

```
Hardware inventory:
```

| Item        | Version | Part number | Serial number | Description           |
|-------------|---------|-------------|---------------|-----------------------|
| Chassis     |         |             | JN000054AC    | M120                  |
| Midplane    | REV 01  | 710-013667  | RB4170        | M120 Midplane         |
| FPM Board   | REV 02  | 710-011407  | CJ9186        | M120 FPM Board        |
| FPM Display | REV 02  | 710-011405  | CJ9173        | M120 FPM Display      |
| FPM CIP     | REV 02  | 710-011410  | CJ9221        | M120 FPM CIP          |
| PEM 0       | Rev 05  | 740-011936  | RM28320       | AC Power Entry Module |



|                  |                                |                                              |                |                         |
|------------------|--------------------------------|----------------------------------------------|----------------|-------------------------|
| PEM 1            | Rev 05                         | 740-011936                                   | RM28321        | AC Power Entry Module   |
| Routing Engine 0 | REV 03                         | 740-014080                                   | 1000642883     | RE-A-1000               |
| ad0 248 MB       |                                | SILICONSYSTEMS INC 256M 126CT505S0763SC00110 |                | Compact Flash           |
| ad2 38154 MB     |                                | HTE541040G9SA00                              | MPBBT0X2HS2E3M | Hard Disk               |
| CB 0             | REV 03                         | 710-011403                                   | CM8346         | M120 Control Board      |
| CB 1             | REV 06                         | 710-011403                                   | CP6728         | M120 Control Board      |
| FPC 1            | REV 02                         | 710-015908                                   | CP6925         | M120 CFPC 10GE          |
| PIC 0            |                                | BUILTIN                                      | BUILTIN        | 1x 10GE(LAN/WAN) XFP    |
| Xcvr 0           | REV 01                         | 740-014279                                   | 62E204N00007   | XFP-10G-LR              |
| FPC 3            | REV 03                         | 710-011393                                   | CJ9234         | M120 FPC Type 2         |
| PIC 0            | REV 16                         | 750-008155                                   | NB5229         | 2x G/E IQ, 1000 BASE    |
| Xcvr 0           | REV 01                         | 740-011613                                   | P9F15JB        | SFP-SX                  |
| Xcvr 1           | REV 01                         | 740-007326                                   | P4Q0R9G        | SFP-SX                  |
| PIC 1            | REV 09                         | 750-007745                                   | CG4360         | 4x OC-3 SONET, SMIR     |
| PIC 2            | REV 16                         | 750-008155                                   | ND7787         | 2x G/E IQ, 1000 BASE    |
| Xcvr 0           | REV 01                         | 740-011613                                   | P9F12AS        | SFP-SX                  |
| Xcvr 1           | REV 01                         | 740-011613                                   | P9F1ALU        | SFP-SX                  |
| PIC 3            | REV 07                         | 750-011800                                   | JW1284         | 8x 1GE(LAN), IQ2        |
| Xcvr 0           | REV 01                         | 740-011613                                   | P9F1AM6        | SFP-SX                  |
| Xcvr 6           | REV 01                         | 740-011613                                   | P9F16NN        | SFP-SX                  |
| Xcvr 7           | REV 01                         | 740-011782                                   | P8C29Y7        | SFP-SX                  |
| Board B          | REV 02                         | 710-011395                                   | CN3754         | M120 FPC Mezz           |
| FPC 4            | REV 02                         | 710-011398                                   | CP6741         | M120 FPC Type 3         |
| PIC 0            | REV 16                         | 750-007141                                   | NB2855         | 10x 1GE(LAN), 1000 BASE |
| Xcvr 0           | REV 01                         | 740-011782                                   | P922A1F        | SFP-SX                  |
| Xcvr 1           | REV 01                         | 740-011782                                   | P922A16        | SFP-SX                  |
| Xcvr 2           | REV 01                         | 740-011782                                   | P922A0U        | SFP-SX                  |
| Xcvr 3           | REV 01                         | 740-011782                                   | P9229UZ        | SFP-SX                  |
| Xcvr 4           | REV 01                         | 740-009029                                   | P11JXWP        | SFP-LX                  |
| Xcvr 6           | REV 01                         | 740-011613                                   | P9F1ALW        | SFP-SX                  |
| FPC 5            | REV 01                         | 710-011388                                   | CJ9088         | M120 FPC Type 1         |
| PIC 0            | *** Hardware Not Supported *** |                                              |                |                         |
| PIC 1            | REV 05                         | 750-012052                                   | NB0410         | 1x CHOC3 IQ SONET, SMLR |
| PIC 2            | REV 01                         | 750-013167                                   | CM3824         | 4x CHDS3 IQ             |
| PIC 3            | REV 01                         | 750-010240                                   | CB5366         | 1x G/E SFP, 1000 BASE   |
| Board B          | REV 01                         | 710-011390                                   | CJ9103         | M120 FPC Mezz Board     |
| FEB 3            | REV 04                         | 710-011663                                   | CP6673         | M120 FEB                |
| FEB 4            | REV 04                         | 710-011663                                   | CJ9368         | M120 FEB                |
| FEB 5            | REV 04                         | 710-011663                                   | CJ9386         | M120 FEB                |
| Fan Tray 0       |                                |                                              |                | Front Top Fan Tray      |
| Fan Tray 1       |                                |                                              |                | Front Bottom Fan Tray   |
| Fan Tray 2       |                                |                                              |                | Rear Top Fan Tray       |
| Fan Tray 3       |                                |                                              |                | Rear Bottom Fan Tray    |

### show chassis hardware models (M120 Router)

```

user@host> show chassis hardware models
Hardware inventory:
Item Version Part number CLEI code FRU model number
Midplane REV 01 710-013667
FPM CIP REV 02 710-011410
PEM 0 Rev 05 740-011936 CRAFT-M120-S
PEM 1 Rev 05 740-011936 PWR-M120-AC-S
Routing Engine 0 REV 03 740-014080 RE-A-1000-2048-S
CB 0 REV 03 710-011403 CB-M120-S
CB 1 REV 06 710-011403 CB-M120-S
FPC 1 REV 02 710-015908 M120-cFPC-1XGE-XFP
FPC 3
PIC 0 REV 16 750-008155 PB-2GE-SFP-QPP

```

|            |        |            |                      |
|------------|--------|------------|----------------------|
| PIC 1      | REV 09 | 750-007745 | PC-40C3-SON-SMIR     |
| PIC 2      | REV 16 | 750-008155 | PB-2GE-SFP-QPP       |
| PIC 3      | REV 07 | 750-011800 | PB-8GE-TYPE2-SFP-IQ2 |
| FPC 4      |        |            |                      |
| PIC 0      | REV 16 | 750-007141 | PC-10GE-SFP          |
| FPC 5      |        |            |                      |
| PIC 1      | REV 05 | 750-012052 | PB-1CHOC3-SMIR-QPP   |
| PIC 2      | REV 01 | 750-013167 | PE-4CHDS3-QPP        |
| PIC 3      | REV 01 | 750-010240 | PB-1GE-SFP           |
| Fan Tray 0 |        |            | FFANTRAY-M120-S      |
| Fan Tray 1 |        |            | FFANTRAY-M120-S      |
| Fan Tray 2 |        |            | RFANTRAY-M120-S      |
| Fan Tray 3 |        |            | RFANTRAY-M120-S      |

### show chassis hardware (M160 Router)

```
user@host> show chassis hardware
```

| Item        | Version | Part number | Serial number    | Description          |
|-------------|---------|-------------|------------------|----------------------|
| Chassis     |         |             | 101              | M160                 |
| Midplane    | REV 02  | 710-001245  | S/N AB4107       |                      |
| FPM CMB     | REV 01  | 710-001642  | S/N AA2911       |                      |
| FPM Display | REV 01  | 710-001647  | S/N AA2999       |                      |
| CIP         | REV 02  | 710-001593  | S/N AA9563       |                      |
| PEM 0       | Rev 01  | 740-001243  | S/N KJ35769      | DC                   |
| PEM 1       | Rev 01  | 740-001243  | S/N KJ35765      | DC                   |
| PCG 0       | REV 01  | 710-001568  | S/N AA9794       |                      |
| PCG 1       | REV 01  | 710-001568  | S/N AA9804       |                      |
| Host 1      |         |             | da000004f8d57001 | teknor               |
| MCS 1       | REV 03  | 710-001226  | S/N AA9777       |                      |
| SFM 0 SPP   | REV 04  | 710-001228  | S/N AA2975       |                      |
| SFM 0 SPR   | REV 02  | 710-001224  | S/N AA9838       | Internet Processor I |
| SFM 1 SPP   | REV 04  | 710-001228  | S/N AA2860       |                      |
| SFM 1 SPR   | REV 01  | 710-001224  | S/N AB0139       | Internet Processor I |
| FPC 0       | REV 03  | 710-001255  | S/N AA9806       | FPC Type 1           |
| CPU         | REV 02  | 710-001217  | S/N AA9590       |                      |
| PIC 1       | REV 05  | 750-000616  | S/N AA1527       | 1x OC-12 ATM, MM     |
| PIC 2       | REV 05  | 750-000616  | S/N AA1535       | 1x OC-12 ATM, MM     |
| PIC 3       | REV 01  | 750-000616  | S/N AA1519       | 1x OC-12 ATM, MM     |
| FPC 1       | REV 02  | 710-001611  | S/N AA9523       | FPC Type 2           |
| CPU         | REV 02  | 710-001217  | S/N AA9571       |                      |
| PIC 0       | REV 03  | 750-001900  | S/N AA9626       | 1x STM-16 SDH, SMIR  |
| PIC 1       | REV 01  | 710-002381  | S/N AD3633       | 2x G/E, 1000 BASE-SX |
| FPC 2       |         |             |                  | FPC Type OC192       |
| CPU         | REV 03  | 710-001217  | S/N AB3329       |                      |
| PIC 0       | REV 01  |             |                  | 1x OC-192 SM SR-2    |
| Fan Tray 0  |         |             |                  | Rear Bottom Blower   |
| Fan Tray 1  |         |             |                  | Rear Top Blower      |
| Fan Tray 2  |         |             |                  | Front Top Blower     |
| Fan Tray 3  |         |             |                  | Front Fan Tray       |

### show chassis hardware models (M160 Router)

```
user@host> show chassis hardware models
```

| Hardware inventory: |         |             |           |                  |
|---------------------|---------|-------------|-----------|------------------|
| Item                | Version | Part number | CLEI code | FRU model number |
| Midplane            | REV 03  | 710-009120  |           | CHAS-BP-M320-S   |
| FPM Display         | REV 02  | 710-009351  |           | CRAFT-M320-S     |
| CIP                 | REV 03  | 710-005926  |           | CIP-M320-S       |
| PEM 2               | Rev X4  | 740-009148  |           | PWR-M-DC-S       |
| PEM 3               | Rev X4  | 740-009148  |           | PWR-M-DC-S       |
| Routing Engine 0    | REV 02  | 740-008883  |           | RE-1600-2048-S   |

|                  |        |            |                    |
|------------------|--------|------------|--------------------|
| Routing Engine 1 | REV 02 | 740-008883 | RE-1600-2048-S     |
| FPC 0            | REV 02 | 710-010419 | M320-FPC1          |
| PIC 0            | REV 01 | 750-001323 | P-TUNNEL           |
| PIC 1            | REV 02 | 750-002987 | PE-10C12-SON-SMIR  |
| PIC 2            | REV 04 | 750-001894 | PB-1GE-SX          |
| PIC 3            | REV 04 | 750-001896 | PB-10C12-SON-SMIR  |
| FPC 1            | REV 02 | 710-010419 | M320-FPC1          |
| PIC 0            | REV 04 | 750-001894 | PB-1GE-SX          |
| PIC 1            | REV 04 | 750-001894 | PB-1GE-SX          |
| PIC 3            | REV 03 | 750-001894 | PB-1GE-SX          |
| FPC 2            | REV 02 | 710-010419 | M320-FPC1          |
| PIC 0            | REV 10 | 750-005634 | PB-1CHOC12SMIR-QPP |
| PIC 1            | REV 10 | 750-005634 | PB-1CHOC12SMIR-QPP |
| PIC 2            | REV 07 | 750-005634 | PB-1CHOC12SMIR-QPP |
| PIC 3            | REV 07 | 750-005634 | PB-1CHOC12SMIR-QPP |
| PIC 1            | REV 10 | 750-005634 | PB-1CHOC12SMIR-QPP |
| PIC 2            | REV 07 | 750-005634 | PB-1CHOC12SMIR-QPP |
| PIC 3            | REV 07 | 750-005634 | PB-1CHOC12SMIR-QPP |
| FPC 3            |        |            |                    |
| PIC 0            | REV 03 | 750-001895 | PB-10C12-SON-MM    |
| PIC 1            | REV 04 | 750-001894 | PB-1GE-SX          |
| PIC 3            | REV 04 | 750-003141 | PB-1GE-SX-B        |
| FPC 4            | REV 02 | 710-010419 | M320-FPC1          |
| FPC 5            | REV 02 | 710-010419 | M320-FPC1          |
| FPC 6            | REV 02 | 710-010419 | M320-FPC1          |
| FPC 7            |        |            |                    |
| PIC 0            | REV 15 | 750-001901 | PB-40C12-SON-SMIR  |
| PIC 1            | REV 06 | 750-001900 | PB-10C48-SON-SMSR  |
| PIC 2            | REV 07 | 750-001900 | PB-10C48-SON-SMSR  |
| PIC 3            | REV 05 | 750-003737 | PB-4GE-SX          |
| SIB 0            | REV 03 | 710-009184 | SIB-M-S            |
| SIB 1            | REV 03 | 710-009184 | SIB-M-S            |
| SIB 2            | REV 03 | 710-009184 | SIB-M-S            |
| SIB 3            | REV 03 | 710-009184 | SIB-M-S            |
| Fan Tray 0       |        |            | FFANTRAY-M320-S    |
| Fan Tray 1       |        |            | FFANTRAY-M320-S    |
| Fan Tray 2       |        |            | RFANTRAY-M320-S    |

### show chassis hardware detail (M160 Router)

```

user@host> show chassis hardware detail
Hardware inventory:

```

| Item         | Version | Part number | Serial number    | Description          |
|--------------|---------|-------------|------------------|----------------------|
| Chassis      |         |             | 101              | M160                 |
| Midplane     | REV 02  | 710-001245  | S/N AB4107       |                      |
| FPM CMB      | REV 01  | 710-001642  | S/N AA2911       |                      |
| FPM Display  | REV 01  | 710-001647  | S/N AA2999       |                      |
| CIP          | REV 02  | 710-001593  | S/N AA9563       |                      |
| PEM 0        | Rev 01  | 740-001243  | S/N KJ35769      | DC                   |
| PEM 1        | Rev 01  | 740-001243  | S/N KJ35765      | DC                   |
| PCG 0        | REV 01  | 710-001568  | S/N AA9794       |                      |
| PCG 1        | REV 01  | 710-001568  | S/N AA9804       |                      |
| Host 1       |         |             | da000004f8d57001 | teknor               |
| MCS 1        | REV 03  | 710-001226  | S/N AA9777       |                      |
| SFM 0 SPP    | REV 04  | 710-001228  | S/N AA2975       |                      |
| SFM 0 SPR    | REV 02  | 710-001224  | S/N AA9838       | Internet Processor I |
| SSRAM bank 0 | REV 01  | 710-000077  | S/N 306456       | 1 MB                 |
| SSRAM bank 1 | REV 01  | 710-000077  | S/N 306474       | 1 MB                 |
| SSRAM bank 2 | REV 01  | 710-000077  | S/N 306388       | 1 MB                 |
| SSRAM bank 3 | REV 01  | 710-000077  | S/N 306392       | 1 MB                 |
| SFM 1 SPP    | REV 04  | 710-001228  | S/N AA2860       |                      |

|              |        |            |            |                      |
|--------------|--------|------------|------------|----------------------|
| SFM 1 SPR    | REV 01 | 710-001224 | S/N AB0139 | Internet Processor I |
| SSRAM bank 0 | REV 01 | 710-000077 | S/N 302917 | 1 MB                 |
| SSRAM bank 1 | REV 01 | 710-000077 | S/N 302662 | 1 MB                 |
| SSRAM bank 2 | REV 01 | 710-000077 | S/N 302593 | 1 MB                 |
| SSRAM bank 3 | REV 01 | 710-000077 | S/N 100160 | 1 MB                 |
| FPC 0        | REV 03 | 710-001255 | S/N AA9806 | FPC Type 1           |
| CPU          | REV 02 | 710-001217 | S/N AA9590 |                      |
| SSRAM        | REV 01 | 710-000077 | S/N 302836 | 1 MB                 |
| SDRAM 0      | REV 01 | 710-001196 | S00141     | 32 MB                |
| SDRAM 1      | REV 01 | 710-001196 | S0010;     | 32 MB                |
| SSRAM        | REV 01 | 710-000077 | S/N 302633 | 1 MB                 |
| SDRAM 0      | REV 01 | 710-001196 | S00143     | 32 MB                |
| SDRAM 1      | REV 01 | 710-001196 | S00115     | 32 MB                |
| SSRAM        | REV 01 | 710-000077 | S/N 302952 | 1 MB                 |
| SDRAM 0      | REV 01 | 710-001196 | S00135     | 32 MB                |
| SDRAM 1      | REV 01 | 710-001196 | S001=3     | 32 MB                |
| SSRAM        | REV 01 | 710-000077 | S/N 302892 | 1 MB                 |
| SDRAM 0      | REV 01 | 710-001196 | S000?6     | 32 MB                |
| SDRAM 1      | REV 01 | 710-001196 | S001=5     | 32 MB                |
| PIC 1        | REV 05 | 750-000616 | S/N AA1527 | 1x OC-12 ATM, MM     |
| PIC 2        | REV 05 | 750-000616 | S/N AA1535 | 1x OC-12 ATM, MM     |
| PIC 3        | REV 01 | 750-000616 | S/N AA1519 | 1x OC-12 ATM, MM     |
| FPC 1        | REV 02 | 710-001611 | S/N AA9523 | FPC Type 2           |
| CPU          | REV 02 | 710-001217 | S/N AA9571 |                      |
| SSRAM        | REV 01 | 710-000077 | S/N 306340 | 1 MB                 |
| SDRAM 0      | REV 01 | 710-001196 | S00012     | 32 MB                |
| SDRAM 1      | REV 01 | 710-001196 | S0001?     | 32 MB                |
| SSRAM        | REV 01 | 710-000077 | S/N 306454 | 1 MB                 |
| SDRAM 0      | REV 01 | 710-001196 | S00028     | 32 MB                |
| SDRAM 1      | REV 01 | 710-001196 | S0002?     | 32 MB                |
| SSRAM        | REV 01 | 710-000077 | S/N 306492 | 1 MB                 |
| SDRAM 0      | REV 01 | 710-001196 | S00015     | 32 MB                |
| SDRAM 1      | REV 01 | 710-001196 | S00031     | 32 MB                |
| SSRAM        | REV 01 | 710-000077 | S/N 306363 | 1 MB                 |
| SDRAM 0      | REV 01 | 710-001196 | S00013     | 32 MB                |
| SDRAM 1      | REV 01 | 710-001196 | S00032     | 32 MB                |
| PIC 0        | REV 03 | 750-001900 | S/N AA9626 | 1x STM-16 SDH, SMIR  |
| PIC 1        | REV 01 | 710-002381 | S/N AD3633 | 2x G/E, 1000 BASE-SX |
| FPC 2        |        |            |            | FPC Type OC192       |
| ... SSRAM    | REV 01 | 710-000077 | S/N 306466 | 1 MB                 |

### show chassis hardware (M320 Router)

```
user@host> show chassis hardware
```

```
Hardware inventory:
```

| Item             | Version | Part number | Serial number | Description           |
|------------------|---------|-------------|---------------|-----------------------|
| Chassis          |         |             | 67245         | M320                  |
| Midplane         | REV 05  | 710-009120  | RB1202        | M320 Midplane         |
| FPM GBUS         | REV 04  | 710-005928  | HZ5697        | M320 Board            |
| FPM Display      | REV 05  | 710-009351  | HR1464        | M320 FPM Display      |
| CIP              | REV 04  | 710-005926  | HT8672        | M320 CIP              |
| PEM 0            | Rev 05  | 740-009148  | QK34208       | DC Power Entry Module |
| PEM 1            | Rev 05  | 740-009148  | QK34262       | DC Power Entry Module |
| PEM 2            | Rev 05  | 740-009148  | QF10449       | DC Power Entry Module |
| PEM 3            | Rev 05  | 740-009148  | QJ18257       | DC Power Entry Module |
| Routing Engine 0 | REV 06  | 740-008883  | P11123901185  | RE-4.0                |
| CB 0             | REV 07  | 710-009115  | JB2382        | M320 Control Board    |
| FPC 0            | REV 02  | 710-005017  | CD9926        | M320 FPC Type 2       |
| CPU              | REV 01  | 710-011659  | CJ6940        | M320 PCA SCPU         |
| PIC 0            | REV 07  | 750-001900  | AT1594        | 1x OC-48 SONET, SMSR  |
| PIC 1            | REV 03  | 750-001850  | HS2746        | 1x Tunnel             |

|            |        |            |        |                       |
|------------|--------|------------|--------|-----------------------|
| PIC 2      | REV 05 | 750-010618 | JE7117 | 4x G/E SFP, 1000 BASE |
| PIC 3      | REV 06 | 750-001900 | HE6083 | 1x OC-48 SONET, SMSR  |
| FPC 2      | REV 02 | 710-005017 | CH0319 | M320 FPC Type 1       |
| CPU        | REV 01 | 710-011659 | CJ6942 | M320 PCA SCPU         |
| PIC 0      | REV 05 | 750-003034 | BD8705 | 4x OC-3 SONET, SMIR   |
| FPC 5      | REV 02 | 710-005017 | CD9938 | M320 FPC Type 2       |
| CPU        |        |            |        |                       |
| FPC 7      | REV 02 | 710-005017 | CD9934 | M320 FPC Type 2       |
| CPU        |        |            |        |                       |
| SIB 0      | REV 09 | 710-009184 | JA6540 | M320 SIB              |
| SIB 1      | REV 09 | 710-009184 | HV9511 | M320 SIB              |
| SIB 2      | REV 09 | 710-009184 | HW2057 | M320 SIB              |
| SIB 3      | REV 09 | 710-009184 | JA6687 | M320 SIB              |
| Fan Tray 0 |        |            |        | Front Top Fan Tray    |
| Fan Tray 1 |        |            |        | Front Bottom Fan Tray |
| Fan Tray 2 |        |            |        | Rear Fan Tray         |

### show chassis hardware models (M320 Router)

```
user@host> show chassis hardware models
```

```
Hardware inventory:
```

| Item             | Version | Part number | CLEI code | FRU model number   |
|------------------|---------|-------------|-----------|--------------------|
| Midplane         | REV 03  | 710-009120  |           | CHAS-BP-M320-S     |
| FPM Display      | REV 02  | 710-009351  |           | CRAFT-M320-S       |
| CIP              | REV 03  | 710-005926  |           | CIP-M320-S         |
| PEM 2            | Rev X4  | 740-009148  |           | PWR-M-DC-S         |
| PEM 3            | Rev X4  | 740-009148  |           | PWR-M-DC-S         |
| Routing Engine 0 | REV 02  | 740-008883  |           | RE-1600-2048-S     |
| Routing Engine 1 | REV 02  | 740-008883  |           | RE-1600-2048-S     |
| FPC 0            | REV 02  | 710-010419  |           | M320-FPC1          |
| PIC 0            | REV 01  | 750-001323  |           | P-TUNNEL           |
| PIC 1            | REV 02  | 750-002987  |           | PE-10C12-SON-SMIR  |
| PIC 2            | REV 04  | 750-001894  |           | PB-1GE-SX          |
| PIC 3            | REV 04  | 750-001896  |           | PB-10C12-SON-SMIR  |
| FPC 1            | REV 02  | 710-010419  |           | M320-FPC1          |
| PIC 0            | REV 04  | 750-001894  |           | PB-1GE-SX          |
| PIC 1            | REV 04  | 750-001894  |           | PB-1GE-SX          |
| PIC 3            | REV 03  | 750-001894  |           | PB-1GE-SX          |
| FPC 2            | REV 02  | 710-010419  |           | M320-FPC1          |
| PIC 0            | REV 10  | 750-005634  |           | PB-1CHOC12SMIR-QPP |
| PIC 1            | REV 10  | 750-005634  |           | PB-1CHOC12SMIR-QPP |
| PIC 2            | REV 07  | 750-005634  |           | PB-1CHOC12SMIR-QPP |
| PIC 3            | REV 07  | 750-005634  |           | PB-1CHOC12SMIR-QPP |
| PIC 1            | REV 10  | 750-005634  |           | PB-1CHOC12SMIR-QPP |
| PIC 2            | REV 07  | 750-005634  |           | PB-1CHOC12SMIR-QPP |
| PIC 3            | REV 07  | 750-005634  |           | PB-1CHOC12SMIR-QPP |
| FPC 3            |         |             |           |                    |
| PIC 0            | REV 03  | 750-001895  |           | PB-10C12-SON-MM    |
| PIC 1            | REV 04  | 750-001894  |           | PB-1GE-SX          |
| PIC 3            | REV 04  | 750-003141  |           | PB-1GE-SX-B        |
| FPC 4            | REV 02  | 710-010419  |           | M320-FPC1          |
| FPC 5            | REV 02  | 710-010419  |           | M320-FPC1          |
| FPC 6            | REV 02  | 710-010419  |           | M320-FPC1          |
| FPC 7            |         |             |           |                    |
| PIC 0            | REV 15  | 750-001901  |           | PB-40C12-SON-SMIR  |
| PIC 1            | REV 06  | 750-001900  |           | PB-10C48-SON-SMSR  |
| PIC 2            | REV 07  | 750-001900  |           | PB-10C48-SON-SMSR  |
| PIC 3            | REV 05  | 750-003737  |           | PB-4GE-SX          |
| SIB 0            | REV 03  | 710-009184  |           | SIB-M-S            |
| SIB 1            | REV 03  | 710-009184  |           | SIB-M-S            |
| SIB 2            | REV 03  | 710-009184  |           | SIB-M-S            |

|            |        |            |                 |
|------------|--------|------------|-----------------|
| SIB 3      | REV 03 | 710-009184 | SIB-M-S         |
| Fan Tray 0 |        |            | FFANTRAY-M320-S |
| Fan Tray 1 |        |            | FFANTRAY-M320-S |
| Fan Tray 2 |        |            | RFANTRAY-M320-S |

### show chassis hardware (MX5 Router)

```
user@host> show chassis hardware
Hardware inventory:
```

| Item           | Version | Part number | Serial number | Description           |
|----------------|---------|-------------|---------------|-----------------------|
| Chassis        |         |             | E1368         | MX5-T                 |
| Midplane       | REV 01  | 711-038215  | YF5288        | MX5-T                 |
| PEM 0          | Rev 04  | 740-028288  | VA01215       | AC Power Entry Module |
| PEM 1          | Rev 04  | 740-028288  | VA01218       | AC Power Entry Module |
| Routing Engine |         | BUILTIN     | BUILTIN       | Routing Engine        |
| TFEB 0         |         | BUILTIN     | BUILTIN       | Forwarding Engine     |
| Processor      |         |             |               |                       |
| QXM 0          | REV 05  | 711-028408  | ZA9136        | MPC QXM               |
| FPC 0          |         | BUILTIN     | BUILTIN       | MPC BUILTIN           |
| MIC 0          |         | BUILTIN     | BUILTIN       | 4x 10GE XFP           |
| PIC 0          |         | BUILTIN     | BUILTIN       | 4x 10GE XFP           |
| FPC 1          |         | BUILTIN     | BUILTIN       | MPC BUILTIN           |
| MIC 0          | REV 24  | 750-028392  | YX9820        | 3D 20x 1GE(LAN) SFP   |
| PIC 0          |         | BUILTIN     | BUILTIN       | 10x 1GE(LAN) SFP      |
| Xcvr 0         | REV 01  | 740-031851  | AM1045SUAQ3   | SFP-SX                |
| Xcvr 1         | REV 01  | 740-031851  | AM1045SUAPA   | SFP-SX                |
| Xcvr 2         | REV 01  | 740-031851  | AM1045SUAN7   | SFP-SX                |
| Xcvr 3         | REV 01  | 740-031851  | AM1045SU91Q   | SFP-SX                |
| Xcvr 4         | REV 01  | 740-031851  | AM1045SUDDR   | SFP-SX                |
| Xcvr 9         | REV 01  | 740-011613  | AM0848SB6A1   | SFP-SX                |
| PIC 1          |         | BUILTIN     | BUILTIN       | 10x 1GE(LAN) SFP      |
| Xcvr 0         | REV 01  | 740-031851  | AM1045SUANO   | SFP-SX                |
| Xcvr 1         | REV 01  | 740-011613  | AS0812S0719   | SFP-SX                |
| Xcvr 2         | REV 01  | 740-011613  | AM0821SA121   | SFP-SX                |
| Xcvr 3         | REV 01  | 740-011613  | PF21K21       | SFP-SX                |
| Xcvr 4         | REV 01  | 740-011613  | AM0848SB69Z   | SFP-SX                |
| Xcvr 5         | REV 01  | 740-011782  | P9P0XV3       | SFP-SX                |
| Xcvr 6         | REV 01  | 740-011613  | AM0812S8WJN   | SFP-SX                |
| Xcvr 7         | REV 01  | 740-011613  | PAM3G9Q       | SFP-SX                |
| Xcvr 8         | REV 01  | 740-011613  | AM0848SB4A6   | SFP-SX                |
| Xcvr 9         | REV 01  | 740-011782  | P9MOU37       | SFP-SX                |
| MIC 1          | REV 20  | 750-028380  | ZG2657        | 3D 2x 10GE XFP        |
| PIC 2          |         | BUILTIN     | BUILTIN       | 1x 10GE XFP           |
| PIC 3          |         | BUILTIN     | BUILTIN       | 1x 10GE XFP           |
| Fan Tray       |         |             |               | Fan Tray              |

### show chassis hardware (MX10 Router)

```
user@host> show chassis hardware
Hardware inventory:
```

| Item           | Version | Part number | Serial number | Description           |
|----------------|---------|-------------|---------------|-----------------------|
| Chassis        |         |             | E1372         | MX10-T                |
| Midplane       | REV 01  | 711-038211  | YF5285        | MX10-T                |
| PEM 0          | Rev 04  | 740-028288  | VB01678       | AC Power Entry Module |
| Routing Engine |         | BUILTIN     | BUILTIN       | Routing Engine        |
| TFEB 0         |         | BUILTIN     | BUILTIN       | Forwarding Engine     |
| Processor      |         |             |               |                       |
| QXM 0          | REV 05  | 711-028408  | ZA9053        | MPC QXM               |
| FPC 0          |         | BUILTIN     | BUILTIN       | MPC BUILTIN           |
| MIC 0          |         | BUILTIN     | BUILTIN       | 4x 10GE XFP           |
| PIC 0          |         | BUILTIN     | BUILTIN       | 4x 10GE XFP           |

```

FPC 1 BUILTIN BUILTIN MPC BUILTIN
 MIC 0 REV 24 750-028392 YX9436 3D 20x 1GE(LAN) SFP
 PIC 0 BUILTIN BUILTIN 10x 1GE(LAN) SFP
 Xcvr 0 REV 01 740-031851 AM1107SUFQW SFP-SX
 PIC 1 BUILTIN BUILTIN 10x 1GE(LAN) SFP
Fan Tray Fan Tray

```

### show chassis hardware (MX40 Router)

```

user@host> show chassis hardware
Hardware inventory:
Item Version Part number Serial number Description
Chassis E1367 MX40-T
Midplane REV 01 711-038211 YF5284 MX40-T
PEM 0 Rev 04 740-028288 VB01680 AC Power Entry Module
PEM 1 Rev 04 740-028288 VB01700 AC Power Entry Module
Routing Engine BUILTIN BUILTIN Routing Engine
TFEB 0 BUILTIN BUILTIN Forwarding Engine
Processor
 QXM 0 REV 05 711-028408 ZA9048 MPC QXM
FPC 0 BUILTIN BUILTIN MPC BUILTIN
 MIC 0 BUILTIN BUILTIN 4x 10GE XFP
 PIC 0 BUILTIN BUILTIN 4x 10GE XFP
 Xcvr 0 REV 01 740-014279 M7067UPP XFP-10G-LR
 Xcvr 1 NON-JNPR K9J02UN XFP-10G-LR
FPC 1 BUILTIN BUILTIN MPC BUILTIN
 MIC 0 REV 24 750-028392 YX3504 3D 20x 1GE(LAN) SFP
 PIC 0 BUILTIN BUILTIN 10x 1GE(LAN) SFP
 Xcvr 0 REV 01 740-011613 AM0812S8WTE SFP-SX
 Xcvr 1 REV 01 740-011613 PFA6KV2 SFP-SX
 Xcvr 2 REV 01 740-031851 AM1045SUDDM SFP-SX
 Xcvr 3 REV 01 740-011613 PD63C7M SFP-SX
 Xcvr 4 REV 01 740-011613 PD63DJY SFP-SX
 Xcvr 5 REV 02 740-011613 AA0950STLL9 SFP-SX
 Xcvr 6 REV 01 740-011782 PAR1YHC SFP-SX
 Xcvr 7 REV 01 740-011782 P9P0XXL SFP-SX
 Xcvr 8 REV 01 740-011613 PD63D95 SFP-SX
 Xcvr 9 REV 01 740-031851 AM1045SU9B8 SFP-SX
 PIC 1 BUILTIN BUILTIN 10x 1GE(LAN) SFP
 Xcvr 0 REV 01 740-011613 PF21L3Z SFP-SX
 Xcvr 1 REV 01 740-031851 AM1045SU7M9 SFP-SX
 Xcvr 2 REV 01 740-031851 AM1045SUAPT SFP-SX
 Xcvr 3 REV 01 740-011613 PFF2BZH SFP-SX
 Xcvr 4 REV 01 740-031851 AM1045SUDDN SFP-SX
 Xcvr 5 REV 01 740-031851 AM1039S00ZR SFP-SX
 Xcvr 6 REV 01 740-031851 AM1045SUD6Y SFP-SX
 Xcvr 8 REV 01 740-011613 PFM1QBS SFP-SX
 Xcvr 9 REV 01 740-011613 PFF2E25 SFP-SX
MIC 1 REV 01 750-021130 KG4391 3D 2x 10GE XFP
 PIC 2 BUILTIN BUILTIN 1x 10GE XFP
 Xcvr 0 REV 01 740-011571 C645XJ04G XFP-10G-SR
 PIC 3 BUILTIN BUILTIN 1x 10GE XFP
 Xcvr 0 NON-JNPR CA49BK0AE XFP-10G-SR
Fan Tray Fan Tray

```

### show chassis hardware (Fixed MX80 Router)

```

user@host> show chassis hardware
Hardware inventory:
Item Version Part number Serial number Description
Chassis MX80-48T

```

|                |        |            |              |                         |
|----------------|--------|------------|--------------|-------------------------|
| Midplane       | REV 01 | 711-031603 | KF9250       | MX80-48T                |
| Routing Engine |        | BUILTIN    | BUILTIN      | Routing Engine          |
| FEB 0          |        | BUILTIN    | BUILTIN      | Forwarding Engine Board |
| FPC 0          |        | BUILTIN    | BUILTIN      | MPC BUILTIN             |
| MIC 0          |        | BUILTIN    | BUILTIN      | 4x 10GE XFP             |
| PIC 0          |        | BUILTIN    | BUILTIN      | 4x 10GE XFP             |
| Xcvr 0         |        | NON-JNPR   | M6439D41     | XFP-10G-LR              |
| Xcvr 1         | REV 01 | 740-014279 | 6XE931N00202 | XFP-10G-LR              |
| Xcvr 2         | REV 01 | 740-014289 | C715XU05F    | XFP-10G-SR              |
| Xcvr 3         | REV 01 | 740-014289 | C650XU0EP    | XFP-10G-SR              |
| FPC 1          |        | BUILTIN    | BUILTIN      | MPC BUILTIN             |
| MIC 0          | REV 01 | 711-029399 | JR6981       | 12x 1GE(LAN) RJ45       |
| PIC 0          |        | BUILTIN    | BUILTIN      | 12x 1GE(LAN) RJ45       |
| PIC 1          |        | BUILTIN    | BUILTIN      | 12x 1GE(LAN) RJ45       |
| MIC 1          | REV 01 | BUILTIN    | BUILTIN      | 12x 1GE(LAN) RJ45       |
| PIC 2          |        | BUILTIN    | BUILTIN      | 12x 1GE(LAN) RJ45       |
| PIC 3          |        | BUILTIN    | BUILTIN      | 12x 1GE(LAN) RJ45       |
| Fan Tray       |        |            |              | Fan Tray                |

### show chassis hardware (Modular MX80 Router)

```
user@host> show chassis hardware
```

Hardware inventory:

| Item           | Version | Part number | Serial number | Description             |
|----------------|---------|-------------|---------------|-------------------------|
| Chassis        |         |             |               | MX80                    |
| Midplane       | REV 02  | 711-031594  | JR7084        | MX80                    |
| PEM 0          | Rev 01  | 740-028288  | 000018        | AC Power Entry Module   |
| Routing Engine |         | BUILTIN     | BUILTIN       | Routing Engine          |
| FEB 0          |         | BUILTIN     | BUILTIN       | Forwarding Engine Board |
| QXM 0          | REV 05  | 711-028408  | JR7041        | MPC QXM                 |
| FPC 0          |         | BUILTIN     | BUILTIN       | MPC BUILTIN             |
| MIC 0          |         | BUILTIN     | BUILTIN       | 4x 10GE XFP             |
| PIC 0          |         | BUILTIN     | BUILTIN       | 4x 10GE XFP             |
| FPC 1          |         | BUILTIN     | BUILTIN       | MPC BUILTIN             |
| MIC 0          | REV 02  | 750-028380  | JR6598        | 3D 2x 10GE XFP          |
| PIC 0          |         | BUILTIN     | BUILTIN       | 1x 10GE XFP             |
| Xcvr 0         | REV 01  | 740-014289  | T07M86365     | XFP-10G-SR              |
| PIC 1          |         | BUILTIN     | BUILTIN       | 1x 10GE XFP             |
| Xcvr 0         | REV 01  | 740-014289  | T07M71094     | XFP-10G-SR              |
| MIC 1          | REV 02  | 750-028380  | JG8548        | 3D 2x 10GE XFP          |
| PIC 2          |         | BUILTIN     | BUILTIN       | 1x 10GE XFP             |
| Xcvr 0         | REV 02  | 740-014289  | T08L86302     | XFP-10G-SR              |
| PIC 3          |         | BUILTIN     | BUILTIN       | 1x 10GE XFP             |
| Xcvr 0         | REV 02  | 740-014289  | C810XU0BA     | XFP-10G-SR              |
| Fan Tray       |         |             |               | Fan Tray                |

### show chassis hardware (MX104 Router)

```
user@host> show chassis hardware
```

Hardware inventory:

| Item             | Version | Part number | Serial number | Description           |
|------------------|---------|-------------|---------------|-----------------------|
| Chassis          |         |             | G3503         | MX104                 |
| Midplane         | REV 28  | 750-044219  | CAAX5741      | MX104                 |
| PEM 0            | REV 03  | 740-045933  | 1H072500016   | AC Power Entry Module |
| PEM 1            | REV 03  | 740-045932  | 1H073050017   | DC Power Entry Module |
| Routing Engine 0 | REV 20  | 750-044228  | CAAY7935      | RE-MX-104             |
| Routing Engine 1 | REV 13  | 750-044228  | CAAM6380      | RE-MX-104             |
| AFEB 0           |         | BUILTIN     | BUILTIN       | Forwarding Engine     |
| Processor        |         |             |               |                       |



```

FPC 0 BUILTIN BUILTIN MPC BUILTIN
FPC 1 BUILTIN BUILTIN MPC BUILTIN
 MIC 0 REV 15 750-036132 CAAF7948 2x0C12/8x0C3 CC-CE
 PIC 0 BUILTIN BUILTIN 2x0C12/8x0C3 CC-CE
 Xcvr 0 REV 01 740-011615 PCQ0U2J SFP-IR
 Xcvr 1 REV 01 740-016068 PJJL7A6G SFP-SR
 Xcvr 2 REV 01 740-016068 PJJL7A5J SFP-SR
 Xcvr 3 REV 01 740-016065 PJJN5HPZ SFP-SR
 Xcvr 4 REV 01 740-029122 PKB38TL SFP-LR
 Xcvr 5 REV 01 740-011787 P6A107G SFP-LR
 Xcvr 6 REV 01 740-029122 PKB38TR SFP-LR
 Xcvr 7 REV 01 740-011787 PBKONK3 SFP-LR
 MIC 1
 FPC 2 BUILTIN BUILTIN MPC BUILTIN
 MIC 0 BUILTIN BUILTIN 4x 10GE(LAN) SFP+
 PIC 0 BUILTIN BUILTIN 4x 10GE(LAN) SFP+
 Xcvr 0 REV 01 740-031980 B10F00465 SFP+-10G-SR
 Xcvr 1 REV 01 740-031980 B10F00461 SFP+-10G-SR
 Xcvr 2 REV 01 740-031980 B10G01545 SFP+-10G-SR
 Xcvr 3 REV 01 740-031980 B10G01385 SFP+-10G-SR
 Fan Tray 0 REV 02 711-049570 CAAX6538 Fan Tray

```

#### show chassis hardware detail (MX104 Router)

```

user@host> show chassis hardware detail
Hardware inventory:
Item Version Part number Serial number Description
Chassis G3503 MX104
Midplane REV 28 750-044219 CAAX5741 MX104
PEM 0 REV 03 740-045933 1H072500016 AC Power Entry Module
PEM 1 REV 03 740-045932 1H073050017 DC Power Entry Module
Routing Engine 0 REV 20 750-044228 CAAY7935 RE-MX-104
 da0 7836 MB ATP IG eUSB SSD Nand Flash 0
 usb0 (addr 1) EHCI root hub 0 Freescale uhub0
 usb0 (addr 2) USB2513Bi 9491 SMSC uhub1
 usb0 (addr 3) ATP IG eUSB SSD 44801 ATP Electronics umass0
Routing Engine 1 REV 13 750-044228 CAAM6380 RE-MX-104
 da0 7836 MB ATP IG eUSB SSD Nand Flash 0
AFEB 0 BUILTIN BUILTIN Forwarding Engine
Processor
FPC 0 BUILTIN BUILTIN MPC BUILTIN
FPC 1 BUILTIN BUILTIN MPC BUILTIN
 MIC 0 REV 15 750-036132 CAAF7948 2x0C12/8x0C3 CC-CE
 PIC 0 BUILTIN BUILTIN 2x0C12/8x0C3 CC-CE
 Xcvr 0 REV 01 740-011615 PCQ0U2J SFP-IR
 Xcvr 1 REV 01 740-016068 PJJL7A6G SFP-SR
 Xcvr 2 REV 01 740-016068 PJJL7A5J SFP-SR
 Xcvr 3 REV 01 740-016065 PJJN5HPZ SFP-SR
 Xcvr 4 REV 01 740-029122 PKB38TL SFP-LR
 Xcvr 5 REV 01 740-011787 P6A107G SFP-LR
 Xcvr 6 REV 01 740-029122 PKB38TR SFP-LR
 Xcvr 7 REV 01 740-011787 PBKONK3 SFP-LR
 MIC 1
 FPC 2 BUILTIN BUILTIN MPC BUILTIN
 MIC 0 BUILTIN BUILTIN 4x 10GE(LAN) SFP+
 PIC 0 BUILTIN BUILTIN 4x 10GE(LAN) SFP+
 Xcvr 0 REV 01 740-031980 B10F00465 SFP+-10G-SR
 Xcvr 1 REV 01 740-031980 B10F00461 SFP+-10G-SR
 Xcvr 2 REV 01 740-031980 B10G01545 SFP+-10G-SR
 Xcvr 3 REV 01 740-031980 B10G01385 SFP+-10G-SR
 Fan Tray 0 REV 02 711-049570 CAAX6538 Fan Tray

```

## show chassis hardware extensive (MX104 Router)

```

user@host> show chassis hardware extensive
Hardware inventory:
Item Version Part number Serial number Description
Chassis
Jedec Code: 0x7fb0 EEPROM Version: 0x02
S/N: G3503
Assembly ID: 0x0560 Assembly Version: 00.00
Date: 00-00-0000 Assembly Flags: 0x00
ID: MX104
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 7f b0 02 ff 05 60 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x20: 47 33 35 30 33 00 00 00 00 00 00 00 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Midplane REV 28 750-044219 CAAX5741 MX104
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 750-044219 S/N: CAAX5741
Assembly ID: 0x0560 Assembly Version: 01.28
Date: 03-27-2013 Assembly Flags: 0x00
Version: REV 28 CLEI Code: PROTOXCLEI
ID: MX104 FRU Model Number: PROTO-ASSEMBLY
Board Information Record:
Address 0x00: ad 01 08 00 b0 a8 6e a7 f8 00 ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 05 60 01 1c 52 45 56 20 32 38 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 34 34 32 31 39 00 00
Address 0x20: 53 2f 4e 20 43 41 41 58 35 37 34 31 00 1b 03 07
Address 0x30: dd ff ff ff ad 01 08 00 b0 a8 6e a7 f8 00 ff ff
Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff c2 47 33 35 30 33 00 00 00 00 00 00 00
PEM 0 REV 03 740-045933 1H072500016 AC Power Entry Module
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-045933 S/N: 1H072500016
Assembly ID: 0x0475 Assembly Version: 00.03
Date: 12-14-2012 Assembly Flags: 0x00
Version: REV 03 CLEI Code: IPUPAJ9KAA
ID: AC Power Entry Module FRU Model Number: PWR-AMX1100-AC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff 02 02 00 ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 75 00 03 52 45 56 20 30 33 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 34 35 39 33 33 00 00
Address 0x20: 31 48 30 37 32 35 30 30 30 31 36 00 00 0e 0c 07
Address 0x30: dc 30 43 ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: 02 02 00 ff 01 49 50 55 50 41 4a 39 4b 41 41 50
Address 0x50: 57 52 2d 41 4d 58 31 31 30 30 2d 41 43 2d 53 00
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 70 ff ff ff ff ff ff ff ff ff ff ff ff
PEM 1 REV 03 740-045932 1H073050017 DC Power Entry Module
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-045932 S/N: 1H073050017

```

```

Assembly ID: 0x0476 Assembly Version: 00.03
Date: 01-30-2013 Assembly Flags: 0x00
Version: REV 03 CLEI Code: IPUPAJ8KAA
ID: DC Power Entry Module FRU Model Number: PWR-AMX1100-DC-S
Board Information Record:
 Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff 02 02 00 ff
I2C Hex Data:
 Address 0x00: 7f b0 02 ff 04 76 00 03 52 45 56 20 30 33 00 00
 Address 0x10: 00 00 00 00 37 34 30 2d 30 34 35 39 33 32 00 00
 Address 0x20: 31 48 30 37 33 30 35 30 30 31 37 00 00 1e 01 07
 Address 0x30: dd 30 44 ff ff ff ff ff ff ff ff ff ff ff ff
 Address 0x40: 02 02 00 ff 01 49 50 55 50 41 4a 38 4b 41 41 50
 Address 0x50: 57 52 2d 41 4d 58 31 31 30 30 2d 44 43 2d 53 00
 Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff
 Address 0x70: ff ff ff 72 ff ff ff ff ff ff ff ff ff ff ff
Routing Engine 0 REV 20 750-044228 CAAY7935 RE-MX-104
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 750-044228 S/N: CAAY7935
Assembly ID: 0x0b81 Assembly Version: 01.20
Date: 03-18-2013 Assembly Flags: 0x00
Version: REV 20 CLEI Code: PROTOXCLEI
ID: RE-MX-104 FRU Model Number: PROTO-ASSEMBLY
Board Information Record:
 Address 0x00: ad 01 00 08 b0 a8 6e a6 fc 10 ff ff ff ff ff ff
I2C Hex Data:
 Address 0x00: 7f b0 02 fe 0b 81 01 14 52 45 56 20 32 30 00 00
 Address 0x10: 00 00 00 00 37 35 30 2d 30 34 34 32 32 38 00 00
 Address 0x20: 53 2f 4e 20 43 41 41 59 37 39 33 35 00 12 03 07
 Address 0x30: dd ff ff ff ad 01 00 08 b0 a8 6e a6 fc 10 ff ff
 Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
 Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
 Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff
 Address 0x70: ff ff ff c2 ff ff ff ff ff ff ff ff ff ff ff
da0 7836 MB ATP IG eUSB SSD Nand Flash 0
usb0 (addr 1) EHCI root hub 0 Freescale uhub0
usb0 (addr 2) USB2513Bi 9491 SMSC uhub1
usb0 (addr 3) ATP IG eUSB SSD 44801 ATP Electronics umass0
Routing Engine 1 REV 13 750-044228 CAAM6380 RE-MX-104
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 750-044228 S/N: CAAM6380
Assembly ID: 0x0b81 Assembly Version: 01.13
Date: 09-17-2012 Assembly Flags: 0x00
Version: REV 13 CLEI Code: PROTOXCLEI
ID: RE-MX-104 FRU Model Number: PROTO-ASSEMBLY
Board Information Record:
 Address 0x00: ad 01 00 08 64 87 88 27 08 18 ff ff ff ff ff ff
I2C Hex Data:
 Address 0x00: 7f b0 02 fe 0b 81 01 0d 52 45 56 20 31 33 00 00
 Address 0x10: 00 00 00 00 37 35 30 2d 30 34 34 32 32 38 00 00
 Address 0x20: 53 2f 4e 20 43 41 41 4d 36 33 38 30 00 11 09 07
 Address 0x30: dc ff ff ff ad 01 00 08 64 87 88 27 08 18 ff ff
 Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
 Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
 Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff
Address 0x70: ff ff ff c2 ff ff ff ff ff ff ff ff ff ff ff ff
da0 7836 MB ATP IG eUSB SSD Nand Flash 0
AFEB 0 BUILTIN BUILTIN Forwarding Engine
Processor
FPC 0 BUILTIN BUILTIN MPC BUILTIN
FPC 1 BUILTIN BUILTIN MPC BUILTIN
MIC 0 REV 15 750-036132 CAAF7948 2xOC12/8xOC3 CC-CE

```

```

Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 750-036132 S/N: CAAF7948
Assembly ID: 0x0a1a Assembly Version: 01.15
Date: 07-03-2012 Assembly Flags: 0x00
Version: REV 15 CLEI Code: IP9IAM2DAA
ID: 2x0C12/8x0C3 CC-CE FRU Model Number: MIC-3D-80C3-20C12-ATM

Board Information Record:
Address 0x00: 12 01 05 03 05 ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0a 1a 01 0f 52 45 56 20 31 35 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 33 36 31 33 32 00 00
Address 0x20: 53 2f 4e 20 43 41 41 46 37 39 34 38 00 03 07 07
Address 0x30: dc ff ff ff 12 01 05 03 05 ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 39 49 41 4d 32 44 41 41 4d
Address 0x50: 49 43 2d 33 44 2d 38 4f 43 33 2d 32 4f 43 31 32
Address 0x60: 2d 41 54 4d 00 00 41 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff e3 c0 02 a3 9c 00 00 00 00 0a 60 00 00
PIC 0
Xcvr 0 REV 01 740-011615 BUILTIN PCQOU2J 2x0C12/8x0C3 CC-CE SFP-IR
Xcvr 1 REV 01 740-016068 P3L7A6G SFP-SR
Xcvr 2 REV 01 740-016068 P3L7A5J SFP-SR
Xcvr 3 REV 01 740-016065 PJN5HPZ SFP-SR
Xcvr 4 REV 01 740-029122 PKB38TL SFP-LR
Xcvr 5 REV 01 740-011787 P6A107G SFP-LR
Xcvr 6 REV 01 740-029122 PKB38TR SFP-LR
Xcvr 7 REV 01 740-011787 PBKONK3 SFP-LR
MIC 1
FPC 2 BUILTIN BUILTIN MPC BUILTIN
MIC 0 BUILTIN BUILTIN 4x 10GE(LAN) SFP+
Jedec Code: 0x0000 EEPROM Version: 0x00
P/N: BUILTIN S/N: BUILTIN
Assembly ID: 0x0a60 Assembly Version: 00.00
Date: 00-00-0000 Assembly Flags: 0x00
ID: 4x 10GE(LAN) SFP+

Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 00 00 00 00 0a 60 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 4d 58 43 00
Address 0x20: 42 55 49 4c 54 49 4e 00 4d 58 43 00 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 c0 02 a5 04 7f b0 02 ff 0a 1a 01 0f
PIC 0
Xcvr 0 REV 01 740-031980 B10F00465 4x 10GE(LAN) SFP+ SFP+-10G-SR
Xcvr 1 REV 01 740-031980 B10F00461 SFP+-10G-SR
Xcvr 2 REV 01 740-031980 B10G01545 SFP+-10G-SR
Xcvr 3 REV 01 740-031980 B10G01385 SFP+-10G-SR
Fan Tray 0 REV 02 711-049570 CAAX6538 Fan Tray
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 711-049570 S/N: CAAX6538
Assembly ID: 0x0b82 Assembly Version: 01.02
Date: 03-01-2013 Assembly Flags: 0x00
Version: REV 02 CLEI Code: PROTOXCLEI
ID: Fan Tray FRU Model Number: PROTO-ASSEMBLY

Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 82 01 02 52 45 56 20 30 32 00 00

```

```

Address 0x10: 00 00 00 00 37 31 31 2d 30 34 39 35 37 30 00 00
Address 0x20: 53 2f 4e 20 43 41 41 58 36 35 33 38 00 01 03 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff c2 ff ff ff ff ff ff ff ff ff ff ff

```

#### show chassis hardware models (MX104 Router)

```

user@host> show chassis hardware models
Hardware inventory:
Item Version Part number Serial number FRU model number
Midplane REV 20 750-044219 CAAS5849 PROTO-ASSEMBLY
PEM 0 REV 01 740-045932 1H072400065
Routing Engine 0 REV 16 750-044228 CAAR5915 PROTO-ASSEMBLY
AFEB 0 BUILTIN BUILTIN
FPC 0 BUILTIN BUILTIN
FPC 1 BUILTIN BUILTIN
 MIC 0 REV 01 750-046905 CAAK7103 MIC-3D-20GE-SFP-EH
FPC 2 BUILTIN BUILTIN
Fan Tray REV 02 711-049570 CAAX6538 PROTO-ASSEMBLY

```

#### show chassis hardware clei-models (MX104 Router)

```

user@host> show chassis hardware clei-models
Hardware inventory:
Item Version Part number CLEI code FRU model number
Midplane REV 20 750-044219 PROTOXCLEI PROTO-ASSEMBLY
PEM 0 REV 01 740-045932
Routing Engine 0 REV 16 750-044228 PROTOXCLEI PROTO-ASSEMBLY
AFEB 0 BUILTIN
FPC 0 BUILTIN
FPC 1 BUILTIN
 MIC 0 REV 01 750-046905 PROTOXCLEI MIC-3D-20GE-SFP-EH
FPC 2 BUILTIN
Fan Tray REV 02 711-049570 CAAX6538 PROTO-ASSEMBLY

```

#### show chassis hardware (MX240 Router)

```

user@host> show chassis hardware
Hardware inventory:
Item Version Part number Serial number Description
Chassis JN10C7F7EAFC MX240
Midplane REV 01 710-021041 TR1502 MX240 Backplane
FPM Board REV 01 710-017254 KD4017 Front Panel Display
PEM 0 Rev 02 740-017330 000332 PS 1.2-1.7kW; 100-240V
AC in
PEM 1 Rev 02 740-017330 000226 PS 1.2-1.7kW; 100-240V
AC in
Routing Engine 0 REV 06 740-013063 1000703522 RE-S-2000
Routing Engine 1 REV 06 740-015113 1000687625 RE-S-1300
CB 0 REV 07 710-013385 KC9057 MX SCB
CB 1 REV 05 710-013385 JY4760 MX SCB
FPC 1 REV 01 750-021679 KC7340 DPCE 40x 1GE R
 CPU REV 06 710-013713 KD4078 DPC PMB
 PIC 0 BUILTIN BUILTIN 10x 1GE(LAN)
 Xcvr 0 REV 01 740-011613 P9F18ME SFP-SX
 PIC 1 BUILTIN BUILTIN 10x 1GE(LAN)
 PIC 2 BUILTIN BUILTIN 10x 1GE(LAN)
 PIC 3 BUILTIN BUILTIN 10x 1GE(LAN)
FPC 2 REV 04 710-016669 JS4529 DPCE 40x 1GE R EQ

```

|            |        |            |         |                 |
|------------|--------|------------|---------|-----------------|
| CPU        | REV 06 | 710-013713 | KB3969  | DPC PMB         |
| PIC 0      |        | BUILTIN    | BUILTIN | 10x 1GE(LAN) EQ |
| Xcvr 0     | REV 01 | 740-011613 | PBG3Y79 | SFP-SX          |
| Xcvr 1     | REV 01 | 740-011613 | PBG3XU8 | SFP-SX          |
| Xcvr 2     | REV 01 | 740-011613 | PBG3YG6 | SFP-SX          |
| Xcvr 3     | REV 01 | 740-011613 | PBG3XUG | SFP-SX          |
| Xcvr 4     | REV 01 | 740-011613 | PBG3XTJ | SFP-SX          |
| PIC 1      |        | BUILTIN    | BUILTIN | 10x 1GE(LAN) EQ |
| Xcvr 0     | REV 01 | 740-011613 | PBG3ZUM | SFP-SX          |
| Xcvr 1     | REV 01 | 740-011613 | PBG3Y5H | SFP-SX          |
| Xcvr 2     | REV 01 | 740-011613 | PBG3UZT | SFP-SX          |
| Xcvr 3     | REV 01 | 740-011613 | PBG3US1 | SFP-SX          |
| PIC 2      |        | BUILTIN    | BUILTIN | 10x 1GE(LAN) EQ |
| Xcvr 0     | REV 01 | 740-011613 | PBG3YG7 | SFP-SX          |
| Xcvr 1     | REV 01 | 740-011613 | PBG3XZ9 | SFP-SX          |
| Xcvr 2     | REV 01 | 740-011613 | PBG3XTY | SFP-SX          |
| Xcvr 3     | REV 01 | 740-011613 | PBG3UZG | SFP-SX          |
| PIC 3      |        | BUILTIN    | BUILTIN | 10x 1GE(LAN) EQ |
| Xcvr 0     | REV 01 | 740-011613 | PBG3Y8W | SFP-SX          |
| Xcvr 1     | REV 01 | 740-011613 | PBG3YVX | SFP-SX          |
| Xcvr 2     | REV 01 | 740-011613 | PBG3YB3 | SFP-SX          |
| Xcvr 3     | REV 01 | 740-011613 | PBG43VQ | SFP-SX          |
| Fan Tray 0 | REV 01 | 710-021113 | JS4642  | MX240 Fan Tray  |

#### show chassis hardware detail (MX 240 Router with Routing Engine Displaying DIMM information)

```
user@host> show chassis hardware detail
```

| Item             | Version                            | Part number | Serial number        | Description             |
|------------------|------------------------------------|-------------|----------------------|-------------------------|
| Chassis          |                                    |             | JN11279B4AFC         | MX240 Backplane         |
| Midplane         | REV 07                             | 760-021404  | TS2474               | MX240 Backplane         |
| FPM Board        | REV 03                             | 760-021392  | XC2643               | Front Panel Display     |
| PEM 0            | Rev 03                             | 740-017343  | QCS0908A068          | DC Power Entry Module   |
| Routing Engine 0 | REV 01                             | 740-031117  | AARCH00              | RE-S-1800x4             |
| ad0 3764 MB      | STEC M2+                           | CF 9.0.2    | STIM2Q3209239145303  | Removable Compact Flash |
| ad1 28626 MB     | WDC SSD-F0030S-5000                |             | C933Z036237215548S00 | Compact Flash           |
| usb0 (addr 1)    | EHCI root hub 0                    |             | Intel                | uhub0                   |
| usb0 (addr 2)    | product 0x0020 32                  |             | vendor 0x8087        | uhub1                   |
| DIMM 0           | VL31B5263E-F8S DIE REV-0 PCB REV-0 |             |                      | MFR ID-ce80             |
| DIMM 1           | VL31B5263E-F8S DIE REV-0 PCB REV-0 |             |                      | MFR ID-ce80             |
| DIMM 2           | VL31B5263E-F8S DIE REV-0 PCB REV-0 |             |                      | MFR ID-ce80             |
| DIMM 3           | SL31B5263E-F8S DIE REV-0 PCB REV-0 |             |                      | MFR ID-ce80             |
| CB 0             | REV 03                             | 710-021523  | XD7225               | MX SCB                  |
| Fan Tray 0       | REV 01                             | 710-021113  | WZ4986               | MX240 Fan Tray          |

#### show chassis hardware (MX240 Router with Enhanced MX SCB)

```
user@host> show chassis hardware
```

```
Hardware inventory:
```

| Item             | Version | Part number | Serial number | Description            |
|------------------|---------|-------------|---------------|------------------------|
| Chassis          |         |             | JN10C7F7EAFC  | MX240                  |
| Midplane         | REV 01  | 710-021041  | TR1502        | MX240 Backplane        |
| FPM Board        | REV 01  | 710-017254  | KD4017        | Front Panel Display    |
| PEM 0            | Rev 02  | 740-017330  | 000332        | PS 1.2-1.7kW; 100-240V |
| AC in            |         |             |               |                        |
| PEM 1            | Rev 02  | 740-017330  | 000226        | PS 1.2-1.7kW; 100-240V |
| AC in            |         |             |               |                        |
| Routing Engine 0 | REV 06  | 740-013063  | 1000703522    | RE-S-2000              |
| Routing Engine 1 | REV 06  | 740-015113  | 1000687625    | RE-S-1300              |
| CB 0             | REV 02  | 710-031391  | YE8494        | Enhanced MX SCB        |

|            |        |            |         |                   |
|------------|--------|------------|---------|-------------------|
| CB 1       | REV 05 | 710-031391 | YOP5764 | Enhanced MX SCB   |
| FPC 1      | REV 01 | 750-021679 | KC7340  | DPCE 40x 1GE R    |
| CPU        | REV 06 | 710-013713 | KD4078  | DPC PMB           |
| PIC 0      |        | BUILTIN    | BUILTIN | 10x 1GE(LAN)      |
| Xcvr 0     | REV 01 | 740-011613 | P9F18ME | SFP-SX            |
| PIC 1      |        | BUILTIN    | BUILTIN | 10x 1GE(LAN)      |
| PIC 2      |        | BUILTIN    | BUILTIN | 10x 1GE(LAN)      |
| PIC 3      |        | BUILTIN    | BUILTIN | 10x 1GE(LAN)      |
| FPC 2      | REV 04 | 710-016669 | JS4529  | DPCE 40x 1GE R EQ |
| CPU        | REV 06 | 710-013713 | KB3969  | DPC PMB           |
| PIC 0      |        | BUILTIN    | BUILTIN | 10x 1GE(LAN) EQ   |
| Xcvr 0     | REV 01 | 740-011613 | PBG3Y79 | SFP-SX            |
| Xcvr 1     | REV 01 | 740-011613 | PBG3XU8 | SFP-SX            |
| Xcvr 2     | REV 01 | 740-011613 | PBG3YG6 | SFP-SX            |
| Xcvr 3     | REV 01 | 740-011613 | PBG3XUG | SFP-SX            |
| Xcvr 4     | REV 01 | 740-011613 | PBG3XTJ | SFP-SX            |
| PIC 1      |        | BUILTIN    | BUILTIN | 10x 1GE(LAN) EQ   |
| Xcvr 0     | REV 01 | 740-011613 | PBG3ZUM | SFP-SX            |
| Xcvr 1     | REV 01 | 740-011613 | PBG3Y5H | SFP-SX            |
| Xcvr 2     | REV 01 | 740-011613 | PBG3UZT | SFP-SX            |
| Xcvr 3     | REV 01 | 740-011613 | PBG3US1 | SFP-SX            |
| PIC 2      |        | BUILTIN    | BUILTIN | 10x 1GE(LAN) EQ   |
| Xcvr 0     | REV 01 | 740-011613 | PBG3YG7 | SFP-SX            |
| Xcvr 1     | REV 01 | 740-011613 | PBG3XZ9 | SFP-SX            |
| Xcvr 2     | REV 01 | 740-011613 | PBG3XTY | SFP-SX            |
| Xcvr 3     | REV 01 | 740-011613 | PBG3UZG | SFP-SX            |
| PIC 3      |        | BUILTIN    | BUILTIN | 10x 1GE(LAN) EQ   |
| Xcvr 0     | REV 01 | 740-011613 | PBG3Y8W | SFP-SX            |
| Xcvr 1     | REV 01 | 740-011613 | PBG3YVX | SFP-SX            |
| Xcvr 2     | REV 01 | 740-011613 | PBG3YB3 | SFP-SX            |
| Xcvr 3     | REV 01 | 740-011613 | PBG43VQ | SFP-SX            |
| Fan Tray 0 | REV 01 | 710-021113 | JS4642  | MX240 Fan Tray    |

### show chassis hardware (MX480 Router)

```
user@host> show chassis hardware
```

```
Hardware inventory:
```

| Item             | Version | Part number | Serial number | Description            |
|------------------|---------|-------------|---------------|------------------------|
| Chassis          |         |             | JN10C7F7FAFB  | MX480                  |
| Midplane         | REV 04  | 710-017414  | TR2071        | MX480 Midplane         |
| FPM Board        | REV 02  | 710-017254  | KB8459        | Front Panel Display    |
| PEM 0            | Rev 02  | 740-017330  | QCS07519029   | PS 1.2-1.7kW; 100-240V |
| AC in            |         |             |               |                        |
| PEM 1            | Rev 02  | 740-017330  | QCS07519041   | PS 1.2-1.7kW; 100-240V |
| AC in            |         |             |               |                        |
| PEM 2            | Rev 02  | 740-017330  | QCS07519097   | PS 1.2-1.7kW; 100-240V |
| AC in            |         |             |               |                        |
| Routing Engine 0 | REV 07  | 740-013063  | 1000733381    | RE-S-2000              |
| Routing Engine 1 | REV 07  | 740-013063  | 1000733540    | RE-S-2000              |
| CB 0             | REV 07  | 710-013385  | KA8022        | MX SCB                 |
| CB 1             | REV 07  | 710-013385  | KA8303        | MX SCB                 |
| FPC 0            | REV 09  | 750-020452  | KA8660        | DPCE 40x 1GE X EQ      |
| CPU              | REV 06  | 710-013713  | KA8185        | DPC PMB                |
| PIC 0            |         | BUILTIN     | BUILTIN       | 10x 1GE(LAN) EQ        |
| PIC 1            |         | BUILTIN     | BUILTIN       | 10x 1GE(LAN) EQ        |
| PIC 2            |         | BUILTIN     | BUILTIN       | 10x 1GE(LAN) EQ        |
| PIC 3            |         | BUILTIN     | BUILTIN       | 10x 1GE(LAN) EQ        |
| Fan Tray         |         |             |               | Left Fan Tray          |

**show chassis hardware (MX480 Router with Enhanced MX SCB)**

```

user@host> show chassis hardware
Hardware inventory:
Item Version Part number Serial number Description
Chassis JN10C7F7FAFB MX480
Midplane REV 04 710-017414 TR2071 MX480 Midplane
FPM Board REV 02 710-017254 KB8459 Front Panel Display
PEM 0 Rev 02 740-017330 QCS07519029 PS 1.2-1.7kW; 100-240V
AC in
PEM 1 Rev 02 740-017330 QCS07519041 PS 1.2-1.7kW; 100-240V
AC in
PEM 2 Rev 02 740-017330 QCS07519097 PS 1.2-1.7kW; 100-240V
AC in
Routing Engine 0 REV 07 740-013063 1000733381 RE-S-2000
Routing Engine 1 REV 07 740-013063 1000733540 RE-S-2000
CB 0 REV 07 710-013385 KA8022 Enhanced MX SCB
CB 1 REV 07 710-013385 KA8303 Enhanced MX SCB
FPC 0 REV 09 750-020452 KA8660 DPCE 40x 1GE X EQ
CPU REV 06 710-013713 KA8185 DPC PMB
PIC 0 BUILTIN BUILTIN 10x 1GE(LAN) EQ
PIC 1 BUILTIN BUILTIN 10x 1GE(LAN) EQ
PIC 2 BUILTIN BUILTIN 10x 1GE(LAN) EQ
PIC 3 BUILTIN BUILTIN 10x 1GE(LAN) EQ
Fan Tray
Left Fan Tray

```

**show chassis hardware (MX480 Routers with MPC5E and built-in OTN PIC)**

```

user@host> show chassis hardware
Hardware inventory:
Item Version Part number Serial number Description
Chassis JN11C0338AFB MX480
Midplane REV 05 710-017414 ABAB8430 MX480 Midplane
FPM Board REV 02 710-017254 ZS8005 Front Panel Display
PEM 0 Rev 05 740-029970 QCS1024U089 PS 1.4-2.52kW; 90-264V
AC in
PEM 1 Rev 10 740-029970 QCS1314U0FJ PS 1.4-2.52kW; 90-264V
AC in
PEM 2 Rev 07 740-029970 QCS1121U076 PS 1.4-2.52kW; 90-264V
AC in
Routing Engine 0 REV 05 740-031116 9009092471 RE-S-1800x4
Routing Engine 1 REV 05 740-031116 9009097958 RE-S-1800x4
CB 0 REV 16 750-031391 CAAX0789 Enhanced MX SCB
CB 1 REV 16 750-031391 CAAX0856 Enhanced MX SCB
FPC 0 REV 32 750-028467 ABBP1782 MPC 3D 16x 10GE
CPU REV 10 711-029089 ABBP5410 AMPC PMB
PIC 0 BUILTIN BUILTIN 4x 10GE(LAN) SFP+
Xcvr 0 REV 01 740-021308 983152A00038 SFP+-10G-SR
Xcvr 1 REV 01 740-031980 B11F00211 SFP+-10G-SR
Xcvr 2 REV 01 740-031980 AQ72LPB SFP+-10G-SR
Xcvr 3 REV 01 740-031980 AHNOWR5 SFP+-10G-SR
PIC 1 BUILTIN BUILTIN 4x 10GE(LAN) SFP+
Xcvr 0 REV 01 740-031980 B11J03627 SFP+-10G-SR
Xcvr 1 REV 01 740-031980 B11F00300 SFP+-10G-SR
Xcvr 2 REV 01 740-021308 AQ42WSS SFP+-10G-SR
Xcvr 3 REV 01 740-021308 AQ43HGC SFP+-10G-SR
PIC 2 BUILTIN BUILTIN 4x 10GE(LAN) SFP+
Xcvr 0 REV 01 740-021308 ANAONDO SFP+-10G-SR
Xcvr 1 REV 01 740-021308 ANAONGF SFP+-10G-SR
Xcvr 2 REV 01 740-021308 ANAONG9 SFP+-10G-SR
Xcvr 3 REV 01 740-021308 ANAOMP9 SFP+-10G-SR

```



|          |             |            |              |                        |
|----------|-------------|------------|--------------|------------------------|
| PIC 3    |             | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+      |
| Xcvr 0   | REV 01      | 740-021308 | AQA06CG      | SFP+-10G-SR            |
| Xcvr 1   | REV 01      | 740-021308 | 19T511100493 | SFP+-10G-SR            |
| Xcvr 2   | REV 01      | 740-031980 | APR040J      | SFP+-10G-SR            |
| FPC 1    | REV 26      | 750-046005 | CACN1894     | MPC5E 3D Q 2CGE+4XGE   |
| CPU      | REV 09      | 711-045719 | CACN8698     | RMPD PMB               |
| PIC 0    |             | BUILTIN    | BUILTIN      | 2X10GE SFPP OTN        |
| Xcvr 0   | REV 01      | 740-031980 | 163363A03046 | SFP+-10G-SR            |
| Xcvr 1   | REV 01      | 740-031980 | AJ40JS8      | SFP+-10G-SR            |
| PIC 1    |             | BUILTIN    | BUILTIN      | 1X100GE CFP2 OTN       |
| PIC 2    |             | BUILTIN    | BUILTIN      | 2X10GE SFPP OTN        |
| Xcvr 0   | REV 01      | 740-031980 | 153363A00593 | SFP+-10G-SR            |
| Xcvr 1   | REV 01      | 740-031980 | AJ40JUJ      | SFP+-10G-SR            |
| PIC 3    |             | BUILTIN    | BUILTIN      | 1X100GE CFP2 OTN       |
| Xcvr 0   |             | NON-JNPR   | UQC0B53      | CFP2-100G-LR4-D        |
| FPC 2    | REV 26      | 750-046005 | CACN1891     | MPC5E 3D Q 2CGE+4XGE   |
| CPU      | REV 09      | 711-045719 | CACN8694     | RMPD PMB               |
| PIC 0    |             | BUILTIN    | BUILTIN      | 2X10GE SFPP OTN        |
| Xcvr 0   |             | NON-JNPR   | URA012A      | SFP+-10G-LR            |
| PIC 1    |             | BUILTIN    | BUILTIN      | 1X100GE CFP2 OTN       |
| Xcvr 0   |             | NON-JNPR   | J13F47042    | CFP2-100G-LR4-D        |
| PIC 2    |             | BUILTIN    | BUILTIN      | 2X10GE SFPP OTN        |
| Xcvr 0   | REV 01      | 740-031980 | AJC0BM3      | SFP+-10G-SR            |
| Xcvr 1   | REV 01      | 740-021308 | 11T511100917 | SFP+-10G-SR            |
| PIC 3    |             | BUILTIN    | BUILTIN      | 1X100GE CFP2 OTN       |
| Xcvr 0   |             | NON-JNPR   | UQK07SU      | CFP2-100G-LR4-D        |
| FPC 3    | REV 03      | 750-045372 | CAAD9425     | MPCE Type 3 3D         |
| CPU      | REV 08      | 711-035209 | CAAD9094     | HMPD PMB 2G            |
| MIC 0    | REV 14      | 750-033196 | CAAW9204     | 1X100GE CXP            |
| PIC 0    |             | BUILTIN    | BUILTIN      | 1X100GE CXP            |
| Xcvr 0   | REV 01      | 740-046563 | XD16FC034    | CFP2-100G-SR10         |
| MIC 1    | REV 19      | 750-033199 | CAAJ1814     | 1X100GE CFP            |
| PIC 2    |             | BUILTIN    | BUILTIN      | 1X100GE CFP            |
| FPC 4    | REV 21.0.11 | 750-045715 | CAAY3568     | MPC5E 3D Q 24XGE+6XLGE |
| CPU      | REV 07      | 711-045719 | CAAW7430     | RMPD PMB               |
| PIC 0    |             | BUILTIN    | BUILTIN      | 12X10GE SFPP OTN       |
| Xcvr 0   | REV 01      | 740-031980 | AP406NG      | SFP+-10G-SR            |
| Xcvr 1   | REV 01      | 740-021308 | AR41NLP      | SFP+-10G-SR            |
| Xcvr 2   | REV 01      | 740-031980 | B11D05630    | SFP+-10G-SR            |
| PIC 1    |             | BUILTIN    | BUILTIN      | 12X10GE SFPP OTN       |
| PIC 2    |             | BUILTIN    | BUILTIN      | 3X40GE QSFPP           |
| PIC 3    |             | BUILTIN    | BUILTIN      | 3X40GE QSFPP           |
| WAN MEZZ | REV 12      | 750-049136 | CACM6678     | MPC5E 24XGE OTN Mezz   |
| FPC 5    | REV 11      | 750-045372 | CABK7539     | MPCE Type 3 3D         |
| CPU      | REV 08      | 711-035209 | CABJ2466     | HMPD PMB 2G            |
| MIC 0    | REV 19      | 750-033199 | CAAJ9719     | 1X100GE CFP            |
| PIC 0    |             | BUILTIN    | BUILTIN      | 1X100GE CFP            |
| Xcvr 0   | REV 01      | 740-035329 | UP1020P      | CFP-100G-SR10          |
| MIC 1    | REV 07      | 750-033196 | YZ0797       | 1X100GE CXP            |
| PIC 2    |             | BUILTIN    | BUILTIN      | 1X100GE CXP            |
| Xcvr 0   | REV 01      | 740-046563 | XC42FC022    | CFP2-100G-SR10         |
| Fan Tray |             |            |              | Enhanced Left Fan Tray |

#### show chassis hardware detail (MX480 Routers with MPC5E and built-in OTN PIC)

```
user@host> show chassis hardware detail
```

```
Hardware inventory:
```

| Item      | Version | Part number | Serial number | Description         |
|-----------|---------|-------------|---------------|---------------------|
| Chassis   |         |             | JN11C0338AFB  | MX480               |
| Midplane  | REV 05  | 710-017414  | ABAB8430      | MX480 Midplane      |
| FPM Board | REV 02  | 710-017254  | ZS8005        | Front Panel Display |

|                  |        |                        |                      |                        |
|------------------|--------|------------------------|----------------------|------------------------|
| PEM 0            | Rev 05 | 740-029970             | QCS1024U089          | PS 1.4-2.52kW; 90-264V |
| AC in            |        |                        |                      |                        |
| PEM 1            | Rev 10 | 740-029970             | QCS1314U0FJ          | PS 1.4-2.52kW; 90-264V |
| AC in            |        |                        |                      |                        |
| PEM 2            | Rev 07 | 740-029970             | QCS1121U076          | PS 1.4-2.52kW; 90-264V |
| AC in            |        |                        |                      |                        |
| Routing Engine 0 | REV 05 | 740-031116             | 9009092471           | RE-S-1800x4            |
| ad0 3896 MB      |        | VRFCF14096DIHK1        | VM4096MB 6862        | Compact Flash          |
| ad1 30533 MB     |        | UGB94ARF32H0S3-KC      | UNIGEN-478612-001127 | Disk 1                 |
| usb0 (addr 1)    |        | EHCI root hub 0        | Intel                | uhub0                  |
| usb0 (addr 2)    |        | product 0x0020 32      | vendor 0x8087        | uhub1                  |
| DIMM 0           |        | SGU04G72H1BB2SA-BB DIE | REV-52 PCB REV-54    | MFR ID-ce80            |
| DIMM 1           |        | SGU04G72H1BB2SA-BB DIE | REV-52 PCB REV-54    | MFR ID-ce80            |
| DIMM 2           |        | SGU04G72H1BB2SA-BB DIE | REV-52 PCB REV-54    | MFR ID-ce80            |
| DIMM 3           |        | SGU04G72H1BB2SA-BB DIE | REV-52 PCB REV-54    | MFR ID-ce80            |
| Routing Engine 1 | REV 05 | 740-031116             | 9009097958           | RE-S-1800x4            |
| ad0 3896 MB      |        | VRFCF14096DIHK1        | VM4096MB 6145        | Compact Flash          |
| ad1 30533 MB     |        | UGB94ARF32H0S3-KC      | UNIGEN-499551-000273 | Disk 1                 |
| CB 0             | REV 16 | 750-031391             | CAAX0789             | Enhanced MX SCB        |
| CB 1             | REV 16 | 750-031391             | CAAX0856             | Enhanced MX SCB        |
| FPC 0            | REV 32 | 750-028467             | ABBP1782             | MPC 3D 16x 10GE        |
| CPU              | REV 10 | 711-029089             | ABBP5410             | AMPC PMB               |
| PIC 0            |        | BUILTIN                | BUILTIN              | 4x 10GE(LAN) SFP+      |
| Xcvr 0           | REV 01 | 740-021308             | 983152A00038         | SFP+-10G-SR            |
| Xcvr 1           | REV 01 | 740-031980             | B11F00211            | SFP+-10G-SR            |
| Xcvr 2           | REV 01 | 740-031980             | AQ72LPB              | SFP+-10G-SR            |
| Xcvr 3           | REV 01 | 740-031980             | AHNRW5               | SFP+-10G-SR            |
| PIC 1            |        | BUILTIN                | BUILTIN              | 4x 10GE(LAN) SFP+      |
| Xcvr 0           | REV 01 | 740-031980             | B11J03627            | SFP+-10G-SR            |
| Xcvr 1           | REV 01 | 740-031980             | B11F00300            | SFP+-10G-SR            |
| Xcvr 2           | REV 01 | 740-021308             | AQ42WSS              | SFP+-10G-SR            |
| Xcvr 3           | REV 01 | 740-021308             | AQ43HGC              | SFP+-10G-SR            |
| PIC 2            |        | BUILTIN                | BUILTIN              | 4x 10GE(LAN) SFP+      |
| Xcvr 0           | REV 01 | 740-021308             | ANAONDO              | SFP+-10G-SR            |
| Xcvr 1           | REV 01 | 740-021308             | ANAONGF              | SFP+-10G-SR            |
| Xcvr 2           | REV 01 | 740-021308             | ANAONG9              | SFP+-10G-SR            |
| Xcvr 3           | REV 01 | 740-021308             | ANAOMP9              | SFP+-10G-SR            |
| PIC 3            |        | BUILTIN                | BUILTIN              | 4x 10GE(LAN) SFP+      |
| Xcvr 0           | REV 01 | 740-021308             | AQA06CG              | SFP+-10G-SR            |
| Xcvr 1           | REV 01 | 740-021308             | 19T511100493         | SFP+-10G-SR            |
| Xcvr 2           | REV 01 | 740-031980             | APR040J              | SFP+-10G-SR            |
| FPC 1            | REV 26 | 750-046005             | CACN1894             | MPC5E 3D Q 2CGE+4XGE   |
| CPU              | REV 09 | 711-045719             | CACN8698             | RMPC PMB               |
| PIC 0            |        | BUILTIN                | BUILTIN              | 2X10GE SFPP OTN        |
| Xcvr 0           | REV 01 | 740-031980             | 163363A03046         | SFP+-10G-SR            |
| Xcvr 1           | REV 01 | 740-031980             | AJ40JS8              | SFP+-10G-SR            |
| PIC 1            |        | BUILTIN                | BUILTIN              | 1X100GE CFP2 OTN       |
| PIC 2            |        | BUILTIN                | BUILTIN              | 2X10GE SFPP OTN        |
| Xcvr 0           | REV 01 | 740-031980             | 153363A00593         | SFP+-10G-SR            |
| Xcvr 1           | REV 01 | 740-031980             | AJ40JUI              | SFP+-10G-SR            |
| PIC 3            |        | BUILTIN                | BUILTIN              | 1X100GE CFP2 OTN       |
| Xcvr 0           |        | NON-JNPR               | UQC0B53              | CFP2-100G-LR4-D        |
| FPC 2            | REV 26 | 750-046005             | CACN1891             | MPC5E 3D Q 2CGE+4XGE   |
| CPU              | REV 09 | 711-045719             | CACN8694             | RMPC PMB               |
| PIC 0            |        | BUILTIN                | BUILTIN              | 2X10GE SFPP OTN        |
| Xcvr 0           |        | NON-JNPR               | URA012A              | SFP+-10G-LR            |
| PIC 1            |        | BUILTIN                | BUILTIN              | 1X100GE CFP2 OTN       |
| Xcvr 0           |        | NON-JNPR               | J13F47042            | CFP2-100G-LR4-D        |
| PIC 2            |        | BUILTIN                | BUILTIN              | 2X10GE SFPP OTN        |
| Xcvr 0           | REV 01 | 740-031980             | AJCOBM3              | SFP+-10G-SR            |
| Xcvr 1           | REV 01 | 740-021308             | 11T511100917         | SFP+-10G-SR            |

|          |             |            |           |                        |
|----------|-------------|------------|-----------|------------------------|
| PIC 3    |             | BUILTIN    | BUILTIN   | 1X100GE CFP2 OTN       |
| Xcvr 0   |             | NON-JNPR   | UQK07SU   | CFP2-100G-LR4-D        |
| FPC 3    | REV 03      | 750-045372 | CAAD9425  | MPCE Type 3 3D         |
| CPU      | REV 08      | 711-035209 | CAAD9094  | HMPCE PMB 2G           |
| MIC 0    | REV 14      | 750-033196 | CAAW9204  | 1X100GE CXP            |
| PIC 0    |             | BUILTIN    | BUILTIN   | 1X100GE CFP            |
| Xcvr 0   | REV 01      | 740-046563 | XD16FC034 | CFP2-100G-SR10         |
| MIC 1    | REV 19      | 750-033199 | CAAJ1814  | 1X100GE CFP            |
| PIC 2    |             | BUILTIN    | BUILTIN   | 1X100GE CFP            |
| FPC 4    | REV 21.0.11 | 750-045715 | CAAY3568  | MPC5E 3D Q 24XGE+6XLGE |
| CPU      | REV 07      | 711-045719 | CAAW7430  | RMPC PMB               |
| PIC 0    |             | BUILTIN    | BUILTIN   | 12X10GE SFPP OTN       |
| Xcvr 0   | REV 01      | 740-031980 | AP406NG   | SFP+-10G-SR            |
| Xcvr 1   | REV 01      | 740-021308 | AR41NLP   | SFP+-10G-SR            |
| Xcvr 2   | REV 01      | 740-031980 | B11D05630 | SFP+-10G-SR            |
| PIC 1    |             | BUILTIN    | BUILTIN   | 12X10GE SFPP OTN       |
| PIC 2    |             | BUILTIN    | BUILTIN   | 3X40GE QSFPP           |
| PIC 3    |             | BUILTIN    | BUILTIN   | 3X40GE QSFPP           |
| WAN MEZZ | REV 12      | 750-049136 | CACM6678  | MPC5E 24XGE OTN Mezz   |
| FPC 5    | REV 11      | 750-045372 | CABK7539  | MPCE Type 3 3D         |
| CPU      | REV 08      | 711-035209 | CABJ2466  | HMPCE PMB 2G           |
| MIC 0    | REV 19      | 750-033199 | CAAJ9719  | 1X100GE CFP            |
| PIC 0    |             | BUILTIN    | BUILTIN   | 1X100GE CFP            |
| Xcvr 0   | REV 01      | 740-035329 | UP1020P   | CFP-100G-SR10          |
| MIC 1    | REV 07      | 750-033196 | YZ0797    | 1X100GE CXP            |
| PIC 2    |             | BUILTIN    | BUILTIN   | 1X100GE CXP            |
| Xcvr 0   | REV 01      | 740-046563 | XC42FC022 | CFP2-100G-SR10         |
| Fan Tray |             |            |           | Enhanced Left Fan Tray |

### show chassis hardware extensive (MX480 Routers with MPC5E and built-in OTN PIC)

```

user@host> show chassis hardware extensive
Hardware inventory:
Item Version Part number Serial number Description
Chassis JN11C0338AFB MX480
Jedec Code: 0x7fb0 EEPROM Version: 0x02
 S/N: JN11C0338AFB
Assembly ID: 0x01fe Assembly Version: 00.00
Date: 00-00-0000 Assembly Flags: 0x02
ID: MX480
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 7f b0 02 ff 01 fe 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x20: 4a 4e 31 31 43 30 33 33 38 41 46 42 02 00 00 00
Address 0x30: 00 00 00 ff 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Midplane REV 05 710-017414 ABAB8430 MX480 Midplane
Jedec Code: 0x7fb0 EEPROM Version: 0x01
P/N: 710-017414 S/N: ABAB8430
Assembly ID: 0x01fe Assembly Version: 01.05
Date: 12-13-2011 Assembly Flags: 0x00
Version: REV 05
ID: MX480 Midplane FRU Model Number: CHAS-BP-MX480-S
Board Information Record:
Address 0x00: ad 01 08 00 00 23 9c fc 98 00 ff ff ff ff ff ff

```

```

I2C Hex Data:
Address 0x00: 7f b0 01 ff 01 fe 01 05 52 45 56 20 30 35 00 00
Address 0x10: 00 00 00 00 37 31 30 2d 30 31 37 34 31 34 00 00
Address 0x20: 53 2f 4e 20 41 42 41 42 38 34 33 30 00 0d 0c 07
Address 0x30: db ff ff ff ad 01 08 00 00 23 9c fc 98 00 ff ff
Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 43
Address 0x50: 48 41 53 2d 42 50 2d 4d 58 34 38 30 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 ff ff ff ff ff ff ff ff ff
Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
FPM Board REV 02 710-017254 ZS8005 Front Panel Display
Jedec Code: 0x7fb0 EEPROM Version: 0x01
P/N: 710-017254 S/N: ZS8005
Assembly ID: 0x01ff Assembly Version: 01.02
Date: 11-21-2011 Assembly Flags: 0x00
Version: REV 02
ID: Front Panel Display FRU Model Number: CRAFT-MX480-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 01 ff 01 ff 01 02 52 45 56 20 30 32 00 00
Address 0x10: 00 00 00 00 37 31 30 2d 30 31 37 32 35 34 00 00
Address 0x20: 53 2f 4e 20 5a 53 38 30 30 35 00 00 00 15 0b 07
Address 0x30: db ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 43
Address 0x50: 52 41 46 54 2d 4d 58 34 38 30 2d 53 00 00 00 00
Address 0x60: 00 00 00 00 00 00 ff ff ff ff ff ff ff ff ff
Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
PEM 0 Rev 05 740-029970 QCS1024U089 PS 1.4-2.52kW; 90-264V
AC in
Jedec Code: 0x7fb0 EEPROM Version: 0x01
P/N: 740-029970 S/N: QCS1024U089
Assembly ID: 0x0432 Assembly Version: 01.05
Date: 06-17-2010 Assembly Flags: 0x00
Version: Rev 05
ID: PS 1.4-2.52kW; 90-264V AC in FRU Model Number: PWR-MX480-2520-AC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00 00
I2C Hex Data:
Address 0x00: 7f b0 01 ff 04 32 01 05 52 65 76 20 30 35 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 32 39 39 37 30 00 00
Address 0x20: 51 43 53 31 30 32 34 55 30 38 39 00 00 11 06 07
Address 0x30: da ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 50
Address 0x50: 57 52 2d 4d 58 34 38 30 2d 32 35 32 30 2d 41 43
Address 0x60: 2d 53 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
PEM 1 Rev 10 740-029970 QCS1314U0FJ PS 1.4-2.52kW; 90-264V
AC in
Jedec Code: 0x7fb0 EEPROM Version: 0x01
P/N: 740-029970 S/N: QCS1314U0FJ
Assembly ID: 0x0432 Assembly Version: 01.10
Date: 04-04-2013 Assembly Flags: 0x00
Version: Rev 10
ID: PS 1.4-2.52kW; 90-264V AC in FRU Model Number: PWR-MX480-2520-AC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00 00
I2C Hex Data:
Address 0x00: 7f b0 01 ff 04 32 01 0a 52 65 76 20 31 30 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 32 39 39 37 30 00 00
Address 0x20: 51 43 53 31 33 31 34 55 30 46 4a 00 00 04 04 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff

```

```

Address 0x40: 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 50
Address 0x50: 57 52 2d 4d 58 34 38 30 2d 32 35 32 30 2d 41 43
Address 0x60: 2d 53 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
PEM 2 Rev 07 740-029970 QCS1121U076 PS 1.4-2.52kW; 90-264V
AC in
Jedec Code: 0x7fb0 EEPROM Version: 0x01
P/N: 740-029970 S/N: QCS1121U076
Assembly ID: 0x0432 Assembly Version: 01.07
Date: 05-23-2011 Assembly Flags: 0x00
Version: Rev 07
ID: PS 1.4-2.52kW; 90-264V AC in FRU Model Number: PWR-MX480-2520-AC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00 00
I2C Hex Data:
Address 0x00: 7f b0 01 ff 04 32 01 07 52 65 76 20 30 37 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 32 39 39 37 30 00 00
Address 0x20: 51 43 53 31 31 32 31 55 30 37 36 00 00 17 05 07
Address 0x30: db ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 50
Address 0x50: 57 52 2d 4d 58 34 38 30 2d 32 35 32 30 2d 41 43
Address 0x60: 2d 53 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Routing Engine 0 REV 05 740-031116 9009092471 RE-S-1800x4
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-031116 S/N: 9009092471
Assembly ID: 0x09c0 Assembly Version: 01.05
Date: 11-01-2011 Assembly Flags: 0x00
Version: REV 05 CLEI Code: COUCALDBAA
ID: RE-S-1800x4 FRU Model Number: RE-S-1800X4-16G-S
Board Information Record:
Address 0x00: 54 32 30 32 37 43 41 2d 34 32 46 42 23 23 23 00
I2C Hex Data:
Address 0x00: 7f b0 02 ff 09 c0 01 05 52 45 56 20 30 35 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 33 31 31 31 36 00 00
Address 0x20: 39 30 30 39 30 39 32 34 37 31 00 00 00 01 0b 07
Address 0x30: db ff ff ff 54 32 30 32 37 43 41 2d 34 32 46 42
Address 0x40: 23 23 23 00 01 43 4f 55 43 41 4c 44 42 41 41 52
Address 0x50: 45 2d 53 2d 31 38 30 30 58 34 2d 31 36 47 2d 53
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 4b ff ff ff ff ff ff ff ff ff ff ff ff
ad0 3896 MB VRFCF14096DIHK1 VM4096MB 6862 Compact Flash
ad1 30533 MB UGB94ARF32H0S3-KC UNIGEN-478612-001127 Disk 1
usb0 (addr 1) EHCI root hub 0 Intel uhub0
usb0 (addr 2) product 0x0020 32 vendor 0x8087 uhub1
DIMM 0 SGU04G72H1BB2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
DIMM 1 SGU04G72H1BB2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
DIMM 2 SGU04G72H1BB2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
DIMM 3 SGU04G72H1BB2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
Routing Engine 1 REV 05 740-031116 9009097958 RE-S-1800x4
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-031116 S/N: 9009097958
Assembly ID: 0x09c0 Assembly Version: 01.05
Date: 02-06-2012 Assembly Flags: 0x00
Version: REV 05 CLEI Code: COUCALDBAA
ID: RE-S-1800x4 FRU Model Number: RE-S-1800X4-16G-S
Board Information Record:
Address 0x00: 54 32 30 32 37 43 41 2d 34 32 46 42 23 23 23 00
I2C Hex Data:
Address 0x00: 7f b0 02 ff 09 c0 01 05 52 45 56 20 30 35 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 33 31 31 31 36 00 00

```

```

Address 0x20: 39 30 30 39 30 39 37 39 35 38 00 00 00 06 02 07
Address 0x30: dc ff ff ff 54 32 30 32 37 43 41 2d 34 32 46 42
Address 0x40: 23 23 23 00 01 43 4f 55 43 41 4c 44 42 41 41 52
Address 0x50: 45 2d 53 2d 31 38 30 30 58 34 2d 31 36 47 2d 53
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 4b ff ff ff ff ff ff ff ff ff ff ff ff
ad0 3896 MB VRFCF14096DIHK1 VM4096MB 6145 Compact Flash
ad1 30533 MB UGB94ARF32H0S3-KC UNIGEN-499551-000273 Disk 1

```

...

### show chassis hardware (MX960 Router)

```

user@host> show chassis hardware
Hardware inventory:
Item Version Part number Serial number Description
Chassis
Midplane REV 01 710-013698 AA6082 MX960 Midplane
PIM Rev 01 740-013110 000008 Power Inlet Module
PEM 2
PEM 3 Rev 01 740-013682 000038 PS 1.7kW; 200-240VAC in
Routing Engine 0 REV 00 740-015113 1000617944 RE-S-1300
CB 0 REV 05 710-013725 JK6947 MX960 Test SCB
FPC 4 REV 01 710-013305 JM7617 MX960 Test DPC
CPU
PIC 0
PIC 1 BUILTIN BUILTIN 1x 10GE(LAN/WAN)
FPC 7 REV 01 710-013305 JL9634 10x 1GE
MX960 Test DPC
CPU
PIC 0 BUILTIN BUILTIN 1x 10GE(LAN/WAN)
Xcvr 0 NON-JNPR MYBG65I82C XFP-10G-SR
PIC 1 BUILTIN BUILTIN 10x 1GE
Xcvr 1 REV 01 740-011782 P7N0368 SFP-SX
Xcvr 4 REV 01 740-011782 P8J1W27 SFP-SX
Xcvr 6 REV 01 740-011782 P8J1VSD SFP-SX
Xcvr 9 REV 01 740-011782 P8J1W25 SFP-SX
Fan Tray 0
Fan Tray 1

```

### show chassis hardware (MX960 Router with Bidirectional Optics)

```

user@host> show chassis hardware
Hardware inventory:
Item Version Part number Serial number Description
Chassis
Midplane REV 03 710-013698 TR0234 MX960 Backplane
FPM Board REV 03 710-014974 JA0878 Front Panel Display
PDM Rev 03 740-013110 QCS11135028 Power Distribution Module
PEM 0 Rev 03 740-013682 QCS11154036 PS 1.7kW; 200-240VAC in
PEM 1 Rev 03 740-013682 QCS11154010 PS 1.7kW; 200-240VAC in
PEM 2 Rev 03 740-013682 QCS11154022 PS 1.7kW; 200-240VAC in
Routing Engine 0 REV 06 740-013063 1000691458 RE-S-2000
CB 0 REV 07 710-013385 KA2190 MX SCB
CB 1 REV 07 710-013385 KA0837 MX SCB
FPC 3 REV 02 750-018122 KB3890 DPCE 40x 1GE R
CPU
FPC 4 REV 01 750-018122 KB3889 DPCE 40x 1GE R
CPU REV 06 710-013713 KB3976 DPC PMB
PIC 0 BUILTIN BUILTIN 10x 1GE(LAN)
Xcvr 1 REV 01 740-020426 4910549 SFP-1000BASE-BX40-D
Xcvr 2 REV 01 740-020426 4910551 SFP-1000BASE-BX40-D

```

|            |        |            |              |                     |
|------------|--------|------------|--------------|---------------------|
| Xcvr 5     | REV 01 | 740-021340 | 77E245N00006 | SFP-1000BASE-BX10-U |
| Xcvr 6     | REV 01 | 740-020425 | 4882821      | SFP-1000BASE-BX40-U |
| Xcvr 8     | REV 01 | 740-020425 | 4882820      | SFP-1000BASE-BX40-U |
| PIC 1      |        | BUILTIN    | BUILTIN      | 10x 1GE(LAN)        |
| Xcvr 0     | REV 01 | 740-020465 | 77E555N00894 | SFP-1000BASE-BX10-D |
| Xcvr 1     | REV 01 | 740-020465 | 75E467X00818 | SFP-1000BASE-BX10-D |
| Xcvr 2     | REV 01 | 740-020465 | 75E467X00573 | SFP-1000BASE-BX10-D |
| Xcvr 3     | REV 01 | 740-020465 | 4888227      | SFP-1000BASE-BX10-D |
| Xcvr 4     | REV 01 | 740-020465 | 4888241      | SFP-1000BASE-BX10-D |
| Xcvr 5     | REV 01 | 740-021340 | 77E245N00005 | SFP-1000BASE-BX10-U |
| Xcvr 6     | REV 01 | 740-021340 | 76E245X00487 | SFP-1000BASE-BX10-U |
| Xcvr 7     | REV 01 | 740-021341 | 5255889      | SFP-1000BASE-BX10-U |
| Xcvr 8     | REV 01 | 740-021341 | 5255887      | SFP-1000BASE-BX10-U |
| Xcvr 9     | REV 01 | 740-021340 | 77E245N00004 | SFP-1000BASE-BX10-U |
| PIC 2      |        | BUILTIN    | BUILTIN      | 10x 1GE(LAN)        |
| Xcvr 0     | REV 01 | 740-020424 | 5007582      | SFP-1000BASE-BX10-D |
| Xcvr 1     | REV 01 | 740-020424 | 4888187      | SFP-1000BASE-BX10-D |
| Xcvr 2     | REV 01 | 740-020424 | 4656500      | SFP-1000BASE-BX10-D |
| Xcvr 5     | REV 01 | 740-021341 | 5255886      | SFP-1000BASE-BX10-U |
| Xcvr 7     | REV 01 | 740-021340 | 77E245N00003 | SFP-1000BASE-BX10-U |
| Xcvr 8     | REV 01 | 740-021341 | 5255888      | SFP-1000BASE-BX10-U |
| PIC 3      |        | BUILTIN    | BUILTIN      | 10x 1GE(LAN)        |
| Xcvr 0     | REV 01 | 740-017726 | 74S184H30341 | SFP-EX              |
| Xcvr 1     | REV 01 | 740-017726 | 4814061      | SFP-EX              |
| Xcvr 5     | REV 01 | 740-017726 | 6ZS184H31108 | SFP-EX              |
| Xcvr 9     | REV 01 | 740-021340 | 76E245X00486 | SFP-1000BASE-BX10-U |
| Fan Tray 0 |        |            |              |                     |
| Fan Tray 1 | REV 03 | 740-014971 | TP0850       | Fan Tray            |

### show chassis hardware (MX960 Router with Enhanced MX SCB)

```
user@host> show chassis hardware
```

Hardware inventory:

| Item             | Version | Part number | Serial number | Description               |
|------------------|---------|-------------|---------------|---------------------------|
| Chassis          |         |             | JN1096805AFA  | MX960                     |
| Midplane         | REV 03  | 710-013698  | TR0183        | MX960 Backplane           |
| Fan Extender     | REV 02  | 710-018051  | JY5227        | Extended Cable Manager    |
| FPM Board        | REV 03  | 710-014974  | JZ6876        | Front Panel Display       |
| PDM              | Rev 03  | 740-013110  | QCS11035023   | Power Distribution Module |
| PEM 1            | Rev 03  | 740-013682  | QCS1109400L   | PS 1.7kW; 200-240VAC in   |
| PEM 2            | Rev 03  | 740-013682  | QCS11094015   | PS 1.7kW; 200-240VAC in   |
| PEM 3            | Rev 03  | 740-013682  | QCS11094012   | PS 1.7kW; 200-240VAC in   |
| Routing Engine 0 | REV 06  | 740-013063  | 1000687969    | RE-S-2000                 |
| Routing Engine 1 | REV 06  | 740-013063  | 1000687955    | RE-S-2000                 |
| CB 0             | REV 11  | 750-031391  | YZ6072        | Enhanced MX SCB           |
| CB 1             | REV 11  | 750-031391  | YZ6068        | Enhanced MX SCB           |
| CB 2             | REV 11  | 750-031391  | YZ6081        | Enhanced MX SCB           |
| FPC 0            | REV 01  | 750-018122  | KA5576        | DPCE 40x 1GE R            |
| CPU              | REV 06  | 710-013713  | KB3961        | DPC PMB                   |
| PIC 0            |         | BUILTIN     | BUILTIN       | 10x 1GE(LAN)              |
| Xcvr 0           | REV 01  | 740-011613  | P9F18GF       | SFP-SX                    |
| Xcvr 2           | REV 01  | 740-011782  | P9M0TL9       | SFP-SX                    |
| Xcvr 7           | REV 01  | 740-011782  | P9P0XXH       | SFP-SX                    |
| Xcvr 9           | REV 01  | 740-011782  | P9M0TN1       | SFP-SX                    |
| PIC 1            |         | BUILTIN     | BUILTIN       | 10x 1GE(LAN)              |
| Xcvr 0           | REV 01  | 740-011613  | PAJ4UHC       | SFP-SX                    |
| PIC 2            |         | BUILTIN     | BUILTIN       | 10x 1GE(LAN)              |
| Xcvr 0           | REV 01  | 740-011613  | PFF2CD0       | SFP-SX                    |
| Xcvr 1           | REV 01  | 740-011613  | PBG3ZUT       | SFP-SX                    |
| Xcvr 2           | REV 01  | 740-011613  | PFF2DDV       | SFP-SX                    |
| Xcvr 5           | REV 01  | 740-011613  | P8E2SST       | SFP-SX                    |

|        |        |            |                 |                      |
|--------|--------|------------|-----------------|----------------------|
| Xcvr 9 | REV 01 | 740-011782 | PB8329N         | SFP-SX               |
| PIC 3  |        | BUILTIN    | BUILTIN         | 10x 1GE(LAN)         |
| Xcvr 0 | REV 01 | 740-026192 | 1U0201084503342 | SFP-100BASE-BX10-U   |
| Xcvr 1 | REV 01 | 740-026193 | 1U1201084503313 | SFP-100BASE-BX10-D   |
| Xcvr 2 | REV 01 | 740-011613 | PAJ4Y5B         | SFP-SX               |
| Xcvr 6 | REV 01 | 740-011782 | P9M0U3M         | SFP-SX               |
| Xcvr 7 | REV 01 | 740-011782 | P9M0TLA         | SFP-SX               |
| FPC 1  | REV 16 | 750-031089 | YL0719          | MPC Type 2 3D        |
| CPU    | REV 06 | 711-030884 | YL1463          | MPC PMB 2G           |
| MIC 0  | REV 07 | 750-028387 | JR6500          | 3D 4x 10GE XFP       |
| PIC 0  |        | BUILTIN    | BUILTIN         | 2x 10GE XFP          |
| Xcvr 0 | REV 01 | 740-014279 | 733019A00154    | XFP-10G-LR           |
| Xcvr 1 | REV 02 | 740-014289 | T09F55034       | XFP-10G-SR           |
| PIC 1  |        | BUILTIN    | BUILTIN         | 2x 10GE XFP          |
| Xcvr 0 | REV 01 | 740-014279 | 913019B00791    | XFP-10G-LR           |
| Xcvr 1 | REV 01 | 740-014289 | 98S803A90384    | XFP-10G-SR           |
| MIC 1  | REV 24 | 750-028387 | YJ3950          | 3D 4x 10GE XFP       |
| PIC 2  |        | BUILTIN    | BUILTIN         | 2x 10GE XFP          |
| Xcvr 0 | REV 02 | 740-014279 | T10B36134       | XFP-10G-LR           |
| Xcvr 1 | REV 01 | 740-014289 | T07M86354       | XFP-10G-SR           |
| PIC 3  |        | BUILTIN    | BUILTIN         | 2x 10GE XFP          |
| FPC 2  | REV 08 | 710-014219 | JY9654          | DPCE 4x 10GE R       |
| CPU    | REV 06 | 710-013713 | JZ6549          | DPC PMB              |
| PIC 0  |        | BUILTIN    | BUILTIN         | 1x 10GE(LAN/WAN)     |
| PIC 1  |        | BUILTIN    | BUILTIN         | 1x 10GE(LAN/WAN)     |
| PIC 2  |        | BUILTIN    | BUILTIN         | 1x 10GE(LAN/WAN)     |
| Xcvr 0 | REV 03 | 740-011571 | C931BK028       | XFP-10G-SR           |
| PIC 3  |        | BUILTIN    | BUILTIN         | 1x 10GE(LAN/WAN)     |
| FPC 3  | REV 10 | 750-024199 | XJ6692          | MX FPC Type 3        |
| CPU    | REV 03 | 710-022351 | XF5182          | DPC PMB              |
| PIC 0  | REV 17 | 750-009553 | RJ2945          | 4x 0C-48 SONET       |
| Xcvr 1 | REV 01 | 740-011785 | PCP3YLL         | SFP-SR               |
| Xcvr 3 | REV 01 | 740-011785 | PDSOMRY         | SFP-SR               |
| PIC 1  | REV 32 | 750-003700 | DP2113          | 1x 0C-192 12xMM VSR  |
| FPC 5  | REV 25 | 750-028467 | YM8256          | MPC 3D 16x 10GE      |
| CPU    | REV 10 | 711-029089 | YL3029          | AMPC PMB             |
| PIC 0  |        | BUILTIN    | BUILTIN         | 4x 10GE(LAN) SFP+    |
| Xcvr 1 | REV 01 | 740-031980 | AHNOX1Z         | SFP+-10G-SR          |
| PIC 1  |        | BUILTIN    | BUILTIN         | 4x 10GE(LAN) SFP+    |
| PIC 2  |        | BUILTIN    | BUILTIN         | 4x 10GE(LAN) SFP+    |
| PIC 3  |        | BUILTIN    | BUILTIN         | 4x 10GE(LAN) SFP+    |
| FPC 7  | REV 02 | 750-031092 | JR6658          | MPC Type 1 3D Q      |
| CPU    | REV 01 | 711-030884 | JZ9038          | MPC PMB 2G           |
| MIC 0  | REV 08 | 750-028392 | JZ8737          | 3D 20x 1GE(LAN) SFP  |
| PIC 0  |        | BUILTIN    | BUILTIN         | 10x 1GE(LAN) SFP     |
| Xcvr 0 | REV 01 | 740-011782 | PBE2C6Y         | SFP-SX               |
| Xcvr 2 |        | NON-JNPR   | U8105N8         | SFP-SX               |
| Xcvr 4 | REV 01 | 740-011613 | PFM18EF         | SFP-SX               |
| Xcvr 7 | REV 01 | 740-011613 | PFF2AM8         | SFP-SX               |
| Xcvr 8 | REV 01 | 740-011613 | PFF2CT6         | SFP-SX               |
| PIC 1  |        | BUILTIN    | BUILTIN         | 10x 1GE(LAN) SFP     |
| Xcvr 0 | REV 01 | 740-011782 | PB82VHH         | SFP-SX               |
| Xcvr 1 | REV 01 | 740-011613 | PFF2CSW         | SFP-SX               |
| Xcvr 9 | REV 01 | 740-011613 | PFF2BY0         | SFP-SX               |
| QXM 0  | REV 04 | 711-028408 | JR6372          | MPC QXM              |
| FPC 8  | REV 05 | 750-024387 | JW9754          | MX FPC Type 2        |
| CPU    | REV 03 | 710-022351 | KF1651          | DPC PMB              |
| PIC 0  | REV 08 | 750-014730 | DM3664          | 4x 0C-3 1x 0C-12 SFP |
| Xcvr 0 | REV 01 | 740-016065 | 81S290N00077    | SFP-SR               |
| Xcvr 1 |        | NON-JNPR   | 2191844         | SFP-SR               |
| Xcvr 2 | REV 01 | 740-011618 | PD81EE5         | SFP-IR               |



|            |        |            |         |                |
|------------|--------|------------|---------|----------------|
| PIC 1      | REV 08 | 750-014637 | DM3671  | 4x OC-12-3 SFP |
| Xcvr 0     | REV 01 | 740-011785 | PCK3UNK | SFP-SR         |
| Xcvr 3     | REV 01 | 740-011785 | PDSOMPZ | SFP-SR         |
| FPC 10     | REV 04 | 710-013699 | JY4654  | DPCE 40x 1GE R |
| CPU        | REV 05 | 710-013713 | JS9717  | DPC PMB        |
| PIC 0      |        | BUILTIN    | BUILTIN | 10x 1GE(LAN)   |
| Xcvr 5     | REV 01 | 740-011782 | PAR1L72 | SFP-SX         |
| Xcvr 6     | REV 01 | 740-011782 | P8N1YQ4 | SFP-SX         |
| PIC 1      |        | BUILTIN    | BUILTIN | 10x 1GE(LAN)   |
| PIC 2      |        | BUILTIN    | BUILTIN | 10x 1GE(LAN)   |
| Xcvr 0     | REV 01 | 740-011782 | P8Q2AVL | SFP-SX         |
| Xcvr 5     | REV 01 | 740-011782 | PAR1L7B | SFP-SX         |
| Xcvr 6     | REV 01 | 740-011782 | PAR1L2J | SFP-SX         |
| Xcvr 8     | REV 01 | 740-011782 | P8N1YMY | SFP-SX         |
| PIC 3      |        | BUILTIN    | BUILTIN | 10x 1GE(LAN)   |
| Fan Tray 0 | REV 03 | 740-014971 | TP0567  | Fan Tray       |
| Fan Tray 1 | REV 03 | 740-014971 | TP0702  | Fan Tray       |

### show chassis hardware models (MX960 Router with Enhanced MX SCB)

```
user@host> show chassis hardware models
```

Hardware inventory:

| Item             | Version | Part number | Serial number | FRU model number       |
|------------------|---------|-------------|---------------|------------------------|
| Midplane         | REV 03  | 710-013698  | TR0183        | CHAS-BP-MX960-S        |
| Fan Extender     | REV 02  | 710-018051  | JY5227        | ECM-MX960              |
| FPM Board        | REV 03  | 710-014974  | JZ6876        | CRAFT-MX960-S          |
| Routing Engine 0 | REV 06  | 740-013063  | 1000687969    | RE-S-2000-4096-S       |
| Routing Engine 1 | REV 06  | 740-013063  | 1000687955    | RE-S-2000-4096-S       |
| CB 0             | REV 11  | 750-031391  | YZ6072        | SCBE-MX-S              |
| CB 1             | REV 11  | 750-031391  | YZ6068        | SCBE-MX-S              |
| CB 2             | REV 11  | 750-031391  | YZ6081        | SCBE-MX-S              |
| FPC 0            | REV 01  | 750-018122  | KA5576        | DPCE-R-40GE-SFP        |
| FPC 1            | REV 16  | 750-031089  | YL0719        | MX-MPC2-3D             |
| MIC 0            | REV 07  | 750-028387  | JR6500        | MIC-3D-4XGE-XFP        |
| MIC 1            | REV 24  | 750-028387  | YJ3950        | MIC-3D-4XGE-XFP        |
| FPC 2            | REV 08  | 710-014219  | JY9654        | DPCE-R-4XGE-XFP        |
| FPC 3            | REV 10  | 750-024199  | XJ6692        | MX-FPC3                |
| PIC 0            | REV 17  | 750-009553  | RJ2945        | PC-40C48-SON-SFP       |
| PIC 1            | REV 32  | 750-003700  | DP2113        | PC-10C192-SON-VSR      |
| FPC 5            | REV 25  | 750-028467  | YM8256        | MPC-3D-16XGE-SFP       |
| FPC 7            | REV 02  | 750-031092  | JR6658        | MX-MPC1-3D-Q           |
| MIC 0            | REV 08  | 750-028392  | JZ8737        | MIC-3D-20GE-SFP        |
| FPC 8            | REV 05  | 750-024387  | JW9754        | MX-FPC2                |
| PIC 0            | REV 08  | 750-014730  | DM3664        | PB-40C3-10C12-SON2-SFP |
| PIC 1            | REV 08  | 750-014637  | DM3671        | PB-40C3-40C12-SON-SFP  |
| FPC 10           | REV 04  | 710-013699  | JY4654        | DPC-R-40GE-SFP         |
| Fan Tray 0       | REV 03  | 740-014971  | TP0567        | FFANTRAY-MX960-S       |
| Fan Tray 1       | REV 03  | 740-014971  | TP0702        | FFANTRAY-MX960-S       |

### show chassis hardware (MX960 Router with MPC5EQ)

```
user@host> show chassis hardware
```

Hardware inventory:

| Item      | Version | Part number | Serial number | Description               |
|-----------|---------|-------------|---------------|---------------------------|
| Chassis   |         |             | JN1214852AFA  | MX960                     |
| Midplane  | REV 01  | 710-030012  | ACAX3674      | MX960 Backplane           |
| FPM Board | REV 03  | 710-014974  | CAAZ9326      | Front Panel Display       |
| PDM       | Rev 03  | 740-013110  | QCS17025017   | Power Distribution Module |
| PEM 0     | Rev 10  | 740-027760  | QCS1702N062   | PS 4.1kW; 200-240V AC     |
| in        |         |             |               |                           |
| PEM 1     | Rev 04  | 740-027760  | QCS1422N02C   | PS 4.1kW; 200-240V AC     |

|                  |        |            |             |                       |
|------------------|--------|------------|-------------|-----------------------|
| in               |        |            |             |                       |
| PEM 2            | Rev 09 | 740-027760 | QCS1614N01X | PS 4.1kW; 200-240V AC |
| in               |        |            |             |                       |
| Routing Engine 0 | REV 08 | 740-031116 | 9009131803  | RE-S-1800x4           |
| Routing Engine 1 | REV 08 | 740-031116 | 9009124913  | RE-S-1800x4           |
| CB 0             | REV 18 | 750-031391 | CABF0579    | Enhanced MX SCB       |
| CB 1             | REV 16 | 750-031391 | CAAZ2471    | Enhanced MX SCB       |
| CB 2             | REV 16 | 750-031391 | CAAW9595    | Enhanced MX SCB       |
| FPC 0            | REV 18 | 750-046005 | CACE6574    | MPC5E 3D Q 2CGE+4XGE  |
| CPU              | REV 09 | 711-045719 | CACG8908    | RMPC PMB              |
| PIC 0            |        | BUILTIN    | BUILTIN     | 2X10GE SFPP OTN       |
| Xcvr 0           | REV 01 | 740-021308 | AQA0DYT     | SFP+-10G-SR           |
| Xcvr 1           | REV 01 | 740-021308 | AQGOMS7     | SFP+-10G-SR           |
| PIC 1            |        | BUILTIN    | BUILTIN     | 1X100GE CFP2 OTN      |
| Xcvr 0           | REV 01 | 740-046563 | XD16FC03Z   | CFP2-100G-SR10        |
| PIC 2            |        | BUILTIN    | BUILTIN     | 2X10GE SFPP OTN       |
| Xcvr 0           | REV 01 | 740-021308 | ANA0NAJ     | SFP+-10G-SR           |
| Xcvr 1           | REV 01 | 740-021308 | AQGOMRQ     | SFP+-10G-SR           |
| PIC 3            |        | BUILTIN    | BUILTIN     | 1X100GE CFP2 OTN      |
| Xcvr 0           | REV 01 | 740-049775 | J13K72993   | CFP2-100G-LR4         |
| FPC 1            | REV 11 | 750-045372 | CABK8154    | MPCE Type 3 3D        |
| CPU              | REV 08 | 711-035209 | CABE7370    | HMPC PMB 2G           |
| MIC 0            | REV 07 | 750-033307 | CABD5255    | 10X10GE SFPP          |
| PIC 0            |        | BUILTIN    | BUILTIN     | 10X10GE SFPP          |
| Xcvr 0           | REV 01 | 740-021308 | AQ50319     | SFP+-10G-SR           |
| Xcvr 1           | REV 01 | 740-021308 | AQ5035V     | SFP+-10G-SR           |
| Xcvr 2           | REV 01 | 740-021308 | AQ502XJ     | SFP+-10G-SR           |
| Xcvr 3           | REV 01 | 740-021308 | AQ43HHR     | SFP+-10G-SR           |
| Xcvr 4           | REV 01 | 740-021308 | AQ502YA     | SFP+-10G-SR           |
| Xcvr 5           | REV 01 | 740-021308 | AQ502EU     | SFP+-10G-SR           |
| Xcvr 6           | REV 01 | 740-021308 | AQ502HR     | SFP+-10G-SR           |
| Xcvr 7           | REV 01 | 740-021308 | AQ502A6     | SFP+-10G-SR           |
| Xcvr 8           | REV 01 | 740-021308 | AQ43H8M     | SFP+-10G-SR           |
| MIC 1            | REV 14 | 750-033196 | CAAP1398    | 1X100GE CXP           |
| PIC 2            |        | BUILTIN    | BUILTIN     | 1X100GE CXP           |
| Xcvr 0           | REV 01 | 740-046563 | XD16FC064   | CFP-100G-SR10         |
| FPC 3            | REV 35 | 750-028467 | CAAT9156    | MPC 3D 16x 10GE       |
| CPU              | REV 11 | 711-029089 | CAAV4645    | AMPC PMB              |
| PIC 0            |        | BUILTIN    | BUILTIN     | 4x 10GE(LAN) SFP+     |
| Xcvr 0           | REV 01 | 740-021308 | AQ43HZ1     | SFP+-10G-SR           |
| Xcvr 1           | REV 01 | 740-021308 | AQ43HZC     | SFP+-10G-SR           |
| Xcvr 2           | REV 01 | 740-021308 | AQ43HD2     | SFP+-10G-SR           |
| Xcvr 3           | REV 01 | 740-021308 | AQ502HN     | SFP+-10G-SR           |
| PIC 1            |        | BUILTIN    | BUILTIN     | 4x 10GE(LAN) SFP+     |
| Xcvr 0           | REV 01 | 740-021308 | AQ43HGF     | SFP+-10G-SR           |
| Xcvr 1           | REV 01 | 740-021308 | AQ501RZ     | SFP+-10G-SR           |
| Xcvr 2           | REV 01 | 740-021308 | AQ5029V     | SFP+-10G-SR           |
| Xcvr 3           | REV 01 | 740-021308 | AQ501X9     | SFP+-10G-SR           |
| PIC 2            |        | BUILTIN    | BUILTIN     | 4x 10GE(LAN) SFP+     |
| Xcvr 0           | REV 01 | 740-021308 | AQ502ZN     | SFP+-10G-SR           |
| Xcvr 1           | REV 01 | 740-021308 | AQ43H86     | SFP+-10G-SR           |
| Xcvr 2           | REV 01 | 740-021308 | AQ502ZY     | SFP+-10G-SR           |
| Xcvr 3           | REV 01 | 740-021308 | AQ502PZ     | SFP+-10G-SR           |
| PIC 3            |        | BUILTIN    | BUILTIN     | 4x 10GE(LAN) SFP+     |
| Xcvr 0           | REV 01 | 740-021308 | AQ503E6     | SFP+-10G-SR           |
| Xcvr 1           | REV 01 | 740-021308 | AQ502XN     | SFP+-10G-SR           |
| Xcvr 2           | REV 01 | 740-031980 | B11F00213   | SFP+-10G-SR           |
| Xcvr 3           | REV 01 | 740-021308 | AQ50336     | SFP+-10G-SR           |
| FPC 4            | REV 18 | 750-046005 | CACE6568    | MPC5E 3D Q 2CGE+4XGE  |
| CPU              | REV 09 | 711-045719 | CACG8900    | RMPC PMB              |
| PIC 0            |        | BUILTIN    | BUILTIN     | 2X10GE SFPP OTN       |

|          |             |            |           |                        |
|----------|-------------|------------|-----------|------------------------|
| Xcvr 0   | REV 01      | 740-021308 | AQA095A   | SFP+-10G-SR            |
| Xcvr 1   | REV 01      | 740-021308 | AQG0M1E   | SFP+-10G-SR            |
| PIC 1    |             | BUILTIN    | BUILTIN   | 1X100GE CFP2 OTN       |
| Xcvr 0   |             | NON-JNPR   | FE13F000F | CFP2-100G-SR10         |
| PIC 2    |             | BUILTIN    | BUILTIN   | 2X10GE SFPP OTN        |
| Xcvr 0   | REV 01      | 740-021308 | AQG0LYC   | SFP+-10G-SR            |
| Xcvr 1   | REV 01      | 740-021308 | AQG0LYB   | SFP+-10G-SR            |
| PIC 3    |             | BUILTIN    | BUILTIN   | 1X100GE CFP2 OTN       |
| Xcvr 0   | REV 01      | 740-048813 | XD32FE00Z | CFP2-100G-SR10         |
| FPC 5    | REV 18      | 750-046005 | CACE6577  | MPC5E 3D Q 2CGE+4XGE   |
| CPU      | REV 09      | 711-045719 | CACG8902  | RMPD PMB               |
| PIC 0    |             | BUILTIN    | BUILTIN   | 2X10GE SFPP OTN        |
| Xcvr 0   | REV 01      | 740-021308 | AQG0MXE   | SFP+-10G-SR            |
| Xcvr 1   | REV 01      | 740-021308 | AQG0LVY   | SFP+-10G-SR            |
| PIC 1    |             | BUILTIN    | BUILTIN   | 1X100GE CFP2 OTN       |
| Xcvr 0   | REV 01      | 740-046563 | XD16FC03T | CFP2-100G-SR10         |
| PIC 2    |             | BUILTIN    | BUILTIN   | 2X10GE SFPP OTN        |
| Xcvr 0   | REV 01      | 740-021308 | AQG0LW1   | SFP+-10G-SR            |
| Xcvr 1   | REV 01      | 740-021308 | AQG0LW3   | SFP+-10G-SR            |
| PIC 3    |             | BUILTIN    | BUILTIN   | 1X100GE CFP2 OTN       |
| Xcvr 0   |             | NON-JNPR   | FE13F000J | CFP2-100G-SR10         |
| FPC 7    | REV 09      | 750-037355 | CAAF0937  | MPC4E 3D Q 2CGE+8XGE   |
| CPU      | REV 08      | 711-035209 | CAAD8004  | HMPD PMB 2G            |
| PIC 0    |             | BUILTIN    | BUILTIN   | 4x10GE SFPP            |
| Xcvr 0   | REV 01      | 740-021308 | ANA0MM3   | SFP+-10G-SR            |
| PIC 1    |             | BUILTIN    | BUILTIN   | 1X100GE CFP            |
| Xcvr 0   | REV 01      | 740-035329 | X000C163  | CFP-100G-SR10          |
| PIC 2    |             | BUILTIN    | BUILTIN   | 4x10GE SFPP            |
| Xcvr 0   | REV 01      | 740-021308 | AQG0MS6   | SFP+-10G-SR            |
| Xcvr 1   | REV 01      | 740-021308 | AQG0MRX   | SFP+-10G-SR            |
| Xcvr 2   | REV 01      | 740-021308 | AQG0M6Y   | SFP+-10G-SR            |
| Xcvr 3   | REV 01      | 740-021308 | AQG0LZM   | SFP+-10G-SR            |
| PIC 3    |             | BUILTIN    | BUILTIN   | 1X100GE CFP            |
| Xcvr 0   | REV 01      | 740-035329 | X12J00499 | CFP-100G-SR10          |
| FPC 8    | REV 39      | 750-045715 | CACD1903  | MPC5E 3D Q 24XGE+6XLGE |
| CPU      | REV 09      | 711-045719 | CACD1815  | RMPD PMB               |
| PIC 0    |             | BUILTIN    | BUILTIN   | 12X10GE SFPP OTN       |
| PIC 1    |             | BUILTIN    | BUILTIN   | 12X10GE SFPP OTN       |
| PIC 2    |             | BUILTIN    | BUILTIN   | 3X40GE QSFPP           |
| Xcvr 0   | REV 01      | 740-046565 | QC480289  | QSFP+-40G-SR4          |
| Xcvr 1   | REV 01      | 740-046565 | QC480274  | QSFP+-40G-SR4          |
| Xcvr 2   | REV 01      | 740-046565 | QD130190  | QSFP+-40G-SR4          |
| PIC 3    |             | BUILTIN    | BUILTIN   | 3X40GE QSFPP           |
| Xcvr 0   | REV 01      | 740-046565 | QD130197  | QSFP+-40G-SR4          |
| Xcvr 1   | REV 01      | 740-046565 | QD130180  | QSFP+-40G-SR4          |
| Xcvr 2   | REV 01      | 740-046565 | QD130199  | QSFP+-40G-SR4          |
| WAN MEZZ | REV 09      | 750-049136 | CABN0415  | MPC5E 24XGE OTN Mezz   |
| FPC 9    | REV 05      | 750-044444 | CAAY9801  | MPCE Type 2 3D P       |
| CPU      | REV 04      | 711-038484 | CAAW3673  | MPCE PMB 2G            |
| MIC 0    | REV 28      | 750-028387 | CAAX1071  | 3D 4x 10GE XFP         |
| PIC 0    |             | BUILTIN    | BUILTIN   | 2x 10GE XFP            |
| Xcvr 0   |             | NON-JNPR   | T12L92342 | XFP-10G-SR             |
| Xcvr 1   |             | NON-JNPR   | T12L92303 | XFP-10G-SR             |
| PIC 1    |             | BUILTIN    | BUILTIN   | 2x 10GE XFP            |
| Xcvr 0   |             | NON-JNPR   | CC07BK02X | XFP-10G-SR             |
| QXM 0    | REV 06      | 711-028408 | CAAW4883  | MPC QXM                |
| QXM 1    | REV 06      | 711-028408 | CAAW4603  | MPC QXM                |
| FPC 10   | REV 21.0.11 | 750-045715 | CAAY3541  | MPC5E 3D Q 24XGE+6XLGE |
| CPU      | REV 07      | 711-045719 | CAAW7426  | RMPD PMB               |
| PIC 0    |             | BUILTIN    | BUILTIN   | 12X10GE SFPP           |
| Xcvr 0   | REV 01      | 740-031980 | AHK01AP   | SFP+-10G-SR            |

|            |        |            |              |                    |
|------------|--------|------------|--------------|--------------------|
| Xcvr 1     | REV 01 | 740-021308 | AQ502ZU      | SFP+-10G-SR        |
| Xcvr 2     | REV 01 | 740-031980 | AP41BLS      | SFP+-10G-SR        |
| Xcvr 3     | REV 01 | 740-021308 | AQA08YA      | SFP+-10G-SR        |
| Xcvr 4     | REV 01 | 740-021308 | AQA0K26      | SFP+-10G-SR        |
| Xcvr 6     | REV 01 | 740-021308 | AQA06S3      | SFP+-10G-SR        |
| Xcvr 7     | REV 01 | 740-021308 | AQA06AS      | SFP+-10G-SR        |
| Xcvr 8     | REV 01 | 740-021308 | AQA053N      | SFP+-10G-SR        |
| Xcvr 9     | REV 01 | 740-021308 | AQA0E97      | SFP+-10G-SR        |
| Xcvr 10    | REV 01 | 740-021308 | AQA0GS4      | SFP+-10G-SR        |
| Xcvr 11    | REV 01 | 740-021308 | AQA0JVA      | SFP+-10G-SR        |
| PIC 1      |        | BUILTIN    | BUILTIN      | 12X10GE SFPP       |
| Xcvr 0     | REV 01 | 740-021308 | AQA057A      | SFP+-10G-SR        |
| Xcvr 1     | REV 01 | 740-021308 | ANA0MLS      | SFP+-10G-SR        |
| Xcvr 2     | REV 01 | 740-021308 | AQA093A      | SFP+-10G-SR        |
| Xcvr 3     | REV 01 | 740-021309 | 943153A00075 | SFP+-10G-LR        |
| Xcvr 4     | REV 01 | 740-021308 | AQA077B      | SFP+-10G-SR        |
| Xcvr 5     | REV 01 | 740-021308 | AQA0JSC      | SFP+-10G-SR        |
| Xcvr 6     | REV 01 | 740-021308 | AQA0735      | SFP+-10G-SR        |
| Xcvr 7     | REV 01 | 740-021308 | AQ5028N      | SFP+-10G-SR        |
| Xcvr 8     | REV 01 | 740-031980 | AP40VN5      | SFP+-10G-SR        |
| Xcvr 9     | REV 01 | 740-021308 | AQA0K0J      | SFP+-10G-SR        |
| Xcvr 10    | REV 01 | 740-021308 | AQA07AP      | SFP+-10G-SR        |
| Xcvr 11    | REV 01 | 740-021308 | AQA08YB      | SFP+-10G-SR        |
| PIC 2      |        | BUILTIN    | BUILTIN      | 3X40GE QSFPP       |
| PIC 3      |        | BUILTIN    | BUILTIN      | 3X40GE QSFPP       |
| WAN MEZZ   | REV 07 | 750-045717 | CAAX3123     | MPC5E 24XGE Mezz   |
| FPC 11     | REV 17 | 750-037355 | CAAT3986     | MPC4E 3D 2CGE+8XGE |
| CPU        | REV 08 | 711-035209 | CAAR3972     | HMPC PMB 2G        |
| PIC 0      |        | BUILTIN    | BUILTIN      | 4x10GE SFPP        |
| Xcvr 0     | REV 01 | 740-021308 | AQA0DSE      | SFP+-10G-SR        |
| Xcvr 1     | REV 01 | 740-021308 | AQ501Y3      | SFP+-10G-SR        |
| Xcvr 2     | REV 01 | 740-021308 | AQ501XU      | SFP+-10G-SR        |
| Xcvr 3     | REV 01 | 740-021308 | AQ5036Y      | SFP+-10G-SR        |
| PIC 1      |        | BUILTIN    | BUILTIN      | 1X100GE CFP        |
| Xcvr 0     |        | NON-JNPR   | X12J00247    | CFP-100G-SR10      |
| PIC 2      |        | BUILTIN    | BUILTIN      | 4x10GE SFPP        |
| Xcvr 0     | REV 01 | 740-031980 | ALQ1DKF      | SFP+-10G-SR        |
| Xcvr 1     | REV 01 | 740-031980 | AJ403YA      | SFP+-10G-SR        |
| Xcvr 2     | REV 01 | 740-031980 | AP40TY0      | SFP+-10G-SR        |
| Xcvr 3     | REV 01 | 740-031980 | ALQ14G0      | SFP+-10G-SR        |
| PIC 3      |        | BUILTIN    | BUILTIN      | 1X100GE CFP        |
| Xcvr 0     | REV 01 | 740-035329 | X12J00095    | CFP-100G-SR10      |
| Fan Tray 0 | REV 08 | 740-031521 | ACAF4219     | Enhanced Fan Tray  |
| Fan Tray 1 | REV 08 | 740-031521 | ACAF4225     | Enhanced Fan Tray  |

### show chassis hardware detail (MX960 Router)

```
user@host> show chassis hardware detail
```

| Hardware inventory: |          |                   |                  |                         |
|---------------------|----------|-------------------|------------------|-------------------------|
| Item                | Version  | Part number       | Serial number    | Description             |
| Chassis             |          |                   |                  | MX960                   |
| Midplane            | REV 01   | 710-013698        | AA6082           | MX960 Midplane          |
| PIM                 | Rev 01   | 740-013110        | 000008           | Power Inlet Module      |
| PEM 2               |          |                   |                  |                         |
| PEM 3               | Rev 01   | 740-013682        | 000038           | PS 1.7kW; 200-240VAC in |
| Routing Engine 0    | REV 00   | 740-015113        | 1000617944       | RE-S-1300               |
| ad0                 | 245 MB   | SanDisk SDCFB-256 | 111419E1805T1141 | Compact Flash           |
| ad2                 | 38154 MB | FUJITSU MHT2040BH | NR0WT5925N77     | Hard Disk               |
| CB 0                | REV 05   | 710-013725        | JK6947           | MX960 Test SCB          |
| FPC 4               | REV 01   | 710-013305        | JM7617           | MX960 Test DPC          |
| CPU                 |          |                   |                  |                         |

|            |        |            |            |                  |
|------------|--------|------------|------------|------------------|
| PIC 0      |        | BUILTIN    | BUILTIN    | 1x 10GE(LAN/WAN) |
| PIC 1      |        | BUILTIN    | BUILTIN    | 10x 1GE          |
| FPC 7      | REV 01 | 710-013305 | JL9634     | MX960 Test DPC   |
| CPU        |        |            |            |                  |
| PIC 0      |        | BUILTIN    | BUILTIN    | 1x 10GE(LAN/WAN) |
| Xcvr 0     |        | NON-JNPR   | MYBG65I82C | XFP-10G-SR       |
| PIC 1      |        | BUILTIN    | BUILTIN    | 10x 1GE          |
| Xcvr 1     | REV 01 | 740-011782 | P7N0368    | SFP-SX           |
| Xcvr 4     | REV 01 | 740-011782 | P8J1W27    | SFP-SX           |
| Xcvr 6     | REV 01 | 740-011782 | P8J1VSD    | SFP-SX           |
| Xcvr 9     | REV 01 | 740-011782 | P8J1W25    | SFP-SX           |
| Fan Tray 0 |        |            |            |                  |
| Fan Tray 1 |        |            |            |                  |

### show chassis hardware detail (MX960 Router with MPC5EQ)

```
user@host> show chassis hardware detail
```

Hardware inventory:

| Item             | Version | Part number         | Serial number      | Description               |
|------------------|---------|---------------------|--------------------|---------------------------|
| Chassis          |         |                     | JN1214852AFA       | MX960                     |
| Midplane         | REV 01  | 710-030012          | ACAX3674           | MX960 Backplane           |
| FPM Board        | REV 03  | 710-014974          | CAAZ9326           | Front Panel Display       |
| PDM              | Rev 03  | 740-013110          | QCS17025017        | Power Distribution Module |
| PEM 0            | Rev 10  | 740-027760          | QCS1702N062        | PS 4.1kW; 200-240V AC     |
| in               |         |                     |                    |                           |
| PEM 1            | Rev 04  | 740-027760          | QCS1422N02C        | PS 4.1kW; 200-240V AC     |
| in               |         |                     |                    |                           |
| PEM 2            | Rev 09  | 740-027760          | QCS1614N01X        | PS 4.1kW; 200-240V AC     |
| in               |         |                     |                    |                           |
| Routing Engine 0 | REV 08  | 740-031116          | 9009131803         | RE-S-1800x4               |
| ad0 3831 MB      |         | UGB30SFA4000T1      | SFA4000T1 000016CD | Compact Flash             |
| ad1 30533 MB     |         | UGB94BPH32H0S1-KCI  | 11000061346        | Disk 1                    |
| usb0 (addr 1)    |         | EHCI root hub 0     | Intel              | uhub0                     |
| usb0 (addr 2)    |         | product 0x0020 32   | vendor 0x8087      | uhub1                     |
| DIMM 0           |         | VL31B5263F-F8SD DIE | REV-0 PCB REV-0    | MFR ID-ce80               |
| DIMM 1           |         | VL31B5263F-F8SD DIE | REV-0 PCB REV-0    | MFR ID-ce80               |
| DIMM 2           |         | VL31B5263F-F8SD DIE | REV-0 PCB REV-0    | MFR ID-ce80               |
| DIMM 3           |         | VL31B5263F-F8SD DIE | REV-0 PCB REV-0    | MFR ID-ce80               |
| Routing Engine 1 | REV 08  | 740-031116          | 9009124913         | RE-S-1800x4               |
| ad0 3831 MB      |         | UGB30SFA4000T1      | SFA4000T1 0000106D | Compact Flash             |
| ad1 30533 MB     |         | UGB94BPH32H0S1-KCI  | 11000052402        | Disk 1                    |
| CB 0             | REV 18  | 750-031391          | CABF0579           | Enhanced MX SCB           |
| CB 1             | REV 16  | 750-031391          | CAAZ2471           | Enhanced MX SCB           |
| CB 2             | REV 16  | 750-031391          | CAAW9595           | Enhanced MX SCB           |
| FPC 0            | REV 18  | 750-046005          | CACE6574           | MPC5E 3D Q 2CGE+4XGE      |
| CPU              | REV 09  | 711-045719          | CACG8908           | RMPC PMB                  |
| PIC 0            |         | BUILTIN             | BUILTIN            | 2X10GE SFPP OTN           |
| Xcvr 0           | REV 01  | 740-021308          | AQA0DYT            | SFP+-10G-SR               |
| Xcvr 1           | REV 01  | 740-021308          | AQG0MS7            | SFP+-10G-SR               |
| PIC 1            |         | BUILTIN             | BUILTIN            | 1X100GE CFP2 OTN          |
| Xcvr 0           | REV 01  | 740-046563          | XD16FC03Z          | CFP2-100G-SR10            |
| PIC 2            |         | BUILTIN             | BUILTIN            | 2X10GE SFPP OTN           |
| Xcvr 0           | REV 01  | 740-021308          | ANA0NAJ            | SFP+-10G-SR               |
| Xcvr 1           | REV 01  | 740-021308          | AQG0MRQ            | SFP+-10G-SR               |
| PIC 3            |         | BUILTIN             | BUILTIN            | 1X100GE CFP2 OTN          |
| Xcvr 0           | REV 01  | 740-049775          | J13K72993          | CFP2-100G-LR4             |
| FPC 1            | REV 11  | 750-045372          | CABK8154           | MPCE Type 3 3D            |
| CPU              | REV 08  | 711-035209          | CABE7370           | HMPC PMB 2G               |
| MIC 0            | REV 07  | 750-033307          | CABD5255           | 10X10GE SFPP              |
| PIC 0            |         | BUILTIN             | BUILTIN            | 10X10GE SFPP              |
| Xcvr 0           | REV 01  | 740-021308          | AQ50319            | SFP+-10G-SR               |

|        |        |            |           |                      |
|--------|--------|------------|-----------|----------------------|
| Xcvr 1 | REV 01 | 740-021308 | AQ5035V   | SFP+-10G-SR          |
| Xcvr 2 | REV 01 | 740-021308 | AQ502XJ   | SFP+-10G-SR          |
| Xcvr 3 | REV 01 | 740-021308 | AQ43HHR   | SFP+-10G-SR          |
| Xcvr 4 | REV 01 | 740-021308 | AQ502YA   | SFP+-10G-SR          |
| Xcvr 5 | REV 01 | 740-021308 | AQ502EU   | SFP+-10G-SR          |
| Xcvr 6 | REV 01 | 740-021308 | AQ502HR   | SFP+-10G-SR          |
| Xcvr 7 | REV 01 | 740-021308 | AQ502A6   | SFP+-10G-SR          |
| Xcvr 8 | REV 01 | 740-021308 | AQ43H8M   | SFP+-10G-SR          |
| MIC 1  | REV 14 | 750-033196 | CAAP1398  | 1X100GE CXP          |
| PIC 2  |        | BUILTIN    | BUILTIN   | 1X100GE CXP          |
| Xcvr 0 | REV 01 | 740-046563 | XD16FC064 | CFP2-100G-SR10       |
| FPC 3  | REV 35 | 750-028467 | CAAT9156  | MPC 3D 16x 10GE      |
| CPU    | REV 11 | 711-029089 | CAAV4645  | AMPC PMB             |
| PIC 0  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+    |
| Xcvr 0 | REV 01 | 740-021308 | AQ43HZ1   | SFP+-10G-SR          |
| Xcvr 1 | REV 01 | 740-021308 | AQ43HZC   | SFP+-10G-SR          |
| Xcvr 2 | REV 01 | 740-021308 | AQ43HD2   | SFP+-10G-SR          |
| Xcvr 3 | REV 01 | 740-021308 | AQ502HN   | SFP+-10G-SR          |
| PIC 1  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+    |
| Xcvr 0 | REV 01 | 740-021308 | AQ43HGF   | SFP+-10G-SR          |
| Xcvr 1 | REV 01 | 740-021308 | AQ501RZ   | SFP+-10G-SR          |
| Xcvr 2 | REV 01 | 740-021308 | AQ5029V   | SFP+-10G-SR          |
| Xcvr 3 | REV 01 | 740-021308 | AQ501X9   | SFP+-10G-SR          |
| PIC 2  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+    |
| Xcvr 0 | REV 01 | 740-021308 | AQ502ZN   | SFP+-10G-SR          |
| Xcvr 1 | REV 01 | 740-021308 | AQ43H86   | SFP+-10G-SR          |
| Xcvr 2 | REV 01 | 740-021308 | AQ502ZY   | SFP+-10G-SR          |
| Xcvr 3 | REV 01 | 740-021308 | AQ502PZ   | SFP+-10G-SR          |
| PIC 3  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+    |
| Xcvr 0 | REV 01 | 740-021308 | AQ503E6   | SFP+-10G-SR          |
| Xcvr 1 | REV 01 | 740-021308 | AQ502XN   | SFP+-10G-SR          |
| Xcvr 2 | REV 01 | 740-031980 | B11F00213 | SFP+-10G-SR          |
| Xcvr 3 | REV 01 | 740-021308 | AQ50336   | SFP+-10G-SR          |
| FPC 4  | REV 18 | 750-046005 | CACE6568  | MPC5E 3D Q 2CGE+4XGE |
| CPU    | REV 09 | 711-045719 | CACG8900  | RMPC PMB             |
| PIC 0  |        | BUILTIN    | BUILTIN   | 2X10GE SFPP OTN      |
| Xcvr 0 | REV 01 | 740-021308 | AQA095A   | SFP+-10G-SR          |
| Xcvr 1 | REV 01 | 740-021308 | AQG0M1E   | SFP+-10G-SR          |
| PIC 1  |        | BUILTIN    | BUILTIN   | 1X100GE CFP2 OTN     |
| Xcvr 0 |        | NON-JNPR   | FE13F000F | CFP2-100G-SR10       |
| PIC 2  |        | BUILTIN    | BUILTIN   | 2X10GE SFPP OTN      |
| Xcvr 0 | REV 01 | 740-021308 | AQG0LYC   | SFP+-10G-SR          |
| Xcvr 1 | REV 01 | 740-021308 | AQG0LYB   | SFP+-10G-SR          |
| PIC 3  |        | BUILTIN    | BUILTIN   | 1X100GE CFP2 OTN     |
| Xcvr 0 | REV 01 | 740-048813 | XD32FE00Z | CFP2-100G-SR10       |
| FPC 5  | REV 18 | 750-046005 | CACE6577  | MPC5E 3D Q 2CGE+4XGE |
| CPU    | REV 09 | 711-045719 | CACG8902  | RMPC PMB             |
| PIC 0  |        | BUILTIN    | BUILTIN   | 2X10GE SFPP OTN      |
| Xcvr 0 | REV 01 | 740-021308 | AQG0MXE   | SFP+-10G-SR          |
| Xcvr 1 | REV 01 | 740-021308 | AQG0LVY   | SFP+-10G-SR          |
| PIC 1  |        | BUILTIN    | BUILTIN   | 1X100GE CFP2 OTN     |
| Xcvr 0 | REV 01 | 740-046563 | XD16FC03T | CFP2-100G-SR10       |
| PIC 2  |        | BUILTIN    | BUILTIN   | 2X10GE SFPP OTN      |
| Xcvr 0 | REV 01 | 740-021308 | AQG0LW1   | SFP+-10G-SR          |
| Xcvr 1 | REV 01 | 740-021308 | AQG0LW3   | SFP+-10G-SR          |
| PIC 3  |        | BUILTIN    | BUILTIN   | 1X100GE CFP2 OTN     |
| Xcvr 0 |        | NON-JNPR   | FE13F000J | CFP2-100G-SR10       |
| FPC 7  | REV 09 | 750-037355 | CAAF0937  | MPC4E 3D 2CGE+8XGE   |
| CPU    | REV 08 | 711-035209 | CAAD8004  | HMPC PMB 2G          |
| PIC 0  |        | BUILTIN    | BUILTIN   | 4x10GE SFPP          |
| Xcvr 0 | REV 01 | 740-021308 | ANA0MM3   | SFP+-10G-SR          |

|          |             |            |              |                        |
|----------|-------------|------------|--------------|------------------------|
| PIC 1    |             | BUILTIN    | BUILTIN      | 1X100GE CFP            |
| Xcvr 0   | REV 01      | 740-035329 | X000C163     | CFP-100G-SR10          |
| PIC 2    |             | BUILTIN    | BUILTIN      | 4x10GE SFPP            |
| Xcvr 0   | REV 01      | 740-021308 | AQGOMS6      | SFP+-10G-SR            |
| Xcvr 1   | REV 01      | 740-021308 | AQGOMRX      | SFP+-10G-SR            |
| Xcvr 2   | REV 01      | 740-021308 | AQGOM6Y      | SFP+-10G-SR            |
| Xcvr 3   | REV 01      | 740-021308 | AQGOLZM      | SFP+-10G-SR            |
| PIC 3    |             | BUILTIN    | BUILTIN      | 1X100GE CFP            |
| Xcvr 0   | REV 01      | 740-035329 | X12J00499    | CFP-100G-SR10          |
| FPC 8    | REV 39      | 750-045715 | CACD1903     | MPC5E 3D Q 24XGE+6XLGE |
| CPU      | REV 09      | 711-045719 | CACD1815     | RMPC PMB               |
| PIC 0    |             | BUILTIN    | BUILTIN      | 12X10GE SFPP OTN       |
| PIC 1    |             | BUILTIN    | BUILTIN      | 12X10GE SFPP OTN       |
| PIC 2    |             | BUILTIN    | BUILTIN      | 3X40GE QSFPP           |
| Xcvr 0   | REV 01      | 740-046565 | QC480289     | QSFP+-40G-SR4          |
| Xcvr 1   | REV 01      | 740-046565 | QC480274     | QSFP+-40G-SR4          |
| Xcvr 2   | REV 01      | 740-046565 | QD130190     | QSFP+-40G-SR4          |
| PIC 3    |             | BUILTIN    | BUILTIN      | 3X40GE QSFPP           |
| Xcvr 0   | REV 01      | 740-046565 | QD130197     | QSFP+-40G-SR4          |
| Xcvr 1   | REV 01      | 740-046565 | QD130180     | QSFP+-40G-SR4          |
| Xcvr 2   | REV 01      | 740-046565 | QD130199     | QSFP+-40G-SR4          |
| WAN MEZZ | REV 09      | 750-049136 | CABN0415     | MPC5E 24XGE OTN Mezz   |
| FPC 9    | REV 05      | 750-044444 | CAAY9801     | MPCE Type 2 3D P       |
| CPU      | REV 04      | 711-038484 | CAAW3673     | MPCE PMB 2G            |
| MIC 0    | REV 28      | 750-028387 | CAAX1071     | 3D 4x 10GE XFP         |
| PIC 0    |             | BUILTIN    | BUILTIN      | 2x 10GE XFP            |
| Xcvr 0   |             | NON-JNPR   | T12L92342    | XFP-10G-SR             |
| Xcvr 1   |             | NON-JNPR   | T12L92303    | XFP-10G-SR             |
| PIC 1    |             | BUILTIN    | BUILTIN      | 2x 10GE XFP            |
| Xcvr 0   |             | NON-JNPR   | CC07BK02X    | XFP-10G-SR             |
| QXM 0    | REV 06      | 711-028408 | CAAW4883     | MPC QXM                |
| QXM 1    | REV 06      | 711-028408 | CAAW4603     | MPC QXM                |
| FPC 10   | REV 21.0.11 | 750-045715 | CAAY3541     | MPC5E 3D Q 24XGE+6XLGE |
| CPU      | REV 07      | 711-045719 | CAAW7426     | RMPC PMB               |
| PIC 0    |             | BUILTIN    | BUILTIN      | 12X10GE SFPP           |
| Xcvr 0   | REV 01      | 740-031980 | AHK01AP      | SFP+-10G-SR            |
| Xcvr 1   | REV 01      | 740-021308 | AQ502ZU      | SFP+-10G-SR            |
| Xcvr 2   | REV 01      | 740-031980 | AP41BLS      | SFP+-10G-SR            |
| Xcvr 3   | REV 01      | 740-021308 | AQA08YA      | SFP+-10G-SR            |
| Xcvr 4   | REV 01      | 740-021308 | AQA0K26      | SFP+-10G-SR            |
| Xcvr 6   | REV 01      | 740-021308 | AQA06S3      | SFP+-10G-SR            |
| Xcvr 7   | REV 01      | 740-021308 | AQA06AS      | SFP+-10G-SR            |
| Xcvr 8   | REV 01      | 740-021308 | AQA053N      | SFP+-10G-SR            |
| Xcvr 9   | REV 01      | 740-021308 | AQA0E97      | SFP+-10G-SR            |
| Xcvr 10  | REV 01      | 740-021308 | AQA0GS4      | SFP+-10G-SR            |
| Xcvr 11  | REV 01      | 740-021308 | AQA0JVA      | SFP+-10G-SR            |
| PIC 1    |             | BUILTIN    | BUILTIN      | 12X10GE SFPP           |
| Xcvr 0   | REV 01      | 740-021308 | AQA057A      | SFP+-10G-SR            |
| Xcvr 1   | REV 01      | 740-021308 | ANAOMLS      | SFP+-10G-SR            |
| Xcvr 2   | REV 01      | 740-021308 | AQA093A      | SFP+-10G-SR            |
| Xcvr 3   | REV 01      | 740-021309 | 943153A00075 | SFP+-10G-LR            |
| Xcvr 4   | REV 01      | 740-021308 | AQA077B      | SFP+-10G-SR            |
| Xcvr 5   | REV 01      | 740-021308 | AQA0JSC      | SFP+-10G-SR            |
| Xcvr 6   | REV 01      | 740-021308 | AQA0735      | SFP+-10G-SR            |
| Xcvr 7   | REV 01      | 740-021308 | AQ5028N      | SFP+-10G-SR            |
| Xcvr 8   | REV 01      | 740-031980 | AP40VN5      | SFP+-10G-SR            |
| Xcvr 9   | REV 01      | 740-021308 | AQA0K0J      | SFP+-10G-SR            |
| Xcvr 10  | REV 01      | 740-021308 | AQA07AP      | SFP+-10G-SR            |
| Xcvr 11  | REV 01      | 740-021308 | AQA08YB      | SFP+-10G-SR            |
| PIC 2    |             | BUILTIN    | BUILTIN      | 3X40GE QSFPP           |
| PIC 3    |             | BUILTIN    | BUILTIN      | 3X40GE QSFPP           |

|            |        |            |           |                    |
|------------|--------|------------|-----------|--------------------|
| WAN MEZZ   | REV 07 | 750-045717 | CAAX3123  | MPC5E 24XGE Mezz   |
| FPC 11     | REV 17 | 750-037355 | CAAT3986  | MPC4E 3D 2CGE+8XGE |
| CPU        | REV 08 | 711-035209 | CAAR3972  | HMPC PMB 2G        |
| PIC 0      |        | BUILTIN    | BUILTIN   | 4x10GE SFPP        |
| Xcvr 0     | REV 01 | 740-021308 | AQA0DSE   | SFP+-10G-SR        |
| Xcvr 1     | REV 01 | 740-021308 | AQ501Y3   | SFP+-10G-SR        |
| Xcvr 2     | REV 01 | 740-021308 | AQ501XU   | SFP+-10G-SR        |
| Xcvr 3     | REV 01 | 740-021308 | AQ5036Y   | SFP+-10G-SR        |
| PIC 1      |        | BUILTIN    | BUILTIN   | 1X100GE CFP        |
| Xcvr 0     |        | NON-JNPR   | X12J00247 | CFP-100G-SR10      |
| PIC 2      |        | BUILTIN    | BUILTIN   | 4x10GE SFPP        |
| Xcvr 0     | REV 01 | 740-031980 | ALQ1DKF   | SFP+-10G-SR        |
| Xcvr 1     | REV 01 | 740-031980 | AJ403YA   | SFP+-10G-SR        |
| Xcvr 2     | REV 01 | 740-031980 | AP40TY0   | SFP+-10G-SR        |
| Xcvr 3     | REV 01 | 740-031980 | ALQ14G0   | SFP+-10G-SR        |
| PIC 3      |        | BUILTIN    | BUILTIN   | 1X100GE CFP        |
| Xcvr 0     | REV 01 | 740-035329 | X12J00095 | CFP-100G-SR10      |
| Fan Tray 0 | REV 08 | 740-031521 | ACAF4219  | Enhanced Fan Tray  |
| Fan Tray 1 | REV 08 | 740-031521 | ACAF4225  | Enhanced Fan Tray  |

#### show chassis hardware extensive (MX960 Router with MPC5EQ)

```

user@host> show chassis hardware extensive
Hardware inventory:
Item Version Part number Serial number Description
Chassis
Jedec Code: 0x7fb0 EEPROM Version: 0x02
S/N: JN1214852AFA
Assembly ID: 0x0512 Assembly Version: 00.00
Date: 00-00-0000 Assembly Flags: 0x00
ID: MX960
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 7f b0 02 ff 05 12 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x20: 4a 4e 31 32 31 34 38 35 32 41 46 41 00 00 00 00
Address 0x30: 00 00 00 ff 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Midplane REV 01 710-030012 ACAX3674 MX960 Backplane
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 710-030012 S/N: ACAX3674
Assembly ID: 0x01df Assembly Version: 01.01
Date: 01-19-2013 Assembly Flags: 0x00
Version: REV 01 CLEI Code: COM8T00CRB
ID: MX960 Backplane FRU Model Number: CHAS-BP-MX960-S
Board Information Record:
Address 0x00: ad 01 08 00 54 e0 32 bc 68 00 ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 01 df 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 31 30 2d 30 33 30 30 31 32 00 00
Address 0x20: 53 2f 4e 20 41 43 41 58 33 36 37 34 00 13 01 07
Address 0x30: dd ff ff ff ad 01 08 00 54 e0 32 bc 68 00 ff ff
Address 0x40: ff ff ff ff 01 43 4f 4d 38 54 30 30 43 52 42 43
Address 0x50: 48 41 53 2d 42 50 2d 4d 58 39 36 30 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 42 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff aa ff ff ff ff ff ff ff ff ff ff ff ff
FPM Board REV 03 710-014974 CAAZ9326 Front Panel Display

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Jedec Code: 0x7fb0 EEPROM Version: 0x01
P/N: 710-014974 S/N: CAAZ9326
Assembly ID: 0x01e6 Assembly Version: 01.03
Date: 12-31-2012 Assembly Flags: 0x00
Version: REV 03
ID: Front Panel Display FRU Model Number: CRAFT-MX960-S
Board Information Record:
 Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
 Address 0x00: 7f b0 01 ff 01 e6 01 03 52 45 56 20 30 33 00 00
 Address 0x10: 00 00 00 00 37 31 30 2d 30 31 34 39 37 34 00 00
 Address 0x20: 53 2f 4e 20 43 41 41 5a 39 33 32 36 00 1f 0c 07
 Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 43
 Address 0x50: 52 41 46 54 2d 4d 58 39 36 30 2d 53 00 00 00 00
 Address 0x60: 00 00 00 00 00 00 ff ff ff ff ff ff ff ff ff ff
 Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
PDM Rev 03 740-013110 QCS17025017 Power Distribution Module
Jedec Code: 0x7fb0 EEPROM Version: 0x01
P/N: 740-013110 S/N: QCS17025017
Assembly ID: 0x0416 Assembly Version: 01.03
Date: 01-10-2013 Assembly Flags: 0x00
Version: Rev 03
ID: Power Distribution Module
Board Information Record:
 Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00
I2C Hex Data:
 Address 0x00: 7f b0 01 ff 04 16 01 03 52 65 76 20 30 33 00 00
 Address 0x10: 00 00 00 00 37 34 30 2d 30 31 33 31 31 30 00 00
 Address 0x20: 51 43 53 31 37 30 32 35 30 31 37 00 00 0a 01 07
 Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 Address 0x40: ff 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
PEM 0 Rev 10 740-027760 QCS1702N062 PS 4.1kW; 200-240V AC
in
Jedec Code: 0x7fb0 EEPROM Version: 0x01
P/N: 740-027760 S/N: QCS1702N062
Assembly ID: 0x0430 Assembly Version: 01.10
Date: 01-15-2013 Assembly Flags: 0x00
Version: Rev 10
ID: PS 4.1kW; 200-240V AC in FRU Model Number: PWR-MX960-4100-AC-S
Board Information Record:
 Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00 00
I2C Hex Data:
 Address 0x00: 7f b0 01 ff 04 30 01 0a 52 65 76 20 31 30 00 00
 Address 0x10: 00 00 00 00 37 34 30 2d 30 32 37 37 36 30 00 00
 Address 0x20: 51 43 53 31 37 30 32 4e 30 36 32 00 00 0f 01 07
 Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 Address 0x40: 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 50
 Address 0x50: 57 52 2d 4d 58 39 36 30 2d 34 31 30 30 2d 41 43
 Address 0x60: 2d 53 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
PEM 1 Rev 04 740-027760 QCS1422N02C PS 4.1kW; 200-240V AC
in
Jedec Code: 0x7fb0 EEPROM Version: 0x01
P/N: 740-027760 S/N: QCS1422N02C
Assembly ID: 0x0430 Assembly Version: 01.04
Date: 06-04-2010 Assembly Flags: 0x00
Version: Rev 04

```

```

ID: PS 4.1kW; 200-240V AC in FRU Model Number: PWR-MX960-4100-AC-S
Board Information Record:
 Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00 00
I2C Hex Data:
 Address 0x00: 7f b0 01 ff 04 30 01 04 52 65 76 20 30 34 00 00
 Address 0x10: 00 00 00 00 37 34 30 2d 30 32 37 37 36 30 00 00
 Address 0x20: 51 43 53 31 34 32 32 4e 30 32 43 00 00 04 06 07
 Address 0x30: da ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 Address 0x40: 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 50
 Address 0x50: 57 52 2d 4d 58 39 36 30 2d 34 31 30 30 2d 41 43
 Address 0x60: 2d 53 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
PEM 2 Rev 09 740-027760 QCS1614N01X PS 4.1kW; 200-240V AC
in
 Jedec Code: 0x7fb0 EEPROM Version: 0x01
 P/N: 740-027760 S/N: QCS1614N01X
Assembly ID: 0x0430 Assembly Version: 01.09
Date: 04-07-2012 Assembly Flags: 0x00
Version: Rev 09
ID: PS 4.1kW; 200-240V AC in FRU Model Number: PWR-MX960-4100-AC-S
Board Information Record:
 Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00 00
I2C Hex Data:
 Address 0x00: 7f b0 01 ff 04 30 01 09 52 65 76 20 30 39 00 00
 Address 0x10: 00 00 00 00 37 34 30 2d 30 32 37 37 36 30 00 00
 Address 0x20: 51 43 53 31 36 31 34 4e 30 31 58 00 00 07 04 07
 Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 Address 0x40: 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 50
 Address 0x50: 57 52 2d 4d 58 39 36 30 2d 34 31 30 30 2d 41 43
 Address 0x60: 2d 53 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Routing Engine 0 REV 08 740-031116 9009131803 RE-S-1800x4
 Jedec Code: 0x7fb0 EEPROM Version: 0x02
 P/N: 740-031116 S/N: 9009131803
Assembly ID: 0x09c0 Assembly Version: 01.08
Date: 03-04-2013 Assembly Flags: 0x00
Version: REV 08 CLEI Code: COUCASKBAA
ID: RE-S-1800x4 FRU Model Number: RE-S-1800X4-16G-S
Board Information Record:
 Address 0x00: 54 32 30 32 37 44 42 2d 34 34 47 42 23 42 23 00
I2C Hex Data:
 Address 0x00: 7f b0 02 ff 09 c0 01 08 52 45 56 20 30 38 00 00
 Address 0x10: 00 00 00 00 37 34 30 2d 30 33 31 31 31 36 00 00
 Address 0x20: 39 30 30 39 31 33 31 38 30 33 00 00 00 04 03 07
 Address 0x30: dd ff ff ff 54 32 30 32 37 44 42 2d 34 34 47 42
 Address 0x40: 23 42 23 00 01 43 4f 55 43 41 53 4b 42 41 41 52
 Address 0x50: 45 2d 53 2d 31 38 30 30 58 34 2d 31 36 47 2d 53
 Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
 Address 0x70: ff ff ff 59 ff ff ff ff ff ff ff ff ff ff ff ff
ad0 3831 MB UGB30SFA4000T1 SFA4000T1 000016CD Compact Flash
ad1 30533 MB UGB94BPH32H0S1-KCI 11000061346 Disk 1
usb0 (addr 1) EHCI root hub 0 Intel uhub0
usb0 (addr 2) product 0x0020 32 vendor 0x8087 uhub1
DIMM 0 VL31B5263F-F8SD DIE REV-0 PCB REV-0 MFR ID-ce80
DIMM 1 VL31B5263F-F8SD DIE REV-0 PCB REV-0 MFR ID-ce80
DIMM 2 VL31B5263F-F8SD DIE REV-0 PCB REV-0 MFR ID-ce80
DIMM 3 VL31B5263F-F8SD DIE REV-0 PCB REV-0 MFR ID-ce80
Routing Engine 1 REV 08 740-031116 9009124913 RE-S-1800x4
 Jedec Code: 0x7fb0 EEPROM Version: 0x02
 P/N: 740-031116 S/N: 9009124913
Assembly ID: 0x09c0 Assembly Version: 01.08

```

```

Date: 01-09-2013 Assembly Flags: 0x00
Version: REV 08 CLEI Code: COUCASKBAA
ID: RE-S-1800x4 FRU Model Number: RE-S-1800X4-16G-S
Board Information Record:
Address 0x00: 54 32 30 32 37 44 42 2d 34 34 47 42 23 42 23 00
I2C Hex Data:
Address 0x00: 7f b0 02 ff 09 c0 01 08 52 45 56 20 30 38 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 33 31 31 31 36 00 00
Address 0x20: 39 30 30 39 31 32 34 39 31 33 00 00 00 09 01 07
Address 0x30: dd ff ff ff 54 32 30 32 37 44 42 2d 34 34 47 42
Address 0x40: 23 42 23 00 01 43 4f 55 43 41 53 4b 42 41 41 52
Address 0x50: 45 2d 53 2d 31 38 30 30 58 34 2d 31 36 47 2d 53
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 59 ff ff ff ff ff ff ff ff ff ff ff ff
ad0 3831 MB UGB30SFA4000T1 SFA4000T1 0000106D Compact Flash
ad1 30533 MB UGB94BPH32H0S1-KCI 11000052402 Disk 1
CB 0 REV 18 750-031391 CABF0579 Enhanced MX SCB
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 750-031391 S/N: CABF0579
Assembly ID: 0x09b0 Assembly Version: 01.18
Date: 04-15-2013 Assembly Flags: 0x00
Version: REV 18 CLEI Code: COUCASRBAA
ID: Enhanced MX SCB FRU Model Number: SCBE-MX-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 09 b0 01 12 52 45 56 20 31 38 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 33 31 33 39 31 00 00
Address 0x20: 53 2f 4e 20 43 41 42 46 30 35 37 39 00 0f 04 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4f 55 43 41 53 52 42 41 41 53
Address 0x50: 43 42 45 2d 4d 58 2d 53 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 43 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 7d ff ff ff ff ff ff ff ff ff ff ff ff
CB 1 REV 16 750-031391 CAAZ2471 Enhanced MX SCB
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 750-031391 S/N: CAAZ2471
Assembly ID: 0x09b0 Assembly Version: 01.16
Date: 03-09-2013 Assembly Flags: 0x00
Version: REV 16 CLEI Code: COUCARCBAB
ID: Enhanced MX SCB FRU Model Number: SCBE-MX-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 09 b0 01 10 52 45 56 20 31 36 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 33 31 33 39 31 00 00
Address 0x20: 53 2f 4e 20 43 41 41 5a 32 34 37 31 00 09 03 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4f 55 43 41 52 43 42 41 42 53
Address 0x50: 43 42 45 2d 4d 58 2d 53 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 42 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 6d ff ff ff ff ff ff ff ff ff ff ff ff
CB 2 REV 16 750-031391 CAAW9595 Enhanced MX SCB
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 750-031391 S/N: CAAW9595
Assembly ID: 0x09b0 Assembly Version: 01.16
Date: 02-01-2013 Assembly Flags: 0x00
Version: REV 16 CLEI Code: COUCARCBAB
ID: Enhanced MX SCB FRU Model Number: SCBE-MX-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff

```

```

I2C Hex Data:
Address 0x00: 7f b0 02 ff 09 b0 01 10 52 45 56 20 31 36 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 33 31 33 39 31 00 00
Address 0x20: 53 2f 4e 20 43 41 41 57 39 35 39 35 00 01 02 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4f 55 43 41 52 43 42 41 42 53
Address 0x50: 43 42 45 2d 4d 58 2d 53 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 42 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 6d ff ff ff ff ff ff ff ff ff ff ff ff
FPC 0 REV 18 750-046005 CACE6574 MPC5E 3D Q 2CGE+4XGE
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 750-046005 S/N: CACE6574
Assembly ID: 0x0b8c Assembly Version: 01.18
Date: 11-20-2013 Assembly Flags: 0x00
Version: REV 18 CLEI Code: PROTOXCLEI
ID: MPC5E 3D Q 2CGE+4XGE FRU Model Number: PROTO-ASSEMBLY
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 8c 01 12 52 45 56 20 31 38 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 34 36 30 30 35 00 00
Address 0x20: 53 2f 4e 20 43 41 43 45 36 35 37 34 00 14 0b 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff c2 ff ff ff ff ff ff ff ff ff ff ff ff
CPU REV 09 711-045719 CACG8908 RMPC PMB
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 711-045719 S/N: CACG8908
Assembly ID: 0x0b85 Assembly Version: 01.09
Date: 11-13-2013 Assembly Flags: 0x00
Version: REV 09
ID: RMPC PMB
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 85 01 09 52 45 56 20 30 39 00 00
Address 0x10: 00 00 00 00 37 31 31 2d 30 34 35 37 31 39 00 00
Address 0x20: 53 2f 4e 20 43 41 43 47 38 39 30 38 00 0d 0b 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 00 50 52 4f 54 4f 58 43 4c 45 49 50
Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff c2 00 00 00 00 00 00 00 00 00 00 00 00
PIC 0 BUILTIN BUILTIN 2X10GE SFPP OTN
Jedec Code: 0x0000 EEPROM Version: 0x00
P/N: BUILTIN S/N: BUILTIN
Assembly ID: 0x0a90 Assembly Version: 00.00
Date: 00-00-0000 Assembly Flags: 0x00
ID: 2X10GE SFPP OTN
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 00 00 00 00 0a 90 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

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Address 0x70: 00 00 00 00 c0 02 ae dc 00 00 00 00 0a 6e 00 00
Xcvr 0 REV 01 740-021308 AQA0DYT SFP+-10G-SR
 Xcvr 1 REV 01 740-021308 AQGOMS7 SFP+-10G-SR
 PIC 1 BUILTIN BUILTIN 1X100GE CFP2 OTN
Jedec Code: 0x0000 EEPROM Version: 0x00
P/N: BUILTIN S/N: BUILTIN
Assembly ID: 0x0a6e Assembly Version: 00.00
Date: 00-00-0000 Assembly Flags: 0x00
ID: 1X100GE CFP2 OTN
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 00 00 00 00 0a 6e 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 c0 03 f3 8c 31 5c e7 80 00 00 00 02
 Xcvr 0 REV 01 740-046563 XD16FC03Z CFP2-100G-SR10
 PIC 2 BUILTIN BUILTIN 2X10GE SFPP OTN
Jedec Code: 0x0000 EEPROM Version: 0x00
P/N: BUILTIN S/N: BUILTIN
Assembly ID: 0x0a90 Assembly Version: 00.00
Date: 00-00-0000 Assembly Flags: 0x00
ID: 2X10GE SFPP OTN
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 00 00 00 00 0a 90 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 c0 03 f5 6c 31 5c db 40 00 00 00 02
 Xcvr 0 REV 01 740-021308 ANA0NAJ SFP+-10G-SR
 Xcvr 1 REV 01 740-021308 AQGOMRQ SFP+-10G-SR
 PIC 3 BUILTIN BUILTIN 1X100GE CFP2 OTN
Jedec Code: 0x0000 EEPROM Version: 0x00
P/N: BUILTIN S/N: BUILTIN
Assembly ID: 0x0a6e Assembly Version: 00.00
Date: 00-00-0000 Assembly Flags: 0x00
ID: 1X100GE CFP2 OTN
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 00 00 00 00 0a 6e 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 c0 03 ed ec 31 5c e2 e8 00 00 00 02
Xcvr 0 REV 01 740-049775 J13K72993 CFP2-100G-LR4
FPC 1 REV 11 750-045372 CABK8154 MPCE Type 3 3D
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 750-045372 S/N: CABK8154

```

```

Assembly ID: 0x09db Assembly Version: 04.11
Date: 05-18-2013 Assembly Flags: 0x00
Version: REV 11 CLEI Code: COUIBBNBAA
ID: MPCE Type 3 3D FRU Model Number: MX-MPC3E-3D
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 09 db 04 0b 52 45 56 20 31 31 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 34 35 33 37 32 00 00
Address 0x20: 53 2f 4e 20 43 41 42 4b 38 31 35 34 00 12 05 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4f 55 49 42 42 4e 42 41 41 4d
Address 0x50: 58 2d 4d 50 43 33 45 2d 33 44 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 44 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff cf ff ff ff ff ff ff ff ff ff ff ff ff
CPU REV 08 711-035209 CABE7370 HMPC PMB 2G
Jedec Code: 0x7fb0 EEPROM Version: 0x01
P/N: 711-035209 S/N: CABE7370
Assembly ID: 0x0b04 Assembly Version: 01.08
Date: 05-08-2013 Assembly Flags: 0x00
Version: REV 08
ID: HMPC PMB 2G
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 01 ff 0b 04 01 08 52 45 56 20 30 38 00 00
Address 0x10: 00 00 00 00 37 31 31 2d 30 33 35 32 30 39 00 00
Address 0x20: 53 2f 4e 20 43 41 42 45 37 33 37 30 00 08 05 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x70: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
MIC 0 REV 07 750-033307 CABD5255 10X10GE SFPP
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 750-033307 S/N: CABD5255
Assembly ID: 0x0a2a Assembly Version: 02.07
Date: 04-25-2013 Assembly Flags: 0x00
Version: REV 07 CLEI Code: COUIBBJBAA
ID: 10X10GE SFPP FRU Model Number: MIC3-3D-10XGE-SFPP
Board Information Record:
Address 0x00: 34 01 03 03 05 ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 fe 0a 2a 02 07 52 45 56 20 30 37 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 33 33 33 30 37 00 00
Address 0x20: 53 2f 4e 20 43 41 42 44 35 32 35 35 00 19 04 07
Address 0x30: dd ff ff ff 34 01 03 03 05 ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4f 55 49 42 42 4a 42 41 41 4d
Address 0x50: 49 43 33 2d 33 44 2d 31 30 58 47 45 2d 53 46 50
Address 0x60: 50 00 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 82 c0 03 f0 bc 57 79 83 80 00 00 00 02
PIC 0 BUILTIN BUILTIN 10X10GE SFPP
Xcvr 0 REV 01 740-021308 AQ50319 SFP+-10G-SR
Xcvr 1 REV 01 740-021308 AQ5035V SFP+-10G-SR
Xcvr 2 REV 01 740-021308 AQ502XJ SFP+-10G-SR
Xcvr 3 REV 01 740-021308 AQ43HHR SFP+-10G-SR
Xcvr 4 REV 01 740-021308 AQ502YA SFP+-10G-SR
Xcvr 5 REV 01 740-021308 AQ502EU SFP+-10G-SR
Xcvr 6 REV 01 740-021308 AQ502HR SFP+-10G-SR
Xcvr 7 REV 01 740-021308 AQ502A6 SFP+-10G-SR
Xcvr 8 REV 01 740-021308 AQ43H8M SFP+-10G-SR

```

```

MIC 1 REV 14 750-033196 CAAP1398 1X100GE CXP
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 750-033196 S/N: CAAP1398
Assembly ID: 0x0a29 Assembly Version: 03.14
Date: 10-27-2012 Assembly Flags: 0x00
Version: REV 14 CLEI Code: COUIBBKBAA
ID: 1X100GE CXP FRU Model Number: MIC3-3D-1X100GE-CXP

Board Information Record:
Address 0x00: 34 01 07 07 08 ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 fe 0a 29 03 0e 52 45 56 20 31 34 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 33 33 31 39 36 00 00
Address 0x20: 53 2f 4e 20 43 41 41 50 31 33 39 38 00 1b 0a 07
Address 0x30: dc ff ff ff 34 01 07 07 08 ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4f 55 49 42 42 4b 42 41 41 4d
Address 0x50: 49 43 33 2d 33 44 2d 31 58 31 30 30 47 45 2d 43
Address 0x60: 58 50 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 96 c0 03 ef cc 57 79 85 08 00 00 00 02

PIC 2 BUILTIN BUILTIN 1X100GE CXP
Xcvr 0 REV 01 740-046563 XD16FC064 CFP2-100G-SR10
FPC 3 REV 35 750-028467 CAAT9156 MPC 3D 16x 10GE
Jedec Code: 0x7fb0 EEPROM Version: 0x01
P/N: 750-028467 S/N: CAAT9156
Assembly ID: 0x0997 Assembly Version: 01.35
Date: 12-17-2012 Assembly Flags: 0x00
Version: REV 35
ID: MPC 3D 16x 10GE FRU Model Number: MPC-3D-16XGE-SFPP

Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 01 ff 09 97 01 23 52 45 56 20 33 35 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 32 38 34 36 37 00 00
Address 0x20: 53 2f 4e 20 43 41 41 54 39 31 35 36 00 11 0c 07
Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 4d
Address 0x50: 50 43 2d 33 44 2d 31 36 58 47 45 2d 53 46 50 50
Address 0x60: 00 00 00 00 00 00 00 00 ff ff ff ff ff ff ff ff
Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff

CPU REV 11 711-029089 CAAV4645 AMPC PMB
Jedec Code: 0x7fb0 EEPROM Version: 0x01
P/N: 711-029089 S/N: CAAV4645
Assembly ID: 0x0998 Assembly Version: 01.11
Date: 12-13-2012 Assembly Flags: 0x00
Version: REV 11
ID: AMPC PMB

Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 01 ff 09 98 01 0b 52 45 56 20 31 31 00 00
Address 0x10: 00 00 00 00 37 31 31 2d 30 32 39 30 38 39 00 00
Address 0x20: 53 2f 4e 20 43 41 41 56 34 36 34 35 00 0d 0c 07
Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x70: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
PIC 0 BUILTIN BUILTIN 4x 10GE(LAN) SFP+
Jedec Code: 0x0000 EEPROM Version: 0x00
P/N: BUILTIN S/N: BUILTIN
Assembly ID: 0x02fe Assembly Version: 00.00
Date: 00-00-0000 Assembly Flags: 0x00

```

```

ID: 4x 10GE(LAN) SFP+
Board Information Record:
 Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
 Address 0x00: 00 00 00 00 02 fe 00 00 00 00 00 00 00 00 00 00
 Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
 Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
 Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 Address 0x70: 00 00 00 00 c0 02 6b 94 00 00 00 00 02 fe 00 00
 Xcvr 0 REV 01 740-021308 AQ43HZ1 SFP+-10G-SR
 Xcvr 1 REV 01 740-021308 AQ43HZC SFP+-10G-SR
 Xcvr 2 REV 01 740-021308 AQ43HD2 SFP+-10G-SR
 Xcvr 3 REV 01 740-021308 AQ502HN SFP+-10G-SR
 PIC 1 BUILTIN BUILTIN 4x 10GE(LAN) SFP+
Jedec Code: 0x0000 EEPROM Version: 0x00
P/N: BUILTIN S/N: BUILTIN
Assembly ID: 0x02fe Assembly Version: 00.00
Date: 00-00-0000 Assembly Flags: 0x00
ID: 4x 10GE(LAN) SFP+
Board Information Record:
 Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
 Address 0x00: 00 00 00 00 02 fe 00 00 00 00 00 00 00 00 00 00
 Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
 Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
 Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 Address 0x70: 00 00 00 00 c0 02 ac 0c 00 00 00 00 02 fe 00 00
 Xcvr 0 REV 01 740-021308 AQ43HGF SFP+-10G-SR
 Xcvr 1 REV 01 740-021308 AQ501RZ SFP+-10G-SR
 Xcvr 2 REV 01 740-021308 AQ5029V SFP+-10G-SR
 Xcvr 3 REV 01 740-021308 AQ501X9 SFP+-10G-SR
 PIC 2 BUILTIN BUILTIN 4x 10GE(LAN) SFP+
Jedec Code: 0x0000 EEPROM Version: 0x00
P/N: BUILTIN S/N: BUILTIN
Assembly ID: 0x02fe Assembly Version: 00.00
Date: 00-00-0000 Assembly Flags: 0x00
.....

```

### show chassis hardware models (MX960 Router with MPC5EQ)

```
user@host> show chassis hardware models
```

```
Hardware inventory:
```

| Item             | Version | Part number | Serial number | FRU model number    |
|------------------|---------|-------------|---------------|---------------------|
| Midplane         | REV 01  | 710-030012  | ACAX3674      | CHAS-BP-MX960-S     |
| FPM Board        | REV 03  | 710-014974  | CAAZ9326      | CRAFT-MX960-S       |
| PEM 0            | Rev 10  | 740-027760  | QCS1702N062   | PWR-MX960-4100-AC-S |
| PEM 1            | Rev 04  | 740-027760  | QCS1422N02C   | PWR-MX960-4100-AC-S |
| PEM 2            | Rev 09  | 740-027760  | QCS1614N01X   | PWR-MX960-4100-AC-S |
| Routing Engine 0 | REV 08  | 740-031116  | 9009131803    | RE-S-1800X4-16G-S   |
| Routing Engine 1 | REV 08  | 740-031116  | 9009124913    | RE-S-1800X4-16G-S   |
| CB 0             | REV 18  | 750-031391  | CABF0579      | SCBE-MX-S           |
| CB 1             | REV 16  | 750-031391  | CAAZ2471      | SCBE-MX-S           |
| CB 2             | REV 16  | 750-031391  | CAAW9595      | SCBE-MX-S           |
| FPC 0            | REV 18  | 750-046005  | CACE6574      | PROTO-ASSEMBLY      |
| FPC 1            | REV 11  | 750-045372  | CABK8154      | MX-MPC3E-3D         |



|            |             |            |          |                     |
|------------|-------------|------------|----------|---------------------|
| MIC 0      | REV 07      | 750-033307 | CABD5255 | MIC3-3D-10XGE-SFPP  |
| MIC 1      | REV 14      | 750-033196 | CAAP1398 | MIC3-3D-1X100GE-CXP |
| FPC 3      | REV 35      | 750-028467 | CAAT9156 | MPC-3D-16XGE-SFPP   |
| FPC 4      | REV 18      | 750-046005 | CACE6568 | PROTO-ASSEMBLY      |
| FPC 5      | REV 18      | 750-046005 | CACE6577 | PROTO-ASSEMBLY      |
| FPC 7      | REV 09      | 750-037355 | CAAF0937 | MPC4E-2CGE-8XGE     |
| FPC 8      | REV 39      | 750-045715 | CACD1903 | PROTO-ASSEMBLY      |
| FPC 9      | REV 05      | 750-044444 | CAAY9801 | MX-MPC2E-3D-P       |
| MIC 0      | REV 28      | 750-028387 | CAAX1071 | MIC-3D-4XGE-XFP     |
| FPC 10     | REV 21.0.11 | 750-045715 | CAAY3541 | PROTO-ASSEMBLY      |
| FPC 11     | REV 17      | 750-037355 | CAAT3986 | MPC4E-3D-2CGE-8XGE  |
| Fan Tray 0 | REV 08      | 740-031521 | ACAF4219 | FFANTRAY-MX960-HC-S |
| Fan Tray 1 | REV 08      | 740-031521 | ACAF4225 | FFANTRAY-MX960-HC-S |

### show chassis hardware clei-models (MX960 Router with MPC5EQ)

```
user@host> show chassis hardware clei-models
```

Hardware inventory:

| Item             | Version     | Part number | CLEI code  | FRU model number    |
|------------------|-------------|-------------|------------|---------------------|
| Midplane         | REV 01      | 710-030012  | COM8T00CRB | CHAS-BP-MX960-S     |
| FPM Board        | REV 03      | 710-014974  |            | CRAFT-MX960-S       |
| PEM 0            | Rev 10      | 740-027760  |            | PWR-MX960-4100-AC-S |
| PEM 1            | Rev 04      | 740-027760  |            | PWR-MX960-4100-AC-S |
| PEM 2            | Rev 09      | 740-027760  |            | PWR-MX960-4100-AC-S |
| Routing Engine 0 | REV 08      | 740-031116  | COUCASKBAA | RE-S-1800X4-16G-S   |
| Routing Engine 1 | REV 08      | 740-031116  | COUCASKBAA | RE-S-1800X4-16G-S   |
| CB 0             | REV 18      | 750-031391  | COUCASRBAA | SCBE-MX-S           |
| CB 1             | REV 16      | 750-031391  | COUCARCBAB | SCBE-MX-S           |
| CB 2             | REV 16      | 750-031391  | COUCARCBAB | SCBE-MX-S           |
| FPC 0            | REV 18      | 750-046005  | PROTOXCLEI | PROTO-ASSEMBLY      |
| FPC 1            | REV 11      | 750-045372  | COUIBBNBAA | MX-MPC3E-3D         |
| MIC 0            | REV 07      | 750-033307  | COUIBBJBAA | MIC3-3D-10XGE-SFPP  |
| MIC 1            | REV 14      | 750-033196  | COUIBBKBAA | MIC3-3D-1X100GE-CXP |
| FPC 3            | REV 35      | 750-028467  |            | MPC-3D-16XGE-SFPP   |
| FPC 4            | REV 18      | 750-046005  | PROTOXCLEI | PROTO-ASSEMBLY      |
| FPC 5            | REV 18      | 750-046005  | PROTOXCLEI | PROTO-ASSEMBLY      |
| FPC 7            | REV 09      | 750-037355  | PROTOXCLEI | MPC4E-2CGE-8XGE     |
| FPC 8            | REV 39      | 750-045715  | PROTOXCLEI | PROTO-ASSEMBLY      |
| FPC 9            | REV 05      | 750-044444  | COUIBBGBAA | MX-MPC2E-3D-P       |
| MIC 0            | REV 28      | 750-028387  | COUIA16BAA | MIC-3D-4XGE-XFP     |
| FPC 10           | REV 21.0.11 | 750-045715  | PROTOXCLEI | PROTO-ASSEMBLY      |
| FPC 11           | REV 17      | 750-037355  | IPU3A4DHAA | MPC4E-3D-2CGE-8XGE  |
| Fan Tray 0       | REV 08      | 740-031521  |            | FFANTRAY-MX960-HC-S |
| Fan Tray 1       | REV 08      | 740-031521  |            | FFANTRAY-MX960-HC-S |

### show chassis hardware (MX2010 Router)

```
user@host > show chassis hardware
```

Hardware inventory:

| Item       | Version | Part number | Serial number | Description         |
|------------|---------|-------------|---------------|---------------------|
| Chassis    |         |             | JN11E3217AFK  | MX2010              |
| Midplane   | REV 01  | 750-044636  | ABAB8506      | Lower Backplane     |
| Midplane 1 | REV 01  | 711-044557  | ZY8296        | Upper Backplane     |
| PMP        | REV 03  | 711-032426  | ACAJ1388      | Power Midplane      |
| FPM Board  | REV 06  | 711-032349  | ZX8744        | Front Panel Display |
| PSM 4      | REV 0C  | 740-033727  | VK00254       | DC 52V Power Supply |
| Module     |         |             |               |                     |
| PSM 5      | REV 0B  | 740-033727  | VG00015       | DC 52V Power Supply |
| Module     |         |             |               |                     |
| PSM 6      | REV 0B  | 740-033727  | VH00097       | DC 52V Power Supply |
| Module     |         |             |               |                     |

|                  |        |            |              |                      |
|------------------|--------|------------|--------------|----------------------|
| PSM 7 Module     | REV 0C | 740-033727 | VJ00151      | DC 52V Power Supply  |
| PSM 8 Module     | REV 0C | 740-033727 | VJ00149      | DC 52V Power Supply  |
| PDM 0            | REV 0B | 740-038109 | WA00008      | DC Power Dist Module |
| PDM 1            | REV 0B | 740-038109 | WA00014      | DC Power Dist Module |
| Routing Engine 0 | REV 02 | 740-041821 | 9009094134   | RE-S-1800x4          |
| Routing Engine 1 | REV 02 | 740-041821 | 9009094141   | RE-S-1800x4          |
| CB 0             | REV 08 | 750-040257 | CAAB3491     | Control Board        |
| CB 1             | REV 08 | 750-040257 | CAAB3489     | Control Board        |
| SPMB 0           | REV 02 | 711-041855 | CAA6135      | PMB Board            |
| SPMB 1           | REV 02 | 711-041855 | CAA6137      | PMB Board            |
| SFB 0            | REV 06 | 711-032385 | ZV1828       | Switch Fabric Board  |
| SFB 1            | REV 07 | 711-032385 | ZZ2568       | Switch Fabric Board  |
| SFB 2            | REV 07 | 711-032385 | ZZ2563       | Switch Fabric Board  |
| SFB 3            | REV 07 | 711-032385 | ZZ2564       | Switch Fabric Board  |
| SFB 4            | REV 07 | 711-032385 | ZZ2580       | Switch Fabric Board  |
| SFB 5            | REV 07 | 711-032385 | ZZ2579       | Switch Fabric Board  |
| SFB 6            | REV 07 | 711-032385 | CAAB4882     | Switch Fabric Board  |
| SFB 7            | REV 07 | 711-032385 | CAAB4898     | Switch Fabric Board  |
| FPC 0            | REV 33 | 750-028467 | CAAB1919     | MPC 3D 16x 10GE      |
| CPU              | REV 11 | 711-029089 | CAAB7174     | AMPC PMB             |
| PIC 0            |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+    |
| Xcvr 0           | REV 01 | 740-021308 | AMH02RE      | SFP+-10G-SR          |
| Xcvr 1           | REV 01 | 740-021308 | AMH038C      | SFP+-10G-SR          |
| Xcvr 2           | REV 01 | 740-021308 | AMH0390      | SFP+-10G-SR          |
| Xcvr 3           | REV 01 | 740-021308 | AMG0SUA      | SFP+-10G-SR          |
| PIC 1            |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+    |
| Xcvr 0           | REV 01 | 740-021308 | AMH0579      | SFP+-10G-SR          |
| Xcvr 1           | REV 01 | 740-021308 | AMG0SGP      | SFP+-10G-SR          |
| Xcvr 2           | REV 01 | 740-021308 | AMH04SV      | SFP+-10G-SR          |
| Xcvr 3           | REV 01 | 740-021308 | AMH04X3      | SFP+-10G-SR          |
| PIC 2            |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+    |
| Xcvr 0           | REV 01 | 740-021308 | AMH0135      | SFP+-10G-SR          |
| Xcvr 1           | REV 01 | 740-021308 | AMH02NC      | SFP+-10G-SR          |
| Xcvr 2           | REV 01 | 740-021308 | AMH02XB      | SFP+-10G-SR          |
| Xcvr 3           | REV 01 | 740-021308 | AMH02PN      | SFP+-10G-SR          |
| PIC 3            |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+    |
| Xcvr 0           | REV 01 | 740-021308 | AMH057Y      | SFP+-10G-SR          |
| Xcvr 1           | REV 01 | 740-021308 | AMG0JHE      | SFP+-10G-SR          |
| Xcvr 2           | REV 01 | 740-021308 | AMH02HT      | SFP+-10G-SR          |
| Xcvr 3           | REV 01 | 740-021308 | AMH04V4      | SFP+-10G-SR          |
| FPC 1            | REV 21 | 750-033205 | ZG5027       | MPC Type 3           |
| CPU              | REV 04 | 711-035209 | YT4780       | HMPC PMB 2G          |
| MIC 0            | REV 03 | 750-033307 | ZV6299       | 10X10GE SFPP         |
| PIC 0            |        | BUILTIN    | BUILTIN      | 10X10GE SFPP         |
| Xcvr 0           | REV 01 | 740-031980 | 083363A00410 | SFP+-10G-SR          |
| Xcvr 1           | REV 01 | 740-031980 | 083363A00334 | SFP+-10G-SR          |
| Xcvr 2           | REV 01 | 740-031980 | 113363A00125 | SFP+-10G-SR          |
| Xcvr 3           | REV 01 | 740-031980 | 083363A00953 | SFP+-10G-SR          |
| Xcvr 4           | REV 01 | 740-031980 | AHR013D      | SFP+-10G-SR          |
| Xcvr 5           | REV 01 | 740-031980 | AJ40JUR      | SFP+-10G-SR          |
| Xcvr 6           | REV 01 | 740-031980 | AJ40JKL      | SFP+-10G-SR          |
| Xcvr 7           | REV 01 | 740-031980 | AJ30ECK      | SFP+-10G-SR          |
| Xcvr 8           | REV 01 | 740-021308 | 19T511100864 | SFP+-10G-SR          |
| Xcvr 9           | REV 01 | 740-021308 | 19T511100868 | SFP+-10G-SR          |
| MIC 1            | REV 03 | 750-033307 | ZV6268       | 10X10GE SFPP         |
| PIC 2            |        | BUILTIN    | BUILTIN      | 10X10GE SFPP         |
| Xcvr 0           | REV 01 | 740-031980 | AJC0JML      | SFP+-10G-SR          |
| Xcvr 1           | REV 01 | 740-031980 | AJ403PC      | SFP+-10G-SR          |
| Xcvr 2           | REV 01 | 740-031980 | AJ10N25      | SFP+-10G-SR          |

|            |        |            |              |                        |
|------------|--------|------------|--------------|------------------------|
| Xcvr 3     | REV 01 | 740-031980 | AJ40JF4      | SFP+-10G-SR            |
| Xcvr 4     | REV 01 | 740-031980 | AJ40JSJ      | SFP+-10G-SR            |
| Xcvr 5     | REV 01 | 740-031980 | AJ403V7      | SFP+-10G-SR            |
| Xcvr 6     | REV 01 | 740-031980 | AJ40JN3      | SFP+-10G-SR            |
| Xcvr 7     | REV 01 | 740-031980 | AJ40JSU      | SFP+-10G-SR            |
| Xcvr 8     | REV 01 | 740-021308 | 19T511100468 | SFP+-10G-SR            |
| Xcvr 9     | REV 01 | 740-021308 | 19T511101363 | SFP+-10G-SR            |
| FPC 8      | REV 22 | 750-031089 | ZT9746       | MPC Type 2 3D          |
| CPU        | REV 06 | 711-030884 | ZS1271       | MPC PMB 2G             |
| MIC 0      | REV 26 | 750-028392 | ABBS1150     | 3D 20x 1GE(LAN) SFP    |
| PIC 0      |        | BUILTIN    | BUILTIN      | 10x 1GE(LAN) SFP       |
| Xcvr 0     | REV 01 | 740-031851 | PLG023C      | SFP-SX                 |
| Xcvr 1     | REV 01 | 740-031851 | PLG09C6      | SFP-SX                 |
| Xcvr 2     | REV 02 | 740-011613 | AM0950SF9L7  | SFP-SX                 |
| Xcvr 3     | REV 02 | 740-011613 | AM1001SFN1H  | SFP-SX                 |
| Xcvr 4     | REV 02 | 740-011613 | AM1001SFM9D  | SFP-SX                 |
| Xcvr 5     | REV 02 | 740-011613 | AM1001SFLTJ  | SFP-SX                 |
| Xcvr 6     | REV 01 | 740-031851 | AC1108S03L9  | SFP-SX                 |
| Xcvr 7     | REV 01 | 740-031851 | AC1102S00NC  | SFP-SX                 |
| Xcvr 8     | REV 01 | 740-031851 | AC1102S00MX  | SFP-SX                 |
| Xcvr 9     | REV 01 | 740-031851 | AC1102S0085  | SFP-SX                 |
| PIC 1      |        | BUILTIN    | BUILTIN      | 10x 1GE(LAN) SFP       |
| Xcvr 0     | REV 01 | 740-031851 | AC1102S00KU  | SFP-SX                 |
| Xcvr 1     | REV 01 | 740-031851 | AC1102S00NG  | SFP-SX                 |
| Xcvr 2     | REV 01 | 740-031851 | AC1102S00K3  | SFP-SX                 |
| Xcvr 3     | REV 01 | 740-031851 | AC1102S008R  | SFP-SX                 |
| Xcvr 4     | REV 01 | 740-031851 | AM1107SUFVJ  | SFP-SX                 |
| Xcvr 5     | REV 01 | 740-031851 | AC1108S03LG  | SFP-SX                 |
| MIC 1      | REV 26 | 750-028387 | ABBR9582     | 3D 4x 10GE XFP         |
| PIC 2      |        | BUILTIN    | BUILTIN      | 2x 10GE XFP            |
| Xcvr 0     |        | NON-JNPR   | T10A91703    | XFP-10G-SR             |
| Xcvr 1     |        | NON-JNPR   | T09L42604    | XFP-10G-SR             |
| PIC 3      |        | BUILTIN    | BUILTIN      | 2x 10GE XFP            |
| FPC 9      | REV 11 | 750-036284 | ZL3591       | MPC 3D 16x 10GE EM     |
| CPU        | REV 10 | 711-029089 | ZL0513       | AMPC PMB               |
| PIC 0      |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+      |
| Xcvr 0     | REV 01 | 740-031980 | 1YT517101825 | SFP+-10G-SR            |
| Xcvr 1     | REV 01 | 740-031980 | 1YT517101821 | SFP+-10G-SR            |
| Xcvr 2     | REV 01 | 740-031980 | 1YT517101682 | SFP+-10G-SR            |
| Xcvr 3     | REV 01 | 740-031980 | ALQ13R6      | SFP+-10G-SR            |
| PIC 1      |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+      |
| Xcvr 0     | REV 01 | 740-031980 | 1YT517101828 | SFP+-10G-SR            |
| Xcvr 1     | REV 01 | 740-031980 | 1YT517101716 | SFP+-10G-SR            |
| Xcvr 2     | REV 01 | 740-031980 | 1YT517101732 | SFP+-10G-SR            |
| Xcvr 3     | REV 01 | 740-031980 | ALP0TR1      | SFP+-10G-SR            |
| PIC 2      |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+      |
| Xcvr 0     | REV 01 | 740-031980 | 1YT517101741 | SFP+-10G-SR            |
| Xcvr 1     | REV 01 | 740-031980 | 1YT517101829 | SFP+-10G-SR            |
| Xcvr 2     | REV 01 | 740-031980 | 1YT517101669 | SFP+-10G-SR            |
| Xcvr 3     | REV 01 | 740-031980 | ALQ14E3      | SFP+-10G-SR            |
| PIC 3      |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+      |
| Xcvr 0     | REV 01 | 740-031980 | 1YT517101826 | SFP+-10G-SR            |
| Xcvr 1     | REV 01 | 740-031980 | 1YT517101817 | SFP+-10G-SR            |
| Xcvr 2     | REV 01 | 740-031980 | 1YT517101735 | SFP+-10G-SR            |
| Xcvr 3     | REV 01 | 740-031980 | ALQ159A      | SFP+-10G-SR            |
| ADC 0      | REV 05 | 750-043596 | CAAC2073     | Adapter Card           |
| ADC 1      | REV 01 | 750-043596 | ZV4117       | Adapter Card           |
| ADC 8      | REV 01 | 750-043596 | ZV4107       | Adapter Card           |
| ADC 9      | REV 02 | 750-043596 | ZW1555       | Adapter Card           |
| Fan Tray 0 | REV 2A | 760-046960 | ACAY0015     | 172mm FanTray - 6 Fans |
| Fan Tray 1 | REV 2A | 760-046960 | ACAY0019     | 172mm FanTray - 6 Fans |

|            |        |            |          |                        |
|------------|--------|------------|----------|------------------------|
| Fan Tray 2 | REV 2A | 760-046960 | ACAY0020 | 172mm FanTray - 6 Fans |
| Fan Tray 3 | REV 2A | 760-046960 | ACAY0021 | 172mm FanTray - 6 Fans |

**show chassis hardware detail (MX2010 Router)**

```

user@host > show chassis hardware detail
Hardware inventory:
Item Version Part number Serial number Description
Chassis JN11E233DAFK MX2010
Midplane REV 26 750-044636 ABAB9357 Lower Backplane
Midplane 1 REV 01 711-044557 ABAB8643 Upper Backplane
PMP REV 04 711-032426 ACAJ1677 Power Midplane
FPM Board REV 08 760-044634 ABBV9726 Front Panel Display
PSM 0 REV 01 740-045050 1E02224000P DC 52V Power Supply
Module
PSM 1 REV 01 740-045050 1E02224000M DC 52V Power Supply
Module
PSM 2 REV 01 740-045050 1E022240010 DC 52V Power Supply
Module
PSM 3 REV 01 740-045050 1E02224000G DC 52V Power Supply
Module
PSM 4 REV 01 740-045050 1E022240013 DC 52V Power Supply
Module
PSM 5 REV 01 740-045050 1E022240007 DC 52V Power Supply
Module
PSM 6 REV 01 740-045050 1E02224001C DC 52V Power Supply
Module
PSM 7 REV 01 740-045050 1E02224001D DC 52V Power Supply
Module
PSM 8 REV 01 740-045050 1E02224001B DC 52V Power Supply
Module
PDM 0 REV 01 740-045234 1E262250067 DC Power Dist Module
Routing Engine 0 REV 02 740-041821 9009099704 RE-S-1800x4
 ad0 3831 MB UGB30SFA4000T1 SFA4000T1 00000651 Compact Flash
 ad1 30533 MB UGB94BPH32H0S1-KCI 11000019592 Disk 1
 usb0 (addr 1) EHCI root hub 0 Intel uhub0
 usb0 (addr 2) product 0x0020 32 vendor 0x8087 uhub1
 DIMM 0 SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
 DIMM 1 SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
 DIMM 2 SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
 DIMM 3 SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
Routing Engine 1 REV 02 740-041821 9009099706 RE-S-1800x4
 ad0 3998 MB Virtium - TuffDrive VCF P1T0200262860208 114 Compact Flash
 ad1 30533 MB UGB94ARF32H0S3-KC UNIGEN-499551-000404 Disk 1
CB 0 REV 13 750-040257 CAAF8436 Control Board
CB 1 REV 13 750-040257 CAAF8434 Control Board
SPMB 0 REV 02 711-041855 ABBV3825 PMB Board
SPMB 1 REV 02 711-041855 ABBV3833 PMB Board
SFB 0 REV 05 711-044466 ABBX5682 Switch Fabric Board
SFB 1 REV 05 711-044466 ABBX5676 Switch Fabric Board
SFB 2 REV 05 711-044466 ABBX5665 Switch Fabric Board
SFB 3 REV 05 711-044466 ABBX5699 Switch Fabric Board
SFB 4 REV 05 711-044466 ABBX5603 Switch Fabric Board
SFB 5 REV 05 711-044466 ABBX5587 Switch Fabric Board
SFB 6 REV 05 711-044466 ABBX5607 Switch Fabric Board
SFB 7 REV 05 711-044466 ABBX5669 Switch Fabric Board
FPC 0 REV 09 750-037355 CAAF0924 MPC Type 4-2
CPU REV 08 711-035209 CAAB9842 HMPC PMB 2G
PIC 0 BUILTIN BUILTIN 4x10GE SFPP
 Xcvr 0 REV 01 740-021308 19T511101656 SFP+-10G-SR
 Xcvr 1 REV 01 740-031980 AMA04RU SFP+-10G-SR

```

|        |        |            |              |                   |
|--------|--------|------------|--------------|-------------------|
| Xcvr 2 | REV 01 | 740-031980 | 193363A00558 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | B10M00202    | SFP+-10G-SR       |
| PIC 1  |        | BUILTIN    | BUILTIN      | 1X100GE CFP       |
| Xcvr 0 |        | NON-JNPR   | X12J00328    | CFP-100G-SR10     |
| PIC 2  |        | BUILTIN    | BUILTIN      | 4x10GE SFPP       |
| Xcvr 0 | REV 01 | 740-031980 | AMA088W      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | B10L04211    | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-021308 | 19T511101602 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | B10L04151    | SFP+-10G-SR       |
| PIC 3  |        | BUILTIN    | BUILTIN      | 1X100GE CFP       |
| Xcvr 0 |        | NON-JNPR   | X12J00332    | CFP-100G-SR10     |
| FPC 1  | REV 18 | 750-033205 | ZE0128       | MPC Type 3        |
| CPU    | REV 06 | 711-035209 | ZG5431       | HMPC PMB 2G       |
| MIC 0  | REV 15 | 750-033199 | ZP6435       | 1X100GE CFP       |
| PIC 0  |        | BUILTIN    | BUILTIN      | 1X100GE CFP       |
| Xcvr 0 | REV 01 | 740-032210 | J11E46118    | CFP-100G-LR4      |
| MIC 1  | REV 15 | 750-033199 | ZP6442       | 1X100GE CFP       |
| PIC 2  |        | BUILTIN    | BUILTIN      | 1X100GE CFP       |
| Xcvr 0 | REV 01 | 740-032210 | UMN03T4      | CFP-100G-LR4      |
| FPC 2  | REV 16 | 750-037358 | CAAL1001     | MPC Type 4-1      |
| CPU    | REV 08 | 711-035209 | CAAK7927     | HMPC PMB 2G       |
| PIC 0  |        | BUILTIN    | BUILTIN      | 8X10GE SFPP       |
| Xcvr 0 | REV 01 | 740-031980 | 193363A00589 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-021308 | 973152A00028 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 193363A00376 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-021308 | 973152A00016 | SFP+-10G-SR       |
| Xcvr 4 | REV 01 | 740-031980 | 193363A00499 | SFP+-10G-SR       |
| Xcvr 5 | REV 01 | 740-021308 | 973152A00039 | SFP+-10G-SR       |
| Xcvr 6 | REV 01 | 740-031980 | B11E01239    | SFP+-10G-SR       |
| Xcvr 7 | REV 01 | 740-021308 | 973152A00058 | SFP+-10G-SR       |
| PIC 1  |        | BUILTIN    | BUILTIN      | 8X10GE SFPP       |
| Xcvr 0 | REV 01 | 740-031980 | B10M00075    | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-021308 | 973152A00014 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AMA0638      | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-021308 | 973152A00063 | SFP+-10G-SR       |
| Xcvr 4 | REV 01 | 740-031980 | AMA0629      | SFP+-10G-SR       |
| Xcvr 5 | REV 01 | 740-021308 | 973152A00053 | SFP+-10G-SR       |
| Xcvr 6 | REV 01 | 740-031980 | 193363A00344 | SFP+-10G-SR       |
| Xcvr 7 | REV 01 | 740-021308 | 973152A00046 | SFP+-10G-SR       |
| PIC 2  |        | BUILTIN    | BUILTIN      | 8X10GE SFPP       |
| Xcvr 0 | REV 01 | 740-031980 | AMA062M      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-021308 | 973152A00080 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 193363A00580 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-021308 | 973152A00064 | SFP+-10G-SR       |
| Xcvr 4 | REV 01 | 740-031980 | 093363A01494 | SFP+-10G-SR       |
| Xcvr 5 | REV 01 | 740-021308 | 973152A00020 | SFP+-10G-SR       |
| Xcvr 6 | REV 01 | 740-031980 | 123363A00047 | SFP+-10G-SR       |
| Xcvr 7 | REV 01 | 740-021308 | 973152A00072 | SFP+-10G-SR       |
| PIC 3  |        | BUILTIN    | BUILTIN      | 8X10GE SFPP       |
| Xcvr 0 | REV 01 | 740-021308 | 03DZ06A01033 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-021308 | 973152A00022 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-021308 | 03DZ06A01026 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-021308 | 973152A00013 | SFP+-10G-SR       |
| Xcvr 4 | REV 01 | 740-021308 | 03DZ06A01028 | SFP+-10G-SR       |
| Xcvr 5 | REV 01 | 740-021308 | 973152A00079 | SFP+-10G-SR       |
| Xcvr 6 | REV 01 | 740-021308 | 03DZ06A01018 | SFP+-10G-SR       |
| Xcvr 7 | REV 01 | 740-021308 | 973152A00025 | SFP+-10G-SR       |
| FPC 3  | REV 33 | 750-028467 | CAAF5400     | MPC 3D 16x 10GE   |
| CPU    | REV 11 | 711-029089 | CAAH7626     | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-021308 | 973152A00066 | SFP+-10G-SR       |

|        |        |            |              |                   |
|--------|--------|------------|--------------|-------------------|
| Xcvr 1 | REV 01 | 740-021308 | 973152A00021 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-021308 | 973152A00062 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-021308 | 973152A00027 | SFP+-10G-SR       |
| PIC 1  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-021308 | 973152A00065 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-021308 | 973152A00069 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-021308 | 973152A00026 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-021308 | 973152A00003 | SFP+-10G-SR       |
| PIC 2  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-021308 | 973152A00035 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-021308 | 973152A00004 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-021308 | 973152A00049 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-021308 | 973152A00055 | SFP+-10G-SR       |
| PIC 3  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-021308 | 973152A00010 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-021308 | 973152A00001 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-021308 | 973152A00073 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-021308 | 973152A00012 | SFP+-10G-SR       |
| FPC 4  | REV 21 | 750-033205 | ZG5028       | MPC Type 3        |
| CPU    | REV 05 | 711-035209 | YX3911       | HMPC PMB 2G       |
| MIC 0  | REV 03 | 750-036233 | ZL2036       | 2X40GE QSFP       |
| PIC 0  |        | BUILTIN    | BUILTIN      | 2X40GE QSFP       |
| Xcvr 0 | REV 01 | 740-032986 | QB220708     | QSFP+-40G-SR4     |
| Xcvr 1 | REV 01 | 740-032986 | QB220735     | QSFP+-40G-SR4     |
| MIC 1  | REV 03 | 750-036233 | ZL2028       | 2X40GE QSFP       |
| PIC 2  |        | BUILTIN    | BUILTIN      | 2X40GE QSFP       |
| Xcvr 0 | REV 01 | 740-032986 | QB220727     | QSFP+-40G-SR4     |
| Xcvr 1 | REV 01 | 740-032986 | QB220715     | QSFP+-40G-SR4     |
| FPC 5  | REV 11 | 750-037358 | CAAE2196     | MPC Type 4-1      |
| CPU    | REV 08 | 711-035209 | CAAD9074     | HMPC PMB 2G       |
| PIC 0  |        | BUILTIN    | BUILTIN      | 8X10GE SFPP       |
| Xcvr 0 | REV 01 | 740-031980 | AMA062S      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AMA062P      | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AMA052R      | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AMA0632      | SFP+-10G-SR       |
| Xcvr 4 | REV 01 | 740-031980 | 193363A00564 | SFP+-10G-SR       |
| Xcvr 5 | REV 01 | 740-031980 | 193363A00229 | SFP+-10G-SR       |
| Xcvr 6 | REV 01 | 740-031980 | 193363A00363 | SFP+-10G-SR       |
| Xcvr 7 | REV 01 | 740-031980 | 193363A00278 | SFP+-10G-SR       |
| PIC 1  |        | BUILTIN    | BUILTIN      | 8X10GE SFPP       |
| Xcvr 0 | REV 01 | 740-031980 | AMA04CC      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-021308 | AD0927A001W  | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AMA04N2      | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AMA062U      | SFP+-10G-SR       |
| Xcvr 4 | REV 01 | 740-031980 | 193363A00491 | SFP+-10G-SR       |
| Xcvr 5 | REV 01 | 740-031980 | 183363A01511 | SFP+-10G-SR       |
| Xcvr 6 | REV 01 | 740-031980 | 193363A00565 | SFP+-10G-SR       |
| Xcvr 7 | REV 01 | 740-031980 | 193363A00405 | SFP+-10G-SR       |
| PIC 2  |        | BUILTIN    | BUILTIN      | 8X10GE SFPP       |
| Xcvr 0 | REV 01 | 740-031980 | AMA07QX      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AMA06MS      | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 193363A00318 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 193363A00402 | SFP+-10G-SR       |
| Xcvr 4 | REV 01 | 740-031980 | 193363A00174 | SFP+-10G-SR       |
| Xcvr 5 | REV 01 | 740-031980 | 193363A00388 | SFP+-10G-SR       |
| Xcvr 6 | REV 01 | 740-031980 | 193363A00377 | SFP+-10G-SR       |
| Xcvr 7 | REV 01 | 740-031980 | 193363A00234 | SFP+-10G-SR       |
| PIC 3  |        | BUILTIN    | BUILTIN      | 8X10GE SFPP       |
| Xcvr 0 | REV 01 | 740-031980 | AMA062T      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 193363A00550 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 193363A00364 | SFP+-10G-SR       |

|        |        |            |              |                   |
|--------|--------|------------|--------------|-------------------|
| Xcvr 3 | REV 01 | 740-031980 | AMA0630      | SFP+-10G-SR       |
| Xcvr 4 | REV 01 | 740-031980 | 193363A00509 | SFP+-10G-SR       |
| Xcvr 5 | REV 01 | 740-031980 | 193363A00459 | SFP+-10G-SR       |
| Xcvr 6 | REV 01 | 740-031980 | 113363A00191 | SFP+-10G-SR       |
| Xcvr 7 | REV 01 | 740-031980 | 193363A00352 | SFP+-10G-SR       |
| FPC 6  | REV 33 | 750-028467 | CAAF5552     | MPC 3D 16x 10GE   |
| CPU    | REV 11 | 711-029089 | CAAH7601     | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-021308 | AD0927A0036  | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-021308 | AD0927A003M  | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-021308 | AD0927A003G  | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-021308 | AD0927A0031  | SFP+-10G-SR       |
| PIC 1  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | 193363A00331 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 193363A00325 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 193363A00417 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 183363A02509 | SFP+-10G-SR       |
| PIC 2  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-021308 | T09K75140    | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | B11A04356    | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | B11K01952    | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | B11K01914    | SFP+-10G-SR       |
| PIC 3  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-021308 | T09K75157    | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-021308 | T09K75194    | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | B11K01926    | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | B11K01936    | SFP+-10G-SR       |
| FPC 7  | REV 16 | 750-037358 | CAAL1012     | MPC Type 4-1      |
| CPU    | REV 08 | 711-035209 | CAAJ3851     | HMPC PMB 2G       |
| PIC 0  |        | BUILTIN    | BUILTIN      | 8X10GE SFPP       |
| Xcvr 0 | REV 01 | 740-031980 | AMA04NK      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | B11F00260    | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | B11E02192    | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AMA04CP      | SFP+-10G-SR       |
| Xcvr 4 | REV 01 | 740-031980 | AJ40JJK      | SFP+-10G-SR       |
| Xcvr 5 | REV 01 | 740-031980 | B11F00238    | SFP+-10G-SR       |
| Xcvr 6 | REV 01 | 740-031980 | B10M00275    | SFP+-10G-SR       |
| Xcvr 7 | REV 01 | 740-031980 | 193363A00211 | SFP+-10G-SR       |
| PIC 1  |        | BUILTIN    | BUILTIN      | 8X10GE SFPP       |
| Xcvr 0 | REV 01 | 740-031980 | B11D05577    | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | B11G00586    | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AMA08B7      | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AMA04Q0      | SFP+-10G-SR       |
| Xcvr 4 | REV 01 | 740-031980 | B11D05840    | SFP+-10G-SR       |
| Xcvr 5 | REV 01 | 740-031980 | B11E00467    | SFP+-10G-SR       |
| Xcvr 6 | REV 01 | 740-031980 | B11E00029    | SFP+-10G-SR       |
| Xcvr 7 | REV 01 | 740-021308 | 19T511101712 | SFP+-10G-SR       |
| PIC 2  |        | BUILTIN    | BUILTIN      | 8X10GE SFPP       |
| Xcvr 0 | REV 01 | 740-031980 | 193363A00568 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | B10M00166    | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | B10M00212    | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | B11D05823    | SFP+-10G-SR       |
| Xcvr 4 | REV 01 | 740-021308 | 03DZ06A01005 | SFP+-10G-SR       |
| Xcvr 5 | REV 01 | 740-021308 | 03DZ06A01003 | SFP+-10G-SR       |
| Xcvr 6 | REV 01 | 740-021308 | 03DZ06A01009 | SFP+-10G-SR       |
| Xcvr 7 | REV 01 | 740-021308 | 03DZ06A01004 | SFP+-10G-SR       |
| PIC 3  |        | BUILTIN    | BUILTIN      | 8X10GE SFPP       |
| Xcvr 0 | REV 01 | 740-021308 | 03DZ06A01017 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-021308 | 03DZ06A01016 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-021308 | 03DZ06A01024 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-021308 | 03DZ06A01008 | SFP+-10G-SR       |

|            |        |            |              |                        |
|------------|--------|------------|--------------|------------------------|
| Xcvr 4     | REV 01 | 740-030658 | AD0946A02UH  | SFP+-10G-USR           |
| Xcvr 5     | REV 01 | 740-021308 | T09J67913    | SFP+-10G-SR            |
| Xcvr 6     | REV 01 | 740-021308 | AD0837ES09G  | SFP+-10G-SR            |
| Xcvr 7     | REV 01 | 740-021308 | 03DZ06A01015 | SFP+-10G-SR            |
| FPC 8      | REV 03 | 750-045372 | CAAD3111     | MPC Type 3             |
| CPU        | REV 08 | 711-035209 | CAAD8033     | HMPC PMB 2G            |
| MIC 0      | REV 03 | 750-036233 | ZL2032       | 2X40GE QSFP            |
| PIC 0      |        | BUILTIN    | BUILTIN      | 2X40GE QSFP            |
| Xcvr 0     | REV 01 | 740-032986 | QB230273     | QSFP+-40G-SR4          |
| Xcvr 1     | REV 01 | 740-032986 | QB230254     | QSFP+-40G-SR4          |
| MIC 1      | REV 03 | 750-036233 | ZL2021       | 2X40GE QSFP            |
| PIC 2      |        | BUILTIN    | BUILTIN      | 2X40GE QSFP            |
| Xcvr 0     | REV 01 | 740-032986 | QB390962     | QSFP+-40G-SR4          |
| Xcvr 1     | REV 01 | 740-032986 | QB390960     | QSFP+-40G-SR4          |
| FPC 9      | REV 09 | 750-037355 | CAAF1531     | MPC Type 4-2           |
| CPU        | REV 08 | 711-035209 | CAAB9927     | HMPC PMB 2G            |
| PIC 0      |        | BUILTIN    | BUILTIN      | 4x10GE SFPP            |
| Xcvr 0     | REV 01 | 740-031980 | 193363A00525 | SFP+-10G-SR            |
| Xcvr 1     | REV 01 | 740-031980 | 193363A00504 | SFP+-10G-SR            |
| Xcvr 2     | REV 01 | 740-031980 | 193363A00368 | SFP+-10G-SR            |
| Xcvr 3     | REV 01 | 740-031980 | AJ40JSS      | SFP+-10G-SR            |
| PIC 1      |        | BUILTIN    | BUILTIN      | 1X100GE CFP            |
| PIC 2      |        | BUILTIN    | BUILTIN      | 4x10GE SFPP            |
| Xcvr 0     | REV 01 | 740-031980 | 123363A00042 | SFP+-10G-SR            |
| Xcvr 1     | REV 01 | 740-031980 | B10M00023    | SFP+-10G-SR            |
| Xcvr 2     | REV 01 | 740-031980 | AJ802EM      | SFP+-10G-SR            |
| Xcvr 3     | REV 01 | 740-031980 | B11E02348    | SFP+-10G-SR            |
| PIC 3      |        | BUILTIN    | BUILTIN      | 1X100GE CFP            |
| ADC 0      | REV 13 | 750-043596 | ABBX5532     | Adapter Card           |
| ADC 1      | REV 13 | 750-043596 | ABBX5550     | Adapter Card           |
| ADC 2      | REV 13 | 750-043596 | ABBX5571     | Adapter Card           |
| ADC 3      | REV 13 | 750-043596 | ABBX5568     | Adapter Card           |
| ADC 4      | REV 13 | 750-043596 | ABBX5556     | Adapter Card           |
| ADC 5      | REV 13 | 750-043596 | ABBX5553     | Adapter Card           |
| ADC 6      | REV 13 | 750-043596 | ABBX5541     | Adapter Card           |
| ADC 7      | REV 13 | 750-043596 | ABBX5578     | Adapter Card           |
| ADC 8      | REV 13 | 750-043596 | ABBX5560     | Adapter Card           |
| ADC 9      | REV 07 | 750-043596 | ABBV7188     | Adapter Card           |
| Fan Tray 0 | REV 03 | 760-046960 | ACAY0127     | 172mm FanTray - 6 Fans |
| Fan Tray 1 | REV 2A | 760-046960 | ACAY0068     | 172mm FanTray - 6 Fans |
| Fan Tray 2 | REV 2A | 760-046960 | ACAY0072     | 172mm FanTray - 6 Fans |
| Fan Tray 3 | REV 2A | 760-046960 | ACAY0070     | 172mm FanTray - 6 Fans |

#### show chassis hardware extensive (MX2010 Router)

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user@host > show chassis hardware extensive
Hardware inventory:
Item Version Part number Serial number Description
Chassis
Jedec Code: 0x7fb0 EEPROM Version: 0x02
 S/N: JN11E233DAFK
Assembly ID: 0x0557 Assembly Version: 00.00
Date: 00-00-0000 Assembly Flags: 0x00
ID: MX2010
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 7f b0 02 ff 05 57 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x20: 4a 4e 31 31 45 32 33 33 44 41 46 4b 00 00 00 00
Address 0x30: 00 00 00 ff 00 00 00 00 00 00 00 00 00 00 00 00

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Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Midplane REV 26 750-044636 ABAB9357 Lower Backplane
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 750-044636 S/N: ABAB9357
Assembly ID: 0x0b66 Assembly Version: 01.26
Date: 08-28-2012 Assembly Flags: 0x00
Version: REV 26 CLEI Code: PROTOXCLEI
ID: Lower Backplane FRU Model Number: PROTO-ASSEMBLY
Board Information Record:
Address 0x00: ad 01 08 00 2c 21 72 70 a0 00 ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 66 01 1a 52 45 56 20 32 36 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 34 34 36 33 36 00 00
Address 0x20: 53 2f 4e 20 41 42 41 42 39 33 35 37 00 1c 08 07
Address 0x30: dc ff ff ff ad 01 08 00 2c 21 72 70 a0 00 ff ff
Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff c2 ff ff ff ff ff ff ff ff ff ff ff ff
Midplane 1 REV 01 711-044557 ABAB8643 Upper Backplane
Jedec Code: 0x7fb0 EEPROM Version: 0x01
P/N: 711-044557 S/N: ABAB8643
Assembly ID: 0x0b65 Assembly Version: 01.01
Date: 07-27-2012 Assembly Flags: 0x00
Version: REV 01
ID: Upper Backplane
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 01 ff 0b 65 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 31 31 2d 30 34 34 35 35 37 00 00
Address 0x20: 53 2f 4e 20 41 42 41 42 38 36 34 33 00 1b 07 07
Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
PMP REV 04 711-032426 ACAJ1677 Power Midplane
Jedec Code: 0x7fb0 EEPROM Version: 0x01
P/N: 711-032426 S/N: ACAJ1677
Assembly ID: 0x045d Assembly Version: 01.04
Date: 07-20-2012 Assembly Flags: 0x00
Version: REV 04
ID: Power Midplane
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 01 ff 04 5d 01 04 52 45 56 20 30 34 00 00
Address 0x10: 00 00 00 00 37 31 31 2d 30 33 32 34 32 36 00 00
Address 0x20: 53 2f 4e 20 41 43 41 4a 31 36 37 37 00 14 07 07
Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
FPM Board REV 08 760-044634 ABBV9726 Front Panel Display
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 760-044634 S/N: ABBV9726

```

```

Assembly ID: 0x0b64 Assembly Version: 01.08
Date: 09-10-2012 Assembly Flags: 0x00
Version: REV 08 CLEI Code: IPMYA4EJRA
ID: Front Panel Display FRU Model Number: MX2010-CRAFT-S
Board Information Record:
 Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
 Address 0x00: 7f b0 02 ff 0b 64 01 08 52 45 56 20 30 38 00 00
 Address 0x10: 00 00 00 00 37 36 30 2d 30 34 34 36 33 34 00 00
 Address 0x20: 53 2f 4e 20 41 42 42 56 39 37 32 36 00 0a 09 07
 Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 Address 0x40: ff ff ff ff 01 49 50 4d 59 41 34 45 4a 52 41 4d
 Address 0x50: 58 32 30 31 30 2d 43 52 41 46 54 2d 53 00 00 00
 Address 0x60: 00 00 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
 Address 0x70: ff ff ff 93 ff ff ff ff ff ff ff ff ff ff ff ff
PSM 0 REV 01 740-045050 1E02224000P DC 52V Power Supply
Module
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-045050 S/N: 1E02224000P
Assembly ID: 0x0478 Assembly Version: 01.01
Date: 12-06-2012 Assembly Flags: 0x00
Version: REV 01 CLEI Code: XXXXXXXXXX
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-HC-DC-S-A
Board Information Record:
 Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
 Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
 Address 0x10: 00 00 00 00 37 34 30 2d 30 34 35 30 35 30 00 00
 Address 0x20: 31 45 30 32 32 32 34 30 30 30 50 00 00 06 0c 07
 Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 Address 0x40: ff ff ff ff 01 58 58 58 58 58 58 58 58 58 58 4d
 Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 48 43 2d 44 43 2d
 Address 0x60: 53 2d 41 00 00 00 31 30 31 ff ff ff ff ff ff ff
 Address 0x70: ff ff ff 4a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 1 REV 01 740-045050 1E02224000M DC 52V Power Supply
Module
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-045050 S/N: 1E02224000M
Assembly ID: 0x0478 Assembly Version: 01.01
Date: 12-06-2012 Assembly Flags: 0x00
Version: REV 01 CLEI Code: XXXXXXXXXX
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-HC-DC-S-A
Board Information Record:
 Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
 Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
 Address 0x10: 00 00 00 00 37 34 30 2d 30 34 35 30 35 30 00 00
 Address 0x20: 31 45 30 32 32 32 34 30 30 30 4d 00 00 06 0c 07
 Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 Address 0x40: ff ff ff ff 01 58 58 58 58 58 58 58 58 58 58 4d
 Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 48 43 2d 44 43 2d
 Address 0x60: 53 2d 41 00 00 00 31 30 31 ff ff ff ff ff ff ff
 Address 0x70: ff ff ff 4a 00 00 00 00 00 00 00 00 00 00 00 00
...
PDM 0 REV 01 740-045234 1E262250067 DC Power Dist Module
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-045234 S/N: 1E262250067
Assembly ID: 0x047b Assembly Version: 01.01
Date: 06-28-2012 Assembly Flags: 0x00
Version: REV 01 CLEI Code: IPUPAJSKAA
ID: DC Power Dist Module FRU Model Number: MX2000-PDM-DC-S-A

```

```

Board Information Record:
 Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
 Address 0x00: 7f b0 02 ff 04 7b 01 01 52 45 56 20 30 31 00 00
 Address 0x10: 00 00 00 00 37 34 30 2d 30 34 35 32 33 34 00 00
 Address 0x20: 31 45 32 36 32 32 35 30 30 36 37 00 00 1c 06 07
 Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 Address 0x40: ff ff ff ff 01 49 50 55 50 41 4a 53 4b 41 41 4d
 Address 0x50: 58 32 30 30 30 2d 50 44 4d 2d 44 43 2d 53 2d 41
 Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
 Address 0x70: ff ff ff 89 00 00 00 00 00 00 00 00 00 00 00 00
Routing Engine 0 REV 02 740-041821 9009099704 RE-S-1800x4
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-041821 S/N: 9009099704
Assembly ID: 0x09c0 Assembly Version: 01.02
Date: 03-15-2012 Assembly Flags: 0x00
Version: REV 02
ID: RE-S-1800x4 FRU Model Number: RE-S-1800X4-16G-S
Board Information Record:
 Address 0x00: 54 32 30 32 37 44 41 2d 34 34 47 42 23 41 23 00
I2C Hex Data:
 Address 0x00: 7f b0 02 ff 09 c0 01 02 52 45 56 20 30 32 00 00
 Address 0x10: 00 00 00 00 37 34 30 2d 30 34 31 38 32 31 00 00
 Address 0x20: 39 30 30 39 30 39 39 37 30 34 00 00 00 0f 03 07
 Address 0x30: dc ff ff ff 54 32 30 32 37 44 41 2d 34 34 47 42
 Address 0x40: 23 41 23 00 01 00 00 00 00 00 00 00 00 00 00 52
 Address 0x50: 45 2d 53 2d 31 38 30 30 58 34 2d 31 36 47 2d 53
 Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
 Address 0x70: ff ff ff 8c ff ff ff ff ff ff ff ff ff ff ff ff
ad0 3831 MB UGB30SFA4000T1 SFA4000T1 00000651 Compact Flash
ad1 30533 MB UGB94BPH32H0S1-KCI 11000019592 Disk 1
usb0 (addr 1) EHCI root hub 0 Intel uhub0
usb0 (addr 2) product 0x0020 32 vendor 0x8087 uhub1
DIMM 0 SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
DIMM 1 SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
DIMM 2 SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
DIMM 3 SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
Routing Engine 1 REV 02 740-041821 9009099706 RE-S-1800x4
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-041821 S/N: 9009099706
Assembly ID: 0x09c0 Assembly Version: 01.02
Date: 02-23-2012 Assembly Flags: 0x00
Version: REV 02
ID: RE-S-1800x4 FRU Model Number: RE-S-1800X4-16G-S
Board Information Record:
 Address 0x00: 54 32 30 32 37 44 41 2d 34 34 47 42 23 41 23 00
I2C Hex Data:
 Address 0x00: 7f b0 02 ff 09 c0 01 02 52 45 56 20 30 32 00 00
 Address 0x10: 00 00 00 00 37 34 30 2d 30 34 31 38 32 31 00 00
 Address 0x20: 39 30 30 39 30 39 39 37 30 36 00 00 00 17 02 07
 Address 0x30: dc ff ff ff 54 32 30 32 37 44 41 2d 34 34 47 42
 Address 0x40: 23 41 23 00 01 00 00 00 00 00 00 00 00 00 00 52
 Address 0x50: 45 2d 53 2d 31 38 30 30 58 34 2d 31 36 47 2d 53
 Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
 Address 0x70: ff ff ff 8c ff ff ff ff ff ff ff ff ff ff ff ff
ad0 3998 MB Virtium - TuffDrive VCF P1T0200262860208 114 Compact Flash
ad1 30533 MB UGB94ARF32H0S3-KC UNIGEN-499551-000404 Disk 1
CB 0 REV 13 750-040257 CAAF8436 Control Board
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 750-040257 S/N: CAAF8436
Assembly ID: 0x0b26 Assembly Version: 01.13

```

```

Date: 08-29-2012 Assembly Flags: 0x00
Version: REV 13 CLEI Code: PROTOXCLEI
ID: Control Board FRU Model Number: PROTO-ASSEMBLY

```

## Board Information Record:

```
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
```

## I2C Hex Data:

```

Address 0x00: 7f b0 02 ff 0b 26 01 0d 52 45 56 20 31 33 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 34 30 32 35 37 00 00
Address 0x20: 53 2f 4e 20 43 41 41 46 38 34 33 36 00 1d 08 07
Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff c2 ff ff ff ff ff ff ff ff ff ff ff ff

```

...

```
SPMB 0 REV 02 711-041855 ABBV3825 PMB Board
```

```

Jedec Code: 0x7fb0 EEPROM Version: 0x01
P/N: 711-041855 S/N: ABBV3825
Assembly ID: 0x0b29 Assembly Version: 01.02
Date: 08-14-2012 Assembly Flags: 0x00
Version: REV 02
ID: PMB Board

```

## Board Information Record:

```
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
```

## I2C Hex Data:

```

Address 0x00: 7f b0 01 ff 0b 29 01 02 52 45 56 20 30 32 00 00
Address 0x10: 00 00 00 00 37 31 31 2d 30 34 31 38 35 35 00 00
Address 0x20: 53 2f 4e 20 41 42 42 56 33 38 32 35 00 0e 08 07
Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x70: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00

```

...

```
SFB 0 REV 05 711-044466 ABBX5682 Switch Fabric Board
```

```

Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 711-044466 S/N: ABBX5682
Assembly ID: 0x0b25 Assembly Version: 01.05
Date: 09-07-2012 Assembly Flags: 0x00
Version: REV 05 CLEI Code: PROTOXCLEI
ID: Switch Fabric Board FRU Model Number: PROTO-ASSEMBLY

```

## Board Information Record:

```
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
```

## I2C Hex Data:

```

Address 0x00: 7f b0 02 ff 0b 25 01 05 52 45 56 20 30 35 00 00
Address 0x10: 00 00 00 00 37 31 31 2d 30 34 34 34 36 36 00 00
Address 0x20: 53 2f 4e 20 41 42 42 58 35 36 38 32 00 07 09 07
Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff c2 00 00 00 01 00 00 00 00 00 00 48 00

```

...

```
FPC 0 REV 09 750-037355 CAAF0924 MPC Type 4-2
```

```

Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 750-037355 S/N: CAAF0924
Assembly ID: 0x0b4e Assembly Version: 01.09
Date: 05-21-2012 Assembly Flags: 0x00
Version: REV 09 CLEI Code: PROTOXCLEI
ID: MPC Type 4-2 FRU Model Number: MPC4E-2CGE-8XGE

```

## Board Information Record:

```

Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 4e 01 09 52 45 56 20 30 39 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 33 37 33 35 35 00 00
Address 0x20: 53 2f 4e 20 43 41 41 46 30 39 32 34 00 15 05 07
Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 4d
Address 0x50: 50 43 34 45 2d 32 43 47 45 2d 38 58 47 45 00 00
Address 0x60: 00 00 00 00 00 00 30 39 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff c6 ff ff ff ff ff ff ff ff ff ff ff ff
CPU REV 08 711-035209 CAAB9842 HMPC PMB 2G
Jedec Code: 0x7fb0 EEPROM Version: 0x01
P/N: 711-035209 S/N: CAAB9842
Assembly ID: 0x0b04 Assembly Version: 01.08
Date: 05-17-2012 Assembly Flags: 0x00
Version: REV 08
ID: HMPC PMB 2G
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 01 ff 0b 04 01 08 52 45 56 20 30 38 00 00
Address 0x10: 00 00 00 00 37 31 31 2d 30 33 35 32 30 39 00 00
Address 0x20: 53 2f 4e 20 43 41 41 42 39 38 34 32 00 11 05 07
Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x70: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
PIC 0 BUILTIN BUILTIN 4x10GE SFP
Jedec Code: 0x0000 EEPROM Version: 0x00
P/N: BUILTIN S/N: BUILTIN
Assembly ID: 0x0a53 Assembly Version: 00.00
Date: 00-00-0000 Assembly Flags: 0x00
ID: 4x10GE SFP
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 00 00 00 00 0a 53 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 4d 58 43 00
Address 0x20: 42 55 49 4c 54 49 4e 00 4d 58 43 00 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 c0 02 ae 64 00 00 00 00 0a 52 00 00
Xcvr 0 REV 01 740-021308 19T511101656 SFP+-10G-SR
Xcvr 1 REV 01 740-031980 AMA04RU SFP+-10G-SR
Xcvr 2 REV 01 740-031980 193363A00558 SFP+-10G-SR
Xcvr 3 REV 01 740-031980 B10M00202 SFP+-10G-SR
...
ADC 0 REV 13 750-043596 ABBX5532 Adapter Card
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 750-043596 S/N: ABBX5532
Assembly ID: 0x0b3d Assembly Version: 01.13
Date: 09-12-2012 Assembly Flags: 0x00
Version: REV 13 CLEI Code: IPUCBA8CAA
ID: Adapter Card FRU Model Number: MX2000-LC-ADAPTER
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 3d 01 0d 52 45 56 20 31 33 00 00

```

```

Address 0x10: 00 00 00 00 37 35 30 2d 30 34 33 35 39 36 00 00
Address 0x20: 53 2f 4e 20 41 42 42 58 35 35 33 32 00 0c 09 07
Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 43 42 41 38 43 41 41 4d
Address 0x50: 58 32 30 30 30 2d 4c 43 2d 41 44 41 50 54 45 52
Address 0x60: 00 00 00 00 00 00 41 00 00 ff ff ff ff ff ff
Address 0x70: ff ff ff 3a 00 00 00 00 00 00 00 00 00 00 00
...

```

### show chassis hardware models (MX2010 Router)

```

user@host > show chassis hardware models
Hardware inventory:
Item Version Part number Serial number FRU model number
FPM Board REV 06 711-032349 ZX8744 711-032349
PSM 4 REV 0C 740-033727 VK00254 00000000000000000000000000000000
PSM 5 REV 0B 740-033727 VG00015 00000000000000000000000000000000
PSM 6 REV 0B 740-033727 VH00097 00000000000000000000000000000000
PSM 7 REV 0C 740-033727 VJ00151 00000000000000000000000000000000
PSM 8 REV 0C 740-033727 VJ00149 00000000000000000000000000000000
PDM 0 REV 0B 740-038109 WA00008
PDM 1 REV 0B 740-038109 WA00014
Routing Engine 0 REV 02 740-041821 9009094134 RE-S-1800X4-16G-S
Routing Engine 1 REV 02 740-041821 9009094141 RE-S-1800X4-16G-S
CB 0 REV 08 750-040257 CAAB3491 750-040257
CB 1 REV 08 750-040257 CAAB3489 750-040257
SFB 0 REV 06 711-032385 ZV1828 711-032385
SFB 1 REV 07 711-032385 ZZ2568 711-032385
SFB 2 REV 07 711-032385 ZZ2563 711-032385
SFB 3 REV 07 711-032385 ZZ2564 711-032385
SFB 4 REV 07 711-032385 ZZ2580 711-032385
SFB 5 REV 07 711-032385 ZZ2579 711-032385
SFB 6 REV 07 711-032385 CAAB4882 711-044170
SFB 7 REV 07 711-032385 CAAB4898 711-044170
FPC 0 REV 33 750-028467 CAAB1919 MPC-3D-16XGE-SFPP
FPC 1 REV 21 750-033205 ZG5027 MX-MPC3-3D
 MIC 0 REV 03 750-033307 ZV6299 MIC3-3D-10XGE-SFPP
 MIC 1 REV 03 750-033307 ZV6268 MIC3-3D-10XGE-SFPP
FPC 8 REV 22 750-031089 ZT9746 MX-MPC2-3D
 MIC 0 REV 26 750-028392 ABBS1150 MIC-3D-20GE-SFP
 MIC 1 REV 26 750-028387 ABBR9582 MIC-3D-4XGE-XFP
FPC 9 REV 11 750-036284 ZL3591 MPCE-3D-16XGE-SFPP
ADC 0 REV 05 750-043596 CAAC2073 750-043596
ADC 1 REV 01 750-043596 ZV4117 750-043596
ADC 8 REV 01 750-043596 ZV4107 750-043596
ADC 9 REV 02 750-043596 ZW1555 750-043596
Fan Tray 0 REV 2A 760-046960 ACAY0015
Fan Tray 1 REV 2A 760-046960 ACAY0019
Fan Tray 2 REV 2A 760-046960 ACAY0020
Fan Tray 3 REV 2A 760-046960 ACAY0021

```

### show chassis hardware clei-models (MX2010 Routers)

```

user@host > show chassis hardware clei-models
Hardware inventory:
Item Version Part number CLEI code FRU model number
FPM Board REV 06 711-032349 PROTOXCLEI 711-032349
PSM 4 REV 0C 740-033727 0000000000 00000000000000000000000000000000
PSM 5 REV 0B 740-033727 0000000000 00000000000000000000000000000000
PSM 6 REV 0B 740-033727 0000000000 00000000000000000000000000000000
PSM 7 REV 0C 740-033727 0000000000 00000000000000000000000000000000

```

|                  |        |            |            |                          |
|------------------|--------|------------|------------|--------------------------|
| PSM 8            | REV 0C | 740-033727 | 0000000000 | 000000000000000000000000 |
| PDM 0            | REV 0B | 740-038109 |            |                          |
| PDM 1            | REV 0B | 740-038109 |            |                          |
| Routing Engine 0 | REV 02 | 740-041821 |            | RE-S-1800X4-16G-S        |
| Routing Engine 1 | REV 02 | 740-041821 |            | RE-S-1800X4-16G-S        |
| CB 0             | REV 08 | 750-040257 | PROTOXCLEI | 750-040257               |
| CB 1             | REV 08 | 750-040257 | PROTOXCLEI | 750-040257               |
| SFB 0            | REV 06 | 711-032385 | PROTOXCLEI | 711-032385               |
| SFB 1            | REV 07 | 711-032385 | PROTOXCLEI | 711-032385               |
| SFB 2            | REV 07 | 711-032385 | PROTOXCLEI | 711-032385               |
| SFB 3            | REV 07 | 711-032385 | PROTOXCLEI | 711-032385               |
| SFB 4            | REV 07 | 711-032385 | PROTOXCLEI | 711-032385               |
| SFB 5            | REV 07 | 711-032385 | PROTOXCLEI | 711-0323856              |
| SFB 6            | REV 07 | 711-032385 | PROTOXCLEI | 711-044170               |
| SFB 7            | REV 07 | 711-032385 | PROTOXCLEI | 711-044170               |
| FPC 0            | REV 33 | 750-028467 |            | MPC-3D-16XGE-SFPP        |
| FPC 1            | REV 21 | 750-033205 |            | MX-MPC3-3D               |
| MIC 0            | REV 03 | 750-033307 | PROTOXCLEI | MIC3-3D-10XGE-SFPP       |
| MIC 1            | REV 03 | 750-033307 | PROTOXCLEI | MIC3-3D-10XGE-SFPP       |
| FPC 8            | REV 22 | 750-031089 | COUIBAYBAA | MX-MPC2-3D               |
| MIC 0            | REV 26 | 750-028392 | COUIA15BAA | MIC-3D-20GE-SFP          |
| MIC 1            | REV 26 | 750-028387 | COUIA16BAA | MIC-3D-4XGE-XFP          |
| FPC 9            | REV 11 | 750-036284 | CMUIACGBAA | MPCE-3D-16XGE-SFPP       |
| ADC 0            | REV 05 | 750-043596 | PROTOXCLEI | 750-043596               |
| ADC 1            | REV 01 | 750-043596 | PROTOXCLEI | 750-043596               |
| ADC 8            | REV 01 | 750-043596 | PROTOXCLEI | 750-043596               |
| ADC 9            | REV 02 | 750-043596 | PROTOXCLEI | 750-043596               |
| Fan Tray 0       | REV 2A | 760-046960 |            |                          |
| Fan Tray 1       | REV 2A | 760-046960 |            |                          |
| Fan Tray 2       | REV 2A | 760-046960 |            |                          |
| Fan Tray 3       | REV 2A | 760-046960 |            |                          |

### show chassis hardware (MX2010 Routers with MPC6E and OTN MIC)

```
user@host> show chassis hardware
```

```
Hardware inventory:
```

| Item       | Version | Part number | Serial number | Description          |
|------------|---------|-------------|---------------|----------------------|
| Chassis    |         |             | JN11C9AFEAFK  | MX2010               |
| Midplane   | REV 35  | 750-044636  | ABAB9188      | Lower Backplane      |
| Midplane 1 | REV 02  | 711-044557  | ABAB8729      | Upper Backplane      |
| PMP        | REV 04  | 711-032426  | ACAJ2432      | Power Midplane       |
| FPD Board  | REV 09  | 760-044634  | ABCA4314      | Front Panel Display  |
| PSM 0      | REV 01  | 740-050037  | 1EDB321015C   | DC 52V Power Supply  |
| Module     |         |             |               |                      |
| PSM 1      | REV 01  | 740-050037  | 1EDB321015J   | DC 52V Power Supply  |
| Module     |         |             |               |                      |
| PSM 2      | REV 01  | 740-050037  | 1EDB32000K8   | DC 52V Power Supply  |
| Module     |         |             |               |                      |
| PSM 3      | REV 01  | 740-050037  | 1EDB32101JW   | DC 52V Power Supply  |
| Module     |         |             |               |                      |
| PSM 4      | REV 01  | 740-050037  | 1EDB321015G   | DC 52V Power Supply  |
| Module     |         |             |               |                      |
| PSM 5      | REV 01  | 740-050037  | 1EDB32101HH   | DC 52V Power Supply  |
| Module     |         |             |               |                      |
| PSM 6      | REV 01  | 740-050037  | 1EDB32101HD   | DC 52V Power Supply  |
| Module     |         |             |               |                      |
| PSM 7      | REV 01  | 740-050037  | 1EDB321015F   | DC 52V Power Supply  |
| Module     |         |             |               |                      |
| PSM 8      | REV 01  | 740-050037  | 1EDB321015B   | DC 52V Power Supply  |
| Module     |         |             |               |                      |
| PDM 0      | REV 03  | 740-045234  | 1EFA3220433   | DC Power Dist Module |

|                  |             |            |              |                      |
|------------------|-------------|------------|--------------|----------------------|
| PDM 1            | REV 03      | 740-045234 | 1EFA3220425  | DC Power Dist Module |
| Routing Engine 0 | REV 02      | 740-041821 | 9009115685   | RE-S-1800x4          |
| Routing Engine 1 | REV 02      | 740-041821 | 9009099711   | RE-S-1800x4          |
| CB 0             | REV 23      | 750-040257 | CABE8395     | Control Board        |
| CB 1             | REV 12      | 750-040257 | CAAD9499     | Control Board        |
| SPMB 0           | REV 02      | 711-041855 | ABCG8426     | PMB Board            |
| SPMB 1           | REV 02      | 711-041855 | ABBS1481     | PMB Board            |
| SFB 0            | REV 06      | 711-044466 | ABCD5013     | Switch Fabric Board  |
| SFB 1            | REV 06      | 711-044466 | ABCD5160     | Switch Fabric Board  |
| SFB 2            | REV 06      | 711-044466 | ABCD5175     | Switch Fabric Board  |
| SFB 3            | REV 06      | 711-044466 | ABCD4938     | Switch Fabric Board  |
| SFB 4            | REV 06      | 711-044466 | ABCD4944     | Switch Fabric Board  |
| SFB 5            | REV 06      | 711-044466 | ABCD4968     | Switch Fabric Board  |
| SFB 6            | REV 06      | 711-044466 | ABCD5267     | Switch Fabric Board  |
| SFB 7            | REV 06      | 711-044466 | ABCD4997     | Switch Fabric Board  |
| FPC 0            | REV 59      | 750-044130 | ABCT7676     | MPC6E 3D             |
| CPU              | REV 10      | 711-045719 | ABCK8527     | RMPD PMB             |
| XLM 0            | REV 13      | 711-046638 | ABCT7810     | MPC6E XL             |
| XLM 1            | REV 13      | 711-046638 | ABCT7811     | MPC6E XL             |
| FPC 2            | REV 27      | 750-033205 | ZL6014       | MPCE Type 3 3D       |
| CPU              | REV 07      | 711-035209 | ZK9068       | HMPD PMB 2G          |
| MIC 0            | REV 14      | 750-033196 | CAAW9214     | 1X100GE CXP          |
| PIC 0            |             | BUILTIN    | BUILTIN      | 1X100GE CXP          |
| Xcvr 0           | REV 01      | 740-046563 | XC49FC030    | CFP2-100G-SR10       |
| MIC 1            | REV 18      | 750-033199 | CAAC3231     | 1X100GE CFP          |
| PIC 2            |             | BUILTIN    | BUILTIN      | 1X100GE CFP          |
| FPC 3            | REV 59      | 750-044130 | ABCT7682     | MPC6E 3D             |
| CPU              | REV 10      | 711-045719 | ABCK8531     | RMPD PMB             |
| XLM 0            | REV 13      | 711-046638 | ABCT7818     | MPC6E XL             |
| XLM 1            | REV 13      | 711-046638 | ABCT7819     | MPC6E XL             |
| FPC 4            | REV 33      | 750-044130 | ABBY9278     | MPC6E 3D             |
| CPU              | REV 09      | 711-045719 | ABBY8677     | RMPD PMB             |
| XLM 0            | REV 06.2.00 | 711-046638 | ABBY8844     | MPC6E XL             |
| XLM 1            | REV 06.2.00 | 711-046638 | ABBY8830     | MPC6E XL             |
| FPC 5            | REV 59      | 750-044130 | ABCT7675     | MPC6E 3D             |
| CPU              | REV 10      | 711-045719 | ABCK8526     | RMPD PMB             |
| XLM 0            | REV 13      | 711-046638 | ABCT7808     | MPC6E XL             |
| XLM 1            | REV 13      | 711-046638 | ABCT7809     | MPC6E XL             |
| FPC 6            | REV 30      | 750-028467 | ZM4986       | MPC 3D 16x 10GE      |
| CPU              | REV 10      | 711-029089 | ZP6541       | AMPD PMB             |
| PIC 0            |             | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+    |
| Xcvr 0           | REV 01      | 740-021308 | AQ43GAC      | SFP+-10G-SR          |
| PIC 1            |             | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+    |
| Xcvr 0           | REV 01      | 740-031980 | ALM0A6D      | SFP+-10G-SR          |
| Xcvr 1           | REV 01      | 740-031980 | AQFORB3      | SFP+-10G-SR          |
| Xcvr 2           | REV 01      | 740-031980 | 153363A00333 | SFP+-10G-SR          |
| Xcvr 3           | REV 01      | 740-021308 | AN10KYE      | SFP+-10G-SR          |
| PIC 2            |             | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+    |
| Xcvr 0           | REV 01      | 740-021308 | APK04YM      | SFP+-10G-SR          |
| PIC 3            |             | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+    |
| Xcvr 0           | REV 01      | 740-031980 | AQFOH44      | SFP+-10G-SR          |
| FPC 8            | REV 38      | 750-031090 | CABF7313     | MPC Type 2 3D EQ     |
| CPU              | REV 08      | 711-030884 | CABE6727     | MPC PMB 2G           |
| MIC 0            | REV 18      | 750-028380 | YK8253       | 3D 2x 10GE XFP       |
| PIC 0            |             | BUILTIN    | BUILTIN      | 1x 10GE XFP          |
| Xcvr 0           | REV 03      | 740-014289 | AD1148M00TP  | XFP-10G-SR           |
| PIC 1            |             | BUILTIN    | BUILTIN      | 1x 10GE XFP          |
| QXM 0            | REV 06      | 711-028408 | CABC5614     | MPC QXM              |
| QXM 1            | REV 06      | 711-028408 | CABC5550     | MPC QXM              |
| FPC 9            | REV 39      | 750-044130 | ABCK1652     | MPC6E 3D             |
| CPU              | REV 09      | 711-045719 | ABCK1655     | RMPD PMB             |



|            |             |            |                |                        |
|------------|-------------|------------|----------------|------------------------|
| MIC 0      | REV 09      | 750-049457 | ABCP1230       | 2X100GE CFP2 OTN       |
| PIC 0      |             | BUILTIN    | BUILTIN        | 2X100GE CFP2 OTN       |
| Xcvr 0     |             | NON-JNPR   | 37300222WP0002 | CFP2-100G-LR4-D        |
| Xcvr 1     |             | NON-JNPR   | FD46F001Y      | CFP2-100G-SR10         |
| MIC 1      | REV 07      | 750-049457 | ABCV6662       | 2X100GE CFP2 OTN       |
| PIC 1      |             | BUILTIN    | BUILTIN        | 2X100GE CFP2 OTN       |
| Xcvr 0     |             | NON-JNPR   | UQD0014        | CFP2-100G-LR4-D        |
| Xcvr 1     |             | NON-JNPR   | J13J68335      | CFP2-100G-LR4-D        |
| XLM 0      | REV 07.2.00 | 711-046638 | ABCK5491       | MPC6E XL               |
| XLM 1      | REV 07.2.00 | 711-046638 | ABCK5475       | MPC6E XL               |
| ADC 1      | REV 17      | 750-043596 | ABCG9023       | Adapter Card           |
| ADC 2      | REV 01      | 750-043596 | ZV4079         | Adapter Card           |
| ADC 6      | REV 17      | 750-043596 | ABCG8866       | Adapter Card           |
| ADC 8      | REV 17      | 750-043596 | ABCA8993       | Adapter Card           |
| Fan Tray 0 | REV 06      | 760-046960 | ACAY0354       | 172mm FanTray - 6 Fans |
| Fan Tray 1 | REV 06      | 760-046960 | ACAY0831       | 172mm FanTray - 6 Fans |
| Fan Tray 2 | REV 06      | 760-046960 | ACAY0892       | 172mm FanTray - 6 Fans |
| Fan Tray 3 | REV 06      | 760-046960 | ACAY0839       | 172mm FanTray - 6 Fans |

### show chassis hardware detail (MX2010 Routers with MPC6E and OTN MIC)

```

user@host> show chassis hardware detail
Hardware inventory:

```

| Item             | Version             | Part number          | Serial number | Description          |
|------------------|---------------------|----------------------|---------------|----------------------|
| Chassis          |                     |                      | JN11C9AFEAFK  | MX2010               |
| Midplane         | REV 35              | 750-044636           | ABAB9188      | Lower Backplane      |
| Midplane 1       | REV 02              | 711-044557           | ABAB8729      | Upper Backplane      |
| PMP              | REV 04              | 711-032426           | ACAJ2432      | Power Midplane       |
| FPM Board        | REV 09              | 760-044634           | ABCA4314      | Front Panel Display  |
| PSM 0            | REV 01              | 740-050037           | 1EDB321015C   | DC 52V Power Supply  |
| Module           |                     |                      |               |                      |
| PSM 1            | REV 01              | 740-050037           | 1EDB321015J   | DC 52V Power Supply  |
| Module           |                     |                      |               |                      |
| PSM 2            | REV 01              | 740-050037           | 1EDB32000K8   | DC 52V Power Supply  |
| Module           |                     |                      |               |                      |
| PSM 3            | REV 01              | 740-050037           | 1EDB32101JW   | DC 52V Power Supply  |
| Module           |                     |                      |               |                      |
| PSM 4            | REV 01              | 740-050037           | 1EDB321015G   | DC 52V Power Supply  |
| Module           |                     |                      |               |                      |
| PSM 5            | REV 01              | 740-050037           | 1EDB32101HH   | DC 52V Power Supply  |
| Module           |                     |                      |               |                      |
| PSM 6            | REV 01              | 740-050037           | 1EDB32101HD   | DC 52V Power Supply  |
| Module           |                     |                      |               |                      |
| PSM 7            | REV 01              | 740-050037           | 1EDB321015F   | DC 52V Power Supply  |
| Module           |                     |                      |               |                      |
| PSM 8            | REV 01              | 740-050037           | 1EDB321015B   | DC 52V Power Supply  |
| Module           |                     |                      |               |                      |
| PDM 0            | REV 03              | 740-045234           | 1EFA3220433   | DC Power Dist Module |
| PDM 1            | REV 03              | 740-045234           | 1EFA3220425   | DC Power Dist Module |
| Routing Engine 0 | REV 02              | 740-041821           | 9009115685    | RE-S-1800x4          |
| ad0 3998 MB      | Virtium - TuffDrive | VCF P1T0200274310822 | 191           | Compact Flash        |
| ad1 30533 MB     | UGB94BPH32H0S1-KCI  | 11000043190          |               | Disk 1               |
| usb0 (addr 1)    | EHCI root hub 0     | Intel                |               | uhub0                |
| usb0 (addr 2)    | product 0x0020 32   | vendor 0x8087        |               | uhub1                |
| DIMM 0           | VL31B5263F-F8SD DIE | REV-0 PCB REV-0      |               | MFR ID-ce80          |
| DIMM 1           | VL31B5263F-F8SD DIE | REV-0 PCB REV-0      |               | MFR ID-ce80          |
| DIMM 2           | VL31B5263F-F8SD DIE | REV-0 PCB REV-0      |               | MFR ID-ce80          |
| DIMM 3           | VL31B5263F-F8SD DIE | REV-0 PCB REV-0      |               | MFR ID-ce80          |
| Routing Engine 1 | REV 02              | 740-041821           | 9009099711    | RE-S-1800x4          |
| ad0 3998 MB      | Virtium - TuffDrive | VCF P1T0200262860208 | 30            | Compact Flash        |
| ad1 30533 MB     | UGB94ARF32H0S3-KC   | UNIGEN-499551-000146 |               | Disk 1               |

|        |             |            |                |                     |
|--------|-------------|------------|----------------|---------------------|
| CB 0   | REV 23      | 750-040257 | CABE8395       | Control Board       |
| CB 1   | REV 12      | 750-040257 | CAAD9499       | Control Board       |
| SPMB 0 | REV 02      | 711-041855 | ABCG8426       | PMB Board           |
| SPMB 1 | REV 02      | 711-041855 | ABBS1481       | PMB Board           |
| SFB 0  | REV 06      | 711-044466 | ABCD5013       | Switch Fabric Board |
| SFB 1  | REV 06      | 711-044466 | ABCD5160       | Switch Fabric Board |
| SFB 2  | REV 06      | 711-044466 | ABCD5175       | Switch Fabric Board |
| SFB 3  | REV 06      | 711-044466 | ABCD4938       | Switch Fabric Board |
| SFB 4  | REV 06      | 711-044466 | ABCD4944       | Switch Fabric Board |
| SFB 5  | REV 06      | 711-044466 | ABCD4968       | Switch Fabric Board |
| SFB 6  | REV 06      | 711-044466 | ABCD5267       | Switch Fabric Board |
| SFB 7  | REV 06      | 711-044466 | ABCD4997       | Switch Fabric Board |
| FPC 0  | REV 59      | 750-044130 | ABCT7676       | MPC6E 3D            |
| CPU    | REV 10      | 711-045719 | ABCK8527       | RMPD PMB            |
| XLM 0  | REV 13      | 711-046638 | ABCT7810       | MPC6E XL            |
| XLM 1  | REV 13      | 711-046638 | ABCT7811       | MPC6E XL            |
| FPC 2  | REV 27      | 750-033205 | ZL6014         | MPCE Type 3 3D      |
| CPU    | REV 07      | 711-035209 | ZK9068         | HMPD PMB 2G         |
| MIC 0  | REV 14      | 750-033196 | CAAW9214       | 1X100GE CXP         |
| PIC 0  |             | BUILTIN    | BUILTIN        | 1X100GE CXP         |
| Xcvt 0 | REV 01      | 740-046563 | XC49FC030      | CFP2-100G-SR10      |
| MIC 1  | REV 18      | 750-033199 | CAAC3231       | 1X100GE CFP         |
| PIC 2  |             | BUILTIN    | BUILTIN        | 1X100GE CFP         |
| FPC 3  | REV 59      | 750-044130 | ABCT7682       | MPC6E 3D            |
| CPU    | REV 10      | 711-045719 | ABCK8531       | RMPD PMB            |
| XLM 0  | REV 13      | 711-046638 | ABCT7818       | MPC6E XL            |
| XLM 1  | REV 13      | 711-046638 | ABCT7819       | MPC6E XL            |
| FPC 4  | REV 33      | 750-044130 | ABBY9278       | MPC6E 3D            |
| CPU    | REV 09      | 711-045719 | ABBY8677       | RMPD PMB            |
| XLM 0  | REV 06.2.00 | 711-046638 | ABBY8844       | MPC6E XL            |
| XLM 1  | REV 06.2.00 | 711-046638 | ABBY8830       | MPC6E XL            |
| FPC 5  | REV 59      | 750-044130 | ABCT7675       | MPC6E 3D            |
| CPU    | REV 10      | 711-045719 | ABCK8526       | RMPD PMB            |
| XLM 0  | REV 13      | 711-046638 | ABCT7808       | MPC6E XL            |
| XLM 1  | REV 13      | 711-046638 | ABCT7809       | MPC6E XL            |
| FPC 6  | REV 30      | 750-028467 | ZM4986         | MPC 3D 16x 10GE     |
| CPU    | REV 10      | 711-029089 | ZP6541         | AMPD PMB            |
| PIC 0  |             | BUILTIN    | BUILTIN        | 4x 10GE(LAN) SFP+   |
| Xcvt 0 | REV 01      | 740-021308 | AQ43GAC        | SFP+-10G-SR         |
| PIC 1  |             | BUILTIN    | BUILTIN        | 4x 10GE(LAN) SFP+   |
| Xcvt 0 | REV 01      | 740-031980 | ALM0A6D        | SFP+-10G-SR         |
| Xcvt 1 | REV 01      | 740-031980 | AQFORB3        | SFP+-10G-SR         |
| Xcvt 2 | REV 01      | 740-031980 | 153363A00333   | SFP+-10G-SR         |
| Xcvt 3 | REV 01      | 740-021308 | AN10KYE        | SFP+-10G-SR         |
| PIC 2  |             | BUILTIN    | BUILTIN        | 4x 10GE(LAN) SFP+   |
| Xcvt 0 | REV 01      | 740-021308 | APK04YM        | SFP+-10G-SR         |
| PIC 3  |             | BUILTIN    | BUILTIN        | 4x 10GE(LAN) SFP+   |
| Xcvt 0 | REV 01      | 740-031980 | AQFOH44        | SFP+-10G-SR         |
| FPC 8  | REV 38      | 750-031090 | CABF7313       | MPC Type 2 3D EQ    |
| CPU    | REV 08      | 711-030884 | CABE6727       | MPC PMB 2G          |
| MIC 0  | REV 18      | 750-028380 | YK8253         | 3D 2x 10GE XFP      |
| PIC 0  |             | BUILTIN    | BUILTIN        | 1x 10GE XFP         |
| Xcvt 0 | REV 03      | 740-014289 | AD1148M00TP    | XFP-10G-SR          |
| PIC 1  |             | BUILTIN    | BUILTIN        | 1x 10GE XFP         |
| QXM 0  | REV 06      | 711-028408 | CABC5614       | MPC QXM             |
| QXM 1  | REV 06      | 711-028408 | CABC5550       | MPC QXM             |
| FPC 9  | REV 39      | 750-044130 | ABCK1652       | MPC6E 3D            |
| CPU    | REV 09      | 711-045719 | ABCK1655       | RMPD PMB            |
| MIC 0  | REV 09      | 750-049457 | ABCP1230       | 2X100GE CFP2 OTN    |
| PIC 0  |             | BUILTIN    | BUILTIN        | 2X100GE CFP2 OTN    |
| Xcvt 0 |             | NON-JNPR   | 37300222WP0002 | CFP2-100G-LR4-D     |

|            |             |            |           |                        |
|------------|-------------|------------|-----------|------------------------|
| Xcvr 1     |             | NON-JNPR   | FD46F001Y | CFP2-100G-SR10         |
| MIC 1      | REV 07      | 750-049457 | ABCV6662  | 2X100GE CFP2 OTN       |
| PIC 1      |             | BUILTIN    | BUILTIN   | 2X100GE CFP2 OTN       |
| Xcvr 0     |             | NON-JNPR   | UQD0014   | CFP2-100G-LR4-D        |
| Xcvr 1     |             | NON-JNPR   | J13J68335 | CFP2-100G-LR4-D        |
| XLM 0      | REV 07.2.00 | 711-046638 | ABCK5491  | MPC6E XL               |
| XLM 1      | REV 07.2.00 | 711-046638 | ABCK5475  | MPC6E XL               |
| ADC 1      | REV 17      | 750-043596 | ABCG9023  | Adapter Card           |
| ADC 2      | REV 01      | 750-043596 | ZV4079    | Adapter Card           |
| ADC 6      | REV 17      | 750-043596 | ABCG8866  | Adapter Card           |
| ADC 8      | REV 17      | 750-043596 | ABCA8993  | Adapter Card           |
| Fan Tray 0 | REV 06      | 760-046960 | ACAY0354  | 172mm FanTray - 6 Fans |
| Fan Tray 1 | REV 06      | 760-046960 | ACAY0831  | 172mm FanTray - 6 Fans |
| Fan Tray 2 | REV 06      | 760-046960 | ACAY0892  | 172mm FanTray - 6 Fans |
| Fan Tray 3 | REV 06      | 760-046960 | ACAY0839  | 172mm FanTray - 6 Fans |

### show chassis hardware extensive (MX2010 Routers with MPC6E and OTN MIC)

```

user@host> show chassis hardware extensive
Hardware inventory:
Item Version Part number Serial number Description
Chassis
Jedec Code: 0x7fb0 EEPROM Version: 0x02
S/N: JN11C9AFEAFK
Assembly ID: 0x0557 Assembly Version: 00.00
Date: 00-00-0000 Assembly Flags: 0x00
ID: MX2010
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 7f b0 02 ff 05 57 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x20: 4a 4e 31 31 43 39 41 46 45 41 46 4b 00 00 00 00
Address 0x30: 00 00 00 ff 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Midplane REV 35 750-044636 ABAB9188 Lower Backplane
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 750-044636 S/N: ABAB9188
Assembly ID: 0x0b66 Assembly Version: 01.35
Date: 06-21-2013 Assembly Flags: 0x00
Version: REV 35 CLEI Code: IPMU810ARA
ID: Lower Backplane FRU Model Number: CHAS-BP-MX2010-S
Board Information Record:
Address 0x00: ad 01 08 00 3c 8a b0 38 68 00 ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 66 01 23 52 45 56 20 33 35 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 34 34 36 33 36 00 00
Address 0x20: 53 2f 4e 20 41 42 41 42 39 31 38 38 00 15 06 07
Address 0x30: dd ff ff ff ad 01 08 00 3c 8a b0 38 68 00 ff ff
Address 0x40: ff ff ff ff 01 49 50 4d 55 38 31 30 41 52 41 43
Address 0x50: 48 41 53 2d 42 50 2d 4d 58 32 30 31 30 2d 53 00
Address 0x60: 00 00 00 00 00 00 30 36 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff f8 ff ff ff ff ff ff ff ff ff ff ff ff
Midplane 1 REV 02 711-044557 ABAB8729 Upper Backplane
Jedec Code: 0x7fb0 EEPROM Version: 0x01
P/N: 711-044557 S/N: ABAB8729
Assembly ID: 0x0b65 Assembly Version: 01.02
Date: 03-21-2013 Assembly Flags: 0x00

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Version: REV 02
ID: Upper Backplane
Board Information Record:
 Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
 Address 0x00: 7f b0 01 ff 0b 65 01 02 52 45 56 20 32 00 00
 Address 0x10: 00 00 00 00 37 31 31 2d 30 34 34 35 35 37 00 00
 Address 0x20: 53 2f 4e 20 41 42 41 42 38 37 32 39 00 15 03 07
 Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 00
 Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 Address 0x60: 00 00 00 00 00 00 ff ff ff ff ff ff ff ff ff ff
 Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
PMP REV 04 711-032426 ACAJ2432 Power Midplane
Jedec Code: 0x7fb0 EEPROM Version: 0x01
P/N: 711-032426 S/N: ACAJ2432
Assembly ID: 0x045d Assembly Version: 01.04
Date: 03-28-2013 Assembly Flags: 0x00
Version: REV 04
ID: Power Midplane
Board Information Record:
 Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
 Address 0x00: 7f b0 01 ff 04 5d 01 04 52 45 56 20 34 00 00
 Address 0x10: 00 00 00 00 37 31 31 2d 30 33 32 34 32 36 00 00
 Address 0x20: 53 2f 4e 20 41 43 41 4a 32 34 33 32 00 1c 03 07
 Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 00
 Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 Address 0x60: 00 00 00 00 00 00 ff ff ff ff ff ff ff ff ff ff
 Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
FPM Board REV 09 760-044634 ABCA4314 Front Panel Display
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 760-044634 S/N: ABCA4314
Assembly ID: 0x0b64 Assembly Version: 01.09
Date: 03-28-2013 Assembly Flags: 0x00
Version: REV 09 CLEI Code: IPMYA4EJRA
ID: Front Panel Display FRU Model Number: MX2010-CRAFT-S
Board Information Record:
 Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
 Address 0x00: 7f b0 02 ff 0b 64 01 09 52 45 56 20 39 00 00
 Address 0x10: 00 00 00 00 37 36 30 2d 30 34 34 36 33 34 00 00
 Address 0x20: 53 2f 4e 20 41 42 43 41 34 33 31 34 00 1c 03 07
 Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 Address 0x40: ff ff ff ff 01 49 50 4d 59 41 34 45 4a 52 41 4d
 Address 0x50: 58 32 30 31 30 2d 43 52 41 46 54 2d 53 00 00 00
 Address 0x60: 00 00 00 00 00 00 41 00 00 ff ff ff ff ff ff ff ff
 Address 0x70: ff ff ff 93 ff ff ff ff ff ff ff ff ff ff ff ff ff
PSM 0 REV 01 740-050037 1EDB321015C DC 52V Power Supply
Module
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-050037 S/N: 1EDB321015C
Assembly ID: 0x0478 Assembly Version: 01.01
Date: 05-28-2013 Assembly Flags: 0x00
Version: REV 01 CLEI Code: IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
 Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
 Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 31 00 00

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Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 33 32 31 30 31 35 43 00 00 1c 05 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 1 REV 01 740-050037 1EDB321015J DC 52V Power Supply
Module
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-050037 S/N: 1EDB321015J
Assembly ID: 0x0478 Assembly Version: 01.01
Date: 05-28-2013 Assembly Flags: 0x00
Version: REV 01 CLEI Code: IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 33 32 31 30 31 35 4a 00 00 1c 05 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 2 REV 01 740-050037 1EDB32000K8 DC 52V Power Supply
Module
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-050037 S/N: 1EDB32000K8
Assembly ID: 0x0478 Assembly Version: 01.01
Date: 05-23-2013 Assembly Flags: 0x00
Version: REV 01 CLEI Code: IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 33 32 30 30 30 4b 38 00 00 17 05 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 3 REV 01 740-050037 1EDB32101JW DC 52V Power Supply
Module
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-050037 S/N: 1EDB32101JW
Assembly ID: 0x0478 Assembly Version: 01.01
Date: 05-30-2013 Assembly Flags: 0x00
Version: REV 01 CLEI Code: IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 33 32 31 30 31 4a 57 00 00 1e 05 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d

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Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 4 REV 01 740-050037 1EDB321015G DC 52V Power Supply
Module
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-050037 S/N: 1EDB321015G
Assembly ID: 0x0478 Assembly Version: 01.01
Date: 05-28-2013 Assembly Flags: 0x00
Version: REV 01 CLEI Code: IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 33 32 31 30 31 35 47 00 00 1c 05 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 5 REV 01 740-050037 1EDB32101HH DC 52V Power Supply
Module
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-050037 S/N: 1EDB32101HH
Assembly ID: 0x0478 Assembly Version: 01.01
Date: 05-30-2013 Assembly Flags: 0x00
Version: REV 01 CLEI Code: IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 33 32 31 30 31 48 48 00 00 1e 05 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 6 REV 01 740-050037 1EDB32101HD DC 52V Power Supply
Module
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-050037 S/N: 1EDB32101HD
Assembly ID: 0x0478 Assembly Version: 01.01
Date: 05-30-2013 Assembly Flags: 0x00
Version: REV 01 CLEI Code: IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 33 32 31 30 31 48 44 00 00 1e 05 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 7 REV 01 740-050037 1EDB321015F DC 52V Power Supply

```

```

Module
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-050037 S/N: 1EDB321015F
Assembly ID: 0x0478 Assembly Version: 01.01
Date: 05-28-2013 Assembly Flags: 0x00
Version: REV 01 CLEI Code: IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 33 32 31 30 31 35 46 00 00 1c 05 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 8 REV 01 740-050037 1EDB321015B DC 52V Power Supply
Module
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-050037 S/N: 1EDB321015B
Assembly ID: 0x0478 Assembly Version: 01.01
Date: 05-28-2013 Assembly Flags: 0x00
Version: REV 01 CLEI Code: IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 33 32 31 30 31 35 42 00 00 1c 05 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PDM 0 REV 03 740-045234 1EFA3220433 DC Power Dist Module
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-045234 S/N: 1EFA3220433
Assembly ID: 0x047b Assembly Version: 01.03
Date: 05-30-2013 Assembly Flags: 0x00
Version: REV 03 CLEI Code: IPUPAJSKAA
ID: DC Power Dist Module FRU Model Number: MX2000-PDM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 7b 01 03 52 45 56 20 30 33 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 34 35 32 33 34 00 00
Address 0x20: 31 45 46 41 33 32 32 30 34 33 33 00 00 1e 05 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 4a 53 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 44 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 33 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 1d 00 00 00 00 00 00 00 00 00 00 00 00
PDM 1 REV 03 740-045234 1EFA3220425 DC Power Dist Module
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-045234 S/N: 1EFA3220425
Assembly ID: 0x047b Assembly Version: 01.03
Date: 05-30-2013 Assembly Flags: 0x00
Version: REV 03 CLEI Code: IPUPAJSKAA

```

```

ID: DC Power Dist Module FRU Model Number: MX2000-PDM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
..

```

### show chassis hardware (MX2020 Router)

```
user@host > show chassis hardware
```

```
Hardware inventory:
```

| Item             | Version | Part number | Serial number | Description          |
|------------------|---------|-------------|---------------|----------------------|
| Chassis          |         |             | JN11E2227AFJ  | MX2020               |
| Midplane         | REV 27  | 750-040240  | ABAB9384      | Lower Power Midplane |
| Midplane 1       | REV 04  | 711-032386  | ABAB9386      | Upper Backplane      |
| PMP 1            | REV 05  | 711-032428  | ACAJ1579      | Upper Power Midplane |
| PMP 0            | REV 04  | 711-032426  | ACAJ1524      | Lower Power Midplane |
| FPM Board        | REV 06  | 760-040242  | ABBT8837      | Front Panel Display  |
| PSM 0            | REV 01  | 740-045050  | 1E022240056   | DC 52V Power Supply  |
| Module           |         |             |               |                      |
| PSM 1            | REV 01  | 740-045050  | 1E022240054   | DC 52V Power Supply  |
| Module           |         |             |               |                      |
| PSM 2            | REV 01  | 740-045050  | 1E02224005H   | DC 52V Power Supply  |
| Module           |         |             |               |                      |
| PSM 3            | REV 01  | 740-045050  | 1E022240053   | DC 52V Power Supply  |
| Module           |         |             |               |                      |
| PSM 4            | REV 01  | 740-045050  | 1E02224004K   | DC 52V Power Supply  |
| Module           |         |             |               |                      |
| PSM 7            | REV 01  | 740-045050  | 1E02224006W   | DC 52V Power Supply  |
| Module           |         |             |               |                      |
| PSM 8            | REV 01  | 740-045050  | 1E022240062   | DC 52V Power Supply  |
| Module           |         |             |               |                      |
| PSM 9            | REV 01  | 740-045050  | 1E02224005B   | DC 52V Power Supply  |
| Module           |         |             |               |                      |
| PSM 10           | REV 01  | 740-045050  | 1E02224005A   | DC 52V Power Supply  |
| Module           |         |             |               |                      |
| PSM 11           | REV 01  | 740-045050  | 1E022240052   | DC 52V Power Supply  |
| Module           |         |             |               |                      |
| PSM 12           | REV 01  | 740-045050  | 1E022240051   | DC 52V Power Supply  |
| Module           |         |             |               |                      |
| PSM 13           | REV 01  | 740-045050  | 1E022240058   | DC 52V Power Supply  |
| Module           |         |             |               |                      |
| PSM 14           | REV 01  | 740-045050  | 1E02224004L   | DC 52V Power Supply  |
| Module           |         |             |               |                      |
| PSM 15           | REV 01  | 740-045050  | 1E02224005M   | DC 52V Power Supply  |
| Module           |         |             |               |                      |
| PSM 16           | REV 01  | 740-045050  | 1E02224006S   | DC 52V Power Supply  |
| Module           |         |             |               |                      |
| PSM 17           | REV 01  | 740-045050  | 1E02224005Z   | DC 52V Power Supply  |
| Module           |         |             |               |                      |
| PDM 0            | REV 01  | 740-045234  | 1E012150033   | DC Power Dist Module |
| PDM 1            | REV 01  | 740-045234  | 1E012150027   | DC Power Dist Module |
| PDM 2            | REV 01  | 740-045234  | 1E012150028   | DC Power Dist Module |
| PDM 3            | REV 01  | 740-045234  | 1E012150045   | DC Power Dist Module |
| Routing Engine 0 | REV 02  | 740-041821  | 9009089704    | RE-S-1800x4          |
| Routing Engine 1 | REV 02  | 740-041821  | 9009094138    | RE-S-1800x4          |
| CB 0             | REV 14  | 750-040257  | CAAF8430      | Control Board        |
| CB 1             | REV 08  | 750-040257  | CAAB3482      | Control Board        |
| SPMB 0           | REV 01  | 711-041855  | ZS2290        | PMB Board            |
| SPMB 1           | REV 02  | 711-041855  | CAAA6141      | PMB Board            |
| SFB 0            | REV 03  | 711-044466  | ABBV6789      | Switch Fabric Board  |
| SFB 1            | REV 05  | 711-044466  | ABBX5666      | Switch Fabric Board  |
| SFB 2            | REV 05  | 711-044466  | ABBX5678      | Switch Fabric Board  |



|        |        |            |           |                     |
|--------|--------|------------|-----------|---------------------|
| SFB 3  | REV 05 | 711-044466 | ABBX5687  | Switch Fabric Board |
| SFB 4  | REV 05 | 711-044466 | ABBX5609  | Switch Fabric Board |
| SFB 5  | REV 05 | 711-044466 | ABBX5675  | Switch Fabric Board |
| SFB 6  | REV 03 | 711-044466 | ABBV6805  | Switch Fabric Board |
| SFB 7  | REV 05 | 711-044466 | ABBX5701  | Switch Fabric Board |
| FPC 0  | REV 30 | 750-028467 | ABBN0284  | MPC 3D 16x 10GE     |
| CPU    | REV 10 | 711-029089 | ABBN0507  | AMPC PMB            |
| PIC 0  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+   |
| Xcvr 0 | REV 01 | 740-030658 | B11E00990 | SFP+-10G-USR        |
| Xcvr 1 | REV 01 | 740-030658 | B11E04357 | SFP+-10G-USR        |
| Xcvr 2 | REV 01 | 740-030658 | B11F01327 | SFP+-10G-USR        |
| Xcvr 3 | REV 01 | 740-030658 | B11E04375 | SFP+-10G-USR        |
| PIC 1  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+   |
| Xcvr 0 | REV 01 | 740-030658 | B11E02760 | SFP+-10G-USR        |
| Xcvr 1 | REV 01 | 740-030658 | B11E02904 | SFP+-10G-USR        |
| Xcvr 2 | REV 01 | 740-030658 | B11E03963 | SFP+-10G-USR        |
| Xcvr 3 | REV 01 | 740-030658 | B11E00756 | SFP+-10G-USR        |
| PIC 2  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+   |
| Xcvr 0 | REV 01 | 740-030658 | B11E04418 | SFP+-10G-USR        |
| Xcvr 1 | REV 01 | 740-030658 | B11E01077 | SFP+-10G-USR        |
| Xcvr 2 | REV 01 | 740-030658 | B11E01128 | SFP+-10G-USR        |
| Xcvr 3 | REV 01 | 740-030658 | B11F01253 | SFP+-10G-USR        |
| PIC 3  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+   |
| Xcvr 0 | REV 01 | 740-030658 | B11E01140 | SFP+-10G-USR        |
| Xcvr 1 | REV 01 | 740-030658 | B11F01626 | SFP+-10G-USR        |
| Xcvr 2 | REV 01 | 740-030658 | B11E01075 | SFP+-10G-USR        |
| Xcvr 3 | REV 01 | 740-030658 | B11E01177 | SFP+-10G-USR        |
| FPC 1  | REV 30 | 750-028467 | ABBN0208  | MPC 3D 16x 10GE     |
| CPU    | REV 10 | 711-029089 | ABBJ1084  | AMPC PMB            |
| PIC 0  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+   |
| Xcvr 0 | REV 01 | 740-030658 | B11E04745 | SFP+-10G-USR        |
| Xcvr 1 | REV 01 | 740-030658 | B11F01570 | SFP+-10G-USR        |
| Xcvr 2 | REV 01 | 740-030658 | B11E04388 | SFP+-10G-USR        |
| Xcvr 3 | REV 01 | 740-030658 | B11F01439 | SFP+-10G-USR        |
| PIC 1  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+   |
| Xcvr 0 | REV 01 | 740-030658 | B11E04739 | SFP+-10G-USR        |
| Xcvr 1 | REV 01 | 740-030658 | B11F01869 | SFP+-10G-USR        |
| Xcvr 2 | REV 01 | 740-030658 | B11F01675 | SFP+-10G-USR        |
| Xcvr 3 | REV 01 | 740-030658 | B11F01901 | SFP+-10G-USR        |
| PIC 2  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+   |
| Xcvr 0 | REV 01 | 740-030658 | B11F01346 | SFP+-10G-USR        |
| Xcvr 1 | REV 01 | 740-030658 | B11F01288 | SFP+-10G-USR        |
| Xcvr 2 | REV 01 | 740-030658 | B11F01824 | SFP+-10G-USR        |
| Xcvr 3 | REV 01 | 740-030658 | B11E04312 | SFP+-10G-USR        |
| PIC 3  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+   |
| Xcvr 0 | REV 01 | 740-030658 | B11E02811 | SFP+-10G-USR        |
| Xcvr 1 | REV 01 | 740-030658 | B11E03847 | SFP+-10G-USR        |
| Xcvr 2 | REV 01 | 740-030658 | B11F01495 | SFP+-10G-USR        |
| Xcvr 3 | REV 01 | 740-030658 | B11F01265 | SFP+-10G-USR        |
| FPC 2  | REV 30 | 750-028467 | ZM5111    | MPC 3D 16x 10GE     |
| CPU    | REV 10 | 711-029089 | ZP6607    | AMPC PMB            |
| PIC 0  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+   |
| Xcvr 0 | REV 01 | 740-031980 | AK80LJA   | SFP+-10G-SR         |
| Xcvr 1 | REV 01 | 740-031980 | AK80MFZ   | SFP+-10G-SR         |
| Xcvr 2 | REV 01 | 740-031980 | AK80NKL   | SFP+-10G-SR         |
| Xcvr 3 | REV 01 | 740-031980 | AK80KF4   | SFP+-10G-SR         |
| PIC 1  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+   |
| Xcvr 0 | REV 01 | 740-031980 | AK80FBJ   | SFP+-10G-SR         |
| Xcvr 1 | REV 01 | 740-031980 | AK80MM2   | SFP+-10G-SR         |
| Xcvr 2 | REV 01 | 740-031980 | AK80LJV   | SFP+-10G-SR         |
| Xcvr 3 | REV 01 | 740-031980 | AK80NXV   | SFP+-10G-SR         |

|        |        |            |           |         |                   |
|--------|--------|------------|-----------|---------|-------------------|
| PIC 2  |        |            | BUILTIN   | BUILTIN | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80N1H   |         | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80NLS   |         | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80FL5   |         | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80NL9   |         | SFP+-10G-SR       |
| PIC 3  |        |            | BUILTIN   | BUILTIN | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80NG2   |         | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80KDU   |         | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80MG1   |         | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80MM0   |         | SFP+-10G-SR       |
| FPC 3  | REV 30 | 750-028467 | ABBN0302  |         | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | ABBN0495  |         | AMPC PMB          |
| PIC 0  |        |            | BUILTIN   | BUILTIN | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11F01581 |         | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11E01176 |         | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11F01251 |         | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11E02752 |         | SFP+-10G-USR      |
| PIC 1  |        |            | BUILTIN   | BUILTIN | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11E00786 |         | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11E01020 |         | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11E01023 |         | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11E02819 |         | SFP+-10G-USR      |
| PIC 2  |        |            | BUILTIN   | BUILTIN | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11E02812 |         | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11D04437 |         | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11F01279 |         | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11F01333 |         | SFP+-10G-USR      |
| PIC 3  |        |            | BUILTIN   | BUILTIN | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11E00978 |         | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11E01018 |         | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11F01784 |         | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-031980 | AK80NKP   |         | SFP+-10G-SR       |
| FPC 4  | REV 30 | 750-028467 | ABBN0308  |         | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | ABBJ1095  |         | AMPC PMB          |
| PIC 0  |        |            | BUILTIN   | BUILTIN | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11E04305 |         | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11E01147 |         | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11E01195 |         | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11F01743 |         | SFP+-10G-USR      |
| PIC 1  |        |            | BUILTIN   | BUILTIN | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11F01892 |         | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11E02880 |         | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11E00725 |         | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11E01057 |         | SFP+-10G-USR      |
| PIC 2  |        |            | BUILTIN   | BUILTIN | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11E02816 |         | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11C04501 |         | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11E02764 |         | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11E00789 |         | SFP+-10G-USR      |
| PIC 3  |        |            | BUILTIN   | BUILTIN | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11F01250 |         | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11E02847 |         | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11E00787 |         | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11E03803 |         | SFP+-10G-USR      |
| FPC 5  | REV 30 | 750-028467 | ABBN0316  |         | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | ABBJ1082  |         | AMPC PMB          |
| PIC 0  |        |            | BUILTIN   | BUILTIN | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | B11K00523 |         | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | B11K01848 |         | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | B11K01865 |         | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | B11K00540 |         | SFP+-10G-SR       |

|        |        |            |           |                   |
|--------|--------|------------|-----------|-------------------|
| PIC 1  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | B11K00422 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | B11K00428 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | B11K00423 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | B11K01855 | SFP+-10G-SR       |
| PIC 2  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | B11K01847 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | B11K00526 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | B11K00529 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | B11K00525 | SFP+-10G-SR       |
| PIC 3  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | B11K00425 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | B11K00530 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | B11K01851 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | B11K00528 | SFP+-10G-SR       |
| FPC 6  | REV 32 | 750-028467 | ABBN6832  | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | ABBK6534  | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80MB4   | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80FQ6   | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80N1F   | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80NLQ   | SFP+-10G-SR       |
| PIC 1  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80KDR   | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80FGJ   | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80N5G   | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80KD8   | SFP+-10G-SR       |
| PIC 2  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80LET   | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80N1X   | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80NRF   | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80NL2   | SFP+-10G-SR       |
| PIC 3  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80N3D   | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80MRB   | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80LEQ   | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80LER   | SFP+-10G-SR       |
| FPC 7  | REV 32 | 750-028467 | ABBN6811  | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | ABBN7288  | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80NK8   | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80LJG   | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80LBU   | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80N21   | SFP+-10G-SR       |
| PIC 1  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80LEU   | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80NLM   | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80NL6   | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80LES   | SFP+-10G-SR       |
| PIC 2  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80LEN   | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80ME0   | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80LMG   | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80MM1   | SFP+-10G-SR       |
| PIC 3  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80MG7   | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80KF9   | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80NRQ   | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80NLE   | SFP+-10G-SR       |
| FPC 8  | REV 23 | 750-028467 | YN2977    | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | YP1856    | AMPC PMB          |

|        |        |            |              |                   |
|--------|--------|------------|--------------|-------------------|
| PIC 0  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | 183363A00875 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 183363A00851 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 183363A00772 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 183363A00882 | SFP+-10G-SR       |
| PIC 1  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | 183363A00735 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 183363A00169 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 183363A00726 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 183363A00077 | SFP+-10G-SR       |
| PIC 2  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | 183363A00168 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 183363A00676 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 183363A00732 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 183363A00091 | SFP+-10G-SR       |
| PIC 3  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | 183363A00725 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 183363A00642 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 183363A00871 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 183363A00853 | SFP+-10G-SR       |
| FPC 9  | REV 32 | 750-028467 | ABBN6798     | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | ABBK6556     | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-021308 | 9ZDZ06A00055 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 183363A00239 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-021308 | AD0915E003K  | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-021308 | AD0915E003A  | SFP+-10G-SR       |
| PIC 1  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80MRC      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80NL5      | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80NKN      | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80N3U      | SFP+-10G-SR       |
| PIC 2  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80N1T      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AJ808DJ      | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80NG4      | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80FND      | SFP+-10G-SR       |
| PIC 3  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80FKQ      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80NLT      | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80NKR      | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80LKM      | SFP+-10G-SR       |
| FPC 10 | REV 32 | 750-028467 | ABBN6813     | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | ABBK6542     | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80NA3      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80NLF      | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80MRH      | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80KE4      | SFP+-10G-SR       |
| PIC 1  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-021308 | 973152A00030 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80L9H      | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80ME8      | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80NLR      | SFP+-10G-SR       |
| PIC 2  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80NG1      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80MCA      | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80LFC      | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80LEM      | SFP+-10G-SR       |
| PIC 3  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80N9X      | SFP+-10G-SR       |

|        |        |            |              |                   |
|--------|--------|------------|--------------|-------------------|
| Xcvr 1 | REV 01 | 740-031980 | AK80LAC      | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80LF2      | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80N8T      | SFP+-10G-SR       |
| FPC 11 | REV 30 | 750-028467 | ABBN0281     | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | ABBN0526     | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11F01326    | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11E03973    | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11E00950    | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11E00674    | SFP+-10G-USR      |
| PIC 1  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11E00775    | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11E04461    | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11E01074    | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11E02821    | SFP+-10G-USR      |
| PIC 2  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11E04501    | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11E00757    | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11F01623    | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11E01022    | SFP+-10G-USR      |
| PIC 3  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11E04359    | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11E02751    | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11E02736    | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11E01178    | SFP+-10G-USR      |
| FPC 12 | REV 32 | 750-028467 | ABBN6796     | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | ABBN7259     | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | B11K01856    | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | B11K01853    | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | B11K01863    | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 163363A02863 | SFP+-10G-SR       |
| PIC 1  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | 163363A02668 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 163363A02881 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 163363A01671 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 163363A02627 | SFP+-10G-SR       |
| PIC 2  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | 163363A02725 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 163363A02692 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 163363A02730 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 163363A03081 | SFP+-10G-SR       |
| PIC 3  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | 163363A02736 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 163363A02568 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 163363A02747 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 163363A02579 | SFP+-10G-SR       |
| FPC 13 | REV 30 | 750-028467 | ABBN0270     | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | ABBJ0966     | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80NL1      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80NXW      | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80KD2      | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80FMD      | SFP+-10G-SR       |
| PIC 1  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80NKQ      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80MGH      | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80N38      | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80NL7      | SFP+-10G-SR       |
| PIC 2  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80LEL      | SFP+-10G-SR       |

|        |        |            |              |                   |
|--------|--------|------------|--------------|-------------------|
| Xcvr 1 | REV 01 | 740-031980 | AK80NKD      | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80KCY      | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80LHK      | SFP+-10G-SR       |
| PIC 3  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80M5J      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80MBE      | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80NLG      | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80LFH      | SFP+-10G-SR       |
| FPC 14 | REV 32 | 750-028467 | ABBN6790     | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | ABBK6515     | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80LZM      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80MCC      | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80KCM      | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80KE0      | SFP+-10G-SR       |
| PIC 1  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-021310 | C10F99155    | SFP+-10G-LRM      |
| Xcvr 1 | REV 01 | 740-021310 | C10F99049    | SFP+-10G-LRM      |
| Xcvr 2 | REV 01 | 740-021310 | C10F99128    | SFP+-10G-LRM      |
| Xcvr 3 | REV 01 | 740-021310 | C10F99169    | SFP+-10G-LRM      |
| PIC 2  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80LF3      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 163363A02597 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 163363A03060 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 163363A03057 | SFP+-10G-SR       |
| PIC 3  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80LEX      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80FEU      | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80FNM      | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-021308 | AJQQQ5G      | SFP+-10G-SR       |
| FPC 15 | REV 32 | 750-028467 | ABBN6791     | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | ABBN7289     | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | B11K00424    | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | B11K01849    | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | B11K01862    | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | B11K01852    | SFP+-10G-SR       |
| PIC 1  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | B11K00427    | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | B11K00430    | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | B11K01854    | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | B11K00426    | SFP+-10G-SR       |
| PIC 2  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | B11K00429    | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | B11K01864    | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | B11K01850    | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | B11K00522    | SFP+-10G-SR       |
| PIC 3  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11E01144    | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11E00985    | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11E00796    | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-031980 | B11K01866    | SFP+-10G-SR       |
| FPC 16 | REV 30 | 750-028467 | ABBM4592     | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | ABBN0465     | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11F01435    | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11E01052    | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11F01328    | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11F01254    | SFP+-10G-USR      |
| PIC 1  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11E02738    | SFP+-10G-USR      |

|        |        |            |              |                   |
|--------|--------|------------|--------------|-------------------|
| Xcvr 1 | REV 01 | 740-030658 | B11E02881    | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11F01624    | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11E00889    | SFP+-10G-USR      |
| PIC 2  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11E02883    | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11E00681    | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11E04306    | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11E02813    | SFP+-10G-USR      |
| PIC 3  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11F01801    | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11E02753    | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11E01156    | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11E04324    | SFP+-10G-USR      |
| FPC 17 | REV 32 | 750-028467 | ABBN6810     | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | ABBN7237     | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | 163363A02638 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 163363A02082 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 163363A01674 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 163363A03058 | SFP+-10G-SR       |
| PIC 1  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | 163363A03048 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 163363A02729 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 163363A02566 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 163363A02567 | SFP+-10G-SR       |
| PIC 2  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | 163363A02878 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 163363A02739 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 163363A01959 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 163363A02660 | SFP+-10G-SR       |
| PIC 3  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | 163363A02731 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 163363A02588 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 163363A02673 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 163363A02654 | SFP+-10G-SR       |
| FPC 18 | REV 30 | 750-028467 | ABBM4739     | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | ABBN0487     | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | 163363A02569 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 163363A02886 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 163363A03082 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 133363A00297 | SFP+-10G-SR       |
| PIC 1  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | 163363A02726 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 163363A03050 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 163363A02884 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 163363A03076 | SFP+-10G-SR       |
| PIC 2  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | 163363A02581 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 163363A02873 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 163363A02582 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 163363A03083 | SFP+-10G-SR       |
| PIC 3  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031981 | UL70BU6      | SFP+-10G-LR       |
| Xcvr 1 | REV 01 | 740-031981 | UL50QC6      | SFP+-10G-LR       |
| Xcvr 2 | REV 01 | 740-031981 | UL708N6      | SFP+-10G-LR       |
| Xcvr 3 | REV 01 | 740-031981 | UL603KK      | SFP+-10G-LR       |
| FPC 19 | REV 32 | 750-028467 | ABBN6827     | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | ABBK6508     | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | 163363A01688 | SFP+-10G-SR       |

|            |        |            |              |                        |
|------------|--------|------------|--------------|------------------------|
| Xcvr 1     | REV 01 | 740-031980 | 163363A01724 | SFP+-10G-SR            |
| Xcvr 2     | REV 01 | 740-031980 | 163363A01773 | SFP+-10G-SR            |
| Xcvr 3     | REV 01 | 740-031980 | 163363A02593 | SFP+-10G-SR            |
| PIC 1      |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+      |
| Xcvr 0     | REV 01 | 740-031980 | 163363A03061 | SFP+-10G-SR            |
| Xcvr 1     | REV 01 | 740-031980 | 163363A03056 | SFP+-10G-SR            |
| Xcvr 2     | REV 01 | 740-031980 | 163363A02669 | SFP+-10G-SR            |
| Xcvr 3     | REV 01 | 740-031980 | 163363A03070 | SFP+-10G-SR            |
| PIC 2      |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+      |
| Xcvr 0     | REV 01 | 740-031980 | 163363A02572 | SFP+-10G-SR            |
| Xcvr 1     | REV 01 | 740-031980 | 163363A02697 | SFP+-10G-SR            |
| Xcvr 2     | REV 01 | 740-031980 | 163363A02585 | SFP+-10G-SR            |
| Xcvr 3     | REV 01 | 740-031980 | 163363A03052 | SFP+-10G-SR            |
| PIC 3      |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+      |
| Xcvr 0     | REV 01 | 740-031980 | 163363A02591 | SFP+-10G-SR            |
| Xcvr 1     | REV 01 | 740-031980 | 163363A02649 | SFP+-10G-SR            |
| Xcvr 2     | REV 01 | 740-031980 | 163363A02577 | SFP+-10G-SR            |
| Xcvr 3     | REV 01 | 740-031980 | 163363A02698 | SFP+-10G-SR            |
| ADC 0      | REV 13 | 750-043596 | ABBX5561     | Adapter Card           |
| ADC 1      | REV 13 | 750-043596 | ABBX5546     | Adapter Card           |
| ADC 2      | REV 13 | 750-043596 | ABBX5535     | Adapter Card           |
| ADC 3      | REV 13 | 750-043596 | ABBX5552     | Adapter Card           |
| ADC 4      | REV 13 | 750-043596 | ABBX5581     | Adapter Card           |
| ADC 5      | REV 13 | 750-043596 | ABBX5545     | Adapter Card           |
| ADC 6      | REV 13 | 750-043596 | ABBX5554     | Adapter Card           |
| ADC 7      | REV 07 | 750-043596 | ABBV7194     | Adapter Card           |
| ADC 8      | REV 07 | 750-043596 | ABBV7251     | Adapter Card           |
| ADC 9      | REV 07 | 750-043596 | ABBV7202     | Adapter Card           |
| ADC 10     | REV 13 | 750-043596 | ABBX5538     | Adapter Card           |
| ADC 11     | REV 13 | 750-043596 | ABBX5566     | Adapter Card           |
| ADC 12     | REV 13 | 750-043596 | ABBX5542     | Adapter Card           |
| ADC 13     | REV 13 | 750-043596 | ABBX5539     | Adapter Card           |
| ADC 14     | REV 13 | 750-043596 | ABBX5555     | Adapter Card           |
| ADC 15     | REV 13 | 750-043596 | ABBX5557     | Adapter Card           |
| ADC 16     | REV 13 | 750-043596 | ABBX5536     | Adapter Card           |
| ADC 17     | REV 13 | 750-043596 | ABBX5559     | Adapter Card           |
| ADC 18     | REV 13 | 750-043596 | ABBX5537     | Adapter Card           |
| ADC 19     | REV 11 | 750-043596 | ABBW5685     | Adapter Card           |
| Fan Tray 0 | REV 2A | 760-046960 | ACAY0030     | 172mm FanTray - 6 Fans |
| Fan Tray 1 | REV 2A | 760-046960 | ACAY0039     | 172mm FanTray - 6 Fans |
| Fan Tray 2 | REV 2A | 760-046960 | ACAY0033     | 172mm FanTray - 6 Fans |
| Fan Tray 3 | REV 2A | 760-046960 | ACAY0062     | 172mm FanTray - 6 Fans |

### show chassis hardware detail (MX2020 Router)

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user@host> show chassis hardware detail
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| Hardware inventory: |         |             |               |                      |
|---------------------|---------|-------------|---------------|----------------------|
| Item                | Version | Part number | Serial number | Description          |
| Chassis             |         |             | JN11E2227AFJ  | MX2020               |
| Midplane            |         |             | ABAB9384      | Lower Power Midplane |
| Midplane 1          | REV 04  | 711-032386  | ABAB9386      | Upper Backplane      |
| PMP 1               | REV 05  | 711-032428  | ACAJ1821      | Upper Power Midplane |
| PMP 0               | REV 04  | 711-032426  | ACAJ1524      | Lower Power Midplane |
| FPM Board           | REV 06  | 760-040242  | ABBT8837      | Front Panel Display  |
| PSM 0               | REV 01  | 740-045050  | 1E02224006G   | DC 52V Power Supply  |
| Module              |         |             |               |                      |
| PSM 1               | REV 01  | 740-045050  | 1E022240053   | DC 52V Power Supply  |
| Module              |         |             |               |                      |
| PSM 2               | REV 01  | 740-045050  | 1E02224004K   | DC 52V Power Supply  |
| Module              |         |             |               |                      |
| PSM 3               | REV 01  | 740-045050  | 1E022240056   | DC 52V Power Supply  |



|                  |          |                        |                           |                      |
|------------------|----------|------------------------|---------------------------|----------------------|
| Module           |          |                        |                           |                      |
| PSM 4            | REV 01   | 740-045050             | 1E022240054               | DC 52V Power Supply  |
| Module           |          |                        |                           |                      |
| PSM 5            | REV 01   | 740-045050             | 1E02224005H               | DC 52V Power Supply  |
| Module           |          |                        |                           |                      |
| PSM 6            | REV 01   | 740-045050             | 1E02224006S               | DC 52V Power Supply  |
| Module           |          |                        |                           |                      |
| PSM 7            | REV 01   | 740-045050             | 1E02224005M               | DC 52V Power Supply  |
| Module           |          |                        |                           |                      |
| PSM 8            | REV 01   | 740-045050             | 1E022240062               | DC 52V Power Supply  |
| Module           |          |                        |                           |                      |
| PSM 9            | REV 03   | 740-045050             | 1EDB2350095               | DC 52V Power Supply  |
| Module           |          |                        |                           |                      |
| PSM 10           | REV 03   | 740-045050             | 1EDB235009L               | DC 52V Power Supply  |
| Module           |          |                        |                           |                      |
| PSM 11           | REV 03   | 740-045050             | 1EDB2350092               | DC 52V Power Supply  |
| Module           |          |                        |                           |                      |
| PSM 12           | REV 03   | 740-045050             | 1EDB23500AT               | DC 52V Power Supply  |
| Module           |          |                        |                           |                      |
| PSM 13           | REV 03   | 740-045050             | 1EDB2350094               | DC 52V Power Supply  |
| Module           |          |                        |                           |                      |
| PSM 15           | REV 03   | 740-045050             | 1EDB235008X               | DC 52V Power Supply  |
| Module           |          |                        |                           |                      |
| PDM 0            | REV 01   | 740-045234             | 1E012150033               | DC Power Dist Module |
| PDM 1            | REV 01   | 740-045234             | 1E012150027               | DC Power Dist Module |
| PDM 2            | REV 01   | 740-045234             | 1E262250072               | DC Power Dist Module |
| Routing Engine 0 | REV 02   | 740-041821             | 9009094138                | RE-S-1800x4          |
| ad0              | 3998 MB  | Virtium - TuffDisk     | VCF3 20110825A021D0000064 | Compact Flash        |
| ad1              | 30533 MB | UGB94ARF32H0S3-KC      | UNIGEN-499551-000347      | Disk 1               |
| usb0 (addr 1)    |          | EHCI root hub 0        | Intel                     | uhub0                |
| usb0 (addr 2)    |          | product 0x0020 32      | vendor 0x8087             | uhub1                |
| DIMM 0           |          | SGU04G72H1BD2SA-BB DIE | REV-52 PCB REV-54         | MFR ID-ce80          |
| DIMM 1           |          | SGU04G72H1BD2SA-BB DIE | REV-52 PCB REV-54         | MFR ID-ce80          |
| DIMM 2           |          | SGU04G72H1BD2SA-BB DIE | REV-52 PCB REV-54         | MFR ID-ce80          |
| DIMM 3           |          | SGU04G72H1BD2SA-BB DIE | REV-52 PCB REV-54         | MFR ID-ce80          |
| Routing Engine 1 | REV 02   | 740-041821             | 9009089709                | RE-S-1800x4          |
| ad0              | 3831 MB  | UGB30SFA4000T1         | SFA4000T1 00000113        | Compact Flash        |
| ad1              | 30533 MB | UGB94ARF32H0S3-KC      | UNIGEN-478612-001044      | Disk 1               |
| CB 0             | REV 08   | 750-040257             | CAAB3482                  | Control Board        |
| CB 1             | REV 04   | 750-040257             | ZT2864                    | Control Board        |
| SPMB 0           | REV 02   | 711-041855             | CAA6141                   | PMB Board            |
| SPMB 1           | REV 01   | 711-041855             | ZS2275                    | PMB Board            |
| SFB 0            | REV 05   | 711-044466             | ABBT2161                  | Switch Fabric Board  |
| SFB 1            | REV 05   | 711-044466             | ABBT2159                  | Switch Fabric Board  |
| SFB 2            | REV 05   | 711-044466             | ABBX3718                  | Switch Fabric Board  |
| SFB 3            | REV 05   | 711-044466             | ABBT2152                  | Switch Fabric Board  |
| SFB 4            | REV 05   | 711-044466             | ABBT2160                  | Switch Fabric Board  |
| SFB 5            | REV 05   | 711-044466             | ABBT2145                  | Switch Fabric Board  |
| SFB 6            | REV 05   | 711-044466             | ABBT2150                  | Switch Fabric Board  |
| SFB 7            | REV 05   | 711-044466             | ABBT2163                  | Switch Fabric Board  |
| FPC 0            | REV 30   | 750-028467             | ABBN0284                  | MPC 3D 16x 10GE      |
| CPU              | REV 10   | 711-029089             | ABBN0507                  | AMPC PMB             |
| PIC 0            |          | BUILTIN                | BUILTIN                   | 4x 10GE(LAN) SFP+    |
| Xcvr 0           | REV 01   | 740-030658             | B11E00990                 | SFP+-10G-USR         |
| Xcvr 1           | REV 01   | 740-030658             | B11E04357                 | SFP+-10G-USR         |
| Xcvr 2           | REV 01   | 740-030658             | B11F01327                 | SFP+-10G-USR         |
| Xcvr 3           | REV 01   | 740-030658             | B11E04375                 | SFP+-10G-USR         |
| PIC 1            |          | BUILTIN                | BUILTIN                   | 4x 10GE(LAN) SFP+    |
| Xcvr 0           | REV 01   | 740-030658             | B11E02760                 | SFP+-10G-USR         |
| Xcvr 1           | REV 01   | 740-030658             | B11E02904                 | SFP+-10G-USR         |
| Xcvr 2           | REV 01   | 740-030658             | B11E03963                 | SFP+-10G-USR         |

|        |        |            |           |                   |
|--------|--------|------------|-----------|-------------------|
| Xcvr 3 | REV 01 | 740-030658 | B11E00756 | SFP+-10G-USR      |
| PIC 2  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11E04418 | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11E01077 | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11E01128 | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11F01253 | SFP+-10G-USR      |
| PIC 3  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11E01140 | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11F01626 | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11E01075 | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11E01177 | SFP+-10G-USR      |
| FPC 1  | REV 30 | 750-028467 | ABBN0308  | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | ABBJ1095  | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11E04305 | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11E01147 | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11E01195 | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11F01743 | SFP+-10G-USR      |
| PIC 1  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11F01892 | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11E02880 | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11E00725 | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11E01057 | SFP+-10G-USR      |
| PIC 2  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11E02816 | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11C04501 | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11E02764 | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11E00789 | SFP+-10G-USR      |
| PIC 3  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11F01250 | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11E02847 | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11E00787 | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11E03803 | SFP+-10G-USR      |
| FPC 2  | REV 30 | 750-028467 | ABBN0316  | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | ABBJ1082  | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | B11K00523 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | B11K01848 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | B11K01865 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | B11K00540 | SFP+-10G-SR       |
| PIC 1  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | B11K00422 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | B11K00428 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | B11K00423 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | B11K01855 | SFP+-10G-SR       |
| PIC 2  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | B11K01847 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | B11K00526 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | B11K00529 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | B11K00525 | SFP+-10G-SR       |
| PIC 3  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | B11K00425 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | B11K00530 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | B11K01851 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | B11K00528 | SFP+-10G-SR       |
| FPC 3  | REV 32 | 750-028467 | ABBN6832  | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | ABBK6534  | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80MB4   | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80FQ6   | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80N1F   | SFP+-10G-SR       |

|        |        |            |           |                   |
|--------|--------|------------|-----------|-------------------|
| Xcvr 3 | REV 01 | 740-031980 | AK80NLQ   | SFP+-10G-SR       |
| PIC 1  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80KDR   | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80FGJ   | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80N5G   | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80KD8   | SFP+-10G-SR       |
| PIC 2  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80LET   | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80N1X   | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80NRF   | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80NL2   | SFP+-10G-SR       |
| PIC 3  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80N3D   | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80MRB   | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80LEQ   | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80LER   | SFP+-10G-SR       |
| FPC 4  | REV 32 | 750-028467 | ABBN6811  | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | ABBN7288  | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80NK8   | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80LJG   | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80LBU   | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80N21   | SFP+-10G-SR       |
| PIC 1  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80LEU   | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80NLM   | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80NL6   | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80LES   | SFP+-10G-SR       |
| PIC 2  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80LEN   | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80ME0   | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80LMG   | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80MM1   | SFP+-10G-SR       |
| PIC 3  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80MG7   | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80KF9   | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80NRQ   | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80NLE   | SFP+-10G-SR       |
| FPC 5  | REV 32 | 750-028467 | ABBN6791  | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | ABBN7289  | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | B11K00424 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | B11K01849 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | B11K01862 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | B11K01852 | SFP+-10G-SR       |
| PIC 1  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP  |
| Xcvr 0 | REV 01 | 740-031980 | B11K00427 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | B11K00430 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | B11K01854 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | B11K00426 | SFP+-10G-SR       |
| PIC 2  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | B11K00429 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | B11K01864 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | B11K01850 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | B11K00522 | SFP+-10G-SR       |
| PIC 3  |        | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11E01144 | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11E00985 | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11E00796 | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-031980 | B11K01866 | SFP+-10G-SR       |
| FPC 6  | REV 30 | 750-028467 | ABBM4592  | MPC 3D 16x 10GE   |

|        |        |            |              |                   |
|--------|--------|------------|--------------|-------------------|
| CPU    | REV 10 | 711-029089 | ABBN0465     | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11F01435    | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11E01052    | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11F01328    | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11F01254    | SFP+-10G-USR      |
| PIC 1  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11E02738    | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11E02881    | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11F01624    | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11E00889    | SFP+-10G-USR      |
| PIC 2  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11E02883    | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11E00681    | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11E04306    | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11E02813    | SFP+-10G-USR      |
| PIC 3  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11F01801    | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11E02753    | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11E01156    | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11E04324    | SFP+-10G-USR      |
| FPC 7  | REV 32 | 750-028467 | ABBN6810     | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | ABBN7237     | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | 163363A03058 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 163363A02082 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 163363A01674 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 163363A02638 | SFP+-10G-SR       |
| PIC 1  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | 163363A03048 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 163363A02729 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 163363A02566 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 163363A02567 | SFP+-10G-SR       |
| PIC 2  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | 163363A02878 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 163363A02739 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 163363A01959 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 163363A02660 | SFP+-10G-SR       |
| PIC 3  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | 163363A02731 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 163363A02588 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 163363A02673 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 163363A02654 | SFP+-10G-SR       |
| FPC 8  | REV 30 | 750-028467 | ABBM4739     | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | ABBN0487     | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | 163363A02569 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 163363A02886 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 163363A03082 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 133363A00297 | SFP+-10G-SR       |
| PIC 1  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | 163363A02726 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 163363A03050 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 163363A02884 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 163363A03076 | SFP+-10G-SR       |
| PIC 2  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | 163363A02581 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 163363A02873 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 163363A02582 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 163363A03083 | SFP+-10G-SR       |
| PIC 3  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |

|        |        |            |              |                   |
|--------|--------|------------|--------------|-------------------|
| Xcvr 0 | REV 01 | 740-031981 | UL70BU6      | SFP+-10G-LR       |
| Xcvr 1 | REV 01 | 740-031981 | UL50QC6      | SFP+-10G-LR       |
| Xcvr 2 | REV 01 | 740-031981 | UL708N6      | SFP+-10G-LR       |
| Xcvr 3 | REV 01 | 740-031981 | UL603KK      | SFP+-10G-LR       |
| FPC 9  | REV 32 | 750-028467 | ABBN6827     | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | ABBK6508     | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | 163363A01688 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 163363A01724 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 163363A01773 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 163363A02593 | SFP+-10G-SR       |
| PIC 1  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | 163363A03061 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 163363A03056 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 163363A02669 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 163363A03070 | SFP+-10G-SR       |
| PIC 2  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | 163363A02572 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 163363A02697 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 163363A02585 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 163363A03052 | SFP+-10G-SR       |
| PIC 3  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | 163363A02591 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 163363A02649 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 163363A02577 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 163363A02698 | SFP+-10G-SR       |
| FPC 10 | REV 30 | 750-028467 | ABBN0302     | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | ABBN0495     | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11F01581    | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11E01176    | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11F01251    | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11E02752    | SFP+-10G-USR      |
| PIC 1  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11E00786    | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11E01020    | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11E01023    | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11E02819    | SFP+-10G-USR      |
| PIC 2  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11E02812    | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11D04437    | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11F01279    | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11F01333    | SFP+-10G-USR      |
| PIC 3  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11E00978    | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11E01018    | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11F01784    | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-031980 | AK80NKP      | SFP+-10G-SR       |
| FPC 11 | REV 32 | 750-028467 | ABBN6790     | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | ABBK6515     | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80LZM      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80MCC      | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80KCM      | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80KE0      | SFP+-10G-SR       |
| PIC 1  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-021310 | C10F99155    | SFP+-10G-LRM      |
| Xcvr 1 | REV 01 | 740-021310 | C10F99049    | SFP+-10G-LRM      |
| Xcvr 2 | REV 01 | 740-021310 | C10F99128    | SFP+-10G-LRM      |
| Xcvr 3 | REV 01 | 740-021310 | C10F99169    | SFP+-10G-LRM      |
| PIC 2  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |

|        |        |            |              |                   |
|--------|--------|------------|--------------|-------------------|
| Xcvr 0 | REV 01 | 740-031980 | AK80LF3      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 163363A02597 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 163363A03060 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 163363A03057 | SFP+-10G-SR       |
| PIC 3  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80LEX      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80FEU      | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80FNM      | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-021308 | AJQQQ5G      | SFP+-10G-SR       |
| FPC 12 | REV 30 | 750-028467 | ZM5111       | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | ZP6607       | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80LJA      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80MFZ      | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80NKL      | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80KF4      | SFP+-10G-SR       |
| PIC 1  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80FBJ      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80MM2      | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80LJV      | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80NXV      | SFP+-10G-SR       |
| PIC 2  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80N1H      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80NLS      | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80FL5      | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80NL9      | SFP+-10G-SR       |
| PIC 3  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80NG2      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80KDU      | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80MG1      | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80MM0      | SFP+-10G-SR       |
| FPC 13 | REV 30 | 750-028467 | ABBN0208     | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | ABB11084     | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11E04745    | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11F01570    | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11E04388    | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11F01439    | SFP+-10G-USR      |
| PIC 1  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11E04739    | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11F01869    | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11F01675    | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11F01901    | SFP+-10G-USR      |
| PIC 2  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11F01346    | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11F01288    | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11F01824    | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11E04312    | SFP+-10G-USR      |
| PIC 3  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11E02811    | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11E03847    | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11F01495    | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11F01265    | SFP+-10G-USR      |
| FPC 14 | REV 23 | 750-028467 | YN2977       | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | YP1856       | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | 183363A00875 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 183363A00851 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 183363A00772 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 183363A00882 | SFP+-10G-SR       |
| PIC 1  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |

|        |        |            |              |                   |
|--------|--------|------------|--------------|-------------------|
| Xcvr 0 | REV 01 | 740-031980 | 183363A00735 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 183363A00169 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 183363A00726 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 183363A00077 | SFP+-10G-SR       |
| PIC 2  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | 183363A00168 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 183363A00676 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 183363A00732 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 183363A00091 | SFP+-10G-SR       |
| PIC 3  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | 183363A00725 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 183363A00642 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 183363A00871 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 183363A00853 | SFP+-10G-SR       |
| FPC 15 | REV 32 | 750-028467 | ABBN6798     | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | ABBK6556     | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-021308 | 9ZDZ06A00055 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 183363A00239 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-021308 | AD0915E003K  | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-021308 | AD0915E003A  | SFP+-10G-SR       |
| PIC 1  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80MRC      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80NL5      | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80NKN      | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80N3U      | SFP+-10G-SR       |
| PIC 2  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80N1T      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AJ808DJ      | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80NG4      | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80FND      | SFP+-10G-SR       |
| PIC 3  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80FKQ      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80NLT      | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80NKR      | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80LKM      | SFP+-10G-SR       |
| FPC 16 | REV 30 | 750-028467 | ABBN0270     | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | ABBJ0966     | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80NL1      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80NXW      | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80KD2      | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80FMD      | SFP+-10G-SR       |
| PIC 1  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80NKQ      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80MGH      | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80N38      | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80NL7      | SFP+-10G-SR       |
| PIC 2  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80M5J      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80NKD      | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80KCY      | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80LHK      | SFP+-10G-SR       |
| PIC 3  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80LEL      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80MBE      | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80NLG      | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80LFH      | SFP+-10G-SR       |
| FPC 17 | REV 32 | 750-028467 | ABBN6796     | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | ABBN7259     | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |

|        |        |            |              |                   |
|--------|--------|------------|--------------|-------------------|
| Xcvr 0 | REV 01 | 740-031980 | B11K01856    | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | B11K01853    | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | B11K01863    | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 163363A02863 | SFP+-10G-SR       |
| PIC 1  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | 163363A02668 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 163363A02881 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 163363A01671 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 163363A02627 | SFP+-10G-SR       |
| PIC 2  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | 163363A02725 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 163363A02692 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 163363A02730 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 163363A03081 | SFP+-10G-SR       |
| PIC 3  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | 163363A02736 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | 163363A02568 | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | 163363A02747 | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | 163363A02579 | SFP+-10G-SR       |
| FPC 18 | REV 30 | 750-028467 | ABBN0281     | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | ABBN0526     | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11F01326    | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11E03973    | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11E00950    | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11E00674    | SFP+-10G-USR      |
| PIC 1  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11E00775    | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11E04461    | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11E01074    | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11E02821    | SFP+-10G-USR      |
| PIC 2  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11E04501    | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11E00757    | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11F01623    | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11E01022    | SFP+-10G-USR      |
| PIC 3  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-030658 | B11E04359    | SFP+-10G-USR      |
| Xcvr 1 | REV 01 | 740-030658 | B11E02751    | SFP+-10G-USR      |
| Xcvr 2 | REV 01 | 740-030658 | B11E02736    | SFP+-10G-USR      |
| Xcvr 3 | REV 01 | 740-030658 | B11E01178    | SFP+-10G-USR      |
| FPC 19 | REV 32 | 750-028467 | ABBN6813     | MPC 3D 16x 10GE   |
| CPU    | REV 10 | 711-029089 | ABBK6542     | AMPC PMB          |
| PIC 0  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80NA3      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80NLF      | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80MRH      | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80KE4      | SFP+-10G-SR       |
| PIC 1  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-021308 | 973152A00030 | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80L9H      | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80ME8      | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80NLR      | SFP+-10G-SR       |
| PIC 2  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80NG1      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80MCA      | SFP+-10G-SR       |
| Xcvr 2 | REV 01 | 740-031980 | AK80LFC      | SFP+-10G-SR       |
| Xcvr 3 | REV 01 | 740-031980 | AK80LEM      | SFP+-10G-SR       |
| PIC 3  |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+ |
| Xcvr 0 | REV 01 | 740-031980 | AK80N9X      | SFP+-10G-SR       |
| Xcvr 1 | REV 01 | 740-031980 | AK80LAC      | SFP+-10G-SR       |



|            |        |            |          |                        |
|------------|--------|------------|----------|------------------------|
| Xcvr 2     | REV 01 | 740-031980 | AK80LF2  | SFP+-10G-SR            |
| Xcvr 3     | REV 01 | 740-031980 | AK80N8T  | SFP+-10G-SR            |
| ADC 0      | REV 13 | 750-043596 | ABBX5561 | Adapter Card           |
| ADC 1      | REV 13 | 750-043596 | ABBX5546 | Adapter Card           |
| ADC 2      | REV 13 | 750-043596 | ABBX5535 | Adapter Card           |
| ADC 3      | REV 13 | 750-043596 | ABBX5552 | Adapter Card           |
| ADC 4      | REV 13 | 750-043596 | ABBX5581 | Adapter Card           |
| ADC 5      | REV 13 | 750-043596 | ABBX5545 | Adapter Card           |
| ADC 6      | REV 13 | 750-043596 | ABBX5554 | Adapter Card           |
| ADC 7      | REV 07 | 750-043596 | ABBV7194 | Adapter Card           |
| ADC 8      | REV 07 | 750-043596 | ABBV7251 | Adapter Card           |
| ADC 9      | REV 07 | 750-043596 | ABBV7202 | Adapter Card           |
| ADC 10     | REV 13 | 750-043596 | ABBX5579 | Adapter Card           |
| ADC 11     | REV 13 | 750-043596 | ABBX5548 | Adapter Card           |
| ADC 12     | REV 13 | 750-043596 | ABBX5575 | Adapter Card           |
| ADC 13     | REV 13 | 750-043596 | ABBX5539 | Adapter Card           |
| ADC 14     | REV 13 | 750-043596 | ABBX5555 | Adapter Card           |
| ADC 15     | REV 13 | 750-043596 | ABBX5557 | Adapter Card           |
| ADC 16     | REV 13 | 750-043596 | ABBX5536 | Adapter Card           |
| ADC 17     | REV 13 | 750-043596 | ABBX5559 | Adapter Card           |
| ADC 18     | REV 13 | 750-043596 | ABBX5537 | Adapter Card           |
| ADC 19     | REV 11 | 750-043596 | ABBW5685 | Adapter Card           |
| Fan Tray 0 | REV 04 | 760-046960 | ACAY0090 | 172mm FanTray - 6 Fans |
| Fan Tray 1 | REV 04 | 760-046960 | ACAY0088 | 172mm FanTray - 6 Fans |
| Fan Tray 2 | REV 04 | 760-046960 | ACAY0089 | 172mm FanTray - 6 Fans |
| Fan Tray 3 | REV 04 | 760-046960 | ACAY0108 | 172mm FanTray - 6 Fans |

#### show chassis hardware models (MX2020 Router)

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Hardware inventory:

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| Item             | Version | Part number | Serial number | FRU model number     |
|------------------|---------|-------------|---------------|----------------------|
| Midplane         | REV 27  | 750-040240  | ABAB9384      | 750-040240           |
| FPM Board        | REV 06  | 760-040242  | ABBT8837      | 760-040242           |
| PSM 0            | REV 01  | 740-045050  | 1E02224006G   | MX2000-PSM-HC-DC-S-A |
| PSM 1            | REV 01  | 740-045050  | 1E022240053   | MX2000-PSM-HC-DC-S-A |
| PSM 2            | REV 01  | 740-045050  | 1E02224004K   | MX2000-PSM-HC-DC-S-A |
| PSM 3            | REV 01  | 740-045050  | 1E022240056   | MX2000-PSM-HC-DC-S-A |
| PSM 4            | REV 01  | 740-045050  | 1E022240054   | MX2000-PSM-HC-DC-S-A |
| PSM 5            | REV 01  | 740-045050  | 1E02224005H   | MX2000-PSM-HC-DC-S-A |
| PSM 6            | REV 01  | 740-045050  | 1E02224006S   | MX2000-PSM-HC-DC-S-A |
| PSM 7            | REV 01  | 740-045050  | 1E02224005M   | MX2000-PSM-HC-DC-S-A |
| PSM 8            | REV 01  | 740-045050  | 1E022240062   | MX2000-PSM-HC-DC-S-A |
| PSM 9            | REV 03  | 740-045050  | 1EDB2350095   | MX2000-PSM-DC-S-A    |
| PSM 10           | REV 03  | 740-045050  | 1EDB235009L   | MX2000-PSM-DC-S-A    |
| PSM 11           | REV 03  | 740-045050  | 1EDB2350092   | MX2000-PSM-DC-S-A    |
| PSM 12           | REV 03  | 740-045050  | 1EDB23500AT   | MX2000-PSM-DC-S-A    |
| PSM 13           | REV 03  | 740-045050  | 1EDB2350094   | MX2000-PSM-DC-S-A    |
| PSM 15           | REV 03  | 740-045050  | 1EDB235008X   | MX2000-PSM-DC-S-A    |
| PDM 0            | REV 01  | 740-045234  | 1E012150033   |                      |
| PDM 1            | REV 01  | 740-045234  | 1E012150027   |                      |
| PDM 2            | REV 01  | 740-045234  | 1E262250072   | MX2000-PDM-DC-S-A    |
| Routing Engine 0 | REV 02  | 740-041821  | 9009094138    | RE-S-1800X4-16G-S    |
| Routing Engine 1 | REV 02  | 740-041821  | 9009089709    | RE-S-1800X4-16G-S    |
| CB 0             | REV 08  | 750-040257  | CAAB3482      | 750-040257           |
| CB 1             | REV 04  | 750-040257  | ZT2864        | 750-040257           |
| SFB 0            | REV 05  | 711-044466  | ABBT2161      | MX2000-SFB-S         |
| SFB 1            | REV 05  | 711-044466  | ABBT2159      | MX2000-SFB-S         |
| SFB 2            | REV 05  | 711-044466  | ABBX3718      | MX2000-SFB-S         |
| SFB 4            | REV 05  | 711-044466  | ABBT2160      | MX2000-SFB-S         |
| SFB 5            | REV 05  | 711-044466  | ABBT2145      | MX2000-SFB-S         |

|            |        |            |          |                   |
|------------|--------|------------|----------|-------------------|
| SFB 7      | REV 05 | 711-044466 | ABBT2163 | MX2000-SFB-S      |
| FPC 0      | REV 30 | 750-028467 | ABBN0284 | MPC-3D-16XGE-SFPP |
| FPC 1      | REV 30 | 750-028467 | ABBN0308 | MPC-3D-16XGE-SFPP |
| FPC 2      | REV 30 | 750-028467 | ABBN0316 | MPC-3D-16XGE-SFPP |
| FPC 3      | REV 32 | 750-028467 | ABBN6832 | MPC-3D-16XGE-SFPP |
| FPC 4      | REV 32 | 750-028467 | ABBN6811 | MPC-3D-16XGE-SFPP |
| FPC 5      | REV 32 | 750-028467 | ABBN6791 | MPC-3D-16XGE-SFPP |
| FPC 6      | REV 30 | 750-028467 | ABBM4592 | MPC-3D-16XGE-SFPP |
| FPC 7      | REV 32 | 750-028467 | ABBN6810 | MPC-3D-16XGE-SFPP |
| FPC 8      | REV 30 | 750-028467 | ABBM4739 | MPC-3D-16XGE-SFPP |
| FPC 9      | REV 32 | 750-028467 | ABBN6827 | MPC-3D-16XGE-SFPP |
| FPC 10     | REV 30 | 750-028467 | ABBN0302 | MPC-3D-16XGE-SFPP |
| FPC 11     | REV 32 | 750-028467 | ABBN6790 | MPC-3D-16XGE-SFPP |
| FPC 12     | REV 30 | 750-028467 | ZM5111   | MPC-3D-16XGE-SFPP |
| FPC 13     | REV 30 | 750-028467 | ABBN0208 | MPC-3D-16XGE-SFPP |
| FPC 14     | REV 23 | 750-028467 | YN2977   | MPC-3D-16XGE-SFPP |
| FPC 15     | REV 32 | 750-028467 | ABBN6798 | MPC-3D-16XGE-SFPP |
| FPC 16     | REV 30 | 750-028467 | ABBN0270 | MPC-3D-16XGE-SFPP |
| FPC 17     | REV 32 | 750-028467 | ABBN6796 | MPC-3D-16XGE-SFPP |
| FPC 18     | REV 30 | 750-028467 | ABBN0281 | MPC-3D-16XGE-SFPP |
| FPC 19     | REV 32 | 750-028467 | ABBN6813 | MPC-3D-16XGE-SFPP |
| ADC 0      | REV 13 | 750-043596 | ABBX5561 | PROTO-ASSEMBLY    |
| ADC 1      | REV 13 | 750-043596 | ABBX5546 | PROTO-ASSEMBLY    |
| ADC 2      | REV 13 | 750-043596 | ABBX5535 | MX2000-LC-ADAPTER |
| ADC 3      | REV 13 | 750-043596 | ABBX5552 | MX2000-LC-ADAPTER |
| ADC 4      | REV 13 | 750-043596 | ABBX5581 | MX2000-LC-ADAPTER |
| ADC 5      | REV 13 | 750-043596 | ABBX5545 | PROTO-ASSEMBLY    |
| ADC 6      | REV 13 | 750-043596 | ABBX5554 | PROTO-ASSEMBLY    |
| ADC 7      | REV 07 | 750-043596 | ABBV7194 | MX2000-LC-ADAPTER |
| ADC 8      | REV 07 | 750-043596 | ABBV7251 | MX2000-LC-ADAPTER |
| ADC 9      | REV 07 | 750-043596 | ABBV7202 | MX2000-LC-ADAPTER |
| ADC 10     | REV 13 | 750-043596 | ABBX5579 | MX2000-LC-ADAPTER |
| ADC 12     | REV 13 | 750-043596 | ABBX5575 | MX2000-LC-ADAPTER |
| ADC 13     | REV 13 | 750-043596 | ABBX5539 | PROTO-ASSEMBLY    |
| ADC 14     | REV 13 | 750-043596 | ABBX5555 | PROTO-ASSEMBLY    |
| ADC 15     | REV 13 | 750-043596 | ABBX5557 | MX2000-LC-ADAPTER |
| ADC 16     | REV 13 | 750-043596 | ABBX5536 | PROTO-ASSEMBLY    |
| ADC 17     | REV 13 | 750-043596 | ABBX5559 | PROTO-ASSEMBLY    |
| ADC 18     | REV 13 | 750-043596 | ABBX5537 | PROTO-ASSEMBLY    |
| ADC 19     | REV 11 | 750-043596 | ABBW5685 | PROTO-ASSEMBLY    |
| Fan Tray 0 | REV 04 | 760-046960 | ACAY0090 |                   |
| Fan Tray 1 | REV 04 | 760-046960 | ACAY0088 |                   |
| Fan Tray 2 | REV 04 | 760-046960 | ACAY0089 |                   |
| Fan Tray 3 | REV 04 | 760-046960 | ACAY0108 |                   |

### show chassis hardware clei-models (MX2020 Router)

```
user@ host > show chassis hardware clei-models
```

```
Hardware inventory:
```

| Item      | Version | Part number | CLEI code  | FRU model number     |
|-----------|---------|-------------|------------|----------------------|
| Midplane  | REV 27  | 750-040240  | PROTOXCLEI | 750-040240           |
| FPM Board | REV 06  | 760-040242  | PROTOXCLEI | 760-040242           |
| PSM 0     | REV 01  | 740-045050  | IPUPAJMKAA | MX2000-PSM-HC-DC-S-A |
| PSM 1     | REV 01  | 740-045050  | IPUPAJMKAA | MX2000-PSM-HC-DC-S-A |
| PSM 2     | REV 01  | 740-045050  | IPUPAJMKAA | MX2000-PSM-HC-DC-S-A |
| PSM 3     | REV 01  | 740-045050  | IPUPAJMKAA | MX2000-PSM-HC-DC-S-A |
| PSM 4     | REV 01  | 740-045050  | IPUPAJMKAA | MX2000-PSM-HC-DC-S-A |
| PSM 5     | REV 01  | 740-045050  | IPUPAJMKAA | MX2000-PSM-HC-DC-S-A |
| PSM 6     | REV 01  | 740-045050  | IPUPAJMKAA | MX2000-PSM-HC-DC-S-A |
| PSM 7     | REV 01  | 740-045050  | IPUPAJMKAA | MX2000-PSM-HC-DC-S-A |
| PSM 8     | REV 01  | 740-045050  | IPUPAJMKAA | MX2000-PSM-HC-DC-S-A |

|                  |        |            |            |                   |
|------------------|--------|------------|------------|-------------------|
| PSM 9            | REV 03 | 740-045050 | IPUPAJMKAA | MX2000-PSM-DC-S-A |
| PSM 10           | REV 03 | 740-045050 | IPUPAJMKAA | MX2000-PSM-DC-S-A |
| PSM 11           | REV 03 | 740-045050 | IPUPAJMKAA | MX2000-PSM-DC-S-A |
| PSM 12           | REV 03 | 740-045050 | IPUPAJMKAA | MX2000-PSM-DC-S-A |
| PSM 13           | REV 03 | 740-045050 | IPUPAJMKAA | MX2000-PSM-DC-S-A |
| PSM 15           | REV 03 | 740-045050 | IPUPAJMKAA | MX2000-PSM-DC-S-A |
| PDM 0            | REV 01 | 740-045234 |            |                   |
| PDM 1            | REV 01 | 740-045234 |            |                   |
| PDM 2            | REV 01 | 740-045234 | IPUPAJSKAA | MX2000-PDM-DC-S-A |
| Routing Engine 0 | REV 02 | 740-041821 |            | RE-S-1800X4-16G-S |
| Routing Engine 1 | REV 02 | 740-041821 |            | RE-S-1800X4-16G-S |
| CB 0             | REV 08 | 750-040257 | PROTOXCLEI | 750-040257        |
| CB 1             | REV 04 | 750-040257 | PROTOXCLEI | 750-040257        |
| SFB 0            | REV 05 | 711-044466 | IPUCBA6CAA | MX2000-SFB-S      |
| SFB 1            | REV 05 | 711-044466 | IPUCBA6CAA | MX2000-SFB-S      |
| SFB 2            | REV 05 | 711-044466 | IPUCBA6CAA | MX2000-SFB-S      |
| SFB 4            | REV 05 | 711-044466 | IPUCBA6CAA | MX2000-SFB-S      |
| SFB 5            | REV 05 | 711-044466 | IPUCBA6CAA | MX2000-SFB-S      |
| SFB 7            | REV 05 | 711-044466 | IPUCBA6CAA | MX2000-SFB-S      |
| FPC 0            | REV 30 | 750-028467 |            | MPC-3D-16XGE-SFPP |
| FPC 1            | REV 30 | 750-028467 |            | MPC-3D-16XGE-SFPP |
| FPC 2            | REV 30 | 750-028467 |            | MPC-3D-16XGE-SFPP |
| FPC 3            | REV 32 | 750-028467 |            | MPC-3D-16XGE-SFPP |
| FPC 4            | REV 32 | 750-028467 |            | MPC-3D-16XGE-SFPP |
| FPC 5            | REV 32 | 750-028467 |            | MPC-3D-16XGE-SFPP |
| FPC 6            | REV 30 | 750-028467 |            | MPC-3D-16XGE-SFPP |
| FPC 7            | REV 32 | 750-028467 |            | MPC-3D-16XGE-SFPP |
| FPC 8            | REV 30 | 750-028467 |            | MPC-3D-16XGE-SFPP |
| FPC 9            | REV 32 | 750-028467 |            | MPC-3D-16XGE-SFPP |
| FPC 10           | REV 30 | 750-028467 |            | MPC-3D-16XGE-SFPP |
| FPC 11           | REV 32 | 750-028467 |            | MPC-3D-16XGE-SFPP |
| FPC 12           | REV 30 | 750-028467 |            | MPC-3D-16XGE-SFPP |
| FPC 13           | REV 30 | 750-028467 |            | MPC-3D-16XGE-SFPP |
| FPC 14           | REV 23 | 750-028467 |            | MPC-3D-16XGE-SFPP |
| FPC 15           | REV 32 | 750-028467 |            | MPC-3D-16XGE-SFPP |
| FPC 16           | REV 30 | 750-028467 |            | MPC-3D-16XGE-SFPP |
| FPC 17           | REV 32 | 750-028467 |            | MPC-3D-16XGE-SFPP |
| FPC 18           | REV 30 | 750-028467 |            | MPC-3D-16XGE-SFPP |
| FPC 19           | REV 32 | 750-028467 |            | MPC-3D-16XGE-SFPP |
| ADC 0            | REV 13 | 750-043596 | PROTOXCLEI | PROTO-ASSEMBLY    |
| ADC 1            | REV 13 | 750-043596 | PROTOXCLEI | PROTO-ASSEMBLY    |
| ADC 2            | REV 13 | 750-043596 | IPUCBA8CAA | MX2000-LC-ADAPTER |
| ADC 3            | REV 13 | 750-043596 | IPUCBA8CAA | MX2000-LC-ADAPTER |
| ADC 4            | REV 13 | 750-043596 | IPUCBA8CAA | MX2000-LC-ADAPTER |
| ADC 5            | REV 13 | 750-043596 | PROTOXCLEI | PROTO-ASSEMBLY    |
| ADC 6            | REV 13 | 750-043596 | PROTOXCLEI | PROTO-ASSEMBLY    |
| ADC 7            | REV 07 | 750-043596 | PROTOXCLEI | MX2000-LC-ADAPTER |
| ADC 8            | REV 07 | 750-043596 | PROTOXCLEI | MX2000-LC-ADAPTER |
| ADC 9            | REV 07 | 750-043596 | PROTOXCLEI | MX2000-LC-ADAPTER |
| ADC 10           | REV 13 | 750-043596 | IPUCBA8CAA | MX2000-LC-ADAPTER |
| ADC 12           | REV 13 | 750-043596 | IPUCBA8CAA | MX2000-LC-ADAPTER |
| ADC 13           | REV 13 | 750-043596 | PROTOXCLEI | PROTO-ASSEMBLY    |
| ADC 14           | REV 13 | 750-043596 | PROTOXCLEI | PROTO-ASSEMBLY    |
| ADC 15           | REV 13 | 750-043596 | IPUCBA8CAA | MX2000-LC-ADAPTER |
| ADC 16           | REV 13 | 750-043596 | PROTOXCLEI | PROTO-ASSEMBLY    |
| ADC 17           | REV 13 | 750-043596 | PROTOXCLEI | PROTO-ASSEMBLY    |
| ADC 18           | REV 13 | 750-043596 | PROTOXCLEI | PROTO-ASSEMBLY    |
| ADC 19           | REV 11 | 750-043596 | PROTOXCLEI | PROTO-ASSEMBLY    |
| Fan Tray 0       | REV 04 | 760-046960 |            |                   |
| Fan Tray 1       | REV 04 | 760-046960 |            |                   |

```
Fan Tray 2 REV 04 760-046960
Fan Tray 3 REV 04 760-046960
```

# show chassis hardware (MX2020 Router with MPC5EQ and MPC6E)

```
user@host> show chassis hardware
```

```
Hardware inventory:
```

| Item             | Version | Part number | Serial number | Description          |
|------------------|---------|-------------|---------------|----------------------|
| Chassis          |         |             | JN120BADBAFJ  | MX2020               |
| Midplane         | REV 51  | 750-040240  | ABAB9243      | Lower Backplane      |
| Midplane 1       | REV 04  | 711-032386  | ABAB9399      | Upper Backplane      |
| PMP 1            | REV 05  | 711-032428  | ACAJ2541      | Upper Power Midplane |
| PMP 0            | REV 04  | 711-032426  | ACAJ2194      | Lower Power Midplane |
| FPM Board        | REV 13  | 760-040242  | ABCA8835      | Front Panel Display  |
| PSM 0            | REV 01  | 740-050037  | 1EDB32403L5   | DC 52V Power Supply  |
| Module           |         |             |               |                      |
| PSM 1            | REV 01  | 740-050037  | 1EDB32403L3   | DC 52V Power Supply  |
| Module           |         |             |               |                      |
| PSM 2            | REV 01  | 740-050037  | 1EDB32403KM   | DC 52V Power Supply  |
| Module           |         |             |               |                      |
| PSM 3            | REV 01  | 740-050037  | 1EDB3130079   | DC 52V Power Supply  |
| Module           |         |             |               |                      |
| PSM 4            | REV 01  | 740-050037  | 1EDB3130077   | DC 52V Power Supply  |
| Module           |         |             |               |                      |
| PSM 5            | REV 01  | 740-050037  | 1EDB3130020   | DC 52V Power Supply  |
| Module           |         |             |               |                      |
| PSM 6            | REV 01  | 740-050037  | 1EDB313009S   | DC 52V Power Supply  |
| Module           |         |             |               |                      |
| PSM 7            | REV 01  | 740-050037  | 1EDB313008E   | DC 52V Power Supply  |
| Module           |         |             |               |                      |
| PSM 8            | REV 01  | 740-050037  | 1EDB3130063   | DC 52V Power Supply  |
| Module           |         |             |               |                      |
| PSM 12           | REV 01  | 740-050037  | 1EDB3130026   | DC 52V Power Supply  |
| Module           |         |             |               |                      |
| PSM 13           | REV 01  | 740-050037  | 1EDB3130074   | DC 52V Power Supply  |
| Module           |         |             |               |                      |
| PSM 14           | REV 01  | 740-050037  | 1EDB313009D   | DC 52V Power Supply  |
| Module           |         |             |               |                      |
| PSM 15           | REV 01  | 740-050037  | 1EDB3130024   | DC 52V Power Supply  |
| Module           |         |             |               |                      |
| PSM 16           | REV 01  | 740-050037  | 1EDB3130054   | DC 52V Power Supply  |
| Module           |         |             |               |                      |
| PSM 17           | REV 01  | 740-050037  | 1EDB3130080   | DC 52V Power Supply  |
| Module           |         |             |               |                      |
| PDM 0            | REV 03  | 740-045234  | 1EGA3170144   | DC Power Dist Module |
| PDM 1            | REV 03  | 740-045234  | 1EGA3170158   | DC Power Dist Module |
| PDM 2            | REV 03  | 740-045234  | 1EGA3170182   | DC Power Dist Module |
| PDM 3            | REV 03  | 740-045234  | 1EGA3170207   | DC Power Dist Module |
| Routing Engine 0 | REV 02  | 740-041821  | 9009112112    | RE-S-1800x4          |
| Routing Engine 1 | REV 02  | 740-041821  | 9009112087    | RE-S-1800x4          |
| CB 0             | REV 23  | 750-040257  | CABA2295      | Control Board        |
| CB 1             | REV 23  | 750-040257  | CABE8379      | Control Board        |
| SPMB 0           | REV 02  | 711-041855  | ABCE8851      | PMB Board            |
| SPMB 1           | REV 02  | 711-041855  | ABCE8839      | PMB Board            |
| SFB 0            | REV 06  | 711-044466  | ABCD5001      | Switch Fabric Board  |
| SFB 1            | REV 06  | 711-044466  | ABCD5034      | Switch Fabric Board  |
| SFB 2            | REV 06  | 711-044466  | ABCH3899      | Switch Fabric Board  |
| SFB 3            | REV 06  | 711-044466  | ABCD5020      | Switch Fabric Board  |
| SFB 4            | REV 06  | 711-044466  | ABCD4975      | Switch Fabric Board  |
| SFB 5            | REV 06  | 711-044466  | ABCH3881      | Switch Fabric Board  |
| SFB 6            | REV 06  | 711-044466  | ABCD5026      | Switch Fabric Board  |

|          |        |            |              |                        |
|----------|--------|------------|--------------|------------------------|
| SFB 7    | REV 06 | 711-044466 | ABCD5032     | Switch Fabric Board    |
| FPC 0    | REV 39 | 750-045715 | CACD1902     | MPC5E 3D Q 24XGE+6XLGE |
| CPU      | REV 09 | 711-045719 | CACB1933     | RMPD PMB               |
| PIC 0    |        | BUILTIN    | BUILTIN      | 12X10GE SFPP OTN       |
| Xcvr 0   | REV 01 | 740-031980 | B11F00361    | SFP+-10G-SR            |
| Xcvr 2   | REV 01 | 740-021308 | 19T511101854 | SFP+-10G-SR            |
| Xcvr 3   | REV 01 | 740-021308 | 19T511100377 | SFP+-10G-SR            |
| Xcvr 4   | REV 01 | 740-031980 | ANT0878      | SFP+-10G-SR            |
| Xcvr 5   | REV 01 | 740-021308 | 19T511100398 | SFP+-10G-SR            |
| Xcvr 6   | REV 01 | 740-021308 | AQ4363J      | SFP+-10G-SR            |
| Xcvr 7   | REV 01 | 740-021308 | 19T511101377 | SFP+-10G-SR            |
| Xcvr 8   | REV 01 | 740-031980 | ANT072M      | SFP+-10G-SR            |
| Xcvr 9   | REV 01 | 740-021308 | AG90C7N      | SFP+-10G-SR            |
| Xcvr 10  | REV 01 | 740-031980 | AM30M09      | SFP+-10G-SR            |
| Xcvr 11  | REV 01 | 740-031980 | B10E01016    | SFP+-10G-SR            |
| PIC 1    |        | BUILTIN    | BUILTIN      | 12X10GE SFPP OTN       |
| Xcvr 0   | REV 01 | 740-031980 | B10L04151    | SFP+-10G-SR            |
| Xcvr 1   | REV 01 | 740-021308 | 19T511101379 | SFP+-10G-SR            |
| Xcvr 2   | REV 01 | 740-021308 | AQ5036J      | SFP+-10G-SR            |
| Xcvr 3   | REV 01 | 740-021308 | AG90C4M      | SFP+-10G-SR            |
| Xcvr 4   | REV 01 | 740-021308 | 19T511101104 | SFP+-10G-SR            |
| Xcvr 5   | REV 01 | 740-021308 | AQ502ZM      | SFP+-10G-SR            |
| Xcvr 6   | REV 01 | 740-021308 | AN10KY2      | SFP+-10G-SR            |
| Xcvr 7   | REV 01 | 740-021308 | AQ43G41      | SFP+-10G-SR            |
| Xcvr 8   | REV 01 | 740-021308 | AQ41F04      | SFP+-10G-SR            |
| Xcvr 9   | REV 01 | 740-031980 | AMS16N3      | SFP+-10G-SR            |
| Xcvr 10  | REV 01 | 740-021308 | AMH04Y3      | SFP+-10G-SR            |
| Xcvr 11  | REV 01 | 740-021308 | ANA093E      | SFP+-10G-SR            |
| PIC 2    |        | BUILTIN    | BUILTIN      | 3X40GE QSFPP           |
| PIC 3    |        | BUILTIN    | BUILTIN      | 3X40GE QSFPP           |
| WAN MEZZ | REV 09 | 750-049136 | CABN0410     | MPC5E 24XGE OTN Mezz   |
| FPC 1    | REV 11 | 750-045372 | CABK8112     | MPCE Type 3 3D         |
| CPU      | REV 08 | 711-035209 | CABJ6621     | HMPD PMB 2G            |
| MIC 0    | REV 07 | 750-033307 | CAAZ2897     | 10X10GE SFPP           |
| PIC 0    |        | BUILTIN    | BUILTIN      | 10X10GE SFPP           |
| Xcvr 0   | REV 01 | 740-021308 | AQ501VK      | SFP+-10G-SR            |
| Xcvr 1   | REV 01 | 740-021308 | AQ501YC      | SFP+-10G-SR            |
| Xcvr 2   | REV 01 | 740-021308 | AQ43HJF      | SFP+-10G-SR            |
| Xcvr 3   | REV 01 | 740-021308 | AQ43H8D      | SFP+-10G-SR            |
| Xcvr 4   | REV 01 | 740-021308 | 19T511100370 | SFP+-10G-SR            |
| Xcvr 5   | REV 01 | 740-031980 | 153363A00763 | SFP+-10G-SR            |
| Xcvr 6   | REV 01 | 740-021308 | APH2LXB      | SFP+-10G-SR            |
| Xcvr 7   | REV 01 | 740-031980 | AMCOLVV      | SFP+-10G-SR            |
| Xcvr 8   | REV 01 | 740-031980 | B11F00230    | SFP+-10G-SR            |
| MIC 1    | REV 14 | 750-033196 | CAAP1390     | 1X100GE CXP            |
| PIC 2    |        | BUILTIN    | BUILTIN      | 1X100GE CXP            |
| Xcvr 0   | REV 01 | 740-032166 | XB11F000M    | CFP2-100G-SR10         |
| FPC 2    | REV 17 | 750-037355 | CAAS5826     | MPC4E 3D 2CGE+8XGE     |
| CPU      | REV 08 | 711-035209 | CAAR3986     | HMPD PMB 2G            |
| PIC 0    |        | BUILTIN    | BUILTIN      | 4x10GE SFPP            |
| Xcvr 0   | REV 01 | 740-021308 | T09F43722    | SFP+-10G-SR            |
| Xcvr 1   | REV 01 | 740-031980 | ALPOKXF      | SFP+-10G-SR            |
| Xcvr 2   | REV 01 | 740-021308 | AQ502FG      | SFP+-10G-SR            |
| Xcvr 3   | REV 01 | 740-021308 | AQ502T7      | SFP+-10G-SR            |
| PIC 1    |        | BUILTIN    | BUILTIN      | 1X100GE CFP            |
| Xcvr 0   | REV 01 | 740-035329 | X12J00571    | CFP-100G-SR10          |
| PIC 2    |        | BUILTIN    | BUILTIN      | 4x10GE SFPP            |
| Xcvr 0   | REV 01 | 740-031980 | AJ71KEH      | SFP+-10G-SR            |
| Xcvr 1   | REV 01 | 740-031980 | B11E01355    | SFP+-10G-SR            |
| Xcvr 3   | REV 01 | 740-031980 | B11F00249    | SFP+-10G-SR            |
| PIC 3    |        | BUILTIN    | BUILTIN      | 1X100GE CFP            |

|        |             |            |           |                      |
|--------|-------------|------------|-----------|----------------------|
| FPC 3  | REV 05      | 750-044444 | CAAY9920  | MPCE Type 2 3D P     |
| CPU    | REV 04      | 711-038484 | CAAW3639  | MPCE PMB 2G          |
| MIC 0  | REV 28      | 750-028387 | CAAX1083  | 3D 4x 10GE XFP       |
| PIC 0  |             | BUILTIN    | BUILTIN   | 2x 10GE XFP          |
| Xcvr 0 |             | NON-JNPR   | CC07BK05B | XFP-10G-SR           |
| Xcvr 1 | REV 01      | 740-011571 | C728XJ00U | XFP-10G-SR           |
| PIC 1  |             | BUILTIN    | BUILTIN   | 2x 10GE XFP          |
| Xcvr 0 |             | NON-JNPR   | T12L92339 | XFP-10G-SR           |
| QXM 0  | REV 06      | 711-028408 | CAAW4915  | MPC QXM              |
| QXM 1  | REV 06      | 711-028408 | CAAW4894  | MPC QXM              |
| FPC 4  | REV 18      | 750-046005 | CACH5661  | MPC5E 3D Q 2CGE+4XGE |
| CPU    | REV 09      | 711-045719 | CACF2880  | RMPC PMB             |
| PIC 0  |             | BUILTIN    | BUILTIN   | 2X10GE SFPP OTN      |
| PIC 1  |             | BUILTIN    | BUILTIN   | 1X100GE CFP2 OTN     |
| Xcvr 0 | REV 01      | 740-046563 | XD16FC03Y | CFP2-100G-SR10       |
| PIC 2  |             | BUILTIN    | BUILTIN   | 2X10GE SFPP OTN      |
| PIC 3  |             | BUILTIN    | BUILTIN   | 1X100GE CFP2 OTN     |
| Xcvr 0 | REV 01      | 740-049775 | J13K72997 | CFP2-100G-LR4-D      |
| FPC 5  | REV 35      | 750-028467 | CAAR2623  | MPC 3D 16x 10GE      |
| CPU    | REV 11      | 711-029089 | CAAR0491  | AMPC PMB             |
| PIC 0  |             | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+    |
| Xcvr 0 | REV 01      | 740-021308 | AQ5027T   | SFP+-10G-SR          |
| Xcvr 1 | REV 01      | 740-021308 | AQ502J0   | SFP+-10G-SR          |
| Xcvr 2 | REV 01      | 740-021308 | AQ5027S   | SFP+-10G-SR          |
| Xcvr 3 | REV 01      | 740-021308 | AQ501Y7   | SFP+-10G-SR          |
| PIC 1  |             | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+    |
| Xcvr 0 | REV 01      | 740-021308 | AQ501YB   | SFP+-10G-SR          |
| Xcvr 1 | REV 01      | 740-021308 | AQ503EB   | SFP+-10G-SR          |
| Xcvr 2 | REV 01      | 740-021308 | AQ43HJH   | SFP+-10G-SR          |
| Xcvr 3 | REV 01      | 740-021308 | AQ43J0Y   | SFP+-10G-SR          |
| PIC 2  |             | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+    |
| Xcvr 0 | REV 01      | 740-021308 | AQ50352   | SFP+-10G-SR          |
| Xcvr 1 | REV 01      | 740-021308 | AQ501X6   | SFP+-10G-SR          |
| Xcvr 2 | REV 01      | 740-021308 | AQ502NV   | SFP+-10G-SR          |
| Xcvr 3 | REV 01      | 740-021308 | AQ502ZJ   | SFP+-10G-SR          |
| PIC 3  |             | BUILTIN    | BUILTIN   | 4x 10GE(LAN) SFP+    |
| Xcvr 0 | REV 01      | 740-021308 | AQ502H4   | SFP+-10G-SR          |
| Xcvr 1 | REV 01      | 740-021308 | AQ43HJK   | SFP+-10G-SR          |
| Xcvr 2 | REV 01      | 740-031980 | AJ30CU7   | SFP+-10G-SR          |
| FPC 9  | REV 30      | 750-044130 | ABCF5773  | MPC6E 3D             |
| CPU    | REV 09      | 711-045719 | ABCF1270  | RMPC PMB             |
| MIC 0  | REV 05      | 750-049457 | ABCD7829  | 2X100GE CFP2 OTN     |
| PIC 0  |             | BUILTIN    | BUILTIN   | 2X100GE CFP2 OTN     |
| Xcvr 0 |             | NON-JNPR   | FE13F000K | CFP2-100G-SR10       |
| Xcvr 1 | REV 01      | 740-048813 | XD32FE017 | CFP2-100G-LR-D       |
| MIC 1  | REV 07      | 750-049457 | ABCK2812  | 2X100GE CFP2 OTN     |
| PIC 1  |             | BUILTIN    | BUILTIN   | 2X100GE CFP2 OTN     |
| Xcvr 0 | REV 01      | 740-048813 | XD32FE018 | CFP2-100G-SR10       |
| Xcvr 1 |             | NON-JNPR   | FE13F000E | CFP2-100G-LR4-D      |
| XLM 0  | REV 05.2.00 | 711-046638 | ABCF5915  | MPC6E XL             |
| XLM 1  | REV 05.2.00 | 711-046638 | ABCF5916  | MPC6E XL             |
| FPC 10 | REV 36      | 750-044130 | ABCS8602  | MPC6E 3D             |
| CPU    | REV 09      | 711-045719 | ABCS8779  | RMPC PMB             |
| MIC 0  | REV 06      | 750-049979 | ABCK2656  | 24X10GE SFPP OTN     |
| PIC 0  |             | BUILTIN    | BUILTIN   | 24X10GE SFPP OTN     |
| Xcvr 0 | REV 01      | 740-021308 | AQ43J08   | SFP+-10G-SR          |
| Xcvr 1 | REV 01      | 740-021308 | AQE1Y2E   | SFP+-10G-SR          |
| Xcvr 2 | REV 01      | 740-021308 | AQE1UW4   | SFP+-10G-SR          |
| Xcvr 3 | REV 01      | 740-021308 | AQE1MQF   | SFP+-10G-SR          |
| Xcvr 4 | REV 01      | 740-021308 | AQGOMN1   | SFP+-10G-SR          |
| Xcvr 5 | REV 01      | 740-021308 | AQE1L9M   | SFP+-10G-SR          |

|         |             |            |              |                        |
|---------|-------------|------------|--------------|------------------------|
| Xcvr 6  | REV 01      | 740-021308 | AQGOMPD      | SFP+-10G-SR            |
| Xcvr 7  | REV 01      | 740-021308 | AQE1Y2B      | SFP+-10G-SR            |
| Xcvr 8  | REV 01      | 740-021308 | AQGOLT5      | SFP+-10G-SR            |
| Xcvr 9  | REV 01      | 740-021308 | AQD2ET4      | SFP+-10G-SR            |
| Xcvr 10 | REV 01      | 740-021308 | AQGOMPC      | SFP+-10G-SR            |
| Xcvr 11 | REV 01      | 740-021308 | AQGOM63      | SFP+-10G-SR            |
| Xcvr 12 | REV 01      | 740-021308 | AQGOLT1      | SFP+-10G-SR            |
| Xcvr 13 | REV 01      | 740-021308 | AQGOM4L      | SFP+-10G-SR            |
| Xcvr 14 | REV 01      | 740-021308 | AQGOLS7      | SFP+-10G-SR            |
| Xcvr 15 | REV 01      | 740-021308 | AQE1MQB      | SFP+-10G-SR            |
| Xcvr 16 | REV 01      | 740-021308 | AQGOLZP      | SFP+-10G-SR            |
| Xcvr 17 | REV 01      | 740-021308 | AQE1LU9      | SFP+-10G-SR            |
| Xcvr 18 | REV 01      | 740-021308 | AQGOMRZ      | SFP+-10G-SR            |
| Xcvr 19 | REV 01      | 740-021308 | AQE1MQ9      | SFP+-10G-SR            |
| Xcvr 20 | REV 01      | 740-021308 | AQGOLRX      | SFP+-10G-SR            |
| Xcvr 21 | REV 01      | 740-021308 | AQE1UWD      | SFP+-10G-SR            |
| Xcvr 22 | REV 01      | 740-021308 | AQGOLT4      | SFP+-10G-SR            |
| Xcvr 23 | REV 01      | 740-021308 | AQE1MQL      | SFP+-10G-SR            |
| MIC 1   | REV 12      | 750-050008 | ABCK5372     | 4X100GE CXP            |
| PIC 1   |             | BUILTIN    | BUILTIN      | 4X100GE CXP            |
| Xcvr 3  | REV 01      | 740-046563 | XD16FC02Z    | CFP2-100G-SR10         |
| XLM 0   | REV 07.2.00 | 711-046638 | ABCK3481     | MPC6E XL               |
| XLM 1   | REV 07.2.00 | 711-046638 | ABCK4725     | MPC6E XL               |
| FPC 17  | REV 28      | 750-044130 | ABBZ3873     | MPC6E 3D               |
| CPU     | REV 08      | 711-045719 | ABBZ3770     | RMPD PMB               |
| MIC 0   | REV 11      | 750-046535 | ABCC7731     | 24X10GE SFPP           |
| PIC 0   |             | BUILTIN    | BUILTIN      | 24X10GE SFPP           |
| Xcvr 1  | REV 01      | 740-021308 | APK0543      | SFP+-10G-SR            |
| Xcvr 2  | REV 01      | 740-031980 | B10G01119    | SFP+-10G-SR            |
| Xcvr 3  | REV 01      | 740-021308 | AQ502SX      | SFP+-10G-SR            |
| Xcvr 4  | REV 01      | 740-021308 | AQ43H84      | SFP+-10G-SR            |
| Xcvr 5  | REV 01      | 740-021308 | AQ501TB      | SFP+-10G-SR            |
| Xcvr 6  | REV 01      | 740-021308 | AQ502JZ      | SFP+-10G-SR            |
| Xcvr 7  | REV 01      | 740-021308 | AQ502SC      | SFP+-10G-SR            |
| Xcvr 8  | REV 01      | 740-021308 | AQ502JW      | SFP+-10G-SR            |
| Xcvr 9  | REV 01      | 740-021308 | AQ502RM      | SFP+-10G-SR            |
| Xcvr 10 | REV 01      | 740-031980 | AHK013B      | SFP+-10G-SR            |
| Xcvr 11 | REV 01      | 740-021308 | AQGOMRT      | SFP+-10G-SR            |
| Xcvr 13 | REV 01      | 740-031980 | AMC0JTC      | SFP+-10G-SR            |
| Xcvr 14 | REV 01      | 740-021308 | ANAOMQ0      | SFP+-10G-SR            |
| Xcvr 15 | REV 01      | 740-021308 | AQ502GS      | SFP+-10G-SR            |
| Xcvr 16 | REV 01      | 740-021308 | AQGOM0J      | SFP+-10G-SR            |
| Xcvr 17 | REV 01      | 740-021308 | AQGOMUR      | SFP+-10G-SR            |
| Xcvr 18 | REV 01      | 740-021308 | AQGOMRR      | SFP+-10G-SR            |
| Xcvr 19 | REV 01      | 740-021308 | AQGOM0F      | SFP+-10G-SR            |
| Xcvr 20 | REV 01      | 740-021308 | AQ50312      | SFP+-10G-SR            |
| Xcvr 21 | REV 01      | 740-021308 | AQ5032U      | SFP+-10G-SR            |
| Xcvr 22 | REV 01      | 740-021308 | APE17B5      | SFP+-10G-SR            |
| Xcvr 23 | REV 01      | 740-021309 | 91D104A00011 | SFP+-10G-LR            |
| MIC 1   | REV 03      | 750-050008 | ABCC4522     | 4X100GE CXP            |
| PIC 1   |             | BUILTIN    | BUILTIN      | 4X100GE CXP            |
| Xcvr 0  | REV 01      | 740-046563 | XD16FC02U    | CFP2-100G-SR10         |
| Xcvr 1  | REV 01      | 740-046563 | XC42FC03K    | CFP2-100G-SR10         |
| Xcvr 2  | REV 01      | 740-046563 | XC42FC01Z    | CFP2-100G-SR10         |
| Xcvr 3  | REV 01      | 740-046563 | XC42FC02U    | CFP2-100G-SR10         |
| XLM 0   | REV 04.2.00 | 711-046638 | ABBZ3779     | MPC6E XL               |
| XLM 1   | REV 04.2.00 | 711-046638 | ABBZ3780     | MPC6E XL               |
| FPC 18  | REV 39      | 750-045715 | CACD1910     | MPC5E 3D Q 24XGE+6XLGE |
| CPU     | REV 09      | 711-045719 | CACD1817     | RMPD PMB               |
| PIC 0   |             | BUILTIN    | BUILTIN      | 12X10GE SFPP OTN       |
| PIC 1   |             | BUILTIN    | BUILTIN      | 12X10GE SFPP OTN       |

|            |        |            |          |                        |
|------------|--------|------------|----------|------------------------|
| PIC 2      |        | BUILTIN    | BUILTIN  | 3X40GE QSFPP           |
| Xcvr 0     | REV 01 | 740-046565 | QD130194 | QSFP+-40G-SR4          |
| Xcvr 1     | REV 01 | 740-046565 | QD130193 | QSFP+-40G-SR4          |
| Xcvr 2     | REV 01 | 740-046565 | QD130196 | QSFP+-40G-SR4          |
| PIC 3      |        | BUILTIN    | BUILTIN  | 3X40GE QSFPP           |
| Xcvr 0     | REV 01 | 740-046565 | QD130191 | QSFP+-40G-SR4          |
| Xcvr 1     | REV 01 | 740-046565 | QD130198 | QSFP+-40G-SR4          |
| Xcvr 2     | REV 01 | 740-046565 | QD130192 | QSFP+-40G-SR4          |
| WAN MEZZ   | REV 09 | 750-049136 | CABN0411 | MPC5E 24XGE OTN Mezz   |
| FPC 19     | REV 39 | 750-045715 | CACD1908 | MPC5E 3D Q 24XGE+6XLGE |
| CPU        | REV 09 | 711-045719 | CACD1820 | RMPC PMB               |
| PIC 0      |        | BUILTIN    | BUILTIN  | 12X10GE SFPP OTN       |
| Xcvr 0     | REV 01 | 740-021308 | AQA0EXJ  | SFP+-10G-SR            |
| Xcvr 1     | REV 01 | 740-021308 | AQGOM6D  | SFP+-10G-SR            |
| Xcvr 2     | REV 01 | 740-021308 | AQGOLW7  | SFP+-10G-SR            |
| Xcvr 3     | REV 01 | 740-021308 | AQA0JKB  | SFP+-10G-SR            |
| Xcvr 4     | REV 01 | 740-021308 | AQGOMTM  | SFP+-10G-SR            |
| Xcvr 5     | REV 01 | 740-021308 | AQA07NE  | SFP+-10G-SR            |
| Xcvr 6     | REV 01 | 740-021308 | AQGOM41  | SFP+-10G-SR            |
| Xcvr 7     | REV 01 | 740-021308 | AQGOMU7  | SFP+-10G-SR            |
| Xcvr 8     | REV 01 | 740-021308 | AQGOMUG  | SFP+-10G-SR            |
| Xcvr 9     | REV 01 | 740-021308 | AQGOMMX  | SFP+-10G-SR            |
| Xcvr 10    | REV 01 | 740-021308 | AQGOM5K  | SFP+-10G-SR            |
| Xcvr 11    | REV 01 | 740-021308 | AQGOLVZ  | SFP+-10G-SR            |
| PIC 1      |        | BUILTIN    | BUILTIN  | 12X10GE SFPP OTN       |
| PIC 2      |        | BUILTIN    | BUILTIN  | 3X40GE QSFPP           |
| PIC 3      |        | BUILTIN    | BUILTIN  | 3X40GE QSFPP           |
| Xcvr 0     | REV 01 | 740-046565 | QD130242 | QSFP+-40G-SR4          |
| Xcvr 1     | REV 01 | 740-046565 | QD130245 | QSFP+-40G-SR4          |
| Xcvr 2     | REV 01 | 740-046565 | QD130613 | QSFP+-40G-SR4          |
| WAN MEZZ   | REV 09 | 750-049136 | CABN0418 | MPC5E 24XGE OTN Mezz   |
| ADC 0      | REV 17 | 750-043596 | ABCD5378 | Adapter Card           |
| ADC 1      | REV 17 | 750-043596 | ABCD5465 | Adapter Card           |
| ADC 2      | REV 17 | 750-043596 | ABCD5431 | Adapter Card           |
| ADC 3      | REV 17 | 750-043596 | ABCD5356 | Adapter Card           |
| ADC 4      | REV 02 | 750-043596 | ZW1545   | Adapter Card           |
| ADC 5      | REV 17 | 750-043596 | ABCD5517 | Adapter Card           |
| ADC 18     | REV 17 | 750-043596 | ABCD5535 | Adapter Card           |
| ADC 19     | REV 01 | 750-043596 | ZV4127   | Adapter Card           |
| Fan Tray 0 | REV 06 | 760-046960 | ACAY0791 | 172mm FanTray - 6 Fans |
| Fan Tray 1 | REV 06 | 760-046960 | ACAY0788 | 172mm FanTray - 6 Fans |
| Fan Tray 2 | REV 06 | 760-046960 | ACAY0755 | 172mm FanTray - 6 Fans |
| Fan Tray 3 | REV 06 | 760-046960 | ACAY0441 | 172mm FanTray - 6 Fans |

#### show chassis hardware detail (MX2020 Router with MPC5EQ and MPC6E)

```
user@host>show chassis hardware detail
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Hardware inventory:
```

| Item       | Version | Part number | Serial number | Description          |
|------------|---------|-------------|---------------|----------------------|
| Chassis    |         |             | JN120BADBAFJ  | MX2020               |
| Midplane   | REV 51  | 750-040240  | ABAB9243      | Lower Backplane      |
| Midplane 1 | REV 04  | 711-032386  | ABAB9399      | Upper Backplane      |
| PMP 1      | REV 05  | 711-032428  | ACAJ2541      | Upper Power Midplane |
| PMP 0      | REV 04  | 711-032426  | ACAJ2194      | Lower Power Midplane |
| FPM Board  | REV 13  | 760-040242  | ABCA8835      | Front Panel Display  |
| PSM 0      | REV 01  | 740-050037  | 1EDB32403L5   | DC 52V Power Supply  |
| Module     |         |             |               |                      |
| PSM 1      | REV 01  | 740-050037  | 1EDB32403L3   | DC 52V Power Supply  |
| Module     |         |             |               |                      |
| PSM 2      | REV 01  | 740-050037  | 1EDB32403KM   | DC 52V Power Supply  |
| Module     |         |             |               |                      |



|                  |        |                        |                      |                        |
|------------------|--------|------------------------|----------------------|------------------------|
| PSM 3            | REV 01 | 740-050037             | 1EDB3130079          | DC 52V Power Supply    |
| Module           |        |                        |                      |                        |
| PSM 4            | REV 01 | 740-050037             | 1EDB3130077          | DC 52V Power Supply    |
| Module           |        |                        |                      |                        |
| PSM 5            | REV 01 | 740-050037             | 1EDB3130020          | DC 52V Power Supply    |
| Module           |        |                        |                      |                        |
| PSM 6            | REV 01 | 740-050037             | 1EDB313009S          | DC 52V Power Supply    |
| Module           |        |                        |                      |                        |
| PSM 7            | REV 01 | 740-050037             | 1EDB313008E          | DC 52V Power Supply    |
| Module           |        |                        |                      |                        |
| PSM 8            | REV 01 | 740-050037             | 1EDB3130063          | DC 52V Power Supply    |
| Module           |        |                        |                      |                        |
| PSM 12           | REV 01 | 740-050037             | 1EDB3130026          | DC 52V Power Supply    |
| Module           |        |                        |                      |                        |
| PSM 13           | REV 01 | 740-050037             | 1EDB3130074          | DC 52V Power Supply    |
| Module           |        |                        |                      |                        |
| PSM 14           | REV 01 | 740-050037             | 1EDB313009D          | DC 52V Power Supply    |
| Module           |        |                        |                      |                        |
| PSM 15           | REV 01 | 740-050037             | 1EDB3130024          | DC 52V Power Supply    |
| Module           |        |                        |                      |                        |
| PSM 16           | REV 01 | 740-050037             | 1EDB3130054          | DC 52V Power Supply    |
| Module           |        |                        |                      |                        |
| PSM 17           | REV 01 | 740-050037             | 1EDB3130080          | DC 52V Power Supply    |
| Module           |        |                        |                      |                        |
| PDM 0            | REV 03 | 740-045234             | 1EGA3170144          | DC Power Dist Module   |
| PDM 1            | REV 03 | 740-045234             | 1EGA3170158          | DC Power Dist Module   |
| PDM 2            | REV 03 | 740-045234             | 1EGA3170182          | DC Power Dist Module   |
| PDM 3            | REV 03 | 740-045234             | 1EGA3170207          | DC Power Dist Module   |
| Routing Engine 0 | REV 02 | 740-041821             | 9009112112           | RE-S-1800x4            |
| ad0 3998 MB      |        | Virtium - TuffDrive    | VCF P1T0200274310822 | 113 Compact Flash      |
| ad1 30533 MB     |        | UGB94BPH32H0S1-KCI     | 11000031656          | Disk 1                 |
| usb0 (addr 1)    |        | EHCI root hub 0        | Intel                | uhub0                  |
| usb0 (addr 2)    |        | product 0x0020 32      | vendor 0x8087        | uhub1                  |
| DIMM 0           |        | SGU04G72H1BD2SA-BB DIE | REV-52 PCB REV-54    | MFR ID-ce80            |
| DIMM 1           |        | SGU04G72H1BD2SA-BB DIE | REV-52 PCB REV-54    | MFR ID-ce80            |
| DIMM 2           |        | SGU04G72H1BD2SA-BB DIE | REV-52 PCB REV-54    | MFR ID-ce80            |
| DIMM 3           |        | SGU04G72H1BD2SA-BB DIE | REV-52 PCB REV-54    | MFR ID-ce80            |
| Routing Engine 1 | REV 02 | 740-041821             | 9009112087           | RE-S-1800x4            |
| ad0 3998 MB      |        | Virtium - TuffDrive    | VCF P1T0200274310822 | 366 Compact Flash      |
| ad1 30533 MB     |        | UGB94BPH32H0S1-KCI     | 11000039979          | Disk 1                 |
| CB 0             | REV 23 | 750-040257             | CABA2295             | Control Board          |
| CB 1             | REV 23 | 750-040257             | CABE8379             | Control Board          |
| SPMB 0           |        |                        |                      |                        |
| SPMB 1           |        |                        |                      |                        |
| FPC 0            | REV 39 | 750-045715             | CACD1902             | MPC5E 3D Q 24XGE+6XLGE |
| CPU              |        |                        |                      |                        |
| FPC 1            | REV 11 | 750-045372             | CABK8112             | MPCE Type 3 3D         |
| CPU              |        |                        |                      |                        |
| FPC 2            | REV 17 | 750-037355             | CAAS5826             | MPC4E 3D 2CGE+8XGE     |
| CPU              |        |                        |                      |                        |
| FPC 3            | REV 05 | 750-044444             | CAAY9920             | MPCE Type 2 3D P       |
| CPU              |        |                        |                      |                        |
| FPC 4            | REV 18 | 750-046005             | CACH5661             | MPC5E 3D Q 2CGE+4XGE   |
| CPU              |        |                        |                      |                        |
| FPC 5            | REV 35 | 750-028467             | CAAR2623             | MPC 3D 16x 10GE        |
| CPU              |        |                        |                      |                        |
| FPC 9            | REV 30 | 750-044130             | ABCF5773             | MPC6E 3D               |
| CPU              |        |                        |                      |                        |
| FPC 10           | REV 36 | 750-044130             | ABCS8602             | MPC6E 3D               |
| CPU              |        |                        |                      |                        |
| FPC 17           | REV 28 | 750-044130             | ABBZ3873             | MPC6E 3D               |

|            |        |            |          |                        |
|------------|--------|------------|----------|------------------------|
| CPU        |        |            |          |                        |
| FPC 18     | REV 39 | 750-045715 | CACD1910 | MPC5E 3D Q 24XGE+6XLGE |
| CPU        |        |            |          |                        |
| FPC 19     | REV 39 | 750-045715 | CACD1908 | MPC5E 3D Q 24XGE+6XLGE |
| CPU        |        |            |          |                        |
| Fan Tray 0 | REV 06 | 760-046960 | ACAY0791 | 172mm FanTray - 6 Fans |
| Fan Tray 1 | REV 06 | 760-046960 | ACAY0788 | 172mm FanTray - 6 Fans |
| Fan Tray 2 | REV 06 | 760-046960 | ACAY0755 | 172mm FanTray - 6 Fans |
| Fan Tray 3 | REV 06 | 760-046960 | ACAY0441 | 172mm FanTray - 6 Fans |

#### show chassis hardware extensive (MX2020 Router with MPC5EQ and MPC6E)

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Hardware inventory:
Item Version Part number Serial number Description
Chassis
Jedec Code: 0x7fb0 EEPROM Version: 0x02
S/N: JN120BADBAFJ
Assembly ID: 0x0557 Assembly Version: 00.00
Date: 00-00-0000 Assembly Flags: 0x00
ID: MX2020
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 7f b0 02 ff 05 57 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x20: 4a 4e 31 32 30 42 41 44 42 41 46 4a 00 00 00 00
Address 0x30: 00 00 00 ff 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Midplane REV 51 750-040240 ABAB9243 Lower Backplane
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 750-040240 S/N: ABAB9243
Assembly ID: 0x0b22 Assembly Version: 01.51
Date: 05-30-2013 Assembly Flags: 0x00
Version: REV 51 CLEI Code: IPMU710ARA
ID: Lower Backplane FRU Model Number: CHAS-BP-MX2020-S
Board Information Record:
Address 0x00: ad 01 10 00 4c 96 14 72 30 08 ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 22 01 33 52 45 56 20 35 31 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 34 30 32 34 30 00 00
Address 0x20: 53 2f 4e 20 41 42 41 42 39 32 34 33 00 1e 05 07
Address 0x30: dd ff ff ff ad 01 10 00 4c 96 14 72 30 08 ff ff
Address 0x40: ff ff ff ff 01 49 50 4d 55 37 31 30 41 52 41 43
Address 0x50: 48 41 53 2d 42 50 2d 4d 58 32 30 32 30 2d 53 00
Address 0x60: 00 00 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff d3 ff ff ff ff ff ff ff ff ff ff ff ff
Midplane 1 REV 04 711-032386 ABAB9399 Upper Backplane
Jedec Code: 0x7fb0 EEPROM Version: 0x01
P/N: 711-032386 S/N: ABAB9399
Assembly ID: 0x0b23 Assembly Version: 01.04
Date: 10-22-2012 Assembly Flags: 0x00
Version: REV 04
ID: Upper Backplane
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 01 fe 0b 23 01 04 52 45 56 20 30 34 00 00
Address 0x10: 00 00 00 00 37 31 31 2d 30 33 32 33 38 36 00 00

```

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Address 0x20: 53 2f 4e 20 41 42 41 42 39 33 39 39 00 16 0a 07
Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff
Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
PMP 1 REV 05 711-032428 ACAJ2541 Upper Power Midplane
Jedec Code: 0x7fb0 EEPROM Version: 0x01
P/N: 711-032428 S/N: ACAJ2541
Assembly ID: 0x045c Assembly Version: 01.05
Date: 04-26-2013 Assembly Flags: 0x00
Version: REV 05
ID: Upper Power Midplane
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 01 ff 04 5c 01 05 52 45 56 20 30 35 00 00
Address 0x10: 00 00 00 00 37 31 31 2d 30 33 32 34 32 38 00 00
Address 0x20: 53 2f 4e 20 41 43 41 4a 32 35 34 31 00 1a 04 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff
Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
PMP 0 REV 04 711-032426 ACAJ2194 Lower Power Midplane
Jedec Code: 0x7fb0 EEPROM Version: 0x01
P/N: 711-032426 S/N: ACAJ2194
Assembly ID: 0x045d Assembly Version: 01.04
Date: 01-29-2013 Assembly Flags: 0x00
Version: REV 04
ID: Lower Power Midplane
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 01 ff 04 5d 01 04 52 45 56 20 30 34 00 00
Address 0x10: 00 00 00 00 37 31 31 2d 30 33 32 34 32 36 00 00
Address 0x20: 53 2f 4e 20 41 43 41 4a 32 31 39 34 00 1d 01 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff
Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
FPM Board REV 13 760-040242 ABCA8835 Front Panel Display
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 760-040242 S/N: ABCA8835
Assembly ID: 0x0b24 Assembly Version: 01.13
Date: 04-13-2013 Assembly Flags: 0x00
Version: REV 13 CLEI Code: IPMYAE5JRA
ID: Front Panel Display FRU Model Number: MX2020-CRAFT-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 24 01 0d 52 45 56 20 31 33 00 00
Address 0x10: 00 00 00 00 37 36 30 2d 30 34 30 32 34 32 00 00
Address 0x20: 53 2f 4e 20 41 42 43 41 38 38 33 35 00 0d 04 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 4d 59 41 45 35 4a 52 41 4d
Address 0x50: 58 32 30 32 30 2d 43 52 41 46 54 2d 53 00 00 00
Address 0x60: 00 00 00 00 00 00 41 00 00 ff ff ff ff ff ff
Address 0x70: ff ff ff 95 ff ff ff ff ff ff ff ff ff ff ff
PSM 0 REV 01 740-050037 1EDB32403L5 DC 52V Power Supply

```

```

Module
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-050037 S/N: 1EDB32403L5
Assembly ID: 0x0478 Assembly Version: 01.01
Date: 06-21-2013 Assembly Flags: 0x00
Version: REV 01 CLEI Code: IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 33 32 34 30 33 4c 35 00 00 15 06 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 1 REV 01 740-050037 1EDB32403L3 DC 52V Power Supply
Module
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-050037 S/N: 1EDB32403L3
Assembly ID: 0x0478 Assembly Version: 01.01
Date: 06-21-2013 Assembly Flags: 0x00
Version: REV 01 CLEI Code: IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 33 32 34 30 33 4c 33 00 00 15 06 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 2 REV 01 740-050037 1EDB32403KM DC 52V Power Supply
Module
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-050037 S/N: 1EDB32403KM
Assembly ID: 0x0478 Assembly Version: 01.01
Date: 06-21-2013 Assembly Flags: 0x00
Version: REV 01 CLEI Code: IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 33 32 34 30 33 4b 4d 00 00 15 06 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 3 REV 01 740-050037 1EDB3130079 DC 52V Power Supply
Module
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-050037 S/N: 1EDB3130079
Assembly ID: 0x0478 Assembly Version: 01.01

```

```

Date: 05-16-2013 Assembly Flags: 0x00
Version: REV 01 CLEI Code: IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 33 31 33 30 30 37 39 00 00 10 05 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff
Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 4 REV 01 740-050037 1EDB3130077 DC 52V Power Supply
Module
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-050037 S/N: 1EDB3130077
Assembly ID: 0x0478 Assembly Version: 01.01
Date: 05-17-2013 Assembly Flags: 0x00
Version: REV 01 CLEI Code: IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 33 31 33 30 30 37 37 00 00 11 05 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff
Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 5 REV 01 740-050037 1EDB3130020 DC 52V Power Supply
Module
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-050037 S/N: 1EDB3130020
Assembly ID: 0x0478 Assembly Version: 01.01
Date: 05-16-2013 Assembly Flags: 0x00
Version: REV 01 CLEI Code: IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 33 31 33 30 30 32 30 00 00 10 05 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff
Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 6 REV 01 740-050037 1EDB313009S DC 52V Power Supply
Module
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-050037 S/N: 1EDB313009S
Assembly ID: 0x0478 Assembly Version: 01.01
Date: 05-17-2013 Assembly Flags: 0x00
Version: REV 01 CLEI Code: IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:

```

```

Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 33 31 33 30 30 39 53 00 00 11 05 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 7 REV 01 740-050037 1EDB313008E DC 52V Power Supply
Module
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-050037 S/N: 1EDB313008E
Assembly ID: 0x0478 Assembly Version: 01.01
Date: 05-17-2013 Assembly Flags: 0x00
Version: REV 01 CLEI Code: IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 33 31 33 30 30 38 45 00 00 11 05 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 8 REV 01 740-050037 1EDB3130063 DC 52V Power Supply
Module
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-050037 S/N: 1EDB3130063
Assembly ID: 0x0478 Assembly Version: 01.01
Date: 05-17-2013 Assembly Flags: 0x00
Version: REV 01 CLEI Code: IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 33 31 33 30 30 36 33 00 00 11 05 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 12 REV 01 740-050037 1EDB3130026 DC 52V Power Supply
Module
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-050037 S/N: 1EDB3130026
Assembly ID: 0x0478 Assembly Version: 01.01
Date: 05-16-2013 Assembly Flags: 0x00
Version: REV 01 CLEI Code: IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00

```

```

Address 0x20: 31 45 44 42 33 31 33 30 30 32 36 00 00 10 05 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff
Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 13 REV 01 740-050037 1EDB3130074 DC 52V Power Supply
Module
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-050037 S/N: 1EDB3130074
Assembly ID: 0x0478 Assembly Version: 01.01
Date: 05-17-2013 Assembly Flags: 0x00
Version: REV 01 CLEI Code: IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 33 31 33 30 30 37 34 00 00 11 05 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff
Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 14 REV 01 740-050037 1EDB313009D DC 52V Power Supply
Module
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-050037 S/N: 1EDB313009D
Assembly ID: 0x0478 Assembly Version: 01.01
Date: 05-17-2013 Assembly Flags: 0x00
Version: REV 01 CLEI Code: IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 33 31 33 30 30 39 44 00 00 11 05 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff
Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 15 REV 01 740-050037 1EDB3130024 DC 52V Power Supply
Module
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-050037 S/N: 1EDB3130024
Assembly ID: 0x0478 Assembly Version: 01.01
Date: 05-16-2013 Assembly Flags: 0x00
Version: REV 01 CLEI Code: IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
...

```

**show chassis hardware models (MX2020 Routers with MPC5EQ and MPC6E)**

```
user@host> show chassis hardware models
```

# Hardware inventory:

| Item             | Version | Part number | Serial number | FRU model number   |
|------------------|---------|-------------|---------------|--------------------|
| Midplane         | REV 51  | 750-040240  | ABAB9243      | CHAS-BP-MX2020-S   |
| FPM Board        | REV 13  | 760-040242  | ABCA8835      | MX2020-CRAFT-S     |
| PSM 0            | REV 01  | 740-050037  | 1EDB32403L5   | MX2000-PSM-DC-S    |
| PSM 1            | REV 01  | 740-050037  | 1EDB32403L3   | MX2000-PSM-DC-S    |
| PSM 2            | REV 01  | 740-050037  | 1EDB32403KM   | MX2000-PSM-DC-S    |
| PSM 3            | REV 01  | 740-050037  | 1EDB3130079   | MX2000-PSM-DC-S    |
| PSM 4            | REV 01  | 740-050037  | 1EDB3130077   | MX2000-PSM-DC-S    |
| PSM 5            | REV 01  | 740-050037  | 1EDB3130020   | MX2000-PSM-DC-S    |
| PSM 6            | REV 01  | 740-050037  | 1EDB313009S   | MX2000-PSM-DC-S    |
| PSM 7            | REV 01  | 740-050037  | 1EDB313008E   | MX2000-PSM-DC-S    |
| PSM 8            | REV 01  | 740-050037  | 1EDB3130063   | MX2000-PSM-DC-S    |
| PSM 12           | REV 01  | 740-050037  | 1EDB3130026   | MX2000-PSM-DC-S    |
| PSM 13           | REV 01  | 740-050037  | 1EDB3130074   | MX2000-PSM-DC-S    |
| PSM 14           | REV 01  | 740-050037  | 1EDB313009D   | MX2000-PSM-DC-S    |
| PSM 15           | REV 01  | 740-050037  | 1EDB3130024   | MX2000-PSM-DC-S    |
| PSM 16           | REV 01  | 740-050037  | 1EDB3130054   | MX2000-PSM-DC-S    |
| PSM 17           | REV 01  | 740-050037  | 1EDB3130080   | MX2000-PSM-DC-S    |
| PDM 0            | REV 03  | 740-045234  | 1EGA3170144   | MX2000-PDM-DC-S    |
| PDM 1            | REV 03  | 740-045234  | 1EGA3170158   | MX2000-PDM-DC-S    |
| PDM 2            | REV 03  | 740-045234  | 1EGA3170182   | MX2000-PDM-DC-S    |
| PDM 3            | REV 03  | 740-045234  | 1EGA3170207   | MX2000-PDM-DC-S    |
| Routing Engine 0 | REV 02  | 740-041821  | 9009112112    | RE-MX2000-1800X4-S |
| Routing Engine 1 | REV 02  | 740-041821  | 9009112087    | RE-MX2000-1800X4-S |
| CB 0             | REV 23  | 750-040257  | CABA2295      | RE-MX2000-1800X4-S |
| CB 1             | REV 23  | 750-040257  | CABE8379      | RE-MX2000-1800X4-S |
| SFB 0            | REV 06  | 711-044466  | ABCD5001      | MX2000-SFB-S       |
| SFB 1            | REV 06  | 711-044466  | ABCD5034      | MX2000-SFB-S       |
| SFB 2            | REV 06  | 711-044466  | ABCH3899      | MX2000-SFB-S       |
| SFB 3            | REV 06  | 711-044466  | ABCD5020      | MX2000-SFB-S       |
| SFB 4            | REV 06  | 711-044466  | ABCD4975      | MX2000-SFB-S       |
| SFB 5            | REV 06  | 711-044466  | ABCH3881      | MX2000-SFB-S       |
| SFB 6            | REV 06  | 711-044466  | ABCD5026      | MX2000-SFB-S       |
| SFB 7            | REV 06  | 711-044466  | ABCD5032      | MX2000-SFB-S       |
| FPC 0            | REV 39  | 750-045715  | CACD1902      | PROTO-ASSEMBLY     |
| FPC 1            | REV 11  | 750-045372  | CABK8112      | MX-MPC3E-3D        |
| FPC 2            | REV 17  | 750-037355  | CAAS5826      | MPC4E-3D-2CGE-8XGE |
| FPC 3            | REV 05  | 750-044444  | CAAY9920      | MX-MPC2E-3D-P      |
| FPC 4            | REV 18  | 750-046005  | CACH5661      | PROTO-ASSEMBLY     |
| FPC 5            | REV 35  | 750-028467  | CAAR2623      | MPC-3D-16XGE-SFPP  |
| FPC 9            | REV 30  | 750-044130  | ABCF5773      | PROTO-ASSEMBLY     |
| FPC 10           | REV 36  | 750-044130  | ABCS8602      | PROTO-ASSEMBLY     |
| FPC 17           | REV 28  | 750-044130  | ABBZ3873      | PROTO-ASSEMBLY     |
| FPC 18           | REV 39  | 750-045715  | CACD1910      | PROTO-ASSEMBLY     |
| FPC 19           | REV 39  | 750-045715  | CACD1908      | PROTO-ASSEMBLY     |
| ADC 0            | REV 17  | 750-043596  | ABCD5378      | MX2000-LC-ADAPTER  |
| ADC 1            | REV 17  | 750-043596  | ABCD5465      | MX2000-LC-ADAPTER  |
| ADC 2            | REV 17  | 750-043596  | ABCD5431      | MX2000-LC-ADAPTER  |
| ADC 3            | REV 17  | 750-043596  | ABCD5356      | MX2000-LC-ADAPTER  |
| ADC 4            | REV 02  | 750-043596  | ZW1545        | 750-043596         |
| ADC 5            | REV 17  | 750-043596  | ABCD5517      | MX2000-LC-ADAPTER  |
| ADC 18           | REV 17  | 750-043596  | ABCD5535      | MX2000-LC-ADAPTER  |
| ADC 19           | REV 01  | 750-043596  | ZV4127        | 750-043596         |
| Fan Tray 0       | REV 06  | 760-046960  | ACAY0791      | MX2000-FANTRAY-S   |
| Fan Tray 1       | REV 06  | 760-046960  | ACAY0788      | MX2000-FANTRAY-S   |
| Fan Tray 2       | REV 06  | 760-046960  | ACAY0755      | MX2000-FANTRAY-S   |
| Fan Tray 3       | REV 06  | 760-046960  | ACAY0441      | MX2000-FANTRAY-S   |



## show chassis hardware clei-models (MX2020 Router with MPC5EQ and MPC6E)

```
user@host> show chassis hardware clei-models
```

```
Hardware inventory:
```

| Item       | Version | Part number | CLEI code  | FRU model number   |
|------------|---------|-------------|------------|--------------------|
| Midplane   | REV 51  | 750-040240  | IPMU710ARA | CHAS-BP-MX2020-S   |
| FPM Board  | REV 13  | 760-040242  | IPMYAE5JRA | MX2020-CRAFT-S     |
| PSM 0      | REV 01  | 740-050037  | IPUPAKRKAA | MX2000-PSM-DC-S    |
| PSM 1      | REV 01  | 740-050037  | IPUPAKRKAA | MX2000-PSM-DC-S    |
| PSM 2      | REV 01  | 740-050037  | IPUPAKRKAA | MX2000-PSM-DC-S    |
| PSM 3      | REV 01  | 740-050037  | IPUPAKRKAA | MX2000-PSM-DC-S    |
| PSM 4      | REV 01  | 740-050037  | IPUPAKRKAA | MX2000-PSM-DC-S    |
| PSM 5      | REV 01  | 740-050037  | IPUPAKRKAA | MX2000-PSM-DC-S    |
| PSM 6      | REV 01  | 740-050037  | IPUPAKRKAA | MX2000-PSM-DC-S    |
| PSM 7      | REV 01  | 740-050037  | IPUPAKRKAA | MX2000-PSM-DC-S    |
| PSM 8      | REV 01  | 740-050037  | IPUPAKRKAA | MX2000-PSM-DC-S    |
| PSM 12     | REV 01  | 740-050037  | IPUPAKRKAA | MX2000-PSM-DC-S    |
| PSM 13     | REV 01  | 740-050037  | IPUPAKRKAA | MX2000-PSM-DC-S    |
| PSM 14     | REV 01  | 740-050037  | IPUPAKRKAA | MX2000-PSM-DC-S    |
| PSM 15     | REV 01  | 740-050037  | IPUPAKRKAA | MX2000-PSM-DC-S    |
| PSM 16     | REV 01  | 740-050037  | IPUPAKRKAA | MX2000-PSM-DC-S    |
| PSM 17     | REV 01  | 740-050037  | IPUPAKRKAA | MX2000-PSM-DC-S    |
| PDM 0      | REV 03  | 740-045234  | IPUPAJSKAA | MX2000-PDM-DC-S    |
| PDM 1      | REV 03  | 740-045234  | IPUPAJSKAA | MX2000-PDM-DC-S    |
| PDM 2      | REV 03  | 740-045234  | IPUPAJSKAA | MX2000-PDM-DC-S    |
| PDM 3      | REV 03  | 740-045234  | IPUPAJSKAA | MX2000-PDM-DC-S    |
| CB 0       | REV 23  | 750-040257  | IPUCBA7CTA | RE-MX2000-1800X4-S |
| CB 1       | REV 23  | 750-040257  | IPUCBA7CTA | RE-MX2000-1800X4-S |
| SFB 0      | REV 06  | 711-044466  | IPUCBA6CAA | MX2000-SFB-S       |
| SFB 1      | REV 06  | 711-044466  | IPUCBA6CAA | MX2000-SFB-S       |
| SFB 2      | REV 06  | 711-044466  | IPUCBA6CAA | MX2000-SFB-S       |
| SFB 3      | REV 06  | 711-044466  | IPUCBA6CAA | MX2000-SFB-S       |
| SFB 4      | REV 06  | 711-044466  | IPUCBA6CAA | MX2000-SFB-S       |
| SFB 5      | REV 06  | 711-044466  | IPUCBA6CAA | MX2000-SFB-S       |
| SFB 6      | REV 06  | 711-044466  | IPUCBA6CAA | MX2000-SFB-S       |
| SFB 7      | REV 06  | 711-044466  | IPUCBA6CAA | MX2000-SFB-S       |
| FPC 0      | REV 39  | 750-045715  | PROTOXCLEI | PROTO-ASSEMBLY     |
| FPC 1      | REV 11  | 750-045372  | COUIBBNBAA | MX-MPC3E-3D        |
| FPC 2      | REV 17  | 750-037355  | IPU3A4DHAA | MPC4E-3D-2CGE-8XGE |
| FPC 3      | REV 05  | 750-044444  | COUIBBGBAA | MX-MPC2E-3D-P      |
| MIC 0      | REV 28  | 750-028387  | COUIA16BAA | MIC-3D-4XGE-XFP    |
| FPC 4      | REV 18  | 750-046005  | PROTOXCLEI | PROTO-ASSEMBLY     |
| FPC 5      | REV 35  | 750-028467  |            | MPC-3D-16XGE-SFPP  |
| FPC 9      | REV 30  | 750-044130  | PROTOXCLEI | PROTO-ASSEMBLY     |
| MIC 0      | REV 05  | 750-049457  | PROTOXCLEI | PROTO-ASSEMBLY     |
| FPC 10     | REV 36  | 750-044130  | PROTOXCLEI | PROTO-ASSEMBLY     |
| MIC 0      | REV 06  | 750-049979  | PROTOXCLEI | PROTO-ASSEMBLY     |
| MIC 1      | REV 12  | 750-050008  | PROTOXCLEI | PROTO-ASSEMBLY     |
| FPC 17     | REV 28  | 750-044130  | PROTOXCLEI | PROTO-ASSEMBLY     |
| MIC 1      | REV 03  | 750-050008  | PROTOXCLEI | PROTO-ASSEMBLY     |
| FPC 18     | REV 39  | 750-045715  | PROTOXCLEI | PROTO-ASSEMBLY     |
| FPC 19     | REV 39  | 750-045715  | PROTOXCLEI | PROTO-ASSEMBLY     |
| ADC 0      | REV 17  | 750-043596  | IPUCBA8CAA | MX2000-LC-ADAPTER  |
| ADC 1      | REV 17  | 750-043596  | IPUCBA8CAA | MX2000-LC-ADAPTER  |
| ADC 2      | REV 17  | 750-043596  | IPUCBA8CAA | MX2000-LC-ADAPTER  |
| ADC 3      | REV 17  | 750-043596  | IPUCBA8CAA | MX2000-LC-ADAPTER  |
| ADC 4      | REV 02  | 750-043596  | PROTOXCLEI | 750-043596         |
| ADC 5      | REV 17  | 750-043596  | IPUCBA8CAA | MX2000-LC-ADAPTER  |
| ADC 18     | REV 17  | 750-043596  | IPUCBA8CAA | MX2000-LC-ADAPTER  |
| ADC 19     | REV 01  | 750-043596  | PROTOXCLEI | 750-043596         |
| Fan Tray 0 | REV 06  | 760-046960  | IPUCBA5CAA | MX2000-FANTRAY-S   |

|            |        |            |            |                  |
|------------|--------|------------|------------|------------------|
| Fan Tray 1 | REV 06 | 760-046960 | IPUCBA5CAA | MX2000-FANTRAY-S |
| Fan Tray 2 | REV 06 | 760-046960 | IPUCBA5CAA | MX2000-FANTRAY-S |
| Fan Tray 3 | REV 06 | 760-046960 | IPUCBA5CAA | MX2000-FANTRAY-S |

### show chassis hardware (MX Series routers with ATM MIC)

```
user@host> show chassis hardware
```

```
Hardware inventory:
```

| Item             | Version  | Part number | Serial number | Description            |
|------------------|----------|-------------|---------------|------------------------|
| Chassis          |          |             | JN115736EAFc  | MX240                  |
| Midplane         | REV 07   | 760-021404  | ABAA5038      | MX240 Backplane        |
| FPM Board        | REV 03   | 760-021392  | ABBA2758      | Front Panel Display    |
| PEM 0            | Rev 01   | 740-022697  | QCS0937C07K   | PS 1.2-1.7kW; 100-240V |
| AC in            |          |             |               |                        |
| PEM 1            | Rev 01   | 740-022697  | QCS0939C04X   | PS 1.2-1.7kW; 100-240V |
| AC in            |          |             |               |                        |
| PEM 2            | Rev 01   | 740-022697  | QCS0937C06B   | PS 1.2-1.7kW; 100-240V |
| AC in            |          |             |               |                        |
| PEM 3            | Rev 01   | 740-022697  | QCS0937C07U   | PS 1.2-1.7kW; 100-240V |
| AC in            |          |             |               |                        |
| Routing Engine 0 | REV 12   | 740-013063  | 9009042291    | RE-S-2000              |
| Routing Engine 1 | REV 12   | 740-013063  | 9009042266    | RE-S-2000              |
| CB 0             | REV 06   | 710-021523  | ABBC1435      | MX SCB                 |
| CB 1             | REV 06   | 710-021523  | ABBC1497      | MX SCB                 |
| FPC 2            | REV 14   | 750-031088  | YH8446        | MPC Type 2 3D Q        |
| CPU              | REV 06   | 711-030884  | YH9612        | MPC PMB 2G             |
| MIC 0            |          |             |               |                        |
| MIC 1            | REV 10   | 750-036132  | ZP7062        | 2x0C12/8x0C3 CC-CE     |
| PIC 2            |          | BUILTIN     | BUILTIN       | 2x0C12/8x0C3 CC-CE     |
| Xcvr 0           | NON-JNPR | 23393-00492 |               | UNKNOWN                |
| Xcvr 1           |          | NON-JNPR    | 23393-00500   | UNKNOWN                |
| Xcvr 2           |          | NON-JNPR    | 23393-00912   | UNKNOWN                |
| Xcvr 3           | REV 01   | 740-015638  | 22216-00575   | Load SFP               |
| Xcvr 4           | REV 01   | 740-015638  | 24145-00110   | Load SFP               |
| Xcvr 5           | REV 01   | 740-015638  | 24145-00016   | Load SFP               |
| Xcvr 6           | REV 01   | 740-015638  | 24145-00175   | Load SFP               |
| Xcvr 7           |          | NON-JNPR    | 23393-00627   | UNKNOWN                |
| QXM 0            | REV 05   | 711-028408  | YF4681        | MPC QXM                |
| QXM 1            | REV 05   | 711-028408  | YF4817        | MPC QXM                |
| Fan Tray 0       | REV 01   | 710-021113  | XL3645        | MX240 Fan Tray         |

### show chassis hardware (MX240, MX480, MX960 routers with Application Services Modular Line Card)

```
user@host>show chassis hardware
```

```
Hardware inventory:
```

| Item             | Version | Part number | Serial number | Description               |
|------------------|---------|-------------|---------------|---------------------------|
| Chassis          |         |             | JN11D969BAFA  | MX960                     |
| Midplane         | REV 03  | 710-013698  | ACAA2362      | MX960 Backplane           |
| FPM Board        | REV 03  | 710-014974  | ZR0639        | Front Panel Display       |
| PDM              | Rev 03  | 740-013110  | QCS152250SX   | Power Distribution Module |
| PEM 0            | Rev 10  | 740-013683  | QCS1512718W   | DC Power Entry Module     |
| PEM 1            | Rev 10  | 740-013683  | QCS1512702Y   | DC Power Entry Module     |
| Routing Engine 0 | REV 15  | 740-013063  | 9012024667    | RE-S-2000                 |
| Routing Engine 1 | REV 15  | 740-013063  | 9012024649    | RE-S-2000                 |
| CB 0             | REV 14  | 750-031391  | ZJ7749        | Enhanced MX SCB           |
| CB 1             | REV 14  | 750-031391  | ZJ7750        | Enhanced MX SCB           |
| CB 2             | REV 14  | 750-031391  | ZY9233        | Enhanced MX SCB           |
| FPC 0            | REV 17  | 750-031089  | YR7434        | MPC Type 2 3D             |
| CPU              |         |             |               |                           |

|            |        |            |          |                 |
|------------|--------|------------|----------|-----------------|
| FPC 1      | REV 11 | 750-037207 | ZW9727   | AS-MCC          |
| CPU        | REV 04 | 711-038173 | ZW4817   | AS-MCC-PMB      |
| MIC 0      | REV 01 | 750-037214 | ZH3764   | AS-MSC          |
| PIC 0      |        | BUILTIN    | BUILTIN  | AS-MSC          |
| MIC 1      | REV 01 | 711-028408 | JZ9200   | AS-MXC          |
| PIC 2      |        | BUILTIN    | BUILTIN  | AS-MXC          |
| FPC 4      | REV 30 | 750-028467 | ABBN0232 | MPC 3D 16x 10GE |
| CPU        |        |            |          |                 |
| FPC 5      | REV 04 | 750-037207 | ZK9074   | AS-MCC          |
| CPU        |        |            |          |                 |
| Fan Tray 0 | REV 05 | 740-014971 | VT5683   | Fan Tray        |
| Fan Tray 1 | REV 05 | 740-014971 | VT5684   | Fan Tray        |

show chassis hardware extensive (MX240, MX480, MX960 routers with Application Services Modular Line Card)

user@host> show chassis hardware extensive

```
ID: AS-MCC FRU Model Number: 750-037207
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 37 01 0b 52 45 56 20 31 31 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 33 37 32 30 37 00 00
Address 0x20: 53 2f 4e 20 5a 57 39 37 32 37 00 00 00 11 02 07
Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 37
Address 0x50: 35 30 2d 30 33 37 32 30 37 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 31 31 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 5e ff ff ff ff ff ff ff ff ff ff ff ff
CPU REV 04 711-038173 ZW4817 AS-MCC-PMB
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 711-038173 S/N: ZW4817
Assembly ID: 0x0b38 Assembly Version: 01.04
Date: 12-30-2011 Assembly Flags: 0x00
Version: REV 04
ID: AS-MCC-PMB
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 38 01 04 52 45 56 20 30 34 00 00
Address 0x10: 00 00 00 00 37 31 31 2d 30 33 38 31 37 33 00 00
Address 0x20: 53 2f 4e 20 5a 57 34 38 31 37 00 00 00 1e 0c 07
Address 0x30: db ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 00 50 52 4f 54 4f 58 43 4c 45 49 37
Address 0x50: 31 31 2d 30 33 38 31 37 33 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 30 34 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 60 00 00 00 00 00 00 00 00 00 00 00 00
MIC 0 REV 01 750-037214 ZH3764 AS-MSC
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 750-037214 S/N: ZH3764
Assembly ID: 0x0a44 Assembly Version: 01.01
Date: 07-04-2011 Assembly Flags: 0x00
Version: REV 01
ID: AS-MSC
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff I2C Hex Data:
Address 0x00: 7f b0 02 ff 0a 44 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 33 37 32 31 34 00 00
Address 0x20: 53 2f 4e 20 5a 48 33 37 36 34 00 00 00 04 07 07
Address 0x30: db ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
```

```

Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff f6 c0 03 e1 bc 00 00 00 00 00 00 00 00
PIC 0 BUILTIN BUILTIN AS-MS
FPC 4 REV 30 750-028467 ABBN0232 MPC 3D 16x 10GE
Jedec Code: 0x7fb0 EEPROM Version: 0x01

```

#### show chassis hardware (MX480 Router with MPC4E)

```

user@host> show chassis hardware
Hardware inventory:
Item Version Part number Serial number Description
Chassis JN10FF57BAFB MX480
Midplane REV 05 750-047849 Good MX480 Midplane
FPM Board REV 02 710-017254 KG2066 Front Panel Display
PEM 0 Rev 03 740-017330 QCS081590BJ PS 1.2-1.7kW; 100-240V
AC in
PEM 1 Rev 03 740-017330 QCS0815908Z PS 1.2-1.7kW; 100-240V
AC in
PEM 2 Rev 03 740-029970 QCS1001U001 PS 1.4-2.52kW; 90-264V
AC in
Routing Engine 0 REV 05 740-031116 9009089502 RE-S-1800x4
Routing Engine 1 REV 05 740-031116 9009089624 RE-S-1800x4
CB 0 REV 02 750-031391 YE8506 Enhanced MX SCB
CB 1 REV 14 750-031391 ZK8265 Enhanced MX SCB
FPC 2 REV 05 750-037358 ZT0638 MPC4E 3D 32XGE
CPU REV 07 711-035209 ZK3187 HMPD PMB 2G
PIC 0 BUILTIN BUILTIN 8X10GE SFPP
PIC 1 BUILTIN BUILTIN 8X10GE SFPP
PIC 2 BUILTIN BUILTIN 8X10GE SFPP
PIC 3 BUILTIN BUILTIN 8X10GE SFPP
FPC 3 REV 06 750-037355 CAAB1144 MPC4E 3D 2CGE+8XGE
CPU REV 08 711-035209 CAAB1278 HMPD PMB 2G
PIC 0 BUILTIN BUILTIN 4x10GE SFPP
Xcvr 0 REV 01 740-031980 B11E01439 SFP+-10G-SR
Xcvr 1 REV 01 740-031980 B11D05809 SFP+-10G-SR
PIC 1 BUILTIN BUILTIN 1X100GE CFP
Xcvr 0 NON-JNPR D5418 UNKNOWN
PIC 2 BUILTIN BUILTIN 4x10GE SFPP
PIC 3 BUILTIN BUILTIN 1X100GE CFP
Xcvr 0 NON-JNPR X12J00362 CFP-100G-SR10
FPC 4 REV 12.3.10 750-033205 YR9445 MPCE Type 3 3D
CPU
Fan Tray Enhanced Left Fan Tray

```

#### show chassis hardware (MX2020 Router with MPC4E)

```

user@host> show chassis hardware
Hardware inventory:
Item Version Part number Serial number Description
Chassis JN11E188CAFJ MX2020
Midplane REV 04 711-032387 ABAC7474 Lower Backplane
Midplane 1 REV 04 711-032386 ABAC7408 Upper Backplane
PMP 1 REV 03 711-032428 ACAJ1137 Upper Power Midplane
PMP 0 REV 03 711-032426 ACAJ1016 Lower Power Midplane
FPM Board REV 06 760-040242 ABBT8832 Front Panel Display
PSM 3 REV 0C 740-033727 VK00255 DC 52V Power Supply
Module
PSM 4 REV 0C 740-033727 VJ00148 DC 52V Power Supply
Module
PSM 5 REV 0C 740-033727 VK00207 DC 52V Power Supply

```

|                  |        |            |              |  |                       |
|------------------|--------|------------|--------------|--|-----------------------|
| Module           |        |            |              |  |                       |
| PSM 6            | REV 0C | 740-033727 | VK00319      |  | DC 52V Power Supply   |
| Module           |        |            |              |  |                       |
| PSM 7            | REV 0C | 740-033727 | VK00264      |  | DC 52V Power Supply   |
| Module           |        |            |              |  |                       |
| PSM 8            | REV 0B | 740-033727 | VG00025      |  | DC 52V Power Supply   |
| Module           |        |            |              |  |                       |
| PSM 13           | REV 0C | 740-033727 | VK00274      |  | DC 52V Power Supply   |
| Module           |        |            |              |  |                       |
| PSM 14           | REV 0C | 740-033727 | VJ00167      |  | DC 52V Power Supply   |
| Module           |        |            |              |  |                       |
| PSM 15           | REV 0C | 740-033727 | VK00299      |  | DC 52V Power Supply   |
| Module           |        |            |              |  |                       |
| PSM 16           | REV 0C | 740-033727 | VK00213      |  | DC 52V Power Supply   |
| Module           |        |            |              |  |                       |
| PSM 17           | REV 0C | 740-033727 | VK00253      |  | DC 52V Power Supply   |
| Module           |        |            |              |  |                       |
| PDM 0            | REV 0B | 740-038109 | VJ00040      |  | DC Power Dist Module  |
| PDM 2            | REV 0B | 740-038109 | VJ00025      |  | DC Power Dist Module  |
| Routing Engine 0 | REV 02 | 740-041821 | 9009089735   |  | RE-S-1800x4           |
| Routing Engine 1 | REV 02 | 740-041821 | 9009089731   |  | RE-S-1800x4           |
| CB 0             | REV 04 | 750-040257 | ZT2846       |  | Control Board         |
| CB 1             | REV 04 | 750-040257 | ZT2877       |  | Control Board         |
| SPMB 0           | REV 01 | 711-041855 | ZS2282       |  | PMB Board             |
| SPMB 1           | REV 01 | 711-041855 | ZS2261       |  | PMB Board             |
| SFB 0            | REV 07 | 711-032385 | ZZ2582       |  | Switch Fabric Board   |
| SFB 1            | REV 04 | 711-032385 | ZV4229       |  | Switch Fabric Board   |
| SFB 2            | REV 07 | 711-032385 | CAAB4902     |  | Switch Fabric Board   |
| SFB 3            | REV 07 | 711-032385 | CAAB4891     |  | Switch Fabric Board   |
| SFB 4            | REV 07 | 711-032385 | CAAB4883     |  | Switch Fabric Board   |
| SFB 5            | REV 07 | 711-032385 | CAAB4889     |  | Switch Fabric Board   |
| SFB 6            | REV 06 | 711-032385 | ZV1818       |  | Switch Fabric Board   |
| SFB 7            | REV 07 | 711-032385 | CAAB4897     |  | Switch Fabric Board   |
| FPC 0            | REV 34 | 750-031090 | ZT9799       |  | MPC Type 2 3D EQ      |
| CPU              | REV 06 | 711-030884 | ZS1122       |  | MPC PMB 2G            |
| MIC 0            | REV 11 | 750-033535 | CAAD7674     |  | MIC-3D-10C192-XFP     |
| PIC 0            |        | BUILTIN    | BUILTIN      |  | MIC-3D-10C192-XFP     |
| Xcvr 0           | REV 01 | 740-014279 | 753019A00404 |  | XFP-0C192-SR          |
| MIC 1            | REV 14 | 750-031967 | ZM6103       |  | MIC-3D-80C30C12-40C48 |
| PIC 2            |        | BUILTIN    | BUILTIN      |  | MIC-3D-80C30C12-40C48 |
| Xcvr 0           | REV 01 | 740-011615 | PEF1AZP      |  | SFP-IR                |
| Xcvr 1           | REV 01 | 740-011615 | PEF1AZN      |  | SFP-IR                |
| Xcvr 2           | REV 01 | 740-021308 | ANA0N8S      |  | SFP+-10G-SR           |
| QXM 0            | REV 06 | 711-028408 | ZT9339       |  | MPC QXM               |
| QXM 1            | REV 06 | 711-028408 | ZT9237       |  | MPC QXM               |
| FPC 9            | REV 34 | 750-031090 | ZT9770       |  | MPC Type 2 3D EQ      |
| CPU              | REV 06 | 711-030884 | ZS1302       |  | MPC PMB 2G            |
| MIC 0            | REV 24 | 750-028387 | YJ3950       |  | 3D 4x 10GE XFP        |
| PIC 0            |        | BUILTIN    | BUILTIN      |  | 2x 10GE XFP           |
| Xcvr 0           |        | NON-JNPR   | T09M52516    |  | XFP-10G-SR            |
| Xcvr 1           |        | NON-JNPR   | CA49BK095    |  | XFP-10G-SR            |
| PIC 1            |        | BUILTIN    | BUILTIN      |  | 2x 10GE XFP           |
| Xcvr 0           | REV 02 | 740-014289 | C834XU01T    |  | XFP-10G-SR            |
| Xcvr 1           |        | NON-JNPR   | T09M52515    |  | XFP-10G-SR            |
| MIC 1            | REV 11 | 750-033535 | CAAD7681     |  | MIC-3D-10C192-XFP     |
| PIC 2            |        | BUILTIN    | BUILTIN      |  | MIC-3D-10C192-XFP     |
| Xcvr 0           | REV 01 | 740-014279 | KBQ02BE      |  | XFP-0C192-SR          |
| QXM 0            | REV 06 | 711-028408 | ZT9151       |  | MPC QXM               |
| QXM 1            | REV 06 | 711-028408 | ZT9116       |  | MPC QXM               |
| FPC 10           | REV 27 | 750-033205 | ZL6215       |  | MPCE Type 3 3D        |
| CPU              | REV 07 | 711-035209 | ZK9038       |  | HMPC PMB 2G           |

|            |        |            |              |                        |
|------------|--------|------------|--------------|------------------------|
| MIC 0      | REV 18 | 750-028380 | YG6885       | 3D 2x 10GE XFP         |
| PIC 0      |        | BUILTIN    | BUILTIN      | 1x 10GE XFP            |
| Xcvr 0     | REV 01 | 740-014289 | C706XU0AG    | XFP-10G-SR             |
| PIC 1      |        | BUILTIN    | BUILTIN      | 1x 10GE XFP            |
| Xcvr 0     | REV 02 | 740-014289 | T08L84366    | XFP-10G-SR             |
| FPC 14     | REV 09 | 750-037355 | CAAF1534     | MPC4E 3D 2CGE+8XGE     |
| CPU        | REV 08 | 711-035209 | CAAB9879     | HMPC PMB 2G            |
| PIC 0      |        | BUILTIN    | BUILTIN      | 4x10GE SFPP            |
| Xcvr 0     | REV 01 | 740-021308 | 21T511100436 | SFP+-10G-SR            |
| Xcvr 1     | REV 01 | 740-031980 | AHPOGPM      | SFP+-10G-SR            |
| Xcvr 2     | REV 01 | 740-031980 | 123363A00032 | SFP+-10G-SR            |
| Xcvr 3     | REV 01 | 740-021308 | 19T511100477 | SFP+-10G-SR            |
| PIC 1      |        | BUILTIN    | BUILTIN      | 1X100GE CFP            |
| Xcvr 0     |        | NON-JNPR   | X12J00260    | CFP-100G-SR10          |
| PIC 2      |        | BUILTIN    | BUILTIN      | 4x10GE SFPP            |
| Xcvr 0     | REV 01 | 740-021308 | 21T511104086 | SFP+-10G-SR            |
| Xcvr 1     | REV 01 | 740-021308 | 21T511104627 | SFP+-10G-SR            |
| Xcvr 3     | REV 01 | 740-021308 | 21T511104644 | SFP+-10G-SR            |
| PIC 3      |        | BUILTIN    | BUILTIN      | 1X100GE CFP            |
| FPC 19     | REV 32 | 750-028467 | ZR2008       | MPC 3D 16x 10GE        |
| CPU        | REV 10 | 711-029089 | ZT6933       | AMPC PMB               |
| PIC 0      |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+      |
| Xcvr 0     | REV 01 | 740-021308 | 19T511100291 | SFP+-10G-SR            |
| Xcvr 1     | REV 01 | 740-021308 | AMH02VE      | SFP+-10G-SR            |
| PIC 1      |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+      |
| Xcvr 0     | REV 01 | 740-021308 | 23T511102128 | SFP+-10G-SR            |
| PIC 2      |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+      |
| Xcvr 0     | REV 01 | 740-021308 | AMS15PP      | SFP+-10G-SR            |
| PIC 3      |        | BUILTIN    | BUILTIN      | 4x 10GE(LAN) SFP+      |
| Xcvr 0     | REV 01 | 740-031980 | 123363A00716 | SFP+-10G-SR            |
| ADC 0      | REV 05 | 750-043596 | CAAC2072     | Adapter Card           |
| ADC 9      | REV 01 | 750-043596 | ZV4111       | Adapter Card           |
| ADC 10     | REV 05 | 750-043596 | CAAC2058     | Adapter Card           |
| ADC 14     | REV 02 | 750-043596 | ZW1561       | Adapter Card           |
| ADC 19     | REV 01 | 750-043596 | ZV4127       | Adapter Card           |
| Fan Tray 0 | REV 03 | 760-046960 | ACAY0124     | 172mm FanTray - 6 Fans |
| Fan Tray 1 | REV 2A | 760-046960 | ACAY0022     | 172mm FanTray - 6 Fans |
| Fan Tray 2 | REV 2A | 760-046960 | ACAY0023     | 172mm FanTray - 6 Fans |
| Fan Tray 3 | REV 2A | 760-046960 | ACAY0025     | 172mm FanTray - 6 Fans |

show chassis hardware (MX5, MX10, MX40, MX80, MX240, MX480, and MX960 routers with Enhanced 20-port Gigabit Ethernet MIC)

```

user@host> show chassis hardware
Hardware inventory:
Item Version Part number Serial number Description
Chassis F3434 MX80-P
Midplane REV 01 711-044315 ZK2681 MX80-P
PEM 0 Rev 04 740-028288 VE05267 AC Power Entry Module
PEM 1 Rev 04 740-028288 VE05270 AC Power Entry Module
Routing Engine BUILTIN BUILTIN Routing Engine
TFEB 0 BUILTIN BUILTIN Forwarding Engine
Processor
QXM 0 REV 05 711-028408 ZK0952 MPC QXM
FPC 0 BUILTIN BUILTIN MPC BUILTIN
MIC 0 BUILTIN BUILTIN 4x 10GE XFP
PIC 0 BUILTIN BUILTIN 4x 10GE XFP
FPC 1 BUILTIN BUILTIN MPC BUILTIN
MIC 0 REV 02 750-049846 CAAV2153 3D 20x 1GE(LAN)-E,SFP
PIC 0 BUILTIN BUILTIN 10x 1GE(LAN) -E SFP
Xcvr 0 REV 01 740-011613 AM0816S9B81 SFP-SX

```

```

Xcvr 1 REV 02 740-011613 AM0925SBLK7 SFP-SX
Xcvr 2 REV 01 740-011613 UAQ0005 SFP-SX
Xcvr 3 REV 01 740-011613 UAQ000C SFP-SX
Xcvr 4 REV 01 740-011613 P9F195E SFP-SX
Xcvr 5 REV 01 740-011613 UAQ0003 SFP-SX
Xcvr 6 REV 01 740-031851 AM1041SU1LD SFP-SX
Xcvr 8 REV 02 740-013111 B101501 SFP-T
PIC 1 BUILTIN BUILTIN 10x 1GE(LAN) -E SFP
Xcvr 0 REV 01 740-011613 PFM1ML7 SFP-SX
Xcvr 4 REV 01 740-011613 PE729P6 SFP-SX
Xcvr 6 REV 02 740-011613 AM1014SGC84 SFP-SX
Xcvr 9 REV 01 740-011613 AM0812S8UK3 SFP-SX
MIC 1 REV 26 750-028392 ZY0187 3D 20x 1GE(LAN) SFP
PIC 2 BUILTIN BUILTIN 10x 1GE(LAN) SFP
Xcvr 0 REV 01 740-011613 P9F1AN9 SFP-SX
Xcvr 5 REV 02 740-011613 AM1003SFUF4 SFP-SX
Xcvr 9 REV 01 740-031851 AM1041SU1LM SFP-SX
PIC 3 BUILTIN BUILTIN 10x 1GE(LAN) SFP
Xcvr 4 REV 01 740-011613 PAJ4MYT SFP-SX
Xcvr 7 + NON-JNPR XG32A024 SFP-SX
Xcvr 8 NON-JNPR PFROV6J SFP-SX
Xcvr 9 REV 01 740-031851 AM1041SU02U SFP-SX
Fan Tray

```

#### show chassis hardware models (MX5, MX10, MX40, MX80, MX240, MX480, and MX960 routers with Enhanced 20-port Gigabit Ethernet MIC)

```

user@host> show chassis hardware models
Hardware inventory:
Item Version Part number Serial number FRU model number
PEM 0 Rev 04 740-028288 VE05267 PWR-MX80-AC-S
PEM 1 Rev 04 740-028288 VE05270 PWR-MX80-AC-S
Routing Engine
TFEB 0 BUILTIN BUILTIN
FPC 0 BUILTIN BUILTIN
FPC 1 BUILTIN BUILTIN
MIC 0 REV 02 750-049846 CAAV2153 MIC-3D-20GE-SFP-E
MIC 1 REV 26 750-028392 ZY0187 MIC-3D-20GE-SFP
Fan Tray FANTRAY-MX80-S

```

#### show chassis hardware (T320 Router)

```

user@host> show chassis hardware
Hardware inventory:
Item Version Part number Serial number Description
Chassis 19093 T320
Midplane REV 04 710-004339 BC1436 T320 Backplane
FPM GBUS REV 03 710-004461 BC1407 T320 FPM Board
FPM Display REV 04 710-002897 BE0763 FPM Display
CIP REV 05 710-002895 BB2311 T Series CIP
PEM 0 Rev 01 740-004359 NB12546 Power Entry Module
SCG 0 REV 06 710-004455 AY4522 T320 Sonet
Clock Gen.
Routing Engine 0 unknown
CB 0 REV 13 710-002728 BC1577 T Series
Control Board
CB 1 REV 13 710-002728 BC1595 T Series
Control Board
FPC 1 REV 09 710-007531 HS1572 FPC Type 2
CPU REV 15 710-001726 HR8763 FPC CPU
PIC 0 REV 01 750-010618 CB5579 4x G/E SFP,

```

|           |        |            |            |                |  |
|-----------|--------|------------|------------|----------------|--|
| 1000 BASE |        |            |            |                |  |
| SFP 0     | REV 01 | 740-007326 | P5809Z1    | SFP-SX         |  |
| SFP 1     | REV 01 | 740-007326 | P4Q10XU    | SFP-SX         |  |
| SFP 2     |        | NON-JNPR   | RA45020031 | SFP-SX         |  |
| SFP 3     |        | NON-JNPR   | RA45020032 | SFP-SX         |  |
| PIC 1     | REV 01 | 750-010618 | CD9587     | 4x G/E SFP,    |  |
| 1000 BASE |        |            |            |                |  |
| SFP 0     |        | NON-JNPR   | P5A08QZ    | SFP-T          |  |
| SFP 1     | REV 01 | 740-007326 | P4Q133K    | SFP-SX         |  |
| SFP 2     | REV 01 | 740-007326 | P5809YY    | SFP-SX         |  |
| SFP 3     | REV 01 | 740-007327 | 4C81704    | SFP-LX         |  |
| MMB 1     | REV 03 | 710-005555 | HR9401     | MMB-288mbit    |  |
| PPB 0     | REV 04 | 710-003758 | HR2886     | PPB Type 2     |  |
| FPC 2     | REV 07 | 710-005860 | HP2392     | FPC Type 1     |  |
| CPU       | REV 14 | 710-001726 | HP7797     | FPC CPU        |  |
| PIC 0     | REV 02 | 750-007643 | HM0853     | 1x G/E QPP,    |  |
| 1000 BASE |        |            |            |                |  |
| SFP 0     | REV 01 | 740-007326 | P11E9JJ    | SFP-SX         |  |
| MMB 1     | REV 02 | 710-005555 | HN2379     | MMB-288mbit    |  |
| PPB 0     | REV 04 | 710-003758 | HP8092     | PPB Type 2     |  |
| FPC 3     | REV 07 | 710-005860 | HP2393     | FPC Type 1     |  |
| CPU       | REV 14 | 710-001726 | HP0968     | FPC CPU        |  |
| PIC 0     | REV 01 | 750-010240 | CB5363     | 1x G/E SFP,    |  |
| 1000 BASE |        |            |            |                |  |
| SFP 0     | REV 01 | 740-007326 | P4R0PNH    | SFP-SX         |  |
| PIC 1     | REV 03 | 750-003034 | HD2832     | 4x OC-3 SONET, |  |
| SMIR      |        |            |            |                |  |
| MMB 1     | REV 02 | 710-005555 | HN6307     | MMB-288mbit    |  |
| PPB 0     | REV 04 | 710-003758 | HP5051     | PPB Type 2     |  |
| FPC 4     | REV 01 | 710-010845 | JD3872     | FPC Type 4     |  |
| CPU       | REV 02 | 710-011481 | JB6042     | FPC CPU        |  |
| 5         | REV 01 | 710-005802 | BC1566     | FPC Type 2     |  |
| CPU       | REV 09 | 710-001726 | AY4922     | FPC CPU        |  |
| PIC 0     | REV 02 | 750-008155 | BE2114     | 2x G/E QPP,    |  |
| 1000 BASE |        |            |            |                |  |
| SFP 0     | REV 01 | 740-007326 | P4R0PMQ    | SFP-SX         |  |
| SFP 1     | REV 01 | 740-007326 | P4R0PN9    | SFP-SX         |  |
| PIC 1     | REV 01 | 750-008155 | BE2116     | 2x G/E QPP,    |  |
| 1000 BASE |        |            |            |                |  |
| SFP 0     | REV 01 | 740-007326 | P4R0PNZ    | SFP-SX         |  |
| SFP 1     |        | NON-JNPR   | 2908       | SFP-T          |  |
| MMB 1     | REV 01 | 710-005555 | AZ2246     | MMB-288mbit    |  |
| PPB 0     | REV 03 | 710-003758 | AY4839     | PPB Type 2     |  |
| FPC 7     | REV 01 | 710-005803 | AZ2123     | FPC Type 3     |  |
| ...       |        |            |            |                |  |

**show chassis hardware (T640 Router)**

```
user@host> show chassis hardware
```

| Hardware inventory: |         |             |               |                        |
|---------------------|---------|-------------|---------------|------------------------|
| Item                | Version | Part number | Serial number | Description            |
| Chassis             |         |             | 19182         | T640                   |
| Midplane            | REV 04  | 710-002726  | AX5608        | T640 Backplane         |
| FPM GBUS            | REV 02  | 710-002901  | HE3064        | T640 FPM Board         |
| FPM Display         | REV 02  | 710-002897  | HE7864        | FPM Display            |
| CIP                 | REV 05  | 710-002895  | HA5024        | T Series CIP           |
| PEM 0               | Rev 02  | 740-029522  | VH26235       | AC PEM 10kw US         |
| PEM 1               | Rev 02  | 740-029522  | VH26230       | AC PEM 10kw US         |
| SCG 0               | REV 03  | 710-003423  | HA4508        | T640 Sonet Clock Gen.  |
| Routing Engine 0    | REV 02  | 740-005022  | 210865700483  | RE-3.0 (RE-600)        |
| CB 0                | REV 01  | 710-002728  | HD3044        | T Series Control Board |



|            |        |            |            |                       |
|------------|--------|------------|------------|-----------------------|
| FPC 2      | REV 04 | 710-001721 | HD5572     | FPC Type 3            |
| CPU        | REV 06 | 710-001726 | HA4712     | FPC CPU               |
| PIC 1      | REV 03 | 750-009567 | HV2331     | 1x 10GE(LAN),XENPAK   |
| SFP 0      | REV 01 | 740-009898 | USC202R103 | XENPAK-SR             |
| PIC 2      | REV 03 | 750-009567 | HV2332     | 1x 10GE(LAN),XENPAK   |
| SFP 0      | REV 01 | 740-011268 | USC202R112 | XENPAK-ZR             |
| PIC 3      | REV 03 | 750-009567 | HX4416     | 1x 10GE(LAN),XENPAK   |
| SFP 0      | REV 01 | 740-012056 | 434TC004   | XENPAK-CX4            |
| PIC 4      | REV 03 | 750-009567 | HX4420     | 1x 10GE(LAN),XENPAK   |
| SFP 0      | REV 01 | 740-012058 | 434TC124   | XENPAK-LX4            |
| FPC 5      | REV 01 | 710-013553 | JE4839     | E2-FPC Type 1         |
| CPU        | REV 01 | 710-013569 | JW9163     | FPC CPU               |
| PIC 0      | REV 01 | 750-009567 | HX4419     | 1x 10GE(LAN),XENPAK   |
| SFP 0      | REV 01 | 740-009898 | USC202RT05 | XENPAK-LR             |
| PIC 1      | REV 03 | 750-009567 | HN7426     | 1x 10GE(LAN),XENPAK   |
| SFP 0      | REV 01 | 740-009550 | 03L90051   | XENPAK-ER             |
| PIC 2      | REV 03 | 750-009467 | HT7423     | 1x 10GE(LAN),XENPAK   |
| SFP 0      |        | NON-JNPR   |            | UNKNOWN               |
| PIC 3      | REV 04 | 750-005100 | AY4850     | 1x 10GE(LAN),DWDW     |
| FPC 4      | REV 01 | 710-010845 | JD3872     | FPC Type 4            |
| CPU        | REV 02 | 710-011481 | JB6042     | FPC CPU               |
| Fan Tray 0 |        |            |            | Front Top Fan Tray    |
| Fan Tray 1 |        |            |            | Front Bottom Fan Tray |
| Fan Tray 2 |        |            |            | Rear Fan Tray         |

#### show chassis hardware models (T640 Router)

```

user@host> show chassis hardware models
Hardware inventory:

```

| Item             | Version | Part number | CLEI code | FRU model number   |
|------------------|---------|-------------|-----------|--------------------|
| Midplane         | REV 04  | 710-002726  |           | CHAS-BP-T640-S     |
| FPM Display      | REV 02  | 710-002897  |           | CRAFT-T640-S       |
| CIP              | REV 05  | 710-002895  |           | CIP-L-T640-S       |
| PEM 0            | Rev 01  | 740-002595  |           | PWR-T-DC-S         |
| SCG 0            | REV 04  | 710-003423  |           | SCG-T-S            |
| SCG 1            | REV 04  | 710-003423  |           | SCG-T-S            |
| Routing Engine 0 | REV 01  | 740-005022  |           | RE-600-2048-S      |
| Routing Engine 1 | REV 07  | 740-005022  |           | RE-600-2048-S      |
| CB 0             | REV 06  | 710-002726  |           | CHAS-BP-T640-S     |
| CB 1             | REV 06  | 710-002728  |           | CB-L-T-S           |
| FPC 5            | REV 05  | 710-007527  |           | T640-FPC2          |
| PIC 0            | REV 05  | 750-002510  |           | PB-2GE-SX          |
| PIC 1            | REV 05  | 750-001901  |           | PB-40C12-SON-SMIR  |
| FPC 6            | REV 03  | 710-001721  |           | T640-FPC3          |
| PIC 1            | REV 01  | 750-009553  |           | PC-40C48-SON-SFP   |
| SIB 4            | REV 02  | 750-005486  |           | SIB-I-T640-S       |
| Fan Tray 0       |         |             |           | FANTRAY-T-S        |
| Fan Tray 1       |         |             |           | FANTRAY-T-S        |
| Fan Tray 2       |         |             |           | FAN-REAR-TX-T640-S |

#### show chassis hardware extensive (T640 Router)

```

user@host> show chassis hardware extensive
Hardware inventory:

```

| Item         | Version    | Part number       | Serial number | Description |
|--------------|------------|-------------------|---------------|-------------|
| Chassis      |            |                   |               | T640        |
| Jedec Code:  | 0x7fb0     | EEPROM Version:   | 0x01          |             |
| P/N:         | .....      | S/N:              | .....         |             |
| Assembly ID: | 0x0507     | Assembly Version: | 00.00         |             |
| Date:        | 00-00-0000 | Assembly Flags:   | 0x00          |             |
| Version:     | .....      |                   |               |             |

```

ID: Gibson LCC Chassis
Board Information Record:
 Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
 Address 0x00: 7f b0 01 ff 05 07 00 00 00 00 00 00 00 00 00 00
 Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 Address 0x20: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Midplane REV 04 710-002726 AX5633
Jedec Code: 0x7fb0 EEPROM Version: 0x01
P/N: 710-002726. S/N: AX5633.
Assembly ID: 0x0127 Assembly Version: 01.04
Date: 06-27-2001 Assembly Flags: 0x00
Version: REV 04.....
ID: Gibson Backplane
Board Information Record:
 Address 0x00: ad 01 08 00 00 90 69 0e f8 00 ff ff ff ff ff ff
I2C Hex Data:
 Address 0x00: 7f b0 01 ff 01 27 01 04 52 45 56 20 30 34 00 00
 Address 0x10: 00 00 00 00 37 31 30 2d 30 30 32 37 32 36 00 00
 Address 0x20: 53 2f 4e 20 41 58 35 36 33 33 00 00 00 1b 06 07
 Address 0x30: d1 ff ff ff ad 01 08 00 00 90 69 0e f8 00 ff ff
 Address 0x40: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
FPM GBUS REV 02 710-002901 HE3245
...
FPM Display REV 02 710-002897 HA4873
...
CIP REV 05 710-002895 HA4729
...
PEM 1 RevX02 740-002595 MD21815 Power Entry Module
...
SCG 0 REV 04 710-003423 HF6023
...
SCG 1 REV 04 710-003423 HF6061
...
Routing Engine 0 REV 01 740-005022 210865700292 RE-3.0
...
CB 0 REV 06 710-002728 HE3614
...
FPC 1 REV 01 710-002385 HE3009 FPC Type 1
...
 REV 06 710-001726 HC0010

```

### show chassis hardware (T4000 Router)

```

user@host> show chassis hardware
Hardware inventory:

```

| Item             | Version | Part number | Serial number | Description             |
|------------------|---------|-------------|---------------|-------------------------|
| Chassis          |         |             | JN1172F25AHA  | T4000                   |
| Midplane         | REV 01  | 710-027486  | RC8355        | T-series Backplane      |
| FPM GBUS         | REV 13  | 710-002901  | BBAE0927      | T640 FPM Board          |
| FPM Display      | REV 01  | 710-021387  | EF6764        | T1600 FPM Display       |
| CIP              | REV 06  | 710-002895  | BBAD9210      | T-series CIP            |
| PEM 0            | REV 01  | 740-036442  | VA00016       | Power Entry Module 6x60 |
| SCG 0            | REV 18  | 710-003423  | BBAD7248      | T640 Sonet Clock Gen.   |
| SCG 1            | REV 18  | 710-003423  | BBAE3874      | T640 Sonet Clock Gen.   |
| Routing Engine 0 | REV 05  | 740-026941  | P737F-002248  | RE-DUO-1800             |
| Routing Engine 1 | REV 06  | 740-026941  | P737F-002653  | RE-DUO-1800             |
| CB 0             | REV 09  | 710-022597  | ED0295        | LCC Control Board       |
| CB 1             | REV 09  | 710-022597  | EA6050        | LCC Control Board       |
| FPC 0            | REV 26  | 750-032819  | EK1173        | FPC Type 5-3D           |

|          |        |            |              |                        |
|----------|--------|------------|--------------|------------------------|
| CPU      | REV 12 | 711-030686 | EJ8584       | SNG PMB                |
| PIC 0    | REV 07 | 750-034624 | EF6837       | 12x10GE (LAN/WAN) SFPP |
| Xcvr 0   | REV 01 | 740-031980 | 123363A01145 | SFP+-10G-SR            |
| Xcvr 1   | REV 01 | 740-031980 | 123363A01147 | SFP+-10G-SR            |
| Xcvr 2   | REV 01 | 740-031980 | AJJ01P3      | SFP+-10G-SR            |
| Xcvr 3   | REV 01 | 740-031980 | B10M03256    | SFP+-10G-SR            |
| Xcvr 4   | REV 01 | 740-031980 | AJJ01M2      | SFP+-10G-SR            |
| Xcvr 5   | REV 01 | 740-031980 | 123363A01137 | SFP+-10G-SR            |
| Xcvr 6   | REV 01 | 740-031980 | AJJ01PN      | SFP+-10G-SR            |
| Xcvr 7   | REV 01 | 740-031980 | AJJ01NW      | SFP+-10G-SR            |
| Xcvr 8   | REV 01 | 740-031980 | 123363A01139 | SFP+-10G-SR            |
| Xcvr 9   | REV 01 | 740-031980 | AJJ01KE      | SFP+-10G-SR            |
| Xcvr 10  | REV 01 | 740-031980 | 123363A01336 | SFP+-10G-SR            |
| Xcvr 11  | REV 01 | 740-031980 | B10M01325    | SFP+-10G-SR            |
| PIC 1    | REV 07 | 750-034624 | EF6800       | 12x10GE (LAN/WAN) SFPP |
| Xcvr 0   | REV 01 | 740-031980 | AJJ01SA      | SFP+-10G-SR            |
| Xcvr 1   | REV 01 | 740-031980 | AJJ01QZ      | SFP+-10G-SR            |
| Xcvr 2   | REV 01 | 740-031980 | AJH0217      | SFP+-10G-SR            |
| Xcvr 3   | REV 01 | 740-031980 | AJJ01TE      | SFP+-10G-SR            |
| Xcvr 4   | REV 01 | 740-031980 | AJJ01KV      | SFP+-10G-SR            |
| Xcvr 5   | REV 01 | 740-031980 | AJJ01MU      | SFP+-10G-SR            |
| Xcvr 6   | REV 01 | 740-031980 | AJJ01R0      | SFP+-10G-SR            |
| Xcvr 7   | REV 01 | 740-031980 | AJJ01TC      | SFP+-10G-SR            |
| Xcvr 8   | REV 01 | 740-031980 | AJJ0364      | SFP+-10G-SR            |
| Xcvr 9   | REV 01 | 740-031980 | AJDOG3V3     | SFP+-10G-SR            |
| Xcvr 10  | REV 01 | 740-031980 | B10M03343    | SFP+-10G-SR            |
| Xcvr 11  | REV 01 | 740-031980 | AJJ01QJ      | SFP+-10G-SR            |
| LMB 0    | REV 05 | 711-034381 | EJ8490       | Type-0 LMB             |
| LMB 1    | REV 04 | 711-035774 | EJ8517       | Type-1 LMB             |
| LMB 2    | REV 05 | 711-034381 | EJ8489       | Type-0 LMB             |
| FPC 3    | REV 07 | 750-032819 | EG3637       | FPC Type 5-3D          |
| CPU      | REV 09 | 711-030686 | EG0150       | SNG PMB                |
| PIC 0    | REV 08 | 750-035293 | EF3657       | 1x100GE                |
| Xcvr 0   | REV 01 | 740-032210 | C22CQNJ      | CFP-100G-LR4           |
| PIC 1    | REV 10 | 750-034624 | BBAN4098     | 12x10GE (LAN/WAN) SFPP |
| Xcvr 0   | REV 01 | 740-031980 | B11J04902    | SFP+-10G-SR            |
| Xcvr 1   | REV 01 | 740-031980 | B11J04891    | SFP+-10G-SR            |
| Xcvr 2   | REV 01 | 740-031980 | AJJ01MX      | SFP+-10G-SR            |
| Xcvr 3   | REV 01 | 740-031980 | B11J04183    | SFP+-10G-SR            |
| Xcvr 4   | REV 01 | 740-031980 | B11J04894    | SFP+-10G-SR            |
| Xcvr 5   | REV 01 | 740-031980 | B11J04184    | SFP+-10G-SR            |
| Xcvr 6   | REV 01 | 740-031980 | B11J04897    | SFP+-10G-SR            |
| Xcvr 7   | REV 01 | 740-031980 | B11J04899    | SFP+-10G-SR            |
| Xcvr 8   | REV 01 | 740-031980 | AJJ01TV      | SFP+-10G-SR            |
| Xcvr 9   | REV 01 | 740-031980 | B11J04057    | SFP+-10G-SR            |
| Xcvr 10  | REV 01 | 740-031980 | AJJ01M4      | SFP+-10G-SR            |
| Xcvr 11  | REV 01 | 740-031980 | B11J04905    | SFP+-10G-SR            |
| LMB 0    | REV 04 | 711-034381 | EG1524       | Type-0 LMB             |
| LMB 1    | REV 03 | 711-035774 | EG0345       | Type-1 LMB             |
| LMB 2    | REV 04 | 711-034381 | EG1522       | Type-0 LMB             |
| FPC 5    | REV 03 | 710-033871 | BBAJ0768     | FPC Type 4-ES          |
| CPU      | REV 11 | 710-016744 | BBAH9342     | ST-PMB2                |
| PIC 0    | REV 09 | 750-029262 | EE6789       | 100GE                  |
| PIC 1    | REV 03 | 750-034781 | EE6655       | 100GE CFP              |
| Xcvr 0   | REV 01 | 740-032210 | J11A22334    | CFP-100G-LR4           |
| BRIDGE 0 | REV 03 | 711-029995 | EE6572       | 100GE Bridge Board     |
| MMB 0    | REV 07 | 710-025563 | BBAJ4657     | ST-MMB2                |
| MMB 1    | REV 07 | 710-025563 | BBAJ3073     | ST-MMB2                |
| FPC 6    | REV 05 | 750-010153 | EF4936       | FPC Type 5-3D          |
| CPU      | REV 06 | 711-030686 | EF4189       | SNG PMB                |
| PIC 0    | REV 10 | 750-034624 | BBAN4109     | 12x10GE (LAN/WAN) SFPP |

|            |        |            |              |                        |
|------------|--------|------------|--------------|------------------------|
| Xcvr 0     | REV 01 | 740-031980 | B11J04895    | SFP+-10G-SR            |
| Xcvr 1     | REV 01 | 740-031980 | B11J04898    | SFP+-10G-SR            |
| Xcvr 2     | REV 01 | 740-031980 | B11J04021    | SFP+-10G-SR            |
| Xcvr 3     | REV 01 | 740-031980 | B11J04903    | SFP+-10G-SR            |
| Xcvr 4     | REV 01 | 740-031980 | B11J04311    | SFP+-10G-SR            |
| Xcvr 5     | REV 01 | 740-031980 | B11J04059    | SFP+-10G-SR            |
| Xcvr 6     | REV 01 | 740-031980 | B11J04016    | SFP+-10G-SR            |
| Xcvr 7     | REV 01 | 740-031980 | B11J04017    | SFP+-10G-SR            |
| Xcvr 8     | REV 01 | 740-031980 | B11J04887    | SFP+-10G-SR            |
| Xcvr 9     | REV 01 | 740-031980 | B11J04297    | SFP+-10G-SR            |
| Xcvr 10    | REV 01 | 740-031980 | B11J04893    | SFP+-10G-SR            |
| Xcvr 11    | REV 01 | 740-031980 | B11J04022    | SFP+-10G-SR            |
| PIC 1      | REV 02 | 750-034624 | EE3711       | 12x10GE (LAN/WAN) SFPP |
| Xcvr 0     | REV 01 | 740-031980 | AJH033X      | SFP+-10G-SR            |
| Xcvr 1     | REV 01 | 740-031980 | AJJ01N0      | SFP+-10G-SR            |
| Xcvr 2     | REV 01 | 740-031980 | AJJ01SV      | SFP+-10G-SR            |
| Xcvr 3     | REV 01 | 740-031980 | AJJ032L      | SFP+-10G-SR            |
| Xcvr 4     | REV 01 | 740-031980 | B10M01593    | SFP+-10G-SR            |
| Xcvr 5     | REV 01 | 740-031980 | AJD0FF1      | SFP+-10G-SR            |
| Xcvr 6     | REV 01 | 740-031980 | AJJ01NU      | SFP+-10G-SR            |
| Xcvr 7     | REV 01 | 740-031980 | 123363A01305 | SFP+-10G-SR            |
| Xcvr 8     | REV 01 | 740-031980 | B10M00361    | SFP+-10G-SR            |
| Xcvr 9     | REV 01 | 740-031980 | AJJ01M7      | SFP+-10G-SR            |
| Xcvr 10    | REV 01 | 740-031980 | AJJ032X      | SFP+-10G-SR            |
| Xcvr 11    | REV 01 | 740-031980 | AJJ01PG      | SFP+-10G-SR            |
| LMB 0      | REV 04 | 711-034381 | EF3838       | Type-0 LMB             |
| LMB 1      | REV 03 | 711-035774 | EF3821       | Type-1 LMB             |
| LMB 2      | REV 04 | 711-034381 | EF3834       | Type-0 LMB             |
| SPMB 0     | REV 05 | 710-023321 | ED1990       | LCC Switch CPU         |
| SPMB 1     | REV 05 | 710-023321 | EA2768       | LCC Switch CPU         |
| SIB 0      | REV 02 | 711-036340 | EF8802       | SIB-HC-3D              |
| SIB 1      | REV 07 | 711-036340 | EG2286       | SIB-HC-3D              |
| SIB 2      | REV 07 | 711-036340 | EG2252       | SIB-HC-3D              |
| SIB 3      | REV 02 | 711-036340 | EF1358       | SIB-HC-3D              |
| SIB 4      | REV 02 | 711-036340 | EF8806       | SIB-HC-3D              |
| Fan Tray 0 |        |            |              | Front Top Fan Tray     |
| Fan Tray 1 |        |            |              | Front Bottom Fan Tray  |
| -- Rev 2   |        |            |              |                        |
| Fan Tray 2 |        |            |              | Rear Fan Tray -- Rev 3 |

#### show chassis hardware (T4000 Router with 16 GB line card chassis (LCC) Routing Engine)

```
user@host> show chassis hardware
```

| Hardware inventory: |         |             |               |                         |
|---------------------|---------|-------------|---------------|-------------------------|
| Item                | Version | Part number | Serial number | Description             |
| Chassis             |         |             | JN11BDF2CAHA  | T1600                   |
| Midplane            | REV 01  | 710-027486  | ACAJ0774      | T640 Backplane          |
| FPM GBUS            | REV 13  | 710-002901  | BBAL6812      | T640 FPM Board          |
| FPM Display         | REV 04  | 710-021387  | BBAP2679      | T1600 FPM Display       |
| CIP                 | REV 06  | 710-002895  | BBAP4758      | T-series CIP            |
| PEM 0               | Rev 03  | 740-026384  | XF86421       | Power Entry Module 3x80 |
| PEM 1               | Rev 03  | 740-026384  | XF86429       | Power Entry Module 3x80 |
| SCG 0               | REV 18  | 710-003423  | BBAP1896      | T640 Sonet Clock Gen.   |
| SCG 1               | REV 18  | 710-003423  | BBAN8659      | T640 Sonet Clock Gen.   |
| Routing Engine 0    | REV 01  | 740-042243  | 737F-002238   | RE-DUO-1800-16G         |
| Routing Engine 1    | REV 01  | 740-042243  | 737F-002403   | RE-DUO-1800-16G         |
| CB 1                | REV 11  | 710-022597  | EK4526        | LCC Control Board       |
| CB 1                | REV 11  | 710-022597  | EK4527        | LCC Control Board       |
| FPC 0               | REV 05  | 710-033871  | EK5644        | FPC Type 4-ES           |
| CPU                 | REV 11  | 710-016744  | EK3428        | ST-PMB2                 |
| PIC 0               | REV 20  | 750-017405  | EJ3041        | 4x 10GE (LAN/WAN) XFP   |

|            |        |            |        |                        |
|------------|--------|------------|--------|------------------------|
| PIC 1      | REV 17 | 750-026962 | EH7536 | 10x10GE(LAN/WAN) SFPP  |
| MMB 0      | REV 07 | 710-025563 | EK6039 | ST-MMB2                |
| MMB 1      | REV 07 | 710-025563 | EK6086 | ST-MMB2                |
| FPC 1      | REV 05 | 710-033871 | EK6583 | FPC Type 4-ES          |
| CPU        | REV 11 | 710-016744 | EK3401 | ST-PMB2                |
| PIC 0      | REV 17 | 750-026962 | EJ8948 | 10x10GE(LAN/WAN) SFPP  |
| MMB 0      | REV 07 | 710-025563 | EK6202 | ST-MMB2                |
| MMB 1      | REV 07 | 710-025563 | EK6112 | ST-MMB2                |
| SPMB 1     | REV 05 | 710-023321 | EK4900 | LCC Switch CPU         |
| SIB 0      | REV 11 | 710-013074 | EK5958 | SIB-I8-SF              |
| SIB 1      | REV 11 | 710-013074 | EK4606 | SIB-I8-SF              |
| SIB 2      | REV 11 | 710-013074 | EK5971 | SIB-I8-SF              |
| SIB 3      | REV 11 | 710-013074 | EK4609 | SIB-I8-SF              |
| SIB 4      | REV 11 | 710-013074 | EK4602 | SIB-I8-SF              |
| Fan Tray 0 |        |            |        | Front Top Fan Tray     |
| Fan Tray 1 |        |            |        | Front Bottom Fan Tray  |
| Fan Tray 2 |        |            |        | Rear Fan Tray -- Rev 2 |

### show chassis hardware (T4000 Router with LSR FPC)

```
user@host> show chassis hardware
Hardware inventory:
```

| Item    | Version | Part number | Serial number | Description            |
|---------|---------|-------------|---------------|------------------------|
| Chassis |         |             | JN1173A24AHA  | T4000                  |
| FPC 3   | REV     | 750-048373  | AN7797        | FPC Type 5-LSR         |
| CPU     | REV 10  | 711-030686  | AN6649        | SNG PMB                |
| PIC 0   | REV 07  | 750-034624  | EF6830        | 12x10GE (LAN/WAN) SFPP |

### show chassis hardware clei-models (T4000 Router)

```
user@host> show chassis hardware clei-models
Hardware inventory:
```

| Item             | Version | Part number | CLEI code  | FRU model number  |
|------------------|---------|-------------|------------|-------------------|
| Midplane         | REV 01  | 710-027486  | IPMJ700DRD | CHAS-BP-T1600-S   |
| FPM Display      | REV 01  | 710-021387  |            | CRAFT-T1600-S     |
| CIP              | REV 06  | 710-002895  |            | CIP-L-T640-S      |
| PEM 0            | REV 01  | 740-036442  | IPUPAG6KAA | PWR-T-6-60-DC     |
| SCG 0            | REV 18  | 710-003423  |            | SCG-T-S           |
| SCG 1            | REV 18  | 710-003423  |            | SCG-T-S           |
| Routing Engine 0 | REV 05  | 740-026941  |            | RE-DUO-C1800-8G-S |
| Routing Engine 1 | REV 06  | 740-026941  |            | RE-DUO-C1800-8G-S |
| CB 0             | REV 09  | 710-022597  |            | CB-LCC-S          |
| CB 1             | REV 09  | 710-022597  |            | CB-LCC-S          |
| FPC 3            |         |             |            |                   |
| PIC 0            | REV 08  | 750-035293  | XXXXXXXXBB | PF-1CGE-CFP       |
| PIC 1            | REV 10  | 750-034624  | XXXXXXXXCC | PF-12XGE-SFPP     |
| FPC 5            | REV 03  | 710-033871  | IPUCAMBCTD | T1600-FPC4-ES     |
| PIC 1            | REV 03  | 750-034781  | IPUIBKLMMA | PD-1CE-CFP-FPC4   |
| FPC 6            |         |             |            |                   |
| PIC 0            | REV 10  | 750-034624  | XXXXXXXXCC | PF-12XGE-SFPP     |
| Fan Tray 0       |         |             |            | FANTRAY-T-S       |
| Fan Tray 1       |         |             |            | FANTRAY-T4000-S   |
| Fan Tray 2       |         |             |            | FANTRAY-TXP-R-S   |

### show chassis hardware detail (T4000 Router)

```
user@host> show chassis hardware detail
Hardware inventory:
```

| Item     | Version | Part number | Serial number | Description        |
|----------|---------|-------------|---------------|--------------------|
| Chassis  |         |             | JN1172F25AHA  | T4000              |
| Midplane | REV 01  | 710-027486  | RC8355        | T-series Backplane |
| FPM GBUS | REV 13  | 710-002901  | BBAE0927      | T640 FPM Board     |

|                  |                       |            |                      |                         |
|------------------|-----------------------|------------|----------------------|-------------------------|
| FPM Display      | REV 01                | 710-021387 | EF6764               | T1600 FPM Display       |
| CIP              | REV 06                | 710-002895 | BBAD9210             | T-series CIP            |
| PEM 0            | REV 01                | 740-036442 | VA00016              | Power Entry Module 6x60 |
| SCG 0            | REV 18                | 710-003423 | BBAD7248             | T640 Sonet Clock Gen.   |
| SCG 1            | REV 18                | 710-003423 | BBAE3874             | T640 Sonet Clock Gen.   |
| Routing Engine 0 | REV 05                | 740-026941 | P737F-002248         | RE-DUO-1800             |
| ad0 3823 MB      | SMART CF              |            | 2009121602A661576157 | Compact Flash           |
| ad1 59690 MB     | STEC MACH-8 SSD       |            | STM000103FDB         | Disk 1                  |
| Routing Engine 1 | REV 06                | 740-026941 | P737F-002653         | RE-DUO-1800             |
| ad0 3823 MB      | SMART CF              |            | 201011150153F52CF52C | Compact Flash           |
| ad1 62720 MB     | SMART Lite SATA Drive |            | 2010110900150A880A88 | Disk 1                  |
| CB 0             | REV 09                | 710-022597 | ED0295               | LCC Control Board       |
| CB 1             | REV 09                | 710-022597 | EA6050               | LCC Control Board       |
| FPC 0            | REV 26                | 750-032819 | EK1173               | FPC Type 5-3D           |
| CPU              | REV 12                | 711-030686 | EJ8584               | SNG PMB                 |
| PIC 0            | REV 07                | 750-034624 | EF6837               | 12x10GE (LAN/WAN) SFPP  |
| Xcvr 0           | REV 01                | 740-031980 | 123363A01145         | SFP+-10G-SR             |
| Xcvr 1           | REV 01                | 740-031980 | 123363A01147         | SFP+-10G-SR             |
| Xcvr 2           | REV 01                | 740-031980 | AJJ01P3              | SFP+-10G-SR             |
| Xcvr 3           | REV 01                | 740-031980 | B10M03256            | SFP+-10G-SR             |
| Xcvr 4           | REV 01                | 740-031980 | AJJ01M2              | SFP+-10G-SR             |
| Xcvr 5           | REV 01                | 740-031980 | 123363A01137         | SFP+-10G-SR             |
| Xcvr 6           | REV 01                | 740-031980 | AJJ01PN              | SFP+-10G-SR             |
| Xcvr 7           | REV 01                | 740-031980 | AJJ01NW              | SFP+-10G-SR             |
| Xcvr 8           | REV 01                | 740-031980 | 123363A01139         | SFP+-10G-SR             |
| Xcvr 9           | REV 01                | 740-031980 | AJJ01KE              | SFP+-10G-SR             |
| Xcvr 10          | REV 01                | 740-031980 | 123363A01336         | SFP+-10G-SR             |
| Xcvr 11          | REV 01                | 740-031980 | B10M01325            | SFP+-10G-SR             |
| PIC 1            | REV 07                | 750-034624 | EF6800               | 12x10GE (LAN/WAN) SFPP  |
| Xcvr 0           | REV 01                | 740-031980 | AJJ01SA              | SFP+-10G-SR             |
| Xcvr 1           | REV 01                | 740-031980 | AJJ01QZ              | SFP+-10G-SR             |
| Xcvr 2           | REV 01                | 740-031980 | AJJ0217              | SFP+-10G-SR             |
| Xcvr 3           | REV 01                | 740-031980 | AJJ01TE              | SFP+-10G-SR             |
| Xcvr 4           | REV 01                | 740-031980 | AJJ01KV              | SFP+-10G-SR             |
| Xcvr 5           | REV 01                | 740-031980 | AJJ01MU              | SFP+-10G-SR             |
| Xcvr 6           | REV 01                | 740-031980 | AJJ01R0              | SFP+-10G-SR             |
| Xcvr 7           | REV 01                | 740-031980 | AJJ01TC              | SFP+-10G-SR             |
| Xcvr 8           | REV 01                | 740-031980 | AJJ0364              | SFP+-10G-SR             |
| Xcvr 9           | REV 01                | 740-031980 | AJD0GV3              | SFP+-10G-SR             |
| Xcvr 10          | REV 01                | 740-031980 | B10M03343            | SFP+-10G-SR             |
| Xcvr 11          | REV 01                | 740-031980 | AJJ01QJ              | SFP+-10G-SR             |
| LMB 0            | REV 05                | 711-034381 | EJ8490               | Type-0 LMB              |
| LMB 1            | REV 04                | 711-035774 | EJ8517               | Type-1 LMB              |
| LMB 2            | REV 05                | 711-034381 | EJ8489               | Type-0 LMB              |
| FPC 3            | REV 07                | 750-032819 | EG3637               | FPC Type 5-3D           |
| CPU              | REV 09                | 711-030686 | EG0150               | SNG PMB                 |
| PIC 0            | REV 08                | 750-035293 | EF3657               | 1x100GE                 |
| Xcvr 0           | REV 01                | 740-032210 | C22CQNJ              | CFP-100G-LR4            |
| PIC 1            | REV 10                | 750-034624 | BBAN4098             | 12x10GE (LAN/WAN) SFPP  |
| Xcvr 0           | REV 01                | 740-031980 | B11J04902            | SFP+-10G-SR             |
| Xcvr 1           | REV 01                | 740-031980 | B11J04891            | SFP+-10G-SR             |
| Xcvr 2           | REV 01                | 740-031980 | AJJ01MX              | SFP+-10G-SR             |
| Xcvr 3           | REV 01                | 740-031980 | B11J04183            | SFP+-10G-SR             |
| Xcvr 4           | REV 01                | 740-031980 | B11J04894            | SFP+-10G-SR             |
| Xcvr 5           | REV 01                | 740-031980 | B11J04184            | SFP+-10G-SR             |
| Xcvr 6           | REV 01                | 740-031980 | B11J04897            | SFP+-10G-SR             |
| Xcvr 7           | REV 01                | 740-031980 | B11J04899            | SFP+-10G-SR             |
| Xcvr 8           | REV 01                | 740-031980 | AJJ01TV              | SFP+-10G-SR             |
| Xcvr 9           | REV 01                | 740-031980 | B11J04057            | SFP+-10G-SR             |
| Xcvr 10          | REV 01                | 740-031980 | AJJ01M4              | SFP+-10G-SR             |
| Xcvr 11          | REV 01                | 740-031980 | B11J04905            | SFP+-10G-SR             |

|            |        |            |              |                        |
|------------|--------|------------|--------------|------------------------|
| LMB 0      | REV 04 | 711-034381 | EG1524       | Type-0 LMB             |
| LMB 1      | REV 03 | 711-035774 | EG0345       | Type-1 LMB             |
| LMB 2      | REV 04 | 711-034381 | EG1522       | Type-0 LMB             |
| FPC 5      | REV 03 | 710-033871 | BBAJ0768     | FPC Type 4-ES          |
| CPU        | REV 11 | 710-016744 | BBAH9342     | ST-PMB2                |
| PIC 0      | REV 09 | 750-029262 | EE6789       | 100GE                  |
| PIC 1      | REV 03 | 750-034781 | EE6655       | 100GE CFP              |
| Xcvr 0     | REV 01 | 740-032210 | J11A22334    | CFP-100G-LR4           |
| BRIDGE 0   | REV 03 | 711-029995 | EE6572       | 100GE Bridge Board     |
| MMB 0      | REV 07 | 710-025563 | BBAJ4657     | ST-MMB2                |
| MMB 1      | REV 07 | 710-025563 | BBAJ3073     | ST-MMB2                |
| FPC 6      | REV 05 | 750-010153 | EF4936       | FPC Type 5-3D          |
| CPU        | REV 06 | 711-030686 | EF4189       | SNG PMB                |
| PIC 0      | REV 10 | 750-034624 | BBAN4109     | 12x10GE (LAN/WAN) SFPP |
| Xcvr 0     | REV 01 | 740-031980 | B11J04895    | SFP+-10G-SR            |
| Xcvr 1     | REV 01 | 740-031980 | B11J04898    | SFP+-10G-SR            |
| Xcvr 2     | REV 01 | 740-031980 | B11J04021    | SFP+-10G-SR            |
| Xcvr 3     | REV 01 | 740-031980 | B11J04903    | SFP+-10G-SR            |
| Xcvr 4     | REV 01 | 740-031980 | B11J04311    | SFP+-10G-SR            |
| Xcvr 5     | REV 01 | 740-031980 | B11J04059    | SFP+-10G-SR            |
| Xcvr 6     | REV 01 | 740-031980 | B11J04016    | SFP+-10G-SR            |
| Xcvr 7     | REV 01 | 740-031980 | B11J04017    | SFP+-10G-SR            |
| Xcvr 8     | REV 01 | 740-031980 | B11J04887    | SFP+-10G-SR            |
| Xcvr 9     | REV 01 | 740-031980 | B11J04297    | SFP+-10G-SR            |
| Xcvr 10    | REV 01 | 740-031980 | B11J04893    | SFP+-10G-SR            |
| Xcvr 11    | REV 01 | 740-031980 | B11J04022    | SFP+-10G-SR            |
| PIC 1      | REV 02 | 750-034624 | EE3711       | 12x10GE (LAN/WAN) SFPP |
| Xcvr 0     | REV 01 | 740-031980 | AJH033X      | SFP+-10G-SR            |
| Xcvr 1     | REV 01 | 740-031980 | AJJ01N0      | SFP+-10G-SR            |
| Xcvr 2     | REV 01 | 740-031980 | AJJ01SV      | SFP+-10G-SR            |
| Xcvr 3     | REV 01 | 740-031980 | AJJ032L      | SFP+-10G-SR            |
| Xcvr 4     | REV 01 | 740-031980 | B10M01593    | SFP+-10G-SR            |
| Xcvr 5     | REV 01 | 740-031980 | AJD0FF1      | SFP+-10G-SR            |
| Xcvr 6     | REV 01 | 740-031980 | AJJ01NU      | SFP+-10G-SR            |
| Xcvr 7     | REV 01 | 740-031980 | 123363A01305 | SFP+-10G-SR            |
| Xcvr 8     | REV 01 | 740-031980 | B10M00361    | SFP+-10G-SR            |
| Xcvr 9     | REV 01 | 740-031980 | AJJ01M7      | SFP+-10G-SR            |
| Xcvr 10    | REV 01 | 740-031980 | AJJ032X      | SFP+-10G-SR            |
| Xcvr 11    | REV 01 | 740-031980 | AJJ01PG      | SFP+-10G-SR            |
| LMB 0      | REV 04 | 711-034381 | EF3838       | Type-0 LMB             |
| LMB 1      | REV 03 | 711-035774 | EF3821       | Type-1 LMB             |
| LMB 2      | REV 04 | 711-034381 | EF3834       | Type-0 LMB             |
| SPMB 0     | REV 05 | 710-023321 | ED1990       | LCC Switch CPU         |
| SPMB 1     | REV 05 | 710-023321 | EA2768       | LCC Switch CPU         |
| SIB 0      | REV 02 | 711-036340 | EF8802       | SIB-HC-3D              |
| SIB 1      | REV 07 | 711-036340 | EG2286       | SIB-HC-3D              |
| SIB 2      | REV 07 | 711-036340 | EG2252       | SIB-HC-3D              |
| SIB 3      | REV 02 | 711-036340 | EF1358       | SIB-HC-3D              |
| SIB 4      | REV 02 | 711-036340 | EF8806       | SIB-HC-3D              |
| Fan Tray 0 |        |            |              | Front Top Fan Tray     |
| Fan Tray 1 |        |            |              | Front Bottom Fan Tray  |
| -- Rev 2   |        |            |              |                        |
| Fan Tray 2 |        |            |              | Rear Fan Tray -- Rev 3 |

### show chassis hardware models (T4000 Router)

```
user@host> show chassis hardware models
```

```
Hardware inventory:
```

| Item     | Version | Part number | Serial number | FRU model number |
|----------|---------|-------------|---------------|------------------|
| Midplane | REV 01  | 710-027486  | RC8355        | CHAS-BP-T1600-S  |

|                  |        |            |              |                   |
|------------------|--------|------------|--------------|-------------------|
| FPM Display      | REV 01 | 710-021387 | EF6764       | CRAFT-T1600-S     |
| CIP              | REV 06 | 710-002895 | BBAD9210     | CIP-L-T640-S      |
| PEM 0            | REV 01 | 740-036442 | VA00016      | PWR-T-6-60-DC     |
| SCG 0            | REV 18 | 710-003423 | BBAD7248     | SCG-T-S           |
| SCG 1            | REV 18 | 710-003423 | BBAE3874     | SCG-T-S           |
| Routing Engine 0 | REV 05 | 740-026941 | P737F-002248 | RE-DUO-C1800-8G-S |
| Routing Engine 1 | REV 06 | 740-026941 | P737F-002653 | RE-DUO-C1800-8G-S |
| CB 0             | REV 09 | 710-022597 | ED0295       | CB-LCC-S          |
| CB 1             | REV 09 | 710-022597 | EA6050       | CB-LCC-S          |
| FPC 3            |        |            |              |                   |
| PIC 0            | REV 08 | 750-035293 | EF3657       | PF-1CGE-CFP       |
| PIC 1            | REV 10 | 750-034624 | BBAN4098     | PF-12XGE-SFPP     |
| FPC 5            | REV 03 | 710-033871 | BBAJ0768     | T1600-FPC4-ES     |
| PIC 1            | REV 03 | 750-034781 | EE6655       | PD-1CE-CFP-FPC4   |
| FPC 6            |        |            |              |                   |
| PIC 0            | REV 10 | 750-034624 | BBAN4109     | PF-12XGE-SFPP     |
| Fan Tray 0       |        |            |              | FANTRAY-T-S       |
| Fan Tray 1       |        |            |              | FANTRAY-T4000-S   |
| Fan Tray 2       |        |            |              | FAN-REAR-TXP-LCC  |

### show chassis hardware lcc (TX Matrix Router)

```
user@host> show chassis hardware lcc 0
lcc0-re0:
```

#### Hardware inventory:

| Item             | Version | Part number | Serial number | Description             |
|------------------|---------|-------------|---------------|-------------------------|
| Chassis          |         |             | 65751         | T640                    |
| Midplane         | REV 03  | 710-005608  | RA1408        | T640 Backplane          |
| FPM GBUS         | REV 09  | 710-002901  | RA2784        | T640 FPM Board          |
| FPM Display      | REV 05  | 710-002897  | RA2825        | FPM Display             |
| CIP              | REV 06  | 710-002895  | HT0684        | T Series CIP            |
| PEM 0            | Rev 11  | 740-002595  | PM18483       | Power Entry Module      |
| PEM 1            | Rev 11  | 740-002595  | qb13984       | Power Entry Module      |
| SCG 0            | REV 11  | 710-003423  | HT0022        | T640 Sonet Clock Gen.   |
| Routing Engine 0 | REV 13  | 740-005022  | 210865700363  | RE-3.0 (RE-600)         |
| CB 0             | REV 03  | 710-007655  | HW1195        | Control Board (CB-T)    |
| FPC 1            | REV 05  | 710-007527  | HM3245        | FPC Type 2              |
| CPU              | REV 14  | 710-001726  | HM1084        | FPC CPU                 |
| PIC 0            | REV 02  | 750-007218  | AZ1112        | 2x OC-12 ATM2 IQ, SMIR  |
| PIC 1            | REV 02  | 750-007745  | HG3462        | 4x OC-3 SONET, SMIR     |
| PIC 2            | REV 14  | 750-001901  | BA5390        | 4x OC-12 SONET, SMIR    |
| PIC 3            | REV 09  | 750-008155  | HS3012        | 2x G/E IQ, 1000 BASE    |
| SFP 0            |         | NON-JNPR    | P1186TY       | SFP-S                   |
| SFP 1            | REV 01  | 740-007326  | P11WLTF       | SFP-SX                  |
| MMB 1            | REV 02  | 710-005555  | HL7514        | MMB-288mbit             |
| PPB 0            | REV 04  | 710-003758  | HM4405        | PPB Type 2              |
| PPB 1            | REV 04  | 710-003758  | AV1960        | PPB Type 2              |
| FPC 2            | REV 08  | 710-010154  | HZ3578        | E-FPC Type 3            |
| CPU              | REV 05  | 710-010169  | HZ3219        | FPC CPU-Enhanced        |
| PIC 0            | REV 02  | 750-009567  | HX2882        | 1x 10GE(LAN), XENPAK    |
| SFP 0            | REV 01  | 740-009898  | USC202U709    | XENPAK-LR               |
| PIC 1            | REV 03  | 750-003336  | HJ9954        | 4x OC-48 SONET, SMSR    |
| PIC 2            | REV 01  | 750-004535  | HC0235        | 1x OC-192 SM SR1        |
| PIC 3            | REV 07  | 750-007141  | HX1699        | 10x 1GE(LAN), 1000 BASE |
| SFP 0            | REV 01  | 740-007326  | 2441042       | SFP-SX                  |
| SFP 1            | REV 01  | 740-007326  | 2441027       | SFP-SX                  |
| MMB 0            | REV 03  | 710-010171  | HV2365        | MMB-5M3-288mbit         |
| MMB 1            | REV 03  | 710-010171  | HZ3888        | MMB-5M3-288mbit         |
| SPMB 0           | REV 09  | 710-003229  | HW5245        | T Series Switch CPU     |



|         |        |            |        |                |
|---------|--------|------------|--------|----------------|
| SIB 3   | REV 07 | 710-005781 | HR5927 | SIB-L8-F16     |
| B Board | REV 06 | 710-005782 | HR5971 | SIB-L8-F16 (B) |
| SIB 4   | REV 07 | 710-005781 | HR5903 | SIB-L8-F16     |
| B Board | REV 06 | 710-005782 | HZ5275 | SIB-L8-F16 (B) |

### show chassis hardware scc (TX Matrix Router)

```
user@host> show chassis hardware scc
scc-re0:
```

```

Hardware inventory:
Item Version Part number Serial number Description
Chassis TX Matrix
Midplane REV 04 710-004396 RB0014 SCC Midplane
FPM GBUS REV 04 710-004617 HW9141 SCC FPM Board
FPM Display REV 04 710-004619 HS5950 SCC FPM
CIP 0 REV 01 710-010218 HV9151 SCC CIP
CIP 1 REV 01 710-010218 HV9152 SCC CIP
PEM 1 Rev 11 740-002595 QB13977 Power Entry Module
Routing Engine 0 REV 05 740-008883 P11123900153 RE-4.0 (RE-1600)
CB 0 REV 01 710-011709 HR5964 Control Board (CB-TX)
SPMB 0 REV 09 710-003229 HW5293 T Series Switch CPU
SIB 3
SIB 4 REV 01 710-005839 HW1177 SIB-S8-F16
B Board REV 01 710-005840 HW1202 SIB-S8-F16 (B)
```

### show chassis hardware (T1600 Router)

```
user@host> show chassis hardware
```

```
Hardware inventory:
Item Version Part number Serial number Description
Chassis T1600
Midplane REV 03 710-005608 RC4137 T640 Backplane
FPM GBUS REV 10 710-002901 DT7062 T640 FPM Board
FPM Display REV 05 710-002897 DS3067 FPM Display
CIP REV 06 710-002895 DT3386 T-series CIP
PEM 0 Rev 07 740-017906 UA26344 Power Entry Module 3x80
PEM 1 Rev 18 740-002595 UF38441 Power Entry Module
SCG 0 REV 15 710-003423 DV0941 T640 Sonet Clock Gen.
Routing Engine 0 REV 08 740-014082 9009014502 RE-A-2000
Routing Engine 1 REV 07 740-014082 9009009591 RE-A-2000
CB 0 REV 05 710-007655 JA9360 Control Board (CB-T)
CB 1 REV 03 710-017707 DT3251 Control Board (CB-T)
FPC 0 REV 07 710-013558 DR4253 E2-FPC Type 2
CPU REV 05 710-013563 DS3902 FPC CPU-Enhanced
PIC 0 REV 01 750-010618 CB5446 4x G/E SFP, 1000 BASE
Xcvr 0 REV 01 740-011613 P9F11CW SFP-SX
Xcvr 1 REV 01 740-011613 P9F15C2 SFP-SX
Xcvr 2 REV 01 740-011782 PB94K0L SFP-SX
PIC 1 REV 06 750-001900 HB6399 1x OC-48 SONET, SMSR
PIC 2 REV 14 750-001901 AP1092 4x OC-12 SONET, SMIR
PIC 3 REV 07 750-001900 AR8275 1x OC-48 SONET, SMSR
MMB 1 REV 07 710-010171 DS1524 MMB-5M3-288mbit
FPC 1 REV 06 710-013553 DL9067 E2-FPC Type 1
CPU REV 04 710-013563 DM1685 FPC CPU-Enhanced
PIC 0 REV 08 750-001072 AB1688 1x G/E, 1000 BASE-SX
PIC 1 REV 10 750-012266 JX5519 4x 1GE(LAN), IQ2
Xcvr 0 REV 01 740-011613 AM0812S8UK6 SFP-SX
Xcvr 2 REV 01 740-011613 AM0812S8UK1 SFP-SX
Xcvr 3 REV 01 740-011782 P8N1YHG SFP-SX
PIC 2 REV 22 750-005634 DP0083 1x CHOC12 IQ SONET, SMIR
```

|          |        |            |             |                         |
|----------|--------|------------|-------------|-------------------------|
| MMB 1    | REV 07 | 710-008923 | DN1862      | MMB 3M 288-bit          |
| FPC 2    | REV 01 | 710-005548 | HJ9899      | FPC Type 3              |
| CPU      | REV 06 | 710-001726 | HC0586      | FPC CPU                 |
| PIC 0    | REV 16 | 750-007141 | NC9660      | 10x 1GE(LAN), 1000 BASE |
| Xcvr 0   | REV 01 | 740-011613 | AM0812S8XAR | SFP-SX                  |
| Xcvr 1   | REV 01 | 740-011782 | P920E7B     | SFP-SX                  |
| Xcvr 2   | REV 01 | 740-011613 | AM0812S8XAU | SFP-SX                  |
| Xcvr 4   | REV 01 | 740-011613 | AM0812S8XAK | SFP-SX                  |
| Xcvr 5   | REV 01 | 740-011613 | AM0812S8XAA | SFP-SX                  |
| Xcvr 6   | REV 01 | 740-011613 | PAJ4NKY     | SFP-SX                  |
| Xcvr 7   | REV 01 | 740-011613 | AM0812S8UJW | SFP-SX                  |
| Xcvr 8   | REV 01 | 740-011782 | PB81X89     | SFP-SX                  |
| Xcvr 9   | REV 01 | 740-011613 | AM0812S8UJX | SFP-SX                  |
| PIC 1    | REV 06 | 750-015217 | DK3280      | 8x 1GE(TYPE3), IQ2      |
| Xcvr 0   | REV 01 | 740-011782 | P8P0A3T     | SFP-SX                  |
| Xcvr 1   | REV 01 | 740-013111 | 5090002     | SFP-T                   |
| Xcvr 2   | REV 01 | 740-011613 | AM0814S93BQ | SFP-SX                  |
| Xcvr 4   |        | NON-JNPR   | PDE0FAN     | SFP-SX                  |
| Xcvr 5   | REV 01 | 740-011782 | P8Q20XY     | SFP-SX                  |
| Xcvr 6   | REV 01 | 740-011613 | AM0812S8UJV | SFP-SX                  |
| Xcvr 7   | REV 01 | 740-011613 | AM0812S8UP7 | SFP-SX                  |
| PIC 2    | REV 05 | 750-004695 | HT4383      | 1x Tunnel               |
| PIC 3    | REV 17 | 750-009553 | RL0204      | 4x OC-48 SONET          |
| Xcvr 0   | REV 01 | 740-011785 | PDS3T23     | SFP-SR                  |
| Xcvr 1   | REV 01 | 740-011785 | P6Q0F3E     | SFP-SR                  |
| MMB 0    | REV 03 | 710-004047 | HD5843      | MMB-288mbit             |
| MMB 1    | REV 03 | 710-004047 | HE3208      | MMB-288mbit             |
| PPB 0    | REV 02 | 710-002845 | HA4524      | PPB Type 3              |
| PPB 1    | REV 02 | 710-002845 | HA4766      | PPB Type 3              |
| FPC 3    | REV 01 | 710-010154 | HR0863      | E-FPC Type 3            |
| CPU      | REV 01 | 710-010169 | HN3422      | FPC CPU-Enhanced        |
| PIC 0    | REV 07 | 750-012793 | WF5096      | 1x 10GE(LAN/WAN) IQ2    |
| Xcvr 0   |        | NON-JNPR   | M64294TP    | XFP-10G-LR              |
| PIC 1    | REV 25 | 750-007141 | DV2127      | 10x 1GE(LAN), 1000 BASE |
| Xcvr 0   | REV 01 | 740-011613 | PFA6LTJ     | SFP-SX                  |
| Xcvr 1   | REV 01 | 740-011782 | P9P0XV4     | SFP-SX                  |
| Xcvr 2   | REV 01 | 740-011782 | P9M0TNX     | SFP-SX                  |
| Xcvr 4   | REV 01 | 740-011782 | P9B0TTP     | SFP-SX                  |
| Xcvr 5   |        | NON-JNPR   | PBS4LED     | SFP-SX                  |
| PIC 2    | REV 17 | 750-009553 | RL0212      | 4x OC-48 SONET          |
| Xcvr 0   | REV 01 | 740-011785 | PDS3T8G     | SFP-SR                  |
| PIC 3    | REV 32 | 750-003700 | DL1279      | 1x OC-192 12xMM VSR     |
| MMB 0    | REV 01 | 710-010171 | HR0821      | MMB-288mbit             |
| MMB 1    | REV 01 | 710-010171 | HR0818      | MMB-288mbit             |
| FPC 4    | REV 16 | 710-013037 | EB4919      | FPC Type 4-ES           |
| CPU      | REV 09 | 710-016744 | BBAA4382    | ST-PMB2                 |
| PIC 0    | REV 03 | 711-029996 | EB1569      | 100GE                   |
| PIC 1    | REV 05 | 711-029999 | EB9983      | 100GE CFP               |
| Xcvr 0   | REV 0  | 740-032210 | J10G80746   | CFP-100G-LR4            |
| BRIDGE 0 | REV 02 | 711-029995 | EB2235      | 100GE Bridge Board      |
| MMB 0    | REV 04 | 710-025563 | BBAA7112    | ST-MMB2                 |
| MMB 1    | REV 04 | 710-025563 | BBAA7149    | ST-MMB2                 |
| FPC 5    | REV 02 | 710-013037 | DE3407      | FPC Type 4-ES           |
| CPU      | REV 04 | 710-016744 | DA2124      | ST-PMB2                 |
| PIC 0    | REV 16 | 750-012518 | DF2554      | 4x OC-192 SONET XFP     |
| Xcvr 0   | REV 01 | 740-014279 | AA0745N1FX8 | XFP-OC192-SR            |
| Xcvr 1   | REV 01 | 740-014279 | AA0748N1HN5 | XFP-OC192-SR            |
| Xcvr 2   | REV 01 | 740-014279 | AA0748N1HT6 | XFP-OC192-SR            |

|            |        |            |             |                        |
|------------|--------|------------|-------------|------------------------|
| Xcvr 3     | REV 01 | 740-014279 | AA0744N1EC9 | XFP-OC192-SR           |
| PIC 1      | REV 01 | 750-010850 | JA0329      | 1x OC-768 SONET SR     |
| MMB 0      | REV 04 | 710-016036 | DE9577      | ST-MMB2                |
| MMB 1      | REV 04 | 710-016036 | DK4060      | ST-MMB2                |
| FPC 6      | REV 14 | 710-013037 | DV1431      | FPC Type 4-ES          |
| CPU        | REV 09 | 710-016744 | DT9020      | ST-PMB2                |
| PIC 0      | REV 11 | 750-017405 | DM6261      | 4x 10GE (LAN/WAN) XFP  |
| Xcvr 0     | REV 01 | 740-014289 | C701XU05Q   | XFP-10G-SR             |
| Xcvr 1     | REV 01 | 740-014279 | AA0748N1HPT | XFP-10G-LR             |
| Xcvr 2     | REV 01 | 740-014289 | T08E19189   | XFP-10G-SR             |
| Xcvr 3     | REV 01 | 740-014289 | C715XU058   | XFP-10G-SR             |
| PIC 1      | REV 13 | 750-017405 | DP8772      | 4x 10GE (LAN/WAN) XFP  |
| Xcvr 0     | REV 02 | 740-011571 | C850XJ037   | XFP-10G-SR             |
| Xcvr 1     | REV 02 | 740-014289 | C839XU0L9   | XFP-10G-SR             |
| Xcvr 2     | REV 02 | 740-014289 | C834XU05A   | XFP-10G-SR             |
| Xcvr 3     | REV 02 | 740-014289 | C810XU0CE   | XFP-10G-SR             |
| MMB 0      | REV 01 | 710-025563 | DT8454      | ST-MMB2                |
| MMB 1      | REV 01 | 710-025563 | DT8366      | ST-MMB2                |
| FPC 7      | REV 09 | 710-007529 | HZ7624      | FPC Type 3             |
| CPU        | REV 15 | 710-001726 | HZ1413      | FPC CPU                |
| PIC 0      | REV 10 | 750-012793 | DM5627      | 1x 10GE(LAN/WAN) IQ2   |
| Xcvr 0     | REV 02 | 740-011571 | C831XJ062   | XFP-10G-SR             |
| PIC 1      | REV 01 | 750-015217 | JT6762      | 8x 1GE(TYPE3), IQ2     |
| Xcvr 0     | REV 01 | 740-011782 | P8Q25JU     | SFP-SX                 |
| Xcvr 1     | REV 01 | 740-011782 | P9B0U0K     | SFP-SX                 |
| PIC 2      | REV 01 | 750-015217 | JS4268      | 8x 1GE(TYPE3), IQ2     |
| Xcvr 0     | REV 01 | 740-011613 | AM0812S8XBZ | SFP-SX                 |
| Xcvr 1     | REV 01 | 740-011613 | AM0812S8XAP | SFP-SX                 |
| Xcvr 2     | REV 01 | 740-011613 | AM0812S8XBY | SFP-SX                 |
| Xcvr 3     | REV 01 | 740-011613 | AM0812S8XBX | SFP-SX                 |
| Xcvr 4     | REV 01 | 740-011613 | P9F1652     | SFP-SX                 |
| Xcvr 5     | REV 01 | 740-011782 | P8Q21YC     | SFP-SX                 |
| Xcvr 6     | REV 01 | 740-011782 | P8Q27HQ     | SFP-SX                 |
| Xcvr 7     | REV 01 | 740-011613 | P8E2SSU     | SFP-SX                 |
| PIC 3      | REV 15 | 750-009450 | NB6790      | 1x OC-192 SM SR2       |
| MMB 0      | REV 03 | 710-005555 | HZ3450      | MMB-288mbit            |
| MMB 1      | REV 03 | 710-005555 | HZ3415      | MMB-288mbit            |
| PPB 0      | REV 04 | 710-002845 | HP0887      | PPB Type 3             |
| PPB 1      | REV 04 | 710-002845 | HW5255      | PPB Type 3             |
| SPMB 0     | REV 10 | 710-003229 | HX3699      | T-series Switch CPU    |
| SPMB 1     | REV 12 | 710-003229 | DT3091      | T-series Switch CPU    |
| SIB 0      | REV 07 | 710-013074 | DS4747      | SIB-I8-SF              |
| SIB 1      | REV 07 | 710-013074 | DS4942      | SIB-I8-SF              |
| SIB 2      | REV 07 | 710-013074 | DS4965      | SIB-I8-SF              |
| SIB 3      | REV 07 | 710-013074 | DS4990      | SIB-I8-SF              |
| SIB 4      | REV 07 | 710-013074 | DS4944      | SIB-I8-SF              |
| Fan Tray 0 |        |            |             | Front Top Fan Tray     |
| Fan Tray 1 |        |            |             | Front Bottom Fan Tray  |
| Fan Tray 2 |        |            |             | Rear Fan Tray -- Rev 2 |

### show chassis hardware (TX Matrix Plus Router)

```
user@host> show chassis hardware
sfc0-re0:
```

```

Hardware inventory:
```

| Item        | Version | Part number | Serial number | Description     |
|-------------|---------|-------------|---------------|-----------------|
| Chassis     |         |             | JN113186EAHB  | TXP             |
| Midplane    | REV 05  | 710-022574  | TS3822        | SFC Midplane    |
| FPM Display | REV 03  | 710-024027  | DW4701        | TXP FPM Display |
| CIP 0       | REV 05  | 710-023792  | DW7998        | TXP CIP         |

|                  |        |            |           |                    |
|------------------|--------|------------|-----------|--------------------|
| CIP 1            | REV 05 | 710-023792 | DW7999    | TXP CIP            |
| PEM 0            | Rev 04 | 740-027463 | UM26367   | Power Entry Module |
| PEM 1            | Rev 04 | 740-027463 | UM26346   | Power Entry Module |
| Routing Engine 0 | REV 06 | 740-026942 | 737A-1081 | RE-DUO-2600        |
| Routing Engine 1 | REV 06 | 740-026942 | 737A-1043 | RE-DUO-2600        |
| CB 0             | REV 05 | 710-022606 | DW4435    | SFC Control Board  |
| CB 1             | REV 09 | 710-022606 | DW6100    | SFC Control Board  |
| SPMB 0           |        | BUILTIN    |           | SFC Switch CPU     |
| SPMB 1           |        | BUILTIN    |           | SFC Switch CPU     |
| SIB F13 0        | REV 04 | 750-024564 | DW5764    | F13 SIB            |
| B Board          | REV 03 | 710-023431 | DW9053    | F13 SIB Mezz       |
| SIB F13 3        | REV 04 | 750-024564 | DW5785    | F13 SIB            |
| B Board          | REV 03 | 710-023431 | DW9030    | F13 SIB Mezz       |
| SIB F13 6        |        |            |           |                    |
| SIB F13 8        | REV 04 | 750-024564 | DW5752    | F13 SIB            |
| B Board          | REV 03 | 710-023431 | DW9051    | F13 SIB Mezz       |
| SIB F13 11       | REV 04 | 750-024564 | DW5782    | F13 SIB            |
| B Board          | REV 03 | 710-023431 | DW9058    | F13 SIB Mezz       |
| SIB F13 12       | REV 03 | 750-024564 | DT9466    | F13 SIB            |
| B Board          | REV 02 | 710-023431 | DT6556    | F13 SIB Mezz       |
| SIB F2S 0/0      | REV 05 | 710-022603 | DW7898    | F2S SIB            |
| B Board          | REV 05 | 710-023787 | DW7625    | F2S SIB Mezz       |
| SIB F2S 0/2      | REV 05 | 710-022603 | DW7811    | F2S SIB            |
| B Board          | REV 05 | 710-023787 | DW7550    | F2S SIB Mezz       |
| SIB F2S 0/4      | REV 04 | 710-022603 | DW4873    | F2S SIB            |
| B Board          | REV 05 | 710-023787 | DW8509    | F2S SIB Mezz       |
| SIB F2S 0/6      | REV 04 | 710-022603 | DW4867    | F2S SIB            |
| B Board          | REV 05 | 710-023787 | DW8472    | F2S SIB Mezz       |
| SIB F2S 1/0      | REV 04 | 710-022603 | DW4871    | F2S SIB            |
| B Board          | REV 05 | 710-023787 | DW8497    | F2S SIB Mezz       |
| SIB F2S 1/2      | REV 05 | 710-022603 | DW7868    | F2S SIB            |
| B Board          | REV 05 | 710-023787 | DW7551    | F2S SIB Mezz       |
| SIB F2S 1/4      | REV 04 | 710-022603 | DW4854    | F2S SIB            |
| B Board          | REV 05 | 710-023787 | DW8496    | F2S SIB Mezz       |
| SIB F2S 1/6      | REV 05 | 710-022603 | DW7889    | F2S SIB            |
| B Board          | REV 05 | 710-023787 | DW7496    | F2S SIB Mezz       |
| SIB F2S 2/0      | REV 04 | 710-022603 | DW4852    | F2S SIB            |
| B Board          | REV 05 | 710-023787 | DW8498    | F2S SIB Mezz       |
| SIB F2S 2/2      | REV 04 | 710-022603 | DW4845    | F2S SIB            |
| B Board          | REV 05 | 710-023787 | DW8457    | F2S SIB Mezz       |
| SIB F2S 2/4      | REV 05 | 710-022603 | DW7802    | F2S SIB            |
| B Board          | REV 05 | 710-023787 | DW7562    | F2S SIB Mezz       |
| SIB F2S 2/6      | REV 04 | 710-022603 | DW4822    | F2S SIB            |
| B Board          | REV 05 | 710-023787 | DW8467    | F2S SIB Mezz       |
| SIB F2S 3/0      | REV 05 | 710-022603 | DW7815    | F2S SIB            |
| B Board          | REV 05 | 710-023787 | DW7518    | F2S SIB Mezz       |
| SIB F2S 3/2      | REV 03 | 710-022603 | DV0068    | F2S SIB            |
| B Board          | REV 03 | 710-023787 | DT9974    | F2S SIB Mezz       |
| SIB F2S 3/4      | REV 05 | 710-022603 | DW7874    | F2S SIB            |
| B Board          | REV 05 | 710-023787 | DW7601    | F2S SIB Mezz       |
| SIB F2S 3/6      | REV 03 | 710-022603 | DV0033    | F2S SIB            |
| B Board          | REV 03 | 710-023787 | DT9969    | F2S SIB Mezz       |
| SIB F2S 4/0      | REV 03 | 710-022603 | DV0043    | F2S SIB            |
| B Board          | REV 03 | 710-023787 | DT9948    | F2S SIB Mezz       |
| SIB F2S 4/2      | REV 05 | 710-022603 | DW5446    | F2S SIB            |
| B Board          | REV 05 | 710-023787 | DW7611    | F2S SIB Mezz       |
| SIB F2S 4/4      | REV 04 | 710-022603 | DW4826    | F2S SIB            |
| B Board          | REV 05 | 710-023787 | DW8458    | F2S SIB Mezz       |
| SIB F2S 4/6      | REV 03 | 710-022603 | DV0026    | F2S SIB            |
| B Board          | REV 03 | 710-023787 | DT9963    | F2S SIB Mezz       |
| Fan Tray 0       | REV 02 | 760-024497 | DR8290    | Front Fan Tray     |

|            |        |            |        |                |
|------------|--------|------------|--------|----------------|
| Fan Tray 1 | REV 02 | 760-024497 | DR8293 | Front Fan Tray |
| Fan Tray 2 | REV 05 | 760-024502 | DR8280 | Rear Fan Tray  |
| Fan Tray 3 |        |            |        |                |
| Fan Tray 4 | REV 05 | 760-024502 | DR8276 | Rear Fan Tray  |
| Fan Tray 5 | REV 02 | 760-024502 | DP5643 | Rear Fan Tray  |

lcc0-re0:

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Hardware inventory:

| Item             | Version | Part number | Serial number | Description              |
|------------------|---------|-------------|---------------|--------------------------|
| Chassis          |         |             | JN11036F8AHA  | T1600                    |
| Midplane         | REV 03  | 710-017247  | RC3799        | T-series Backplane       |
| FPM GBUS         | REV 10  | 710-002901  | DP7009        | T640 FPM Board           |
| FPM Display      | REV 01  | 710-021387  | DN7026        | T1600 FPM Display        |
| CIP              | REV 06  | 710-002895  | DP6024        | T-series CIP             |
| PEM 1            | Rev 02  | 740-023211  | WA50019       | Power Entry Module 4x60A |
| SCG 0            | REV 15  | 710-003423  | DR6757        | T640 Sonet Clock Gen.    |
| SCG 1            | REV 15  | 710-003423  | DS2225        | T640 Sonet Clock Gen.    |
| Routing Engine 0 | REV 01  | 740-026941  | 737F-1040     | RE-DUO-1800              |
| Routing Engine 1 | REV 01  | 740-026941  | 737F-1016     | RE-DUO-1800              |
| CB 0             | REV 06  | 710-022597  | DX4011        | LCC Control Board        |
| CB 1             | REV 06  | 710-022597  | DX4017        | LCC Control Board        |
| FPC 1            | REV 07  | 710-013035  | DN5847        | FPC Type 3-ES            |
| CPU              | REV 08  | 710-016744  | DP2570        | ST-PMB2                  |
| PIC 0            | REV 05  | 750-015217  | DB0418        | 8x 1GE(TYPE3), IQ2       |
| Xcvr 0           | REV 01  | 740-011782  | P8Q27ZG       | SFP-SX                   |
| Xcvr 1           |         | NON-JNPR    | PDA1U0D       | SFP-SX                   |
| Xcvr 2           | REV 01  | 740-011613  | P9F1ALW       | SFP-SX                   |
| Xcvr 3           | REV 01  | 740-011782  | PBA403V       | SFP-SX                   |
| Xcvr 4           |         | NON-JNPR    | PDE09DP       | SFP-SX                   |
| Xcvr 5           | REV 01  | 740-011782  | PCH2P4K       | SFP-SX                   |
| Xcvr 6           | REV 01  | 740-011782  | PB94K0F       | SFP-SX                   |
| Xcvr 7           | REV 01  | 740-011782  | PBA2R2A       | SFP-SX                   |
| PIC 1            | REV 03  | 750-004424  | HJ4020        | 1x 10GE(LAN),DWDM        |
| PIC 2            | REV 01  | 750-003336  | HG6073        | 4x OC-48 SONET, SMSR     |
| MMB 0            | REV 04  | 710-016036  | DP3401        | ST-MMB2                  |
| FPC 3            | REV 12  | 710-013037  | DR1169        | FPC Type 4-ES            |
| CPU              | REV 08  | 710-016744  | DP9429        | ST-PMB2                  |
| PIC 0            | REV 02  | 750-010850  | JA0332        | 1x OC-768 SONET SR       |
| MMB 0            | REV 04  | 710-016036  | DR0628        | ST-MMB2                  |
| MMB 1            | REV 04  | 710-016036  | DR0592        | ST-MMB2                  |
| FPC 4            | REV 05  | 710-021534  | DR7350        | FPC Type 1-ES            |
| CPU              | REV 08  | 710-016744  | DP8096        | ST-PMB2                  |
| PIC 0            | REV 04  | 750-014627  | DP9171        | 4x OC-3 1x OC-12 SFP     |
| Xcvr 0           | REV 02  | 740-011615  | PDE2RVR       | SFP-SR                   |
| PIC 1            | REV 22  | 750-005634  | DS5815        | 1x CHOC12 IQ SONET, SMIR |
| PIC 2            | REV 09  | 750-002911  | CF4539        | 4x F/E, 100 BASE-TX      |
| PIC 3            | REV 08  | 750-021652  | DR2827        | 1x CHOC12 IQE SONET      |
| Xcvr 0           |         | NON-JNPR    | 8             | UNKNOWN                  |
| MMB 0            | REV 04  | 710-016036  | DR0809        | ST-MMB2                  |
| FPC 5            | REV 07  | 710-007529  | HS5608        | FPC Type 3               |
| CPU              | REV 15  | 710-001726  | HX4351        | FPC CPU                  |
| PIC 0            | REV 14  | 750-009567  | WJ8961        | 1x 10GE(LAN),XENPAK      |
| Xcvr 0           | REV 01  | 740-013170  | J05K05961     | XENPAK-LR                |
| PIC 1            | REV 16  | 750-007141  | JJ8146        | 10x 1GE(LAN), 1000 BASE  |
| Xcvr 1           | REV 01  | 740-011613  | P9F117T       | SFP-SX                   |
| Xcvr 2           | REV 01  | 740-011782  | PBA2VCL       | SFP-SX                   |
| Xcvr 3           | REV 01  | 740-011782  | PB83DRB       | SFP-SX                   |
| Xcvr 4           | REV 01  | 740-011613  | AM0812S8UP8   | SFP-SX                   |

|            |        |            |             |                        |
|------------|--------|------------|-------------|------------------------|
| PIC 2      | REV 12 | 750-009567 | WF3566      | 1x 10GE(LAN),XENPAK    |
| Xcvr 0     | REV 02 | 740-013170 | T07C94489   | XENPAK-LR              |
| MMB 0      | REV 03 | 710-005555 | HZ1907      | MMB-288mbit            |
| MMB 1      | REV 03 | 710-005555 | HW5283      | MMB-288mbit            |
| PPB 0      | REV 04 | 710-002845 | HZ7717      | PPB Type 3             |
| PPB 1      | REV 04 | 710-002845 | HS0110      | PPB Type 3             |
| FPC 6      | REV 07 | 710-013035 | DP7486      | FPC Type 3-ES          |
| CPU        | REV 08 | 710-016744 | DP2545      | ST-PMB2                |
| PIC 0      | REV 09 | 750-009567 | NE6323      | 1x 10GE(LAN),XENPAK    |
| Xcvr 0     | REV 02 | 740-013170 | T09C71959   | XENPAK-LR              |
| PIC 1      | REV 06 | 750-015217 | DN4775      | 8x 1GE(TYPE3), IQ2     |
| Xcvr 0     | REV 01 | 740-011782 | P7E0T6M     | SFP-SX                 |
| Xcvr 1     | REV 01 | 740-011613 | AM0812S8XAY | SFP-SX                 |
| Xcvr 2     | REV 01 | 740-011782 | P7E0T6J     | SFP-SX                 |
| Xcvr 3     | REV 01 | 740-011782 | PCH2P7D     | SFP-SX                 |
| Xcvr 4     | REV 01 | 740-011782 | P9B0QYT     | SFP-SX                 |
| Xcvr 5     | REV 01 | 740-011613 | AM0812S8WQJ | SFP-SX                 |
| Xcvr 6     | REV 02 | 740-013111 | 9301220     | SFP-T                  |
| Xcvr 7     | REV 01 | 740-011782 | P9B0TZ5     | SFP-SX                 |
| PIC 2      | REV 06 | 750-015217 | DM6747      | 8x 1GE(TYPE3), IQ2     |
| Xcvr 0     | REV 01 | 740-011613 | PAP0ZB2     | SFP-SX                 |
| Xcvr 1     | REV 01 | 740-013111 | 70191002    | SFP-T                  |
| Xcvr 6     | REV 01 | 740-011782 | PBA29H8     | SFP-SX                 |
| Xcvr 7     | REV 01 | 740-011613 | AM0812S8WQG | SFP-SX                 |
| MMB 0      | REV 04 | 710-016036 | DP3238      | ST-MMB2                |
| FPC 7      | REV 03 | 710-021540 | DV3154      | FPC Type 2-ES          |
| CPU        | REV 09 | 710-016744 | DT9053      | ST-PMB2                |
| PIC 0      | REV 13 | 750-001901 | HB4225      | 4x OC-12 SONET, SMIR   |
| PIC 1      | REV 05 | 750-001900 | AD3644      | 1x OC-48 SONET, SMSR   |
| PIC 2      | REV 10 | 750-008155 | HV0335      | 2x G/E IQ, 1000 BASE   |
| Xcvr 0     | REV 01 | 740-011782 | PCH2UKF     | SFP-SX                 |
| Xcvr 1     | REV 01 | 740-011782 | PCH2V19     | SFP-SX                 |
| PIC 3      | REV 03 | 750-014638 | JS9493      | 1x OC-48-12-3 SFP      |
| Xcvr 0     | REV 01 | 740-011785 | P6Q0ENK     | SFP-SR                 |
| MMB 0      | REV 05 | 710-016036 | DP3323      | ST-MMB2                |
| SPMB 0     | REV 04 | 710-023321 | DX3004      | LCC Switch CPU         |
| SPMB 1     | REV 04 | 710-023321 | DX3009      | LCC Switch CPU         |
| SIB 0      | REV 07 | 710-022594 | DW4195      | LCC SIB                |
| B Board    | REV 07 | 710-023185 | DW3930      | LCC SIB Mezz           |
| SIB 1      | REV 07 | 710-022594 | DW4179      | LCC SIB                |
| B Board    | REV 07 | 710-023185 | DW3919      | LCC SIB Mezz           |
| SIB 2      |        |            |             |                        |
| SIB 3      | REV 06 | 710-022594 | DT8251      | LCC SIB                |
| B Board    | REV 06 | 710-023185 | DT5792      | LCC SIB Mezz           |
| SIB 4      | REV 08 | 710-022594 | DW8014      | LCC SIB                |
| B Board    | REV 07 | 710-023185 | DW3917      | LCC SIB Mezz           |
| Fan Tray 0 |        |            |             | Front Top Fan Tray     |
| Fan Tray 1 |        |            |             | Front Bottom Fan Tray  |
| Fan Tray 2 |        |            |             | Rear Fan Tray -- Rev 3 |

lcc1-re0:

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Hardware inventory:

| Item        | Version | Part number | Serial number | Description              |
|-------------|---------|-------------|---------------|--------------------------|
| Chassis     |         |             | JN1102270AHA  | T1600                    |
| Midplane    | REV 04  | 710-017247  | RC5358        | T-series Backplane       |
| FPM GBUS    | REV 10  | 710-002901  | DS3443        | T640 FPM Board           |
| FPM Display | REV 01  | 710-021387  | DS6411        | T1600 FPM Display        |
| CIP         | REV 06  | 710-002895  | DS4235        | T-series CIP             |
| PEM 0       | Rev 02  | 740-023211  | VM82438       | Power Entry Module 4x60A |
| SCG 0       | REV 15  | 710-003423  | DS6649        | T640 Sonet Clock Gen.    |

|                  |        |            |             |                          |
|------------------|--------|------------|-------------|--------------------------|
| SCG 1            | REV 15 | 710-003423 | DR6775      | T640 Sonet Clock Gen.    |
| Routing Engine 0 | REV 01 | 740-026941 | 737F-1083   | RE-DUO-1800              |
| Routing Engine 1 | REV 01 | 740-026941 | 737F-1104   | RE-DUO-1800              |
| CB 0             | REV 06 | 710-022597 | DW8542      | LCC Control Board        |
| CB 1             | REV 06 | 710-022597 | DW8530      | LCC Control Board        |
| FPC 0            | REV 02 | 710-010845 | JE2392      | FPC Type 4               |
| CPU              | REV 02 | 710-011481 | JF6820      | FPC CPU-Enhanced         |
| PIC 0            | REV 11 | 750-017405 | DP7259      | 4x 10GE (LAN/WAN) XFP    |
| Xcvr 0           | REV 01 | 740-014279 | AA0741N1C8T | XFP-10G-LR               |
| Xcvr 1           | REV 01 | 740-014279 | AA0746N1GAM | XFP-10G-LR               |
| Xcvr 2           | REV 01 | 740-014279 | AA0747N1H0B | XFP-10G-LR               |
| Xcvr 3           | REV 01 | 740-014279 | AA0748N1HZ5 | XFP-10G-LR               |
| MMB 0            | REV 03 | 710-010842 | HY7601      | ST-MMB                   |
| FPC 1            | REV 16 | 710-013037 | BBAA7398    | FPC Type 4-ES            |
| CPU              | REV 09 | 710-016744 | BBAA2329    | ST-PMB2                  |
| PIC 0            | REV 03 | 711-029996 | EB1575      | 100GE                    |
| PIC 1            | REV 06 | 750-034781 | EB9980      | 100GE CFP                |
| MMB 0            | REV 04 | 710-025563 | BBAA5325    | ST-MMB2                  |
| MMB 1            | REV 04 | 710-025563 | BBAA5444    | ST-MMB2                  |
| FPC 2            | REV 16 | 710-013037 | BBAA7185    | FPC Type 4-ES            |
| CPU              | REV 09 | 710-016744 | BBAA3522    | ST-PMB2                  |
| PIC 0            | REV 03 | 711-029996 | EB1557      | 100GE                    |
| PIC 1            | REV 05 | 750-034781 | EB4660      | 100GE CFP                |
| Xcvr 0           | REV 0  | 740-032210 | J10F73666   | CFP-100G-LR4             |
| BRIDGE 0         | REV 02 | 711-029995 | EB2237      | 100GE Bridge Board       |
| MMB 0            | REV 04 | 710-025563 | BBAA5347    | ST-MMB2                  |
| MMB 1            | REV 04 | 710-025563 | BBAA5401    | ST-MMB2                  |
| FPC 3            | REV 10 | 710-021534 | DZ0941      | FPC Type 1-ES            |
| CPU              | REV 09 | 710-016744 | DY6364      | ST-PMB2                  |
| PIC 0            | REV 13 | 750-012266 | DK9192      | 4x 1GE(LAN), IQ2         |
| Xcvr 0           | REV 01 | 740-011613 | AM0812S8WVD | SFP-SX                   |
| Xcvr 1           |        | NON-JNPR   | PDD63Q4     | SFP-SX                   |
| Xcvr 2           |        | NON-JNPR   | PDE4G54     | SFP-SX                   |
| Xcvr 3           |        | NON-JNPR   | PD40MAG     | SFP-SX                   |
| PIC 1            | REV 01 | 750-007641 | HJ2003      | 1x G/E IQ, 1000 BASE     |
| Xcvr 0           | REV 01 | 740-011613 | AM0812S8WVG | SFP-SX                   |
| PIC 3            | REV 17 | 750-007444 | JB6873      | 1x CHSTM1 IQ SDH, SMIR   |
| MMB 0            | REV 04 | 710-025563 | DZ0281      | ST-MMB2                  |
| FPC 4            | REV 06 | 710-013035 | DK0614      | FPC Type 3-ES            |
| CPU              | REV 07 | 710-016744 | DK1616      | ST-PMB2                  |
| PIC 0            | REV 22 | 750-007141 | DM1870      | 10x 1GE(LAN), 1000 BASE  |
| Xcvr 0           | REV 01 | 740-011782 | PCL3UKW     | SFP-SX                   |
| Xcvr 1           | REV 01 | 740-011782 | P7E0T73     | SFP-SX                   |
| Xcvr 2           | REV 01 | 740-007326 | P4TOWLR     | SFP-SX                   |
| Xcvr 3           | REV 01 | 740-011782 | PAR1LLRL    | SFP-SX                   |
| Xcvr 4           | REV 01 | 740-011782 | P9M0U3Z     | SFP-SX                   |
| Xcvr 5           | REV 01 | 740-011782 | P9M0U0C     | SFP-SX                   |
| Xcvr 6           | REV 01 | 740-011782 | P9M0TLG     | SFP-SX                   |
| Xcvr 7           | REV 01 | 740-011782 | P9M0U0F     | SFP-SX                   |
| Xcvr 8           | REV 01 | 740-011613 | PFA6LAP     | SFP-SX                   |
| Xcvr 9           | REV 01 | 740-011782 | PCH2P0U     | SFP-SX                   |
| PIC 1            | REV 16 | 750-009450 | CV2565      | 1x OC-192 SM SR2         |
| PIC 2            | REV 05 | 750-004424 | HH3057      | 1x 10GE(LAN), 10GBASE-LR |
| PIC 3            | REV 12 | 750-013423 | DP0403      | MultiServices 500        |
| MMB 0            | REV 04 | 710-016036 | DK1988      | ST-MMB2                  |
| FPC 5            | REV 07 | 710-013560 | DR0004      | E2-FPC Type 3            |
| CPU              | REV 05 | 710-013563 | DR0089      | FPC CPU-Enhanced         |
| PIC 0            | REV 11 | 750-012793 | DR6107      | 1x 10GE(LAN/WAN) IQ2     |
| Xcvr 0           | REV 01 | 740-014289 | C743XU074   | XFP-10G-SR               |

|            |        |            |              |                        |
|------------|--------|------------|--------------|------------------------|
| PIC 1      | REV 01 | 750-004695 | HD5980       | 1x Tunnel              |
| PIC 2      | REV 32 | 750-003700 | DL3770       | 1x OC-192 12xMM VSR    |
| PIC 3      | REV 12 | 750-009553 | WB8901       | 4x OC-48 SONET         |
| Xcvr 0     | REV 01 | 740-011785 | P9D1GTQ      | SFP-SR                 |
| Xcvr 1     | REV 01 | 740-011785 | PDSOMMB      | SFP-SR                 |
| Xcvr 3     | REV 01 | 740-011785 | PDE1KXP      | SFP-SR                 |
| MMB 0      | REV 07 | 710-010171 | DP7374       | MMB-5M3-288mbit        |
| MMB 1      | REV 07 | 710-010171 | DP7404       | MMB-5M3-288mbit        |
| FPC 6      | REV 07 | 710-013035 | DM0994       | FPC Type 3-ES          |
| CPU        | REV 07 | 710-016744 | DM3651       | ST-PMB2                |
| PIC 0      | REV 07 | 750-015217 | DN4743       | 8x 1GE(TYPE3), IQ2     |
| Xcvr 3     | REV 01 | 740-011613 | AM0812S8XB0  | SFP-SX                 |
| Xcvr 4     | REV 01 | 740-011782 | PB829RB      | SFP-SX                 |
| Xcvr 5     | REV 01 | 740-011782 | P8J1SYX      | SFP-SX                 |
| PIC 1      | REV 03 | 750-003336 | HJ9954       | 4x OC-48 SONET, SMSR   |
| PIC 3      | REV 02 | 750-012793 | JM7665       | 1x 10GE(LAN/WAN) IQ2   |
| MMB 0      | REV 04 | 710-016036 | DN6913       | ST-MMB2                |
| FPC 7      | REV 08 | 710-010845 | JM3958       | FPC Type 4             |
| CPU        | REV 04 | 710-011481 | JK3669       | FPC CPU-Enhanced       |
| PIC 0      | REV 11 | 750-017405 | DP8837       | 4x 10GE (LAN/WAN) XFP  |
| Xcvr 1     | REV 01 | 740-014279 | 753019A00277 | XFP-10G-LR             |
| Xcvr 2     | REV 02 | 740-011571 | C850XJ00P    | XFP-10G-SR             |
| Xcvr 3     | REV 01 | 740-014279 | AA0813N1RTG  | XFP-10G-LR             |
| MMB 0      | REV 04 | 710-010842 | JN1971       | ST-MMB                 |
| SPMB 0     | REV 04 | 710-023321 | DW3629       | LCC Switch CPU         |
| SPMB 1     | REV 04 | 710-023321 | DW3621       | LCC Switch CPU         |
| SIB 0      | REV 07 | 710-022594 | DW4200       | LCC SIB                |
| B Board    | REV 07 | 710-023185 | DW3932       | LCC SIB Mezz           |
| SIB 1      | REV 07 | 710-022594 | DW4193       | LCC SIB                |
| B Board    | REV 07 | 710-023185 | DW3904       | LCC SIB Mezz           |
| SIB 2      |        |            |              |                        |
| SIB 3      | REV 07 | 710-022594 | DW4210       | LCC SIB                |
| B Board    | REV 06 | 710-023185 | DT5780       | LCC SIB Mezz           |
| SIB 4      | REV 08 | 710-022594 | DW8019       | LCC SIB                |
| B Board    | REV 06 | 710-023185 | DT5795       | LCC SIB Mezz           |
| Fan Tray 0 |        |            |              | Front Top Fan Tray     |
| Fan Tray 1 |        |            |              | Front Bottom Fan Tray  |
| Fan Tray 2 |        |            |              | Rear Fan Tray -- Rev 3 |

### show chassis hardware sfc (TX Matrix Plus Router)

```
user@host> show chassis hardware sfc 0
sfc0-re0:
```

```

Hardware inventory:
```

| Item             | Version | Part number | Serial number | Description        |
|------------------|---------|-------------|---------------|--------------------|
| Chassis          |         |             | JN112F007AHB  | TXP                |
| Midplane         | REV 05  | 710-022574  | TS4027        | SFC Midplane       |
| FPM Display      | REV 03  | 710-024027  | DX0282        | TXP FPM Display    |
| CIP 0            | REV 04  | 710-023792  | DW4889        | TXP CIP            |
| CIP 1            | REV 04  | 710-023792  | DW4887        | TXP CIP            |
| PEM 0            | Rev 07  | 740-027463  | UM26368       | Power Entry Module |
| Routing Engine 0 | REV 01  | 740-026942  | 737A-1064     | SFC RE             |
| Routing Engine 1 | REV 01  | 740-026942  | 737A-1082     | SFC RE             |
| CB 0             | REV 09  | 710-022606  | DW6099        | SFC Control Board  |
| CB 1             | REV 09  | 710-022606  | DW6096        | SFC Control Board  |
| SPMB 0           |         | BUILTIN     |               | SFC Switch CPU     |
| SPMB 1           |         | BUILTIN     |               | SFC Switch CPU     |
| SIB F13 0        | REV 04  | 710-022600  | DX0841        | F13 SIB            |
| B Board          | REV 03  | 710-023431  | DX0966        | F13 SIB Mezz       |
| SIB F13 1        | REV 04  | 750-024564  | DW5776        | F13 SIB            |



|             |        |            |        |                |
|-------------|--------|------------|--------|----------------|
| B Board     | REV 03 | 710-023431 | DW9028 | F13 SIB        |
| SIB F13 3   | REV 04 | 750-024564 | DW5762 | F13 SIB        |
| B Board     | REV 03 | 710-023431 | DW9059 | F13 SIB        |
| SIB F13 4   | REV 04 | 750-024564 | DW5797 | F13 SIB        |
| B Board     | REV 03 | 710-023431 | DW9041 | F13 SIB        |
| SIB F13 6   | REV 04 | 750-024564 | DW5770 | F13 SIB        |
| B Board     | REV 03 | 710-023431 | DW9079 | F13 SIB Mezz   |
| SIB F13 7   | REV 04 | 750-024564 | DW5758 | F13 SIB        |
| B Board     | REV 03 | 710-023431 | DW9047 | F13 SIB        |
| SIB F13 8   | REV 04 | 750-024564 | DW5761 | F13 SIB        |
| B Board     | REV 03 | 710-023431 | DW9043 | F13 SIB Mezz   |
| SIB F13 9   | REV 04 | 750-024564 | DW5754 | F13 SIB        |
| B Board     | REV 03 | 710-023431 | DW9078 | F13 SIB Mezz   |
| SIB F13 11  | REV 04 | 710-022600 | DX0826 | F13 SIB        |
| B Board     | REV 03 | 710-023431 | DX0967 | F13 SIB Mezz   |
| SIB F13 12  | REV 04 | 750-024564 | DW5794 | F13 SIB        |
| B Board     | REV 03 | 710-023431 | DW9044 | F13 SIB Mezz   |
| SIB F2S 0/0 | REV 05 | 710-022603 | DW7897 | F2S SIB        |
| B Board     | REV 05 | 710-023787 | DW7657 | NEO PMB        |
| SIB F2S 0/2 | REV 05 | 710-022603 | DW7833 | F2S SIB        |
| B Board     | REV 05 | 710-023787 | DW7526 | NEO PMB        |
| SIB F2S 0/4 | REV 05 | 710-022603 | DW7875 | F2S SIB        |
| B Board     | REV 05 | 710-023787 | DW7588 | NEO PMB        |
| SIB F2S 0/6 | REV 05 | 710-022603 | DW7860 | F2S SIB        |
| B Board     | REV 05 | 710-023787 | DW7589 | NEO PMB        |
| SIB F2S 1/0 | REV 04 | 710-022603 | DW4820 | F2S SIB        |
| B Board     | REV 05 | 710-023787 | DW8510 | NEO PMB        |
| SIB F2S 1/2 | REV 05 | 710-022603 | DW7849 | F2S SIB        |
| B Board     | REV 05 | 710-023787 | DW7525 | NEO PMB        |
| SIB F2S 1/4 | REV 05 | 710-022603 | DW7927 | F2S SIB        |
| B Board     | REV 05 | 710-023787 | DW7556 | F2S SIB Mezz   |
| SIB F2S 1/6 | REV 05 | 710-022603 | DW7866 | F2S SIB        |
| B Board     | REV 05 | 710-023787 | DW7651 | NEO PMB        |
| SIB F2S 2/0 | REV 05 | 710-022603 | DW7880 | F2S SIB        |
| B Board     | REV 05 | 710-023787 | DW7523 | NEO PMB        |
| SIB F2S 2/2 | REV 05 | 710-022603 | DW7895 | F2S SIB        |
| B Board     | REV 05 | 710-023787 | DW7591 | NEO PMB        |
| SIB F2S 2/4 | REV 05 | 710-022603 | DW7907 | F2S SIB        |
| B Board     | REV 05 | 710-023787 | DW7590 | NEO PMB        |
| SIB F2S 2/6 | REV 05 | 710-022603 | DW7785 | F2S SIB        |
| B Board     | REV 05 | 710-023787 | DW7524 | NEO PMB        |
| SIB F2S 3/0 | REV 05 | 710-022603 | DW7782 | F2S SIB        |
| B Board     | REV 05 | 710-023787 | DW7634 | NEO PMB        |
| SIB F2S 3/2 | REV 05 | 710-022603 | DW7793 | F2S SIB        |
| B Board     | REV 05 | 710-023787 | DW7548 | NEO PMB        |
| SIB F2S 3/4 | REV 05 | 710-022603 | DW7779 | F2S SIB        |
| B Board     | REV 05 | 710-023787 | DW7587 | NEO PMB        |
| SIB F2S 3/6 | REV 05 | 710-022603 | DW7930 | F2S SIB        |
| B Board     | REV 05 | 710-023787 | DW7505 | NEO PMB        |
| SIB F2S 4/0 | REV 05 | 710-022603 | DW7867 | F2S SIB        |
| B Board     | REV 05 | 710-023787 | DW7656 | NEO PMB        |
| SIB F2S 4/2 | REV 05 | 710-022603 | DW7917 | F2S SIB        |
| B Board     | REV 05 | 710-023787 | DW7640 | NEO PMB        |
| SIB F2S 4/4 | REV 05 | 710-022603 | DW7929 | F2S SIB        |
| B Board     | REV 05 | 710-023787 | DW7643 | NEO PMB        |
| SIB F2S 4/6 | REV 05 | 710-022603 | DW7870 | F2S SIB        |
| B Board     | REV 05 | 710-023787 | DW7635 | NEO PMB        |
| Fan Tray 0  | REV 06 | 760-024497 | DV7831 | Front Fan Tray |
| Fan Tray 1  | REV 06 | 760-024497 | DV9614 | Front Fan Tray |
| Fan Tray 2  | REV 06 | 760-024502 | DV9618 | Rear Fan Tray  |
| Fan Tray 3  | REV 06 | 760-024502 | DV9616 | Rear Fan Tray  |

|            |        |            |        |               |
|------------|--------|------------|--------|---------------|
| Fan Tray 4 | REV 06 | 760-024502 | DV7807 | Rear Fan Tray |
| Fan Tray 5 | REV 06 | 760-024502 | DV7828 | Rear Fan Tray |

### show chassis hardware extensive (TX Matrix Plus Router)

```
user@host> show chassis hardware extensive
sfc0-re0:
```

```

Hardware inventory:
```

| Item         | Version    | Part number | Serial number     | Description  |
|--------------|------------|-------------|-------------------|--------------|
| Chassis      |            |             | JN112F007AHB      | TXP          |
| Jedec Code:  | 0x7fb0     |             | EEPROM Version:   | 0x02         |
|              |            |             | S/N:              | JN112F007AHB |
| Assembly ID: | 0x052c     |             | Assembly Version: | 00.00        |
| Date:        | 00-00-0000 |             | Assembly Flags:   | 0x00         |

```
ID: TXP
```

```
Board Information Record:
```

```
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

```
I2C Hex Data:
```

```
Address 0x00: 7f b0 02 ff 05 2c 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x20: 4a 4e 31 31 32 46 30 30 37 41 48 42 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

```
Midplane REV 05 710-022574 TS4027 SFC Midplane
```

|              |            |                   |        |
|--------------|------------|-------------------|--------|
| Jedec Code:  | 0x7fb0     | EEPROM Version:   | 0x01   |
| P/N:         | 710-022574 | S/N:              | TS4027 |
| Assembly ID: | 0x0962     | Assembly Version: | 01.05  |
| Date:        | 03-23-2009 | Assembly Flags:   | 0x00   |
| Version:     | REV 05     |                   |        |

```
ID: SFC Midplane
```

```
Board Information Record:
```

```
Address 0x00: ad 01 ff ff 00 1d b5 14 00 00 ff ff ff ff ff ff
```

```
I2C Hex Data:
```

```
Address 0x00: 7f b0 01 ff 09 62 01 05 52 45 56 20 30 35 00 00
Address 0x10: 00 00 00 00 37 31 30 2d 30 32 32 35 37 34 00 00
Address 0x20: 53 2f 4e 20 54 53 34 30 32 37 00 00 00 17 03 07
Address 0x30: d9 ff ff ff ad 01 ff ff 00 1d b5 14 00 00 ff ff
Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff
Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
```

```
FPM Display REV 03 710-024027 DX0282 TXP FPM Display
```

|              |            |                   |        |
|--------------|------------|-------------------|--------|
| Jedec Code:  | 0x7fb0     | EEPROM Version:   | 0x01   |
| P/N:         | 710-024027 | S/N:              | DX0282 |
| Assembly ID: | 0x096c     | Assembly Version: | 01.03  |
| Date:        | 02-10-2009 | Assembly Flags:   | 0x00   |
| Version:     | REV 03     |                   |        |

```
ID: TXP FPM Display FRU Model Number: CRAFT-TXP
```

```
Board Information Record:
```

```
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
```

```
I2C Hex Data:
```

```
Address 0x00: 7f b0 01 ff 09 6c 01 03 52 45 56 20 30 33 00 00
Address 0x10: 00 00 00 00 37 31 30 2d 30 32 34 30 32 37 00 00
Address 0x20: 53 2f 4e 20 44 58 30 32 38 32 00 00 00 0a 02 07
Address 0x30: d9 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 43
Address 0x50: 52 41 46 54 2d 54 58 50 00 00 00 00 00 00 00 00
```

```

Address 0x60: 00 00 00 00 00 00 ff ff ff ff ff ff ff ff ff
Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
CIP 0 REV 04 710-023792 DW4889 TXP CIP
Jedec Code: 0x7fb0 EEPROM Version: 0x01
P/N: 710-023792 S/N: DW4889
Assembly ID: 0x0969 Assembly Version: 01.04
Date: 01-26-2009 Assembly Flags: 0x00
Version: REV 04
ID: TXP CIP FRU Model Number: CIP-TXP
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff

```

### show chassis hardware clei-models (TX Matrix Plus Router)

```

user@host> show chassis hardware clei-models
sfc0-re0:

```

```

Hardware inventory:

```

| Item             | Version | Part number | CLEI code  | FRU model number   |
|------------------|---------|-------------|------------|--------------------|
| Midplane         | REV 05  | 710-022574  |            | CHAS-BP-TXP-S      |
| FPM Display      | REV 03  | 710-024027  |            | CRAFT-TXP-S        |
| CIP 0            | REV 05  | 710-023792  |            | CIP-TXP-S          |
| CIP 1            | REV 05  | 710-023792  |            | CIP-TXP-S          |
| PEM 0            | Rev 04  | 740-027463  | IPUPAFGKTA | PWR-TXP-7-60-DC    |
| PEM 1            | Rev 04  | 740-027463  | IPUPAFGKTA | PWR-TXP-7-60-DC    |
| Routing Engine 0 | REV 06  | 740-026942  |            | RE-DUO-C2600-16G-S |
| Routing Engine 1 | REV 06  | 740-026942  |            | RE-DUO-C2600-16G-S |
| CB 0             | REV 05  | 710-022606  |            | CB-TXP-S           |
| CB 1             | REV 09  | 710-022606  |            | CB-TXP-S           |
| SIB F13 0        | REV 04  | 750-024564  |            | SIB-TXP-F13        |
| SIB F13 3        | REV 04  | 750-024564  |            | SIB-TXP-F13        |
| SIB F13 8        | REV 04  | 750-024564  |            | SIB-TXP-F13        |
| SIB F13 11       | REV 04  | 750-024564  |            | SIB-TXP-F13        |
| SIB F13 12       | REV 03  | 750-024564  |            | SIB-TXP-F13        |
| SIB F2S 0/0      | REV 05  | 710-022603  |            | SIB-TXP-F2S-S      |
| SIB F2S 0/2      | REV 05  | 710-022603  |            | SIB-TXP-F2S-S      |
| SIB F2S 0/4      | REV 04  | 710-022603  |            | SIB-TXP-F2S-S      |
| SIB F2S 0/6      | REV 04  | 710-022603  |            | SIB-TXP-F2S-S      |
| SIB F2S 1/0      | REV 04  | 710-022603  |            | SIB-TXP-F2S-S      |
| SIB F2S 1/2      | REV 05  | 710-022603  |            | SIB-TXP-F2S-S      |
| SIB F2S 1/4      | REV 04  | 710-022603  |            | SIB-TXP-F2S-S      |
| SIB F2S 1/6      | REV 05  | 710-022603  |            | SIB-TXP-F2S-S      |
| SIB F2S 2/0      | REV 04  | 710-022603  |            | SIB-TXP-F2S-S      |
| SIB F2S 2/2      | REV 04  | 710-022603  |            | SIB-TXP-F2S-S      |
| SIB F2S 2/4      | REV 05  | 710-022603  |            | SIB-TXP-F2S-S      |
| SIB F2S 2/6      | REV 04  | 710-022603  |            | SIB-TXP-F2S-S      |
| SIB F2S 3/0      | REV 05  | 710-022603  |            | SIB-TXP-F2S-S      |
| SIB F2S 3/2      | REV 03  | 710-022603  |            | SIB-TXP-F2S-S      |
| SIB F2S 3/4      | REV 05  | 710-022603  |            | SIB-TXP-F2S-S      |
| SIB F2S 3/6      | REV 03  | 710-022603  |            | SIB-TXP-F2S-S      |
| SIB F2S 4/0      | REV 03  | 710-022603  |            | SIB-TXP-F2S-S      |
| SIB F2S 4/2      | REV 05  | 710-022603  |            | SIB-TXP-F2S-S      |
| SIB F2S 4/4      | REV 04  | 710-022603  |            | SIB-TXP-F2S-S      |
| SIB F2S 4/6      | REV 03  | 710-022603  |            | SIB-TXP-F2S-S      |
| Fan Tray 0       | REV 02  | 760-024497  |            | FANTRAY-TXP-H-S    |
| Fan Tray 1       | REV 02  | 760-024497  |            | FANTRAY-TXP-H-S    |
| Fan Tray 2       | REV 05  | 760-024502  |            | FANTRAY-TXP-V-S    |
| Fan Tray 3       |         |             |            |                    |
| Fan Tray 4       | REV 05  | 760-024502  |            | FANTRAY-TXP-V-S    |
| Fan Tray 5       | REV 02  | 760-024502  |            | FANTRAY-TXP-V-S    |

## lcc0-re0:

-----  
Hardware inventory:

| Item             | Version | Part number | CLEI code  | FRU model number        |
|------------------|---------|-------------|------------|-------------------------|
| Midplane         | REV 03  | 710-017247  |            | CHAS-BP-T1600-S         |
| FPM Display      | REV 01  | 710-021387  |            | CRAFT-T1600-S           |
| CIP              | REV 06  | 710-002895  |            | CIP-L-T640-S            |
| PEM 1            | Rev 02  | 740-023211  | IPUPAC8KTA | PWR-T1600-4-60-DC-S     |
| SCG 0            | REV 15  | 710-003423  |            | SCG-T-S                 |
| SCG 1            | REV 15  | 710-003423  |            | SCG-T-S                 |
| Routing Engine 0 | REV 01  | 740-026941  |            | RE-DUO-C1800-8G-S       |
| Routing Engine 1 | REV 01  | 740-026941  |            | RE-DUO-C1800-8G-S       |
| CB 0             | REV 06  | 710-022597  |            | CB-LCC-S                |
| CB 1             | REV 06  | 710-022597  |            | CB-LCC-S                |
| FPC 1            | REV 07  | 710-013035  |            | T640-FPC3-ES            |
| PIC 0            | REV 05  | 750-015217  |            | PC-8GE-TYPE3-SFP-IQ2    |
| PIC 1            | REV 03  | 750-004424  |            | PC-1XGE-LR              |
| PIC 2            | REV 01  | 750-003336  |            | PC-40C48-SON-SMSR       |
| FPC 3            | REV 12  | 710-013037  |            | T1600-FPC4-ES           |
| PIC 0            | REV 02  | 750-010850  |            | PD-10C768-SON-SR        |
| FPC 4            | REV 05  | 710-021534  |            | T640-FPC1-ES            |
| PIC 0            | REV 04  | 750-014627  |            | PB-40C3-10C12-SON-SFP   |
| PIC 1            | REV 22  | 750-005634  |            | PB-1CHOC12SMIR-QPP      |
| PIC 2            | REV 09  | 750-002911  |            | PB-4FE-TX               |
| PIC 3            | REV 08  | 750-021652  |            | PB-1CHOC12-STM4-IQE-SFP |
| FPC 5            | REV 07  | 710-007529  |            | T640-FPC3               |
| PIC 0            | REV 14  | 750-009567  |            | PC-1XGE-XENPAK          |
| PIC 1            | REV 16  | 750-007141  |            | PC-10GE-SFP             |
| PIC 2            | REV 12  | 750-009567  |            | PC-1XGE-XENPAK          |
| FPC 6            | REV 07  | 710-013035  |            | T640-FPC3-ES            |
| PIC 0            | REV 09  | 750-009567  |            | PC-1XGE-XENPAK          |
| PIC 1            | REV 06  | 750-015217  |            | PC-8GE-TYPE3-SFP-IQ2    |
| PIC 2            | REV 06  | 750-015217  |            | PC-8GE-TYPE3-SFP-IQ2    |
| FPC 7            | REV 03  | 710-021540  |            | T640-FPC2-ES            |
| PIC 0            | REV 13  | 750-001901  |            | PB-40C12-SON-SMIR       |
| PIC 1            | REV 05  | 750-001900  |            | PB-10C48-SON-SMSR       |
| PIC 2            | REV 10  | 750-008155  |            | PB-2GE-SFP-QPP          |
| PIC 3            | REV 03  | 750-014638  |            | PB-10C48-SON-B-SFP      |
| SIB 0            | REV 07  | 710-022594  |            | SIB-TXP-T1600-S         |
| SIB 1            | REV 07  | 710-022594  |            | SIB-TXP-T1600-S         |
| SIB 3            | REV 06  | 710-022594  |            | SIB-TXP-T1600-S         |
| SIB 4            | REV 08  | 710-022594  |            | SIB-TXP-T1600-S         |
| Fan Tray 0       |         |             |            | FANTRAY-T-S             |
| Fan Tray 1       |         |             |            | FANTRAY-T-S             |
| Fan Tray 2       |         |             |            | FANTRAY-TXP-R-S         |

## lcc1-re0:

-----  
Hardware inventory:

| Item             | Version | Part number | CLEI code  | FRU model number    |
|------------------|---------|-------------|------------|---------------------|
| Midplane         | REV 04  | 710-017247  |            | CHAS-BP-T1600-S     |
| FPM Display      | REV 01  | 710-021387  |            | CRAFT-T1600-S       |
| CIP              | REV 06  | 710-002895  |            | CIP-L-T640-S        |
| PEM 0            | Rev 02  | 740-023211  | IPUPAC8KTA | PWR-T1600-4-60-DC-S |
| SCG 0            | REV 15  | 710-003423  |            | SCG-T-S             |
| SCG 1            | REV 15  | 710-003423  |            | SCG-T-S             |
| Routing Engine 0 | REV 01  | 740-026941  |            | RE-DUO-C1800-8G-S   |
| Routing Engine 1 | REV 01  | 740-026941  |            | RE-DUO-C1800-8G-S   |
| CB 0             | REV 06  | 710-022597  |            | CB-LCC-S            |
| CB 1             | REV 06  | 710-022597  |            | CB-LCC-S            |
| FPC 0            | REV 02  | 710-010845  |            | T640-FPC4-ES        |

|            |        |            |                       |
|------------|--------|------------|-----------------------|
| PIC 0      | REV 11 | 750-017405 | PD-4XGE-XFP           |
| FPC 1      | REV 16 | 710-013037 | T1600-FPC4-ES         |
| PIC 1      | REV 06 | 750-034781 | PD-1CE-CFP            |
| FPC 2      | REV 16 | 710-013037 | T1600-FPC4-ES         |
| PIC 1      | REV 05 | 750-034781 | PD-1CE-CFP            |
| FPC 3      | REV 10 | 710-021534 | T640-FPC1-ES          |
| PIC 0      | REV 13 | 750-012266 | PB-4GE-TYPE1-SFP-IQ2  |
| PIC 1      | REV 01 | 750-007641 | PE-1GE-SFP-QPP        |
| PIC 3      | REV 17 | 750-007444 | PB-1CHSTM1-SMIR-QPP   |
| FPC 4      | REV 06 | 710-013035 | T640-FPC3-ES          |
| PIC 0      | REV 22 | 750-007141 | PC-10GE-SFP           |
| PIC 1      | REV 16 | 750-009450 | PC-10C192-SON-SR2     |
| PIC 2      | REV 05 | 750-004424 | PC-1XGE-LR            |
| PIC 3      | REV 12 | 750-013423 | PC-MS-500-3           |
| FPC 5      | REV 07 | 710-013560 | T640-FPC3-E2          |
| PIC 0      | REV 11 | 750-012793 | PC-1XGE-TYPE3-XFP-IQ2 |
| PIC 1      | REV 01 | 750-004695 | PC-TUNNEL             |
| PIC 2      | REV 32 | 750-003700 | PC-10C192-SON-VSR     |
| PIC 3      | REV 12 | 750-009553 | PC-40C48-SON-SFP      |
| FPC 6      | REV 07 | 710-013035 | T640-FPC3-ES          |
| PIC 0      | REV 07 | 750-015217 | PC-8GE-TYPE3-SFP-IQ2  |
| PIC 1      | REV 03 | 750-003336 | PC-40C48-SON-SMSR     |
| PIC 3      | REV 02 | 750-012793 | PC-1XGE-TYPE3-XFP-IQ2 |
| FPC 7      | REV 08 | 710-010845 | T640-FPC4-ES          |
| PIC 0      | REV 11 | 750-017405 | PD-4XGE-XFP           |
| SIB 0      | REV 07 | 710-022594 | SIB-TXP-T1600-S       |
| SIB 1      | REV 07 | 710-022594 | SIB-TXP-T1600-S       |
| SIB 3      | REV 07 | 710-022594 | SIB-TXP-T1600-S       |
| SIB 4      | REV 08 | 710-022594 | SIB-TXP-T1600-S       |
| Fan Tray 0 |        |            | FANTRAY-T-S           |
| Fan Tray 1 |        |            | FANTRAY-T-S           |
| Fan Tray 2 |        |            | FANTRAY-TXP-R-S       |

### show chassis hardware detail (TX Matrix Plus Router)

```
user@host> show chassis hardware detail
sfc0-re0:
```

```

Hardware inventory:
```

| Item             | Version  | Part number | Serial number              | Description        |
|------------------|----------|-------------|----------------------------|--------------------|
| Chassis          |          |             | JN111B023AHB               | TXP                |
| Midplane         | REV 01   | 710-022574  | TR7990                     | SFC Midplane       |
| FPM Display      | REV 03   | 710-024027  | DW4699                     | TXP FPM Display    |
| CIP 0            | REV 01   | 710-023792  | DR1437                     | TXP CIP            |
| CIP 1            | REV 02   | 710-023792  | DS4564                     | TXP CIP            |
| PEM 0            | Rev 07   | 740-027463  | UM26360                    | Power Entry Module |
| Routing Engine 0 | REV 01   | 740-026942  | 737A-1024                  | SFC RE             |
| ad0              | 3887 MB  | SMART CF    | 200811050193CEB1CEB1       | Compact Flash      |
| ad1              | 30533 MB | SAMSUNG     | MCBQE32G8MPP-0V SY814A0762 | Disk 1             |
| Routing Engine 1 | REV 01   | 740-026942  | 737A-1024                  | SFC RE             |
| ad0              | 3887 MB  | SMART CF    | 20081105004C19A019A0       | Compact Flash      |
| ad1              | 30533 MB | SAMSUNG     | MCBQE32G8MPP-0V SY814A0794 | Disk 1             |
| CB 0             | REV 03   | 710-022606  | DR7134                     | SFC Control Board  |
| CB 1             | REV 01   | 710-022606  | DP8890                     | SFC Control Board  |
| SPMB 0           |          | BUILTIN     |                            | SFC Switch CPU     |
| SPMB 1           |          | BUILTIN     |                            | SFC Switch CPU     |
| SIB F13 0        | REV 03   | 750-024564  | DT9478                     | F13 SIB            |
| B Board          | REV 02   | 710-023431  | DT6554                     | F13 SIB            |
| SIB F13 1        | REV 03   | 750-024564  | DT9454                     | F13 SIB            |
| B Board          | REV 02   | 710-023431  | DT6551                     | F13 SIB            |
| SIB F2S 0/0      | REV 02   | 710-022603  | DT2838                     | F2S SIB            |

|             |        |            |        |                |
|-------------|--------|------------|--------|----------------|
| B Board     | REV 02 | 710-023787 | DT1725 | NEO PMB        |
| SIB F2S 0/2 | REV 02 | 710-022603 | DT2824 | F2S SIB        |
| B Board     | REV 02 | 710-023787 | DT1706 | NEO PMB        |
| SIB F2S 0/4 | REV 02 | 710-022603 | DT2822 | F2S SIB        |
| B Board     | REV 02 | 710-023787 | DT1696 | NEO PMB        |
| SIB F2S 0/6 | REV 02 | 710-022603 | DT2823 | F2S SIB        |
| B Board     | REV 02 | 710-023787 | DT1717 | NEO PMB        |
| SIB F2S 1/0 | REV 03 | 710-022603 | DV0059 | F2S SIB        |
| B Board     | REV 03 | 710-023787 | DT9942 | NEO PMB        |
| SIB F2S 1/2 | REV 02 | 710-022603 | DT2826 | F2S SIB        |
| B Board     | REV 02 | 710-023787 | DT1713 | NEO PMB        |
| SIB F2S 1/4 | REV 03 | 710-022603 | DV0092 | F2S SIB        |
| B Board     | REV 03 | 710-023787 | DV0000 | NEO PMB        |
| SIB F2S 1/6 | REV 03 | 710-022603 | DV0079 | F2S SIB        |
| B Board     | REV 03 | 710-023787 | DT9972 | NEO PMB        |
| SIB F2S 2/0 | REV 03 | 710-022603 | DV0100 | F2S SIB        |
| B Board     | REV 03 | 710-023787 | DT9925 | NEO PMB        |
| SIB F2S 2/2 | REV 03 | 710-022603 | DV0050 | F2S SIB        |
| B Board     | REV 03 | 710-023787 | DV0005 | NEO PMB        |
| SIB F2S 2/4 | REV 03 | 710-022603 | DV0097 | F2S SIB        |
| B Board     | REV 03 | 710-023787 | DT9936 | NEO PMB        |
| Fan Tray 0  | REV 02 | 760-024497 | DR8286 | Front Fan Tray |
| Fan Tray 1  | REV 06 | 760-024497 | DV9624 | Front Fan Tray |
| Fan Tray 2  | REV 02 | 760-024502 | DR8259 | Rear Fan Tray  |
| Fan Tray 3  | REV 02 | 760-024502 | DR8270 | Rear Fan Tray  |
| Fan Tray 4  | REV 02 | 760-024502 | DR8284 | Rear Fan Tray  |
| Fan Tray 5  | REV 06 | 760-024502 | DV7813 | Rear Fan Tray  |

1cc0-re0:

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Hardware inventory:

| Item             | Version  | Part number | Serial number              | Description             |
|------------------|----------|-------------|----------------------------|-------------------------|
| Chassis          |          |             | JN1101F27AHA               | T1600                   |
| Midplane         | REV 04   | 710-017247  | RC5317                     | T Series Backplane      |
| FPM GBUS         | REV 10   | 710-002901  | DS8197                     | T640 FPM Board          |
| FPM Display      | REV 01   | 710-021387  | DS6433                     | T1600 FPM Display       |
| CIP              | REV 06   | 710-002895  | DS1493                     | T Series CIP            |
| PEM 0            | Rev 08   | 740-017906  | UD26601                    | Power Entry Module 3x80 |
| SCG 0            | REV 15   | 710-003423  | DP5847                     | T640 Sonet Clock Gen.   |
| SCG 1            | REV 15   | 710-003423  | DR0924                     | T640 Sonet Clock Gen.   |
| Routing Engine 0 | REV 01   | 740-026942  | 737F-1024                  | LCC RE                  |
| ad0              | 3887 MB  | SMART CF    | 2008110502B63E513E51       | Compact Flash           |
| ad1              | 30533 MB | SAMSUNG     | MCBQE32G8MPP-0V SY814A1208 | Disk 1                  |
| Routing Engine 1 | REV 01   | 740-026942  | 737F-1024                  | LCC RE                  |
| ad0              | 3887 MB  | SMART CF    | 2008110500F9A8A8A8A8       | Compact Flash           |
| ad1              | 30533 MB | SAMSUNG     | MCBQE32G8MPP-0V SY814A1076 | Disk 1                  |
| CB 0             | REV 05   | 710-022597  | DV4264                     | LCC Control Board       |
| CB 1             | REV 03   | 710-022597  | DP8558                     | LCC Control Board       |
| FPC 0            | REV 14   | 710-013037  | DS9967                     | FPC Type 4-ES           |
| CPU              | REV 08   | 710-016744  | DS3989                     | ST-PMB2                 |
| PIC 0            | REV 12   | 750-013198  | DL7506                     | 1x Tunnel               |
| PIC 1            | REV 12   | 750-013198  | DL7505                     | 1x Tunnel               |
| MMB 0            | REV 01   | 710-025563  | DS8524                     | ST-MMB2                 |
| MMB 1            | REV 01   | 710-025563  | DS8373                     | ST-MMB2                 |
| FPC 1            | REV 14   | 710-013037  | DT0027                     | FPC Type 4-ES           |
| CPU              | REV 09   | 710-016744  | DS7684                     | ST-PMB2                 |
| PIC 0            | REV 12   | 750-013198  | DL7512                     | 1x Tunnel               |
| PIC 1            | REV 12   | 750-013198  | DL7498                     | 1x Tunnel               |
| MMB 0            | REV 01   | 710-025563  | DS8494                     | ST-MMB2                 |
| MMB 1            | REV 01   | 710-025563  | DS8436                     | ST-MMB2                 |
| SPMB 0           | REV 04   | 710-023321  | DV3867                     | LCC Switch CPU          |

|            |        |            |        |                       |
|------------|--------|------------|--------|-----------------------|
| SPMB 1     | REV 02 | 710-023321 | DP0238 | LCC Switch CPU        |
| SIB 0      | REV 06 | 710-022594 | DT8268 | LCC SIB               |
| B Board    | REV 06 | 710-023185 | DT5791 | LCC SIB Mezz          |
| SIB 1      | REV 06 | 710-022594 | DT8261 | LCC SIB               |
| B Board    | REV 06 | 710-023185 | DT5769 | LCC SIB Mezz          |
| SIB 2      | REV 04 | 710-022594 | DS2315 | LCC SIB               |
| B Board    | REV 06 | 710-023185 | DT5788 | LCC SIB Mezz          |
| SIB 3      | REV 06 | 710-022594 | DT8253 | LCC SIB               |
| B Board    | REV 06 | 710-023185 | DT5811 | LCC SIB Mezz          |
| SIB 4      | REV 06 | 710-022594 | DT8248 | LCC SIB               |
| B Board    | REV 06 | 710-023185 | DT5812 | LCC SIB Mezz          |
| Fan Tray 0 |        |            |        | Front Top Fan Tray    |
| Fan Tray 1 |        |            |        | Front Bottom Fan Tray |
| Fan Tray 2 |        |            |        | Rear Fan Tray         |

### show chassis hardware models (TX Matrix Plus Router)

```
user@host> show chassis hardware models
sfc0-re0:
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Hardware inventory:
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| Item             | Version | Part number | Serial number | FRU model number               |
|------------------|---------|-------------|---------------|--------------------------------|
| FPM Display      | REV 03  | 710-024027  | DX0282        | CRAFT-TXP                      |
| CIP 0            | REV 04  | 710-023792  | DW4889        | CIP-TXP                        |
| CIP 1            | REV 04  | 710-023792  | DW4887        | CIP-TXP                        |
| PEM 0            | Rev 07  | 740-027463  | UM26368       | yyyyyyyyyyyyyyyyyyyyyyyyyyyyyy |
| Routing Engine 0 | REV 01  | 740-026942  | 737A-1064     | RE-TXP-SFC-DUO-2600-16G        |
| Routing Engine 1 | REV 01  | 740-026942  | 737A-1082     | RE-TXP-SFC-DUO-2600-16G        |
| CB 0             | REV 09  | 710-022606  | DW6099        | CB-TXP                         |
| CB 1             | REV 09  | 710-022606  | DW6096        | CB-TXP                         |
| SIB F13 1        | REV 04  | 750-024564  | DW5776        | SIB-TXP-F13                    |
| SIB F13 3        | REV 04  | 750-024564  | DW5762        | SIB-TXP-F13                    |
| SIB F13 4        | REV 04  | 750-024564  | DW5797        | SIB-TXP-F13                    |
| SIB F13 6        | REV 04  | 750-024564  | DW5770        | SIB-TXP-F13                    |
| SIB F13 7        | REV 04  | 750-024564  | DW5758        | SIB-TXP-F13                    |
| SIB F13 8        | REV 04  | 750-024564  | DW5761        | SIB-TXP-F13                    |
| SIB F13 9        | REV 04  | 750-024564  | DW5754        | SIB-TXP-F13                    |
| SIB F13 12       | REV 04  | 750-024564  | DW5794        | SIB-TXP-F13                    |
| SIB F2S 0/0      | REV 05  | 710-022603  | DW7897        |                                |
| SIB F2S 0/2      | REV 05  | 710-022603  | DW7833        |                                |
| SIB F2S 0/4      | REV 05  | 710-022603  | DW7875        |                                |
| SIB F2S 0/6      | REV 05  | 710-022603  | DW7860        |                                |
| SIB F2S 1/0      | REV 04  | 710-022603  | DW4820        |                                |
| SIB F2S 1/2      | REV 05  | 710-022603  | DW7849        |                                |
| SIB F2S 1/4      | REV 05  | 710-022603  | DW7927        | SIB-TXP-F2S                    |
| SIB F2S 1/6      | REV 05  | 710-022603  | DW7866        |                                |
| SIB F2S 2/0      | REV 05  | 710-022603  | DW7880        |                                |
| SIB F2S 2/2      | REV 05  | 710-022603  | DW7895        |                                |
| SIB F2S 2/4      | REV 05  | 710-022603  | DW7907        |                                |
| SIB F2S 2/6      | REV 05  | 710-022603  | DW7785        |                                |
| SIB F2S 3/0      | REV 05  | 710-022603  | DW7782        |                                |
| SIB F2S 3/2      | REV 05  | 710-022603  | DW7793        |                                |
| SIB F2S 3/4      | REV 05  | 710-022603  | DW7779        |                                |
| SIB F2S 3/6      | REV 05  | 710-022603  | DW7930        |                                |
| SIB F2S 4/0      | REV 05  | 710-022603  | DW7867        |                                |
| SIB F2S 4/2      | REV 05  | 710-022603  | DW7917        |                                |
| SIB F2S 4/4      | REV 05  | 710-022603  | DW7929        |                                |
| SIB F2S 4/6      | REV 05  | 710-022603  | DW7870        |                                |
| Fan Tray 0       | REV 06  | 760-024497  | DV7831        | FANTRAY-TXP-F                  |
| Fan Tray 1       | REV 06  | 760-024497  | DV9614        | FANTRAY-TXP-F                  |
| Fan Tray 2       | REV 06  | 760-024502  | DV9618        | FANTRAY-TXP-R                  |

|            |        |            |        |               |
|------------|--------|------------|--------|---------------|
| Fan Tray 3 | REV 06 | 760-024502 | DV9616 | FANTRAY-TXP-R |
| Fan Tray 4 | REV 06 | 760-024502 | DV7807 | FANTRAY-TXP-R |
| Fan Tray 5 | REV 06 | 760-024502 | DV7828 | FANTRAY-TXP-R |

lcc0-re0:

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Hardware inventory:

| Item        | Version | Part number | Serial number | FRU model number    |
|-------------|---------|-------------|---------------|---------------------|
| Midplane    | REV 03  | 710-017247  | RC3765        | CHAS-BP-T1600-S     |
| FPM Display | REV 01  | 710-021387  | DN5441        | CRAFT-T1600-S       |
| CIP         | REV 06  | 710-002895  | DP6021        | CIP-L-T640-S        |
| PEM 0       | Rev 07  | 740-017906  | UA26384       | PWR-T1600-3-80-DC-S |
| PEM 1       | Rev 07  | 740-017906  | UA26296       | PWR-T1600-3-80-DC-S |
| SCG 0       | REV 15  | 710-003423  | DR0875        | SCG-T-S             |
| CB 0        | REV 06  | 710-022597  | DW8534        | CB-LCC              |
| CB 1        | REV 06  | 710-022597  | DW8527        | CB-LCC              |
| FPC 4       | REV 12  | 710-013037  | DJ8717        | T1600-FPC4-ES       |
| PIC 0       | REV 11  | 750-017405  | DP8795        | PD-4XGE-XFP         |
| PIC 1       | REV 11  | 750-017405  | DP8794        | PD-4XGE-XFP         |
| FPC 6       | REV 14  | 710-013037  | DS5335        | T1600-FPC4-ES       |
| PIC 0       | REV 13  | 750-017405  | DS7634        | PD-4XGE-XFP         |
| PIC 1       | REV 13  | 750-017405  | DS7637        | PD-4XGE-XFP         |
| FPC 7       | REV 07  | 710-013035  | DM0990        | T1600-FPC3-ES       |
| PIC 0       | REV 16  | 750-007141  | JJ8067        | PC-10GE-SFP         |
| PIC 1       | REV 08  | 750-015749  | WE9598        | PC-10C192-SON-XFP   |
| PIC 2       | REV 10  | 750-009450  | HX6466        | PC-10C192-SON-SR2   |
| SIB 0       | REV 08  | 710-022594  | DW8033        | SIB-TXP-T1600-S     |
| SIB 1       | REV 08  | 710-022594  | DW8044        | SIB-TXP-T1600-S     |
| SIB 2       | REV 08  | 710-022594  | DW8020        | SIB-TXP-T1600-S     |
| SIB 3       | REV 08  | 710-022594  | DW8063        | SIB-TXP-T1600-S     |
| SIB 4       | REV 08  | 710-022594  | DW8064        | SIB-TXP-T1600-S     |
| Fan Tray 0  |         |             |               | FANTRAY-T-S         |
| Fan Tray 1  |         |             |               | FANTRAY-T-S         |
| Fan Tray 2  |         |             |               | FANTRAY-TXP-R-S     |

lcc1-re0:

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Hardware inventory:

| Item        | Version | Part number | Serial number | FRU model number    |
|-------------|---------|-------------|---------------|---------------------|
| Midplane    | REV 04  | 710-017247  | RC5361        | CHAS-BP-T1600-S     |
| FPM Display | REV 01  | 710-021387  | DS6430        | CRAFT-T1600-S       |
| CIP         | REV 06  | 710-002895  | DS4239        | CIP-L-T640-S        |
| PEM 0       | Rev 08  | 740-017906  | UD26649       | PWR-T1600-3-80-DC-S |
| SCG 0       | REV 15  | 710-003423  | DP5820        | SCG-T-S             |
| CB 0        | REV 06  | 710-022597  | DW8523        | CB-LCC              |
| CB 1        | REV 06  | 710-022597  | DW8528        | CB-LCC              |
| FPC 4       | REV 12  | 710-013037  | DP8509        | T1600-FPC4-ES       |
| PIC 0       | REV 11  | 750-017405  | DP8808        | PD-4XGE-XFP         |
| PIC 1       | REV 11  | 750-017405  | DP7263        | PD-4XGE-XFP         |
| FPC 6       | REV 14  | 710-013037  | DS9961        | T1600-FPC4-ES       |
| PIC 0       | REV 13  | 750-017405  | DS5532        | PD-4XGE-XFP         |
| PIC 1       | REV 13  | 750-017405  | DS7639        | PD-4XGE-XFP         |
| FPC 7       | REV 03  | 710-013035  | DF5564        | T1600-FPC3-ES       |
| PIC 0       | REV 16  | 750-007141  | JJ8063        | PC-10GE-SFP         |
| SIB 0       | REV 08  | 710-022594  | DW8035        | SIB-TXP-T1600-S     |
| SIB 1       | REV 10  | 710-022594  | DX7672        | SIB-TXP-T1600-S     |
| SIB 2       | REV 08  | 710-022594  | DW8060        | SIB-TXP-T1600-S     |
| SIB 3       | REV 08  | 710-022594  | DW8072        | SIB-TXP-T1600-S     |
| SIB 4       | REV 08  | 710-022594  | DW8043        | SIB-TXP-T1600-S     |
| Fan Tray 0  |         |             |               | FANTRAY-T-S         |
| Fan Tray 1  |         |             |               | FANTRAY-T-S         |



Fan Tray 2

FANTRAY-TXP-R-S

lcc2-re0:

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Hardware inventory:

| Item        | Version | Part number | Serial number | FRU model number    |
|-------------|---------|-------------|---------------|---------------------|
| Midplane    | REV 03  | 710-017247  | RC3956        | CHAS-BP-T1600-S     |
| FPM Display | REV 01  | 710-021387  | DN7030        | CRAFT-T1600-S       |
| CIP         | REV 06  | 710-002895  | DM3962        | CIP-L-T640-S        |
| PEM 0       | Rev 08  | 740-017906  | UD26519       | PWR-T1600-3-80-DC-S |
| PEM 1       | Rev 07  | 740-017906  | UC26601       | PWR-T1600-3-80-DC-S |
| SCG 0       | REV 15  | 710-003423  | DP0277        | SCG-T-S             |
| CB 0        | REV 06  | 710-022597  | DW8524        | CB-LCC              |
| CB 1        | REV 06  | 710-022597  | DW8536        | CB-LCC              |
| FPC 4       | REV 12  | 710-013037  | DR1194        | T1600-FPC4-ES       |
| PIC 0       | REV 11  | 750-017405  | DP8811        | PD-4XGE-XFP         |
| PIC 1       | REV 11  | 750-017405  | DP8823        | PD-4XGE-XFP         |
| FPC 5       | REV 12  | 710-013037  | DR1184        | T1600-FPC4-ES       |
| PIC 1       | REV 11  | 750-017405  | DP4744        | PD-4XGE-XFP         |
| FPC 6       | REV 12  | 710-013037  | DN8622        | T1600-FPC4-ES       |
| PIC 0       | REV 14  | 750-012518  | JY9924        | PD-40C192-SON-XFP   |
| PIC 1       | REV 11  | 750-017405  | DP8776        | PD-4XGE-XFP         |
| FPC 7       | REV 04  | 710-013560  | JR3968        | T640-FPC3-E2        |
| PIC 0       | REV 16  | 750-007141  | NC9330        | PC-10GE-SFP         |
| SIB 0       | REV 07  | 710-022594  | DW4217        | SIB-TXP-T1600-S     |
| SIB 1       | REV 07  | 710-022594  | DW4213        | SIB-TXP-T1600-S     |
| SIB 2       | REV 07  | 710-022594  | DW4189        | SIB-TXP-T1600-S     |
| SIB 3       | REV 07  | 710-022594  | DW4173        | SIB-TXP-T1600-S     |
| SIB 4       | REV 07  | 710-022594  | DW4201        | SIB-TXP-T1600-S     |
| Fan Tray 0  |         |             |               | FANTRAY-T-S         |
| Fan Tray 1  |         |             |               | FANTRAY-T-S         |
| Fan Tray 2  |         |             |               | FANTRAY-TXP-R-S     |

lcc3-re0:

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Hardware inventory:

| Item        | Version | Part number | Serial number | FRU model number    |
|-------------|---------|-------------|---------------|---------------------|
| Midplane    | REV 04  | 710-017247  | RC5319        | CHAS-BP-T1600-S     |
| FPM Display | REV 01  | 710-021387  | DS6402        | CRAFT-T1600-S       |
| CIP         | REV 06  | 710-002895  | DR9973        | CIP-L-T640-S        |
| PEM 0       | Rev 07  | 740-017906  | UC26496       | PWR-T1600-3-80-DC-S |
| PEM 1       | Rev 07  | 740-017906  | UC26599       | PWR-T1600-3-80-DC-S |
| SCG 0       | REV 15  | 710-003423  | DP5831        | SCG-T-S             |
| CB 0        | REV 06  | 710-022597  | DW8533        | CB-LCC              |
| CB 1        | REV 06  | 710-022597  | DW8538        | CB-LCC              |
| FPC 0       | REV 14  | 710-013037  | DS5345        | T1600-FPC4-ES       |
| PIC 0       | REV 13  | 750-017405  | DS7641        | PD-4XGE-XFP         |
| PIC 1       | REV 13  | 750-017405  | DS5479        | PD-4XGE-XFP         |
| FPC 1       | REV 14  | 710-013037  | DS7338        | T1600-FPC4-ES       |
| PIC 0       | REV 13  | 750-017405  | DS7631        | PD-4XGE-XFP         |
| PIC 1       | REV 13  | 750-017405  | DS7632        | PD-4XGE-XFP         |
| FPC 2       | REV 14  | 710-013037  | DS9962        | T1600-FPC4-ES       |
| PIC 0       | REV 13  | 750-017405  | DS7581        | PD-4XGE-XFP         |
| PIC 1       | REV 13  | 750-017405  | DS7627        | PD-4XGE-XFP         |
| FPC 4       | REV 10  | 710-010845  | JZ6573        | T640-FPC4-ES        |
| PIC 0       | REV 14  | 750-012518  | JT5124        | PD-40C192-SON-XFP   |
| FPC 5       | REV 14  | 710-013037  | DT0016        | T1600-FPC4-ES       |
| PIC 0       | REV 14  | 750-012518  | JY9918        | PD-40C192-SON-XFP   |
| FPC 7       | REV 07  | 710-013035  | DM0967        | T1600-FPC3-ES       |
| PIC 0       | REV 16  | 750-007141  | JJ8059        | PC-10GE-SFP         |
| PIC 1       | REV 13  | 750-004695  | DM5712        | PC-TUNNEL           |

|            |        |            |        |                 |
|------------|--------|------------|--------|-----------------|
| SIB 0      | REV 07 | 710-022594 | DW4174 | SIB-TXP-T1600-S |
| SIB 1      | REV 07 | 710-022594 | DW4207 | SIB-TXP-T1600-S |
| SIB 2      | REV 06 | 710-022594 | DT8231 | SIB-TXP-T1600-S |
| SIB 3      | REV 07 | 710-022594 | DW4175 | SIB-TXP-T1600-S |
| SIB 4      | REV 07 | 710-022594 | DW4209 | SIB-TXP-T1600-S |
| Fan Tray 0 |        |            |        | FANTRAY-T-S     |
| Fan Tray 1 |        |            |        | FANTRAY-T-S     |
| Fan Tray 2 |        |            |        | FANTRAY-TXP-R-S |

### show chassis hardware (TX Matrix Plus router with 3D SIBs)

```
user@host> show chassis hardware
sfc0-re0:
```

```

Hardware inventory:
```

| Item             | Version | Part number | Serial number | Description        |
|------------------|---------|-------------|---------------|--------------------|
| Chassis          |         |             | JN11CAAA4AHB  | TXP                |
| Midplane         | REV 05  | 710-022574  | ABAC4696      | SFC Midplane       |
| FPM Display      | REV 09  | 710-024027  | EH3138        | TXP FPM Display    |
| CIP 0            | REV 12  | 710-023792  | EF6349        | TXP CIP            |
| CIP 1            | REV 12  | 710-023792  | EG5294        | TXP CIP            |
| PEM 0            | Rev 06  | 740-027463  | XH04595       | Power Entry Module |
| PEM 1            | Rev 06  | 740-027463  | XH04592       | Power Entry Module |
| Routing Engine 0 | REV 07  | 740-026942  | P737A-002541  | RE-DUO-2600        |
| Routing Engine 1 | REV 07  | 740-026942  | P737A-002602  | RE-DUO-2600        |
| CB 0             | REV 15  | 710-022606  | EH4376        | SFC Control Board  |
| CB 1             | REV 15  | 710-022606  | EH4379        | SFC Control Board  |
| SPMB 0           |         | BUILTIN     |               | SFC Switch CPU     |
| SPMB 1           |         | BUILTIN     |               | SFC Switch CPU     |
| SIB F13 0        | REV 10  | 750-035002  | EM9305        | F13 SIB 3D         |
| B Board          | REV 06  | 711-035082  | EM9667        | F13 SIB 3D Mezz    |
| P Board          | REV 05  | 711-043544  | EM9708        | F13 SIB 3D Power   |
| Xcvr 0           | REV 01  | 740-047547  | XB34FB00S     | CXP Module         |
| Xcvr 2           | REV 01  | 740-047547  | XB48FB01H     | CXP Module         |
| Xcvr 4           | REV 01  | 740-047547  | XB34FB02W     | CXP Module         |
| Xcvr 6           | REV 01  | 740-047547  | XB34FB01T     | CXP Module         |
| Xcvr 8           | REV 01  | 740-047547  | XB48FB00W     | CXP Module         |
| Xcvr 10          | REV 01  | 740-047547  | XB34FB01S     | CXP Module         |
| Xcvr 12          | REV 01  | 740-047547  | XB34FB03H     | CXP Module         |
| Xcvr 14          | REV 01  | 740-047547  | XB34FB023     | CXP Module         |
| SIB F13 3        | REV 01  | 710-035001  | EJ2612        | F13 SIB 3D         |
| B Board          | REV 01  | 711-035082  | EJ3815        | F13 SIB 3D Mezz    |
| P Board          | REV 01  | 711-043544  | EJ2678        | F13 SIB 3D Power   |
| Xcvr 0           | REV 01  | 740-047547  | XB48FB04C     | CXP Module         |
| Xcvr 2           | REV 01  | 740-047547  | XB48FB00Z     | CXP Module         |
| Xcvr 4           | REV 01  | 740-047547  | XB47FB036     | CXP Module         |
| Xcvr 6           | REV 01  | 740-047547  | XB47FB029     | CXP Module         |
| Xcvr 8           | REV 01  | 740-047547  | XB48FB02N     | CXP Module         |
| Xcvr 10          | REV 01  | 740-047547  | XB42FB0CS     | CXP Module         |
| Xcvr 12          | REV 01  | 740-047547  | XB47FB01X     | CXP Module         |
| Xcvr 14          | REV 01  | 740-047547  | XB48FB02F     | CXP Module         |
| SIB F13 6        | REV 05  | 750-035002  | EK2675        | F13 SIB 3D         |
| B Board          | REV 03  | 711-035082  | EK2612        | F13 SIB 3D Mezz    |
| P Board          | REV 04  | 711-043544  | EK1179        | F13 SIB 3D Power   |
| Xcvr 0           | REV 01  | 740-047547  | XB48FB01T     | CXP Module         |
| Xcvr 2           | REV 01  | 740-047547  | XB48FB02M     | CXP Module         |
| Xcvr 4           | REV 01  | 740-047547  | XB48FB031     | CXP Module         |
| Xcvr 6           | REV 01  | 740-047547  | XB48FB04P     | CXP Module         |
| Xcvr 8           | REV 01  | 740-047547  | XB48FB02T     | CXP Module         |
| Xcvr 10          | REV 01  | 740-047547  | XB34FB01V     | CXP Module         |
| Xcvr 12          | REV 01  | 740-047547  | XB48FB02C     | CXP Module         |

|             |        |            |        |                  |
|-------------|--------|------------|--------|------------------|
| Xcvr 14     |        | NON-JNPR   |        | No Module        |
| SIB F13 12  | REV 01 | 710-035001 | EJ2631 | F13 SIB 3D       |
| B Board     | REV 01 | 711-035082 | EJ3808 | F13 SIB 3D Mezz  |
| P Board     | REV 01 | 711-043544 | EJ2676 | F13 SIB 3D Power |
| SIB F2S 0/0 | REV 01 | 711-034977 | EH9829 | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EH9927 | F2S SIB 3D Mezz  |
| SIB F2S 0/2 | REV 01 | 711-034977 | EH9791 | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EH9852 | F2S SIB 3D Mezz  |
| SIB F2S 0/4 | REV 01 | 711-034977 | EH9803 | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EH9915 | F2S SIB 3D Mezz  |
| SIB F2S 0/6 | REV 01 | 711-034977 | EH9763 | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EH9880 | F2S SIB 3D Mezz  |
| SIB F2S 1/0 | REV 01 | 711-034977 | EH9757 | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EH9889 | F2S SIB 3D Mezz  |
| SIB F2S 1/2 | REV 01 | 711-034977 | EH9815 | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EH9890 | F2S SIB 3D Mezz  |
| SIB F2S 1/4 | REV 08 | 750-034978 | EN1954 | F2S SIB 3D       |
| B Board     | REV 02 | 711-034979 | EN1436 | F2S SIB 3D Mezz  |
| SIB F2S 1/6 | REV 01 | 711-034977 | EJ7054 | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EJ8238 | F2S SIB 3D Mezz  |
| SIB F2S 2/0 | REV 01 | 711-034977 | EH9830 | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EH9844 | F2S SIB 3D Mezz  |
| SIB F2S 2/2 | REV 01 | 711-034977 | EH9818 | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EH9888 | F2S SIB 3D Mezz  |
| SIB F2S 2/4 | REV 01 | 711-034977 | EH9795 | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EH9869 | F2S SIB 3D Mezz  |
| SIB F2S 2/6 | REV 01 | 711-034977 | EJ7026 | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EJ8273 | F2S SIB 3D Mezz  |
| SIB F2S 3/0 | REV 01 | 711-034977 | EH9811 | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EH9892 | F2S SIB 3D Mezz  |
| SIB F2S 3/2 | REV 01 | 711-034977 | EH9812 | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EH9877 | F2S SIB 3D Mezz  |
| SIB F2S 3/4 | REV 08 | 750-034978 | EN1947 | F2S SIB 3D       |
| B Board     | REV 02 | 711-034979 | EN1471 | F2S SIB 3D Mezz  |
| Fan Tray 0  | REV 10 | 760-024497 | EH3313 | Front Fan Tray   |
| Fan Tray 1  | REV 10 | 760-024497 | EH3290 | Front Fan Tray   |
| Fan Tray 2  | REV 10 | 760-024502 | EH3292 | Rear Fan Tray    |
| Fan Tray 3  | REV 10 | 760-024502 | EH3287 | Rear Fan Tray    |
| Fan Tray 4  | REV 10 | 760-024502 | EH3286 | Rear Fan Tray    |
| Fan Tray 5  | REV 10 | 760-024502 | EH3285 | Rear Fan Tray    |

lcc0-re0:

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Hardware inventory:

| Item             | Version | Part number | Serial number | Description             |
|------------------|---------|-------------|---------------|-------------------------|
| Chassis          |         |             | JN11B23FEAHA  | T1600                   |
| Midplane         | REV 01  | 710-027486  | RC9787        | T-series Backplane      |
| FPM GBUS         | REV 13  | 710-002901  | BBAG5132      | T640 FPM Board          |
| FPM Display      | REV 04  | 710-021387  | BBAL9612      | T1600 FPM Display       |
| CIP              | REV 06  | 710-002895  | BBAN0605      | T-series CIP            |
| PEM 0            | REV 05  | 740-036442  | 1G022060143   | Power Entry Module 6x60 |
| PEM 1            | REV 05  | 740-036442  | 1G022060011   | Power Entry Module 6x60 |
| SCG 0            | REV 18  | 710-003423  | BBAL7318      | T640 Sonet Clock Gen.   |
| SCG 1            | REV 18  | 710-003423  | BBAL7255      | T640 Sonet Clock Gen.   |
| Routing Engine 0 | REV 07  | 740-026941  | P737F-002933  | RE-DUO-1800             |
| Routing Engine 1 | REV 06  | 740-026941  | P737F-002749  | RE-DUO-1800             |
| CB 0             | REV 11  | 710-022597  | EH3611        | LCC Control Board       |
| CB 1             | REV 11  | 710-022597  | EH4798        | LCC Control Board       |
| FPC 5            | REV 17  | 710-013037  | BBAC5333      | FPC Type 4-ES           |
| CPU              | REV 10  | 710-016744  | BBAB7619      | ST-PMB2                 |
| PIC 0            | REV 18  | 750-017405  | BBAE3420      | 4x 10GE (LAN/WAN) XFP   |

|            |        |            |           |                        |
|------------|--------|------------|-----------|------------------------|
| Xcvr 0     | REV 03 | 740-014289 | T10C90659 | XFP-10G-SR             |
| MMB 0      | REV 05 | 710-025563 | BBAB9538  | ST-MMB2                |
| MMB 1      | REV 05 | 710-025563 | BBAB9502  | ST-MMB2                |
| FPC 7      | REV 01 | 750-045173 | BBAV0032  | FPC Type 5-3D          |
| CPU        |        |            |           |                        |
| SPMB 0     | REV 05 | 710-023321 | EG9434    | LCC Switch CPU         |
| SPMB 1     | REV 05 | 710-023321 | EH3878    | LCC Switch CPU         |
| SIB 0      | REV 01 | 750-041657 | EH7997    | LCC SIB 3D             |
| B Board    | REV 01 | 711-042424 | EH7674    | LCC SIB 3D Mezz        |
| Xcvr 0     | REV 01 | 740-047547 | XB48FB014 | CXP Module             |
| Xcvr 2     | REV 01 | 740-047547 | XB48FB05A | CXP Module             |
| Xcvr 4     | REV 01 | 740-047547 | XB48FB052 | CXP Module             |
| Xcvr 6     | REV 01 | 740-047547 | XB48FB01B | CXP Module             |
| SIB 1      | REV 01 | 750-041657 | EH8023    | LCC SIB 3D             |
| B Board    | REV 01 | 711-042424 | EH7659    | LCC SIB 3D Mezz        |
| Xcvr 0     | REV 01 | 740-047547 | XB48FB05J | CXP Module             |
| Xcvr 2     | REV 01 | 740-047547 | XB48FB01E | CXP Module             |
| Xcvr 4     | REV 01 | 740-047547 | XB48FB01J | CXP Module             |
| Xcvr 6     | REV 01 | 740-047547 | XB48FB02S | CXP Module             |
| SIB 2      | REV 03 | 750-041657 | EJ6554    | LCC SIB 3D             |
| B Board    | REV 02 | 711-042424 | EJ5756    | LCC SIB 3D Mezz        |
| Xcvr 0     | REV 01 | 740-047547 | XB34FB01Z | CXP Module             |
| Xcvr 2     | REV 01 | 740-047547 | XB34FB013 | CXP Module             |
| Xcvr 4     | REV 01 | 740-047547 | XB48FB04Z | CXP Module             |
| Xcvr 6     | REV 01 | 740-047547 | XB48FB05N | CXP Module             |
| Fan Tray 0 |        |            |           | Front Top Fan Tray     |
| Fan Tray 1 |        |            |           | Front Bottom Fan Tray  |
| Fan Tray 2 |        |            |           | Rear Fan Tray -- Rev 4 |

lcc2-re0:

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Hardware inventory:

| Item             | Version | Part number | Serial number | Description             |
|------------------|---------|-------------|---------------|-------------------------|
| Chassis          |         |             | JN11B3975AHA  | T1600                   |
| Midplane         | REV 01  | 710-027486  | RC9826        | T-series Backplane      |
| FPM GBUS         | REV 13  | 710-002901  | BBAG5124      | T640 FPM Board          |
| FPM Display      | REV 03  | 710-021387  | BBAJ1112      | T1600 FPM Display       |
| CIP              | REV 06  | 710-002895  | BBAL3744      | T-series CIP            |
| PEM 0            | REV 05  | 740-036442  | 1G022060081   | Power Entry Module 6x60 |
| PEM 1            | REV 05  | 740-036442  | 1G022060188   | Power Entry Module 6x60 |
| SCG 0            | REV 18  | 710-003423  | BBAH8775      | T640 Sonet Clock Gen.   |
| SCG 1            | REV 18  | 710-003423  | BBAL7272      | T640 Sonet Clock Gen.   |
| Routing Engine 0 | REV 07  | 740-026941  | P737F-002992  | RE-DUO-1800             |
| Routing Engine 1 | REV 07  | 740-026941  | P737F-002938  | RE-DUO-1800             |
| CB 0             | REV 11  | 710-022597  | EH4805        | LCC Control Board       |
| CB 1             | REV 11  | 710-022597  | EH4786        | LCC Control Board       |
| FPC 1            | REV 01  | 710-033873  | BBAH0320      | FPC Type 3-ES           |
| CPU              | REV 11  | 710-016744  | BBAF3281      | ST-PMB2                 |
| MMB 0            | REV 06  | 710-025563  | BBAF5061      | ST-MMB2                 |
| FPC 5            | REV 04  | 710-033871  | BBAM5070      | FPC Type 4-ES           |
| CPU              | REV 11  | 710-016744  | BBAM6653      | ST-PMB2                 |
| PIC 1            | REV 20  | 750-017405  | BBAM1296      | 4x 10GE (LAN/WAN) XFP   |
| Xcvr 0           | REV 03  | 740-014289  | T10B42981     | XFP-10G-SR              |
| MMB 0            | REV 07  | 710-025563  | BBAN2631      | ST-MMB2                 |
| MMB 1            | REV 07  | 710-025563  | BBAN2538      | ST-MMB2                 |
| SPMB 0           | REV 05  | 710-023321  | EH3903        | LCC Switch CPU          |
| SPMB 1           | REV 05  | 710-023321  | EH3902        | LCC Switch CPU          |
| SIB 0            | REV 01  | 750-041657  | EH8019        | LCC SIB 3D              |
| B Board          | REV 01  | 711-042424  | EH7680        | LCC SIB 3D Mezz         |
| Xcvr 0           | REV 01  | 740-047547  | XB48FB04F     | CXP Module              |
| Xcvr 2           | REV 01  | 740-047547  | XB48FB04S     | CXP Module              |

|            |        |            |           |                        |
|------------|--------|------------|-----------|------------------------|
| Xcvr 4     | REV 01 | 740-047547 | XB48FB04B | CXP Module             |
| Xcvr 6     | REV 01 | 740-047547 | XB48FB043 | CXP Module             |
| SIB 1      | REV 01 | 750-041657 | EH8012    | LCC SIB 3D             |
| B Board    | REV 01 | 711-042424 | EH7658    | LCC SIB 3D Mezz        |
| Xcvr 0     | REV 01 | 740-047547 | XB48FB05E | CXP Module             |
| Xcvr 2     | REV 01 | 740-047547 | XB48FB01Z | CXP Module             |
| Xcvr 4     | REV 01 | 740-047547 | XB48FB018 | CXP Module             |
| Xcvr 6     | REV 01 | 740-047547 | XB48FB054 | CXP Module             |
| SIB 2      | REV 01 | 750-041657 | EH7993    | LCC SIB 3D             |
| B Board    | REV 01 | 711-042424 | EH7678    | LCC SIB 3D Mezz        |
| Xcvr 0     | REV 01 | 740-047547 | XB48FB05C | CXP Module             |
| Xcvr 2     | REV 01 | 740-047547 | XB47FB00N | CXP Module             |
| Xcvr 4     | REV 01 | 740-047547 | XB48FB05U | CXP Module             |
| Xcvr 6     | REV 01 | 740-047547 | XB48FB05L | CXP Module             |
| Fan Tray 0 |        |            |           | Front Top Fan Tray     |
| Fan Tray 1 |        |            |           | Front Bottom Fan Tray  |
| Fan Tray 2 |        |            |           | Rear Fan Tray -- Rev 4 |

### show chassis hardware clei-models (TX Matrix Plus router with 3D SIBs)

```
user@host> show chassis hardware clei-models
sfc0-re0:

Hardware inventory:
Item Version Part number CLEI code FRU model number
Midplane REV 05 710-022574
FPM Display REV 09 710-024027
CIP 0 REV 12 710-023792
CIP 1 REV 12 710-023792
PEM 0 Rev 06 740-027463 IPUPAFGKTA PWR-TXP-7-60-DC-S
Routing Engine 0 REV 07 740-026942 RE-DUO-C2600-16G-S
Routing Engine 1 REV 07 740-026942 RE-DUO-C2600-16G-S
CB 0 REV 13 710-022606 CB-TXP-S
CB 1 REV 14 710-022606 CB-TXP-S
SIB F13 0 REV 10 750-035002 PROTOXCLEI SIB-TXP-3D-F13-S
 Xcvr 0 REV 01 740-048813
 Xcvr 1 REV 01 740-048813
 Xcvr 2 REV 01 740-048813
 Xcvr 3 REV 01 740-048813
 Xcvr 4 REV 01 740-048813
 Xcvr 5 REV 01 740-048813
 Xcvr 6 REV 01 740-048813
 Xcvr 7 REV 01 740-048813
 Xcvr 8 REV 01 740-047547 CXP-TXP-3D
 Xcvr 10 REV 01 740-047547 CXP-TXP-3D
 Xcvr 12 REV 01 740-047547 CXP-TXP-3D
 Xcvr 14 REV 01 740-047547 CXP-TXP-3D
SIB F13 1 REV 10 750-035002 PROTOXCLEI SIB-TXP-3D-F13-S
 Xcvr 0 REV 01 740-047547 CXP-TXP-3D
 Xcvr 1 REV 01 740-047547 CXP-TXP-3D
 Xcvr 2 REV 01 740-047547 CXP-TXP-3D
 Xcvr 3 REV 01 740-047547 CXP-TXP-3D
 Xcvr 4 REV 01 740-047547 CXP-TXP-3D
 Xcvr 5 REV 01 740-047547 CXP-TXP-3D
 Xcvr 6 REV 01 740-047547 CXP-TXP-3D
 Xcvr 7 REV 01 740-047547 CXP-TXP-3D
 Xcvr 8 REV 01 740-047547 CXP-TXP-3D
 Xcvr 10 REV 01 740-047547 CXP-TXP-3D
 Xcvr 12 REV 01 740-047547 CXP-TXP-3D
 Xcvr 14 REV 01 740-047547 CXP-TXP-3D
 Xcvr 0 REV 01 740-048813
```

|           |        |            |            |                  |
|-----------|--------|------------|------------|------------------|
| Xcvr 1    | REV 01 | 740-048813 |            |                  |
| Xcvr 2    | REV 01 | 740-048813 |            |                  |
| Xcvr 3    | REV 01 | 740-048813 |            |                  |
| Xcvr 4    | REV 01 | 740-048813 |            |                  |
| Xcvr 5    | REV 01 | 740-048813 |            |                  |
| Xcvr 6    | REV 01 | 740-048813 |            |                  |
| Xcvr 7    | REV 01 | 740-048813 |            |                  |
| Xcvr 8    | REV 01 | 740-048813 |            |                  |
| Xcvr 10   | REV 01 | 740-048813 |            |                  |
| Xcvr 12   | REV 01 | 740-048813 |            |                  |
| Xcvr 14   | REV 01 | 740-048813 |            |                  |
| Xcvr 0    | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| Xcvr 1    | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| Xcvr 2    | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| Xcvr 3    | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| Xcvr 4    | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| Xcvr 5    | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| Xcvr 6    | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| Xcvr 7    | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| Xcvr 8    | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| Xcvr 10   | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| Xcvr 12   | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| Xcvr 14   | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| SIB F13 6 | REV 16 | 750-035002 | PROTOXCLEI | SIB-TXP-3D-F13   |
| Xcvr 0    | REV 01 | 740-048813 |            |                  |
| Xcvr 1    | REV 01 | 740-048813 |            |                  |
| Xcvr 2    | REV 01 | 740-048813 |            |                  |
| Xcvr 3    | REV 01 | 740-048813 |            |                  |
| Xcvr 4    | REV 01 | 740-048813 |            |                  |
| Xcvr 5    | REV 01 | 740-048813 |            |                  |
| Xcvr 6    | REV 01 | 740-048813 |            |                  |
| Xcvr 7    | REV 01 | 740-048813 |            |                  |
| Xcvr 8    | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| Xcvr 10   | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| Xcvr 12   | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| Xcvr 14   | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| SIB F13 7 | REV 10 | 750-035002 | PROTOXCLEI | SIB-TXP-3D-F13-S |
| Xcvr 0    | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| Xcvr 1    | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| Xcvr 2    | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| Xcvr 3    | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| Xcvr 4    | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| Xcvr 5    | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| Xcvr 6    | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| Xcvr 7    | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| Xcvr 8    | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| Xcvr 10   | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| Xcvr 12   | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| Xcvr 14   | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| Xcvr 0    | REV 01 | 740-048813 |            |                  |
| Xcvr 1    | REV 01 | 740-048813 |            |                  |
| Xcvr 2    | REV 01 | 740-048813 |            |                  |
| Xcvr 3    | REV 01 | 740-048813 |            |                  |
| Xcvr 4    | REV 01 | 740-048813 |            |                  |
| Xcvr 5    | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| Xcvr 6    | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| Xcvr 7    | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| Xcvr 8    | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| Xcvr 10   | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| Xcvr 12   | REV 01 | 740-047547 |            | CXP-TXP-3D       |
| Xcvr 14   | REV 01 | 740-047547 |            | CXP-TXP-3D       |

|             |        |            |            |                 |
|-------------|--------|------------|------------|-----------------|
| SIB F13 9   | REV 16 | 750-035002 | PROTOXCLEI | SIB-TXP-3D-F13  |
| Xcvr 0      | REV 01 | 740-047547 |            | CXP-TXP-3D      |
| Xcvr 1      | REV 01 | 740-047547 |            | CXP-TXP-3D      |
| Xcvr 2      | REV 01 | 740-047547 |            | CXP-TXP-3D      |
| Xcvr 3      | REV 01 | 740-047547 |            | CXP-TXP-3D      |
| Xcvr 4      | REV 01 | 740-047547 |            | CXP-TXP-3D      |
| Xcvr 5      | REV 01 | 740-047547 |            | CXP-TXP-3D      |
| Xcvr 6      | REV 01 | 740-047547 |            | CXP-TXP-3D      |
| Xcvr 7      | REV 01 | 740-047547 |            | CXP-TXP-3D      |
| Xcvr 8      | REV 01 | 740-047547 |            | CXP-TXP-3D      |
| Xcvr 10     | REV 01 | 740-047547 |            | CXP-TXP-3D      |
| Xcvr 12     | REV 01 | 740-047547 |            | CXP-TXP-3D      |
| Xcvr 14     | REV 01 | 740-047547 |            | CXP-TXP-3D      |
| SIB F13 11  | REV 10 | 750-035002 | PROTOXCLEI | 750-035002      |
| Xcvr 0      | REV 01 | 740-048813 |            |                 |
| Xcvr 1      | REV 01 | 740-048813 |            |                 |
| Xcvr 2      | REV 01 | 740-048813 |            |                 |
| Xcvr 3      | REV 01 | 740-048813 |            |                 |
| Xcvr 4      | REV 01 | 740-048813 |            |                 |
| Xcvr 5      | REV 01 | 740-048813 |            |                 |
| Xcvr 6      | REV 01 | 740-047547 |            | CXP-TXP-3D      |
| Xcvr 7      | REV 01 | 740-048813 |            |                 |
| Xcvr 8      | REV 01 | 740-047547 |            | CXP-TXP-3D      |
| Xcvr 12     | REV 01 | 740-047547 |            | CXP-TXP-3D      |
| Xcvr 14     | REV 01 | 740-047547 |            | CXP-TXP-3D      |
| SIB F13 12  | REV 16 | 750-035002 | PROTOXCLEI | SIB-TXP-3D-F13  |
| Xcvr 0      | REV 01 | 740-047547 |            | CXP-TXP-3D      |
| Xcvr 1      | REV 01 | 740-047547 |            | CXP-TXP-3D      |
| Xcvr 2      | REV 01 | 740-047547 |            | CXP-TXP-3D      |
| Xcvr 3      | REV 01 | 740-047547 |            | CXP-TXP-3D      |
| Xcvr 4      | REV 01 | 740-047547 |            | CXP-TXP-3D      |
| Xcvr 5      | REV 01 | 740-047547 |            | CXP-TXP-3D      |
| Xcvr 6      | REV 01 | 740-047547 |            | CXP-TXP-3D      |
| Xcvr 7      | REV 01 | 740-047547 |            | CXP-TXP-3D      |
| Xcvr 8      | REV 01 | 740-047547 |            | CXP-TXP-3D      |
| Xcvr 10     | REV 01 | 740-047547 |            | CXP-TXP-3D      |
| Xcvr 12     | REV 01 | 740-047547 |            | CXP-TXP-3D      |
| Xcvr 14     | REV 01 | 740-047547 |            | CXP-TXP-3D      |
| SIB F2S 0/0 | REV 06 | 750-034978 | PROTOXCLEI | SIB-TXP-3D-F2S  |
| SIB F2S 0/2 | REV 07 | 750-034978 | PROTOXCLEI | SIB-TXP-3D-F2S  |
| SIB F2S 0/4 | REV 06 | 750-034978 | PROTOXCLEI | SIB-TXP-3D-F2S  |
| SIB F2S 0/6 | REV 06 | 750-034978 | PROTOXCLEI | SIB-TXP-3D-F2S  |
| SIB F2S 1/0 | REV 07 | 750-034978 | PROTOXCLEI | SIB-TXP-3D-F2S  |
| SIB F2S 1/2 | REV 07 | 750-034978 | PROTOXCLEI | SIB-TXP-3D-F2S  |
| SIB F2S 1/4 | REV 07 | 750-034978 | PROTOXCLEI | SIB-TXP-3D-F2S  |
| SIB F2S 1/6 | REV 08 | 750-034978 | PROTOXCLEI | SIB-TXP-3D-F2S  |
| SIB F2S 2/0 | REV 06 | 750-034978 | PROTOXCLEI | SIB-TXP-3D-F2S  |
| SIB F2S 2/2 | REV 06 | 750-034978 | PROTOXCLEI | SIB-TXP-3D-F2S  |
| SIB F2S 2/4 | REV 07 | 750-034978 | PROTOXCLEI | SIB-TXP-3D-F2S  |
| SIB F2S 2/6 | REV 06 | 750-034978 | PROTOXCLEI | SIB-TXP-3D-F2S  |
| SIB F2S 3/0 | REV 07 | 750-034978 | PROTOXCLEI | SIB-TXP-3D-F2S  |
| SIB F2S 3/2 | REV 06 | 750-034978 | PROTOXCLEI | SIB-TXP-3D-F2S  |
| SIB F2S 3/4 | REV 06 | 750-034978 | PROTOXCLEI | SIB-TXP-3D-F2S  |
| SIB F2S 3/6 | REV 06 | 750-034978 | PROTOXCLEI | SIB-TXP-3D-F2S  |
| SIB F2S 4/0 | REV 07 | 750-034978 | PROTOXCLEI | SIB-TXP-3D-F2S  |
| SIB F2S 4/2 | REV 06 | 750-034978 | PROTOXCLEI | SIB-TXP-3D-F2S  |
| SIB F2S 4/4 | REV 06 | 750-034978 | PROTOXCLEI | SIB-TXP-3D-F2S  |
| SIB F2S 4/6 | REV 06 | 750-034978 | PROTOXCLEI | SIB-TXP-3D-F2S  |
| Fan Tray 0  | REV 10 | 760-024497 |            | FANTRAY-TXP-H-S |
| Fan Tray 1  | REV 10 | 760-024497 |            | FANTRAY-TXP-H-S |
| Fan Tray 2  | REV 10 | 760-024502 |            | FANTRAY-TXP-V-S |

|            |        |            |                 |
|------------|--------|------------|-----------------|
| Fan Tray 3 | REV 10 | 760-024502 | FANTRAY-TXP-V-S |
| Fan Tray 4 | REV 10 | 760-024502 | FANTRAY-TXP-V-S |
| Fan Tray 5 | REV 10 | 760-024502 | FANTRAY-TXP-V-S |

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Hardware inventory:

| Item             | Version | Part number | CLEI code  | FRU model number  |
|------------------|---------|-------------|------------|-------------------|
| Midplane         | REV 01  | 710-027486  | IPMJ700DRD | CHAS-BP-T1600-S   |
| FPM Display      | REV 04  | 710-021387  |            | CRAFT-T1600-S     |
| CIP              | REV 06  | 710-002895  |            | CIP-L-T640-S      |
| PEM 0            | REV 05  | 740-036442  | IPUPAG6KAA | PWR-T-6-60-DC-S   |
| PEM 1            | REV 05  | 740-036442  | IPUPAG6KAA | PWR-T-6-60-DC-S   |
| SCG 0            | REV 18  | 710-003423  |            | SCG-T-S           |
| SCG 1            | REV 18  | 710-003423  |            | SCG-T-S           |
| Routing Engine 0 | REV 10  | 740-026941  |            | RE-DUO-C1800-8G-S |
| Routing Engine 1 | REV 07  | 740-026941  |            | RE-DUO-C1800-8G-S |
| CB 0             | REV 11  | 710-022597  |            | CB-LCC-S          |
| CB 1             | REV 11  | 710-022597  |            | CB-LCC-S          |
| FPC 0            | REV 01  | 750-045173  | IP9IAL4DAB | T4000-FPC5-3D     |
| PIC 0            | REV 17  | 750-034624  | IP9IAL2DAA | PF-12XGE-SFPP     |
| PIC 1            | REV 17  | 750-034624  | IP9IAL2DAA | PF-12XGE-SFPP     |
| FPC 3            | REV 01  | 750-045173  | IP9IAL4DAB | T4000-FPC5-3D     |
| PIC 0            | REV 13  | 750-033423  | XXXXXXXXDD | PF-12-24XGE-SFPP  |
| FPC 4            | REV 02  | 750-045173  | IP9IAL4DAC | T4000-FPC5-3D     |
| PIC 0            | REV 17  | 750-034624  | IP9IAL2DAA | PF-12XGE-SFPP     |
| PIC 1            | REV 17  | 750-034624  | IP9IAL2DAA | PF-12XGE-SFPP     |
| FPC 5            | REV 01  | 750-045173  | IP9IAL4DAB | T4000-FPC5-3D     |
| PIC 0            | REV 17  | 750-034624  | IP9IAL2DAA | PF-12XGE-SFPP     |
| PIC 1            | REV 17  | 750-034624  | IP9IAL2DAA | PF-12XGE-SFPP     |
| FPC 6            | REV 01  | 750-045173  | IP9IAL4DAB | T4000-FPC5-3D     |
| PIC 0            | REV 17  | 750-034624  | IP9IAL2DAA | PF-12XGE-SFPP     |
| PIC 1            | REV 10  | 750-035293  | IP9IAL3DAA | PF-1CGE-CFP       |
| SIB 0            | REV 06  | 750-041657  | PROTOXCLEI | SIB-TXP-3D-LCC    |
| Xcvr 0           | REV 01  | 740-048813  |            |                   |
| Xcvr 1           | REV 01  | 740-048813  |            |                   |
| Xcvr 2           | REV 01  | 740-048813  |            |                   |
| Xcvr 3           | REV 01  | 740-048813  |            |                   |
| Xcvr 4           | REV 01  | 740-048813  |            |                   |
| Xcvr 5           | REV 01  | 740-048813  |            |                   |
| Xcvr 6           | REV 01  | 740-048813  |            |                   |
| Xcvr 7           | REV 01  | 740-048813  |            |                   |
| SIB 1            | REV 06  | 750-041657  | PROTOXCLEI | SIB-TXP-3D-LCC    |
| Xcvr 0           | REV 01  | 740-048813  |            |                   |
| Xcvr 1           | REV 01  | 740-048813  |            |                   |
| Xcvr 2           | REV 01  | 740-048813  |            |                   |
| Xcvr 3           | REV 01  | 740-048813  |            |                   |
| Xcvr 4           | REV 01  | 740-048813  |            |                   |
| Xcvr 5           | REV 01  | 740-048813  |            |                   |
| Xcvr 6           | REV 01  | 740-048813  |            |                   |
| Xcvr 7           | REV 01  | 740-048813  |            |                   |
| SIB 2            | REV 06  | 750-041657  | PROTOXCLEI | SIB-TXP-3D-LCC    |
| Xcvr 0           | REV 01  | 740-048813  |            |                   |
| Xcvr 1           | REV 01  | 740-048813  |            |                   |
| Xcvr 2           | REV 01  | 740-048813  |            |                   |
| Xcvr 3           | REV 01  | 740-048813  |            |                   |
| Xcvr 4           | REV 01  | 740-048813  |            |                   |
| Xcvr 5           | REV 01  | 740-048813  |            |                   |
| Xcvr 6           | REV 01  | 740-048813  |            |                   |
| Xcvr 7           | REV 01  | 740-048813  |            |                   |
| SIB 3            | REV 07  | 750-041657  | PROTOXCLEI | SIB-TXP-3D-LCC    |



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Xcvr 0 REV 01 740-048813
Xcvr 1 REV 01 740-048813
Xcvr 2 REV 01 740-048813
Xcvr 3 REV 01 740-048813
Xcvr 4 REV 01 740-048813
Xcvr 5 REV 01 740-048813
Xcvr 6 REV 01 740-048813
Xcvr 7 REV 01 740-048813
SIB 4 REV 06 750-041657 PROTOXCLEI SIB-TXP-3D-LCC
Xcvr 0 REV 01 740-048813
Xcvr 1 REV 01 740-048813
Xcvr 2 REV 01 740-048813
Xcvr 3 REV 01 740-048813
Xcvr 4 REV 01 740-048813
Xcvr 5 REV 01 740-048813
Xcvr 6 REV 01 740-048813
Xcvr 7 REV 01 740-048813
Fan Tray 0
Fan Tray 1
Fan Tray 2
[Output Truncated]
FANTRAY-T-S
FANTRAY-T-S
FANTRAY-TXP3D-LCC-R-S

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#### show chassis hardware detail (TX Matrix Plus router with 3D SIBs)

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user@host> show chassis hardware detail
sfc0-re0:

Hardware inventory:
Item Version Part number Serial number Description
Chassis JN11CAAA4AHB TXP
Midplane REV 05 710-022574 ABAC4696 SFC Midplane
FPM Display REV 09 710-024027 EH3138 TXP FPM Display
CIP 0 REV 12 710-023792 EF6349 TXP CIP
CIP 1 REV 12 710-023792 EG5294 TXP CIP
PEM 0 Rev 06 740-027463 XH04595 Power Entry Module
PEM 1 Rev 06 740-027463 XH04592 Power Entry Module
Routing Engine 0 REV 07 740-026942 P737A-002541 RE-DUO-2600
 ad0 3823 MB SMART CF 2011030400062C132C13 Compact Flash
 ad1 62720 MB SMART Lite SATA Drive 201105100009A452A452 Disk 1
Routing Engine 1 REV 07 740-026942 P737A-002602 RE-DUO-2600
 ad0 3823 MB SMART CF 20110508085EE471E471 Compact Flash
 ad1 62720 MB SMART Lite SATA Drive 201110210089DF39DF39 Disk 1
CB 0 REV 15 710-022606 EH4376 SFC Control Board
CB 1 REV 15 710-022606 EH4379 SFC Control Board
SPMB 0 BUILTIN SFC Switch CPU
SPMB 1 BUILTIN SFC Switch CPU
SIB F13 0 REV 10 750-035002 EM9305 F13 SIB 3D
 B Board REV 06 711-035082 EM9667 F13 SIB 3D Mezz
 P Board REV 05 711-043544 EM9708 F13 SIB 3D Power
Xcvr 0 REV 01 740-047547 XB34FB00S CXP Module
Xcvr 2 REV 01 740-047547 XB48FB01H CXP Module
Xcvr 4 REV 01 740-047547 XB34FB02W CXP Module
Xcvr 6 REV 01 740-047547 XB34FB01T CXP Module
Xcvr 8 REV 01 740-047547 XB48FB00W CXP Module
Xcvr 10 REV 01 740-047547 XB34FB01S CXP Module
Xcvr 12 REV 01 740-047547 XB34FB03H CXP Module
Xcvr 14 REV 01 740-047547 XB34FB023 CXP Module
SIB F13 3 REV 01 710-035001 EJ2612 F13 SIB 3D
 B Board REV 01 711-035082 EJ3815 F13 SIB 3D Mezz
 P Board REV 01 711-043544 EJ2678 F13 SIB 3D Power
Xcvr 0 REV 01 740-047547 XB48FB04C CXP Module

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|             |        |            |           |                  |
|-------------|--------|------------|-----------|------------------|
| Xcvr 2      | REV 01 | 740-047547 | XB48FB00Z | CXP Module       |
| Xcvr 4      | REV 01 | 740-047547 | XB47FB036 | CXP Module       |
| Xcvr 6      | REV 01 | 740-047547 | XB47FB029 | CXP Module       |
| Xcvr 8      | REV 01 | 740-047547 | XB48FB02N | CXP Module       |
| Xcvr 10     | REV 01 | 740-047547 | XB42FB0CS | CXP Module       |
| Xcvr 12     | REV 01 | 740-047547 | XB47FB01X | CXP Module       |
| Xcvr 14     | REV 01 | 740-047547 | XB48FB02F | CXP Module       |
| SIB F13 6   | REV 05 | 750-035002 | EK2675    | F13 SIB 3D       |
| B Board     | REV 03 | 711-035082 | EK2612    | F13 SIB 3D Mezz  |
| P Board     | REV 04 | 711-043544 | EK1179    | F13 SIB 3D Power |
| Xcvr 0      | REV 01 | 740-047547 | XB48FB01T | CXP Module       |
| Xcvr 2      | REV 01 | 740-047547 | XB48FB02M | CXP Module       |
| Xcvr 4      | REV 01 | 740-047547 | XB48FB031 | CXP Module       |
| Xcvr 6      | REV 01 | 740-047547 | XB48FB04P | CXP Module       |
| Xcvr 8      | REV 01 | 740-047547 | XB48FB02T | CXP Module       |
| Xcvr 10     | REV 01 | 740-047547 | XB34FB01V | CXP Module       |
| Xcvr 12     | REV 01 | 740-047547 | XB48FB02C | CXP Module       |
| Xcvr 14     |        | NON-JNPR   |           | No Module        |
| SIB F13 12  | REV 01 | 710-035001 | EJ2631    | F13 SIB 3D       |
| B Board     | REV 01 | 711-035082 | EJ3808    | F13 SIB 3D Mezz  |
| P Board     | REV 01 | 711-043544 | EJ2676    | F13 SIB 3D Power |
| SIB F2S 0/0 | REV 01 | 711-034977 | EH9829    | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EH9927    | F2S SIB 3D Mezz  |
| SIB F2S 0/2 | REV 01 | 711-034977 | EH9791    | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EH9852    | F2S SIB 3D Mezz  |
| SIB F2S 0/4 | REV 01 | 711-034977 | EH9803    | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EH9915    | F2S SIB 3D Mezz  |
| SIB F2S 0/6 | REV 01 | 711-034977 | EH9763    | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EH9880    | F2S SIB 3D Mezz  |
| SIB F2S 1/0 | REV 01 | 711-034977 | EH9757    | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EH9889    | F2S SIB 3D Mezz  |
| SIB F2S 1/2 | REV 01 | 711-034977 | EH9815    | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EH9890    | F2S SIB 3D Mezz  |
| SIB F2S 1/4 | REV 08 | 750-034978 | EN1954    | F2S SIB 3D       |
| B Board     | REV 02 | 711-034979 | EN1436    | F2S SIB 3D Mezz  |
| SIB F2S 1/6 | REV 01 | 711-034977 | EJ7054    | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EJ8238    | F2S SIB 3D Mezz  |
| SIB F2S 2/0 | REV 01 | 711-034977 | EH9830    | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EH9844    | F2S SIB 3D Mezz  |
| SIB F2S 2/2 | REV 01 | 711-034977 | EH9818    | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EH9888    | F2S SIB 3D Mezz  |
| SIB F2S 2/4 | REV 01 | 711-034977 | EH9795    | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EH9869    | F2S SIB 3D Mezz  |
| SIB F2S 2/6 | REV 01 | 711-034977 | EJ7026    | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EJ8273    | F2S SIB 3D Mezz  |
| SIB F2S 3/0 | REV 01 | 711-034977 | EH9811    | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EH9892    | F2S SIB 3D Mezz  |
| SIB F2S 3/2 | REV 01 | 711-034977 | EH9812    | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EH9877    | F2S SIB 3D Mezz  |
| SIB F2S 3/4 | REV 08 | 750-034978 | EN1947    | F2S SIB 3D       |
| B Board     | REV 02 | 711-034979 | EN1471    | F2S SIB 3D Mezz  |
| Fan Tray 0  | REV 10 | 760-024497 | EH3313    | Front Fan Tray   |
| Fan Tray 1  | REV 10 | 760-024497 | EH3290    | Front Fan Tray   |
| Fan Tray 2  | REV 10 | 760-024502 | EH3292    | Rear Fan Tray    |
| Fan Tray 3  | REV 10 | 760-024502 | EH3287    | Rear Fan Tray    |
| Fan Tray 4  | REV 10 | 760-024502 | EH3286    | Rear Fan Tray    |
| Fan Tray 5  | REV 10 | 760-024502 | EH3285    | Rear Fan Tray    |

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Hardware inventory:

| Item             | Version               | Part number | Serial number        | Description             |
|------------------|-----------------------|-------------|----------------------|-------------------------|
| Chassis          |                       |             | JN1B23FEAHA          | T1600                   |
| Midplane         | REV 01                | 710-027486  | RC9787               | T-series Backplane      |
| FPM GBUS         | REV 13                | 710-002901  | BBAG5132             | T640 FPM Board          |
| FPM Display      | REV 04                | 710-021387  | BBAL9612             | T1600 FPM Display       |
| CIP              | REV 06                | 710-002895  | BBAN0605             | T-series CIP            |
| PEM 0            | REV 05                | 740-036442  | 1G022060143          | Power Entry Module 6x60 |
| PEM 1            | REV 05                | 740-036442  | 1G022060011          | Power Entry Module 6x60 |
| SCG 0            | REV 18                | 710-003423  | BBAL7318             | T640 Sonet Clock Gen.   |
| SCG 1            | REV 18                | 710-003423  | BBAL7255             | T640 Sonet Clock Gen.   |
| Routing Engine 0 | REV 07                | 740-026941  | P737F-002933         | RE-DUO-1800             |
| ad0 3823 MB      | SMART CF              |             | 201103030490604E604E | Compact Flash           |
| ad1 62720 MB     | SMART Lite SATA Drive |             | 20110729028B11D411D4 | Disk 1                  |
| Routing Engine 1 | REV 06                | 740-026941  | P737F-002749         | RE-DUO-1800             |
| ad0 3823 MB      | SMART CF              |             | 2011010504EB99649964 | Compact Flash           |
| ad1 62720 MB     | SMART Lite SATA Drive |             | 201102140058934A934A | Disk 1                  |
| CB 0             | REV 11                | 710-022597  | EH3611               | LCC Control Board       |
| CB 1             | REV 11                | 710-022597  | EH4798               | LCC Control Board       |
| FPC 5            | REV 17                | 710-013037  | BBAC5333             | FPC Type 4-ES           |
| CPU              | REV 10                | 710-016744  | BBAB7619             | ST-PMB2                 |
| PIC 0            | REV 18                | 750-017405  | BBAE3420             | 4x 10GE (LAN/WAN) XFP   |
| Xcvr 0           | REV 03                | 740-014289  | T10C90659            | XFP-10G-SR              |
| MMB 0            | REV 05                | 710-025563  | BBAB9538             | ST-MMB2                 |
| MMB 1            | REV 05                | 710-025563  | BBAB9502             | ST-MMB2                 |
| FPC 7            | REV 01                | 750-045173  | BBAV0032             | FPC Type 5-3D           |
| CPU              |                       |             |                      |                         |
| SPMB 0           | REV 05                | 710-023321  | EG9434               | LCC Switch CPU          |
| SPMB 1           | REV 05                | 710-023321  | EH3878               | LCC Switch CPU          |
| SIB 0            | REV 01                | 750-041657  | EH7997               | LCC SIB 3D              |
| B Board          | REV 01                | 711-042424  | EH7674               | LCC SIB 3D Mezz         |
| Xcvr 0           | REV 01                | 740-047547  | XB48FB014            | CXP Module              |
| Xcvr 2           | REV 01                | 740-047547  | XB48FB05A            | CXP Module              |
| Xcvr 4           | REV 01                | 740-047547  | XB48FB052            | CXP Module              |
| Xcvr 6           | REV 01                | 740-047547  | XB48FB01B            | CXP Module              |
| SIB 1            | REV 01                | 750-041657  | EH8023               | LCC SIB 3D              |
| B Board          | REV 01                | 711-042424  | EH7659               | LCC SIB 3D Mezz         |
| Xcvr 0           | REV 01                | 740-047547  | XB48FB05J            | CXP Module              |
| Xcvr 2           | REV 01                | 740-047547  | XB48FB01E            | CXP Module              |
| Xcvr 4           | REV 01                | 740-047547  | XB48FB01J            | CXP Module              |
| Xcvr 6           | REV 01                | 740-047547  | XB48FB02S            | CXP Module              |
| SIB 2            | REV 03                | 750-041657  | EJ6554               | LCC SIB 3D              |
| B Board          | REV 02                | 711-042424  | EJ5756               | LCC SIB 3D Mezz         |
| Xcvr 0           | REV 01                | 740-047547  | XB34FB01Z            | CXP Module              |
| Xcvr 2           | REV 01                | 740-047547  | XB34FB013            | CXP Module              |
| Xcvr 4           | REV 01                | 740-047547  | XB48FB04Z            | CXP Module              |
| Xcvr 6           | REV 01                | 740-047547  | XB48FB05N            | CXP Module              |
| Fan Tray 0       |                       |             |                      | Front Top Fan Tray      |
| Fan Tray 1       |                       |             |                      | Front Bottom Fan Tray   |
| Fan Tray 2       |                       |             |                      | Rear Fan Tray -- Rev 4  |

lcc2-re0:

-----  
Hardware inventory:

| Item        | Version | Part number | Serial number | Description             |
|-------------|---------|-------------|---------------|-------------------------|
| Chassis     |         |             | JN1B3975AHA   | T1600                   |
| Midplane    | REV 01  | 710-027486  | RC9826        | T-series Backplane      |
| FPM GBUS    | REV 13  | 710-002901  | BBAG5124      | T640 FPM Board          |
| FPM Display | REV 03  | 710-021387  | BBAJ1112      | T1600 FPM Display       |
| CIP         | REV 06  | 710-002895  | BBAL3744      | T-series CIP            |
| PEM 0       | REV 05  | 740-036442  | 1G022060081   | Power Entry Module 6x60 |
| PEM 1       | REV 05  | 740-036442  | 1G022060188   | Power Entry Module 6x60 |

|                  |          |                       |                      |                        |
|------------------|----------|-----------------------|----------------------|------------------------|
| SCG 0            | REV 18   | 710-003423            | BBAH8775             | T640 Sonet Clock Gen.  |
| SCG 1            | REV 18   | 710-003423            | BBAL7272             | T640 Sonet Clock Gen.  |
| Routing Engine 0 | REV 07   | 740-026941            | P737F-002992         | RE-DUO-1800            |
| ad0              | 3823 MB  | SMART CF              | 201103030356329E329E | Compact Flash          |
| ad1              | 62720 MB | SMART Lite SATA Drive | 2011051000488D8B8D8B | Disk 1                 |
| Routing Engine 1 | REV 07   | 740-026941            | P737F-002938         | RE-DUO-1800            |
| ad0              | 3823 MB  | SMART CF              | 20110304000F02680268 | Compact Flash          |
| ad1              | 62720 MB | SMART Lite SATA Drive | 201105300A70F325F325 | Disk 1                 |
| CB 0             | REV 11   | 710-022597            | EH4805               | LCC Control Board      |
| CB 1             | REV 11   | 710-022597            | EH4786               | LCC Control Board      |
| FPC 1            | REV 01   | 710-033873            | BBAH0320             | FPC Type 3-ES          |
| CPU              | REV 11   | 710-016744            | BBAF3281             | ST-PMB2                |
| MMB 0            | REV 06   | 710-025563            | BBAF5061             | ST-MMB2                |
| FPC 5            | REV 04   | 710-033871            | BBAM5070             | FPC Type 4-ES          |
| CPU              | REV 11   | 710-016744            | BBAM6653             | ST-PMB2                |
| PIC 1            | REV 20   | 750-017405            | BBAM1296             | 4x 10GE (LAN/WAN) XFP  |
| Xcvr 0           | REV 03   | 740-014289            | T10B42981            | XFP-10G-SR             |
| MMB 0            | REV 07   | 710-025563            | BBAN2631             | ST-MMB2                |
| MMB 1            | REV 07   | 710-025563            | BBAN2538             | ST-MMB2                |
| SPMB 0           | REV 05   | 710-023321            | EH3903               | LCC Switch CPU         |
| SPMB 1           | REV 05   | 710-023321            | EH3902               | LCC Switch CPU         |
| SIB 0            | REV 01   | 750-041657            | EH8019               | LCC SIB 3D             |
| B Board          | REV 01   | 711-042424            | EH7680               | LCC SIB 3D Mezz        |
| Xcvr 0           | REV 01   | 740-047547            | XB48FB04F            | CXP Module             |
| Xcvr 2           | REV 01   | 740-047547            | XB48FB04S            | CXP Module             |
| Xcvr 4           | REV 01   | 740-047547            | XB48FB04B            | CXP Module             |
| Xcvr 6           | REV 01   | 740-047547            | XB48FB043            | CXP Module             |
| SIB 1            | REV 01   | 750-041657            | EH8012               | LCC SIB 3D             |
| B Board          | REV 01   | 711-042424            | EH7658               | LCC SIB 3D Mezz        |
| Xcvr 0           | REV 01   | 740-047547            | XB48FB05E            | CXP Module             |
| Xcvr 2           | REV 01   | 740-047547            | XB48FB01Z            | CXP Module             |
| Xcvr 4           | REV 01   | 740-047547            | XB48FB018            | CXP Module             |
| Xcvr 6           | REV 01   | 740-047547            | XB48FB054            | CXP Module             |
| SIB 2            | REV 01   | 750-041657            | EH7993               | LCC SIB 3D             |
| B Board          | REV 01   | 711-042424            | EH7678               | LCC SIB 3D Mezz        |
| Xcvr 0           | REV 01   | 740-047547            | XB48FB05C            | CXP Module             |
| Xcvr 2           | REV 01   | 740-047547            | XB47FB00N            | CXP Module             |
| Xcvr 4           | REV 01   | 740-047547            | XB48FB05U            | CXP Module             |
| Xcvr 6           | REV 01   | 740-047547            | XB48FB05L            | CXP Module             |
| Fan Tray 0       |          |                       |                      | Front Top Fan Tray     |
| Fan Tray 1       |          |                       |                      | Front Bottom Fan Tray  |
| Fan Tray 2       |          |                       |                      | Rear Fan Tray -- Rev 4 |

### show chassis hardware lcc (TX Matrix Plus router with 3D SIBs)

```
user@host> show chassis hardware lcc 0
lcc0-re0:
```

#### Hardware inventory:

| Item             | Version | Part number | Serial number | Description             |
|------------------|---------|-------------|---------------|-------------------------|
| Chassis          |         |             | JN11B23FEAHA  | T1600                   |
| Midplane         | REV 01  | 710-027486  | RC9787        | T-series Backplane      |
| FPM GBUS         | REV 13  | 710-002901  | BBAG5132      | T640 FPM Board          |
| FPM Display      | REV 04  | 710-021387  | BBAL9612      | T1600 FPM Display       |
| CIP              | REV 06  | 710-002895  | BBAN0605      | T-series CIP            |
| PEM 0            | REV 05  | 740-036442  | 1G022060143   | Power Entry Module 6x60 |
| PEM 1            | REV 05  | 740-036442  | 1G022060011   | Power Entry Module 6x60 |
| SCG 0            | REV 18  | 710-003423  | BBAL7318      | T640 Sonet Clock Gen.   |
| SCG 1            | REV 18  | 710-003423  | BBAL7255      | T640 Sonet Clock Gen.   |
| Routing Engine 0 | REV 07  | 740-026941  | P737F-002933  | RE-DUO-1800             |
| Routing Engine 1 | REV 06  | 740-026941  | P737F-002749  | RE-DUO-1800             |

|            |        |            |           |                        |
|------------|--------|------------|-----------|------------------------|
| CB 0       | REV 11 | 710-022597 | EH3611    | LCC Control Board      |
| CB 1       | REV 11 | 710-022597 | EH4798    | LCC Control Board      |
| FPC 5      | REV 17 | 710-013037 | BBAC5333  | FPC Type 4-ES          |
| CPU        | REV 10 | 710-016744 | BBAB7619  | ST-PMB2                |
| PIC 0      | REV 18 | 750-017405 | BBAE3420  | 4x 10GE (LAN/WAN) XFP  |
| Xcvr 0     | REV 03 | 740-014289 | T10C90659 | XFP-10G-SR             |
| MMB 0      | REV 05 | 710-025563 | BBAB9538  | ST-MMB2                |
| MMB 1      | REV 05 | 710-025563 | BBAB9502  | ST-MMB2                |
| FPC 7      | REV 01 | 750-045173 | BBAV0032  | FPC Type 5-3D          |
| CPU        |        |            |           |                        |
| SPMB 0     | REV 05 | 710-023321 | EG9434    | LCC Switch CPU         |
| SPMB 1     | REV 05 | 710-023321 | EH3878    | LCC Switch CPU         |
| SIB 0      | REV 01 | 750-041657 | EH7997    | LCC SIB 3D             |
| B Board    | REV 01 | 711-042424 | EH7674    | LCC SIB 3D Mezz        |
| Xcvr 0     | REV 01 | 740-047547 | XB48FB014 | CXP Module             |
| Xcvr 2     | REV 01 | 740-047547 | XB48FB05A | CXP Module             |
| Xcvr 4     | REV 01 | 740-047547 | XB48FB052 | CXP Module             |
| Xcvr 6     | REV 01 | 740-047547 | XB48FB01B | CXP Module             |
| SIB 1      | REV 01 | 750-041657 | EH8023    | LCC SIB 3D             |
| B Board    | REV 01 | 711-042424 | EH7659    | LCC SIB 3D Mezz        |
| Xcvr 0     | REV 01 | 740-047547 | XB48FB05J | CXP Module             |
| Xcvr 2     | REV 01 | 740-047547 | XB48FB01E | CXP Module             |
| Xcvr 4     | REV 01 | 740-047547 | XB48FB01J | CXP Module             |
| Xcvr 6     | REV 01 | 740-047547 | XB48FB02S | CXP Module             |
| SIB 2      | REV 03 | 750-041657 | EJ6554    | LCC SIB 3D             |
| B Board    | REV 02 | 711-042424 | EJ5756    | LCC SIB 3D Mezz        |
| Xcvr 0     | REV 01 | 740-047547 | XB34FB01Z | CXP Module             |
| Xcvr 2     | REV 01 | 740-047547 | XB34FB013 | CXP Module             |
| Xcvr 4     | REV 01 | 740-047547 | XB48FB04Z | CXP Module             |
| Xcvr 6     | REV 01 | 740-047547 | XB48FB05N | CXP Module             |
| Fan Tray 0 |        |            |           | Front Top Fan Tray     |
| Fan Tray 1 |        |            |           | Front Bottom Fan Tray  |
| Fan Tray 2 |        |            |           | Rear Fan Tray -- Rev 4 |

### show chassis hardware sfc (TX Matrix Plus router with 3D SIBs)

```
user@host> show chassis hardware sfc 0
sfc0-re0:
```

```

```

| Hardware inventory: |         |             |               |                    |
|---------------------|---------|-------------|---------------|--------------------|
| Item                | Version | Part number | Serial number | Description        |
| Chassis             |         |             | JN11CAAA4AHB  | TXP                |
| Midplane            | REV 05  | 710-022574  | ABAC4696      | SFC Midplane       |
| FPM Display         | REV 09  | 710-024027  | EH3138        | TXP FPM Display    |
| CIP 0               | REV 12  | 710-023792  | EF6349        | TXP CIP            |
| CIP 1               | REV 12  | 710-023792  | EG5294        | TXP CIP            |
| PEM 0               | Rev 06  | 740-027463  | XH04595       | Power Entry Module |
| PEM 1               | Rev 06  | 740-027463  | XH04592       | Power Entry Module |
| Routing Engine 0    | REV 07  | 740-026942  | P737A-002541  | RE-DUO-2600        |
| Routing Engine 1    | REV 07  | 740-026942  | P737A-002602  | RE-DUO-2600        |
| CB 0                | REV 15  | 710-022606  | EH4376        | SFC Control Board  |
| CB 1                | REV 15  | 710-022606  | EH4379        | SFC Control Board  |
| SPMB 0              |         | BUILTIN     |               | SFC Switch CPU     |
| SPMB 1              |         | BUILTIN     |               | SFC Switch CPU     |
| SIB F13 0           | REV 10  | 750-035002  | EM9305        | F13 SIB 3D         |
| B Board             | REV 06  | 711-035082  | EM9667        | F13 SIB 3D Mezz    |
| P Board             | REV 05  | 711-043544  | EM9708        | F13 SIB 3D Power   |
| Xcvr 0              | REV 01  | 740-047547  | XB34FB00S     | CXP Module         |
| Xcvr 2              | REV 01  | 740-047547  | XB48FB01H     | CXP Module         |
| Xcvr 4              | REV 01  | 740-047547  | XB34FB02W     | CXP Module         |
| Xcvr 6              | REV 01  | 740-047547  | XB34FB01T     | CXP Module         |

|             |        |            |           |                  |
|-------------|--------|------------|-----------|------------------|
| Xcvr 8      | REV 01 | 740-047547 | XB48FB00W | CXP Module       |
| Xcvr 10     | REV 01 | 740-047547 | XB34FB01S | CXP Module       |
| Xcvr 12     | REV 01 | 740-047547 | XB34FB03H | CXP Module       |
| Xcvr 14     | REV 01 | 740-047547 | XB34FB023 | CXP Module       |
| SIB F13 3   | REV 01 | 710-035001 | EJ2612    | F13 SIB 3D       |
| B Board     | REV 01 | 711-035082 | EJ3815    | F13 SIB 3D Mezz  |
| P Board     | REV 01 | 711-043544 | EJ2678    | F13 SIB 3D Power |
| Xcvr 0      | REV 01 | 740-047547 | XB48FB04C | CXP Module       |
| Xcvr 2      | REV 01 | 740-047547 | XB48FB00Z | CXP Module       |
| Xcvr 4      | REV 01 | 740-047547 | XB47FB036 | CXP Module       |
| Xcvr 6      | REV 01 | 740-047547 | XB47FB029 | CXP Module       |
| Xcvr 8      | REV 01 | 740-047547 | XB48FB02N | CXP Module       |
| Xcvr 10     | REV 01 | 740-047547 | XB42FB0CS | CXP Module       |
| Xcvr 12     | REV 01 | 740-047547 | XB47FB01X | CXP Module       |
| Xcvr 14     | REV 01 | 740-047547 | XB48FB02F | CXP Module       |
| SIB F13 6   | REV 05 | 750-035002 | EK2675    | F13 SIB 3D       |
| B Board     | REV 03 | 711-035082 | EK2612    | F13 SIB 3D Mezz  |
| P Board     | REV 04 | 711-043544 | EK1179    | F13 SIB 3D Power |
| Xcvr 0      | REV 01 | 740-047547 | XB48FB01T | CXP Module       |
| Xcvr 2      | REV 01 | 740-047547 | XB48FB02M | CXP Module       |
| Xcvr 4      | REV 01 | 740-047547 | XB48FB031 | CXP Module       |
| Xcvr 6      | REV 01 | 740-047547 | XB48FB04P | CXP Module       |
| Xcvr 8      | REV 01 | 740-047547 | XB48FB02T | CXP Module       |
| Xcvr 10     | REV 01 | 740-047547 | XB34FB01V | CXP Module       |
| Xcvr 12     | REV 01 | 740-047547 | XB48FB02C | CXP Module       |
| Xcvr 14     |        | NON-JNPR   |           | No Module        |
| SIB F13 12  | REV 01 | 710-035001 | EJ2631    | F13 SIB 3D       |
| B Board     | REV 01 | 711-035082 | EJ3808    | F13 SIB 3D Mezz  |
| P Board     | REV 01 | 711-043544 | EJ2676    | F13 SIB 3D Power |
| SIB F2S 0/0 | REV 01 | 711-034977 | EH9829    | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EH9927    | F2S SIB 3D Mezz  |
| SIB F2S 0/2 | REV 01 | 711-034977 | EH9791    | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EH9852    | F2S SIB 3D Mezz  |
| SIB F2S 0/4 | REV 01 | 711-034977 | EH9803    | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EH9915    | F2S SIB 3D Mezz  |
| SIB F2S 0/6 | REV 01 | 711-034977 | EH9763    | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EH9880    | F2S SIB 3D Mezz  |
| SIB F2S 1/0 | REV 01 | 711-034977 | EH9757    | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EH9889    | F2S SIB 3D Mezz  |
| SIB F2S 1/2 | REV 01 | 711-034977 | EH9815    | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EH9890    | F2S SIB 3D Mezz  |
| SIB F2S 1/4 | REV 08 | 750-034978 | EN1954    | F2S SIB 3D       |
| B Board     | REV 02 | 711-034979 | EN1436    | F2S SIB 3D Mezz  |
| SIB F2S 1/6 | REV 01 | 711-034977 | EJ7054    | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EJ8238    | F2S SIB 3D Mezz  |
| SIB F2S 2/0 | REV 01 | 711-034977 | EH9830    | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EH9844    | F2S SIB 3D Mezz  |
| SIB F2S 2/2 | REV 01 | 711-034977 | EH9818    | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EH9888    | F2S SIB 3D Mezz  |
| SIB F2S 2/4 | REV 01 | 711-034977 | EH9795    | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EH9869    | F2S SIB 3D Mezz  |
| SIB F2S 2/6 | REV 01 | 711-034977 | EJ7026    | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EJ8273    | F2S SIB 3D Mezz  |
| SIB F2S 3/0 | REV 01 | 711-034977 | EH9811    | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EH9892    | F2S SIB 3D Mezz  |
| SIB F2S 3/2 | REV 01 | 711-034977 | EH9812    | F2S SIB 3D       |
| B Board     | REV 01 | 711-034979 | EH9877    | F2S SIB 3D Mezz  |
| SIB F2S 3/4 | REV 08 | 750-034978 | EN1947    | F2S SIB 3D       |
| B Board     | REV 02 | 711-034979 | EN1471    | F2S SIB 3D Mezz  |
| Fan Tray 0  | REV 10 | 760-024497 | EH3313    | Front Fan Tray   |
| Fan Tray 1  | REV 10 | 760-024497 | EH3290    | Front Fan Tray   |

|            |        |            |        |               |
|------------|--------|------------|--------|---------------|
| Fan Tray 2 | REV 10 | 760-024502 | EH3292 | Rear Fan Tray |
| Fan Tray 3 | REV 10 | 760-024502 | EH3287 | Rear Fan Tray |
| Fan Tray 4 | REV 10 | 760-024502 | EH3286 | Rear Fan Tray |
| Fan Tray 5 | REV 10 | 760-024502 | EH3285 | Rear Fan Tray |

### show chassis hardware (16-Port 10-Gigabit Ethernet MPC with SFP+ Optics [MX Series Routers])

```
user@host> show chassis hardware
```

```
Hardware inventory:
```

| Item             | Version | Part number | Serial number | Description          |
|------------------|---------|-------------|---------------|----------------------|
| Chassis          |         |             | JN112D865AFA  | MX960                |
| Midplane         | REV 03  | 710-013698  | TS3339        | MX960 Backplane      |
| FPM Board        | REV 03  | 710-014974  | WW6267        | Front Panel Display  |
| PDM              | Rev 03  | 740-013110  | QCS12485026   | Power Distribution   |
| Module           |         |             |               |                      |
| PEM 0            | Rev 04  | 740-013682  | QCS12434086   | PS 1.7kW; 200-240VAC |
| in               |         |             |               |                      |
| PEM 1            | Rev 04  | 740-013682  | QCS1243408Z   | PS 1.7kW; 200-240VAC |
| in               |         |             |               |                      |
| PEM 2            | Rev 04  | 740-013682  | QCS1243407X   | PS 1.7kW; 200-240VAC |
| in               |         |             |               |                      |
| Routing Engine 0 | REV 07  | 740-015113  | 9009009677    | RE-S-1300            |
| Routing Engine 1 | REV 07  | 740-015113  | 9009011510    | RE-S-1300            |
| CB 0             | REV 03  | 710-021523  | XF0394        | MX SCB               |
| CB 1             | REV 03  | 710-021523  | XF0550        | MX SCB               |
| CB 2             | REV 03  | 710-021523  | XD7455        | MX SCB               |
| FPC 4            | REV 02  | 750-028467  | JR6127        | MPC M 16x 10GE       |
| CPU              | REV 02  | 711-029089  | JX0129        | AS PMB               |
| PIC 0            |         | BUILTIN     | BUILTIN       | 4x 10GE(LAN) SFP+    |
| PIC 1            |         | BUILTIN     | BUILTIN       | 4x 10GE(LAN) SFP+    |
| PIC 2            |         | BUILTIN     | BUILTIN       | 4x 10GE(LAN) SFP+    |
| PIC 3            |         | BUILTIN     | BUILTIN       | 4x 10GE(LAN) SFP+    |
| Fan Tray 0       | REV 05  | 740-014971  | TP9990        | Fan Tray             |
| Fan Tray 1       | REV 05  | 740-014971  | VS1709        | Fan Tray             |

### show chassis hardware (MPC3E [MX Series Routers])

```
user@host> show chassis hardware
```

```
Hardware inventory:
```

| Item             | Version     | Part number | Serial number | Description            |
|------------------|-------------|-------------|---------------|------------------------|
| Chassis          |             |             | JN1101AFEAFB  | MX480                  |
| Midplane         | REV 05      | 710-017414  | TR4444        | MX480 Midplane         |
| FPM Board        | REV 02      | 710-017254  | KG6056        | Front Panel Display    |
| PEM 0            | Rev 03      | 740-017330  | QCS082090FC   | PS 1.2-1.7kW; 100-240V |
| PEM 1            | Rev 03      | 740-017330  | QCS082090FD   | PS 1.2-1.7kW; 100-240V |
| Routing Engine 0 | REV 07      | 740-013063  | 9009004124    | RE-S-2000              |
| Routing Engine 1 | REV 07      | 740-013063  | 9009005569    | RE-S-2000              |
| CB 0             | REV 07      | 710-021523  | XZ3587        | MX SCB                 |
| CB 1             | REV 03      | 710-021523  | KH8306        | MX SCB                 |
| FPC 1            | REV 04.1.07 | 750-033205  | P1240         | MPC Type 3             |
| CPU              | REV 01      | 711-035209  | YL0504        | HMPC PMB 2G            |
| MIC 1            | REV 10      | 750-033199  | YX4495        | 1X100GE CFP            |
| PIC 2            |             | BUILTIN     | BUILTIN       | 1X100GE CFP            |
| Xcvr 0           | REV 01      | 740-032210  | C22CQNE       | CFP-100G-LR4           |
| FPC 2            | REV 26      | 750-016670  | KH0045        | DPCE 40x 1GE R EQ      |
| CPU              | REV 07      | 710-013713  | KF5448        | DPC PMB                |
| PIC 0            |             | BUILTIN     | BUILTIN       | 10x 1GE(LAN) EQ        |

|          |             |            |             |                     |
|----------|-------------|------------|-------------|---------------------|
| Xcvr 0   | REV 01      | 740-011613 | PF21JHU     | SFP-SX              |
| PIC 1    |             | BUILTIN    | BUILTIN     | 10x 1GE(LAN) EQ     |
| Xcvr 9   | REV 01      | 740-011613 | AM0813S8ZL6 | SFP-SX              |
| PIC 2    |             | BUILTIN    | BUILTIN     | 10x 1GE(LAN) EQ     |
| Xcvr 0   | REV 02      | 740-011613 | PGL2KYF     | SFP-SX              |
| Xcvr 2   | REV 01      | 740-011613 | AM0806S8N4P | SFP-SX              |
| PIC 3    |             | BUILTIN    | BUILTIN     | 10x 1GE(LAN) EQ     |
| Xcvr 5   | REV 01      | 740-011613 | AM0815S967N | SFP-SX              |
| Xcvr 7   | REV 01      | 740-011613 | AM0806S8N1X | SFP-SX              |
| Xcvr 8   | REV 01      | 740-011613 | AM0815S967J | SFP-SX              |
| Xcvr 9   | REV 01      | 740-011613 | AM0815S967M | SFP-SX              |
| FPC 3    | REV 12.2.09 | 750-033205 | YR9443      | MPC Type 3          |
| CPU      | REV 03      | 711-035209 | YL6931      | HMPD PMB 2G         |
| MIC 0    | REV 05      | 750-033199 | YR3269      | 1X100GE CFP         |
| PIC 0    |             | BUILTIN    | BUILTIN     | 1X100GE CFP         |
| Xcvr 0   | REV 01      | 740-032210 | ULHOKG3     | CFP-100G-LR4        |
| MIC 1    | REV 02      | 750-033199 | YG3245      | 1X100GE CFP         |
| PIC 2    |             | BUILTIN    | BUILTIN     | 1X100GE CFP         |
| Xcvr 0   | REV 01      | 740-032210 | ULHOKGF     | CFP-100G-LR4        |
| FPC 4    | REV 12.3.09 | 750-033205 | YR9437      | MPC Type 3          |
| CPU      | REV 03      | 711-035209 | YT5857      | HMPD PMB 2G         |
| MIC 0    | REV 05      | 750-033199 | YR3295      | 1X100GE CFP         |
| PIC 0    |             | BUILTIN    | BUILTIN     | 1X100GE CFP         |
| Xcvr 0   |             | NON-JNPR   | X12000187   | CFP-100G-SR10       |
| MIC 1    | REV 10      | 750-033199 | YX4518      | 1X100GE CFP         |
| PIC 2    |             | BUILTIN    | BUILTIN     | 1X100GE CFP         |
| Xcvr 0   | REV 01      | 740-035329 | X12J00008   | CFP-100G-SR10       |
| FPC 5    | REV 06      | 750-024884 | JW9769      | MPC Type 2 3D EQ    |
| CPU      | REV 02      | 711-028401 | JR6158      | MPC PMB 2G Proto    |
| MIC 0    | REV 05      | 750-028387 | JR6197      | 3D 4x 10GE XFP      |
| PIC 0    |             | BUILTIN    | BUILTIN     | 2x 10GE XFP         |
| Xcvr 0   | REV 01      | 740-014289 | T07M71112   | XFP-10G-SR          |
| Xcvr 1   | REV 02      | 740-014289 | T08L85610   | XFP-10G-SR          |
| PIC 1    |             | BUILTIN    | BUILTIN     | 2x 10GE XFP         |
| MIC 1    | REV 22      | 750-028392 | YM0053      | 3D 20x 1GE(LAN) SFP |
| PIC 2    |             | BUILTIN    | BUILTIN     | 10x 1GE(LAN) SFP    |
| Xcvr 0   | REV 01      | 740-011613 | AM0703S005B | SFP-SX              |
| Xcvr 1   | REV 01      | 740-011613 | E07L01352   | SFP-SX              |
| PIC 3    |             | BUILTIN    | BUILTIN     | 10x 1GE(LAN) SFP    |
| Xcvr 5   | REV 01      | 740-013111 | 6500217     | SFP-T               |
| Xcvr 9   | REV 02      | 740-013111 | 8499527     | SFP-T               |
| Fan Tray |             |            |             | Left Fan Tray       |

The PIC number for MIC 1 always starts from 2 (even if the first MIC is a 1X100GE CFP or a legacy MIC).

### show chassis hardware (QFX3500 Switches)

```
user@switch> show chassis hardware
```

Hardware inventory:

| Item             | Version | Part number | Serial number | Description          |
|------------------|---------|-------------|---------------|----------------------|
| Chassis          |         |             |               | QFX3500              |
| Routing Engine 0 |         |             |               | QFX Routing Engine   |
| FPC 0            | REV 04  | 750-044071  | BBAR3902      | QFX3500-48S4Q-AFI    |
| CPU              |         | BUILTIN     | BUILTIN       | FPC CPU              |
| PIC 0            |         | BUILTIN     | BUILTIN       | 48x 10G-SFP+         |
| PIC 1            |         | BUILTIN     | BUILTIN       | 15x 10G-SFP+         |
| MGMT BRD         | REV 02  | 750-044063  | BBAR0398      | QFX3500-MGMT-SFP-AF0 |
| Xcvr 0           | REV 01  | 740-011614  | AC0946S0BD1   | SFP-LX10             |
| Xcvr 1           | REV 02  | 740-013111  | A281922       | SFP-T                |



|                |        |            |         |                       |
|----------------|--------|------------|---------|-----------------------|
| Power Supply 0 | Rev 04 | 740-032091 | UI00677 | JPSU-650W-AC-AFI      |
| Power Supply 1 | REV 00 | 740-041741 | VJ00162 | JPSU-650W-AC-AFO      |
| Fan Tray 0     |        |            |         | QFX Fan Tray, Back to |
| Front Airflow  |        |            |         |                       |
| Fan Tray 1     |        |            |         | QFX Fan Tray, Back to |
| Front Airflow  |        |            |         |                       |
| Fan Tray 2     |        |            |         | QFX Fan Tray, Back to |
| Front Airflow  |        |            |         |                       |

### show chassis hardware detail (QFX3500 Switches)

```
user@switch> show chassis hardware detail
```

```
Hardware inventory:
```

| Item             | Version | Part number | Serial number | Description        |
|------------------|---------|-------------|---------------|--------------------|
| Chassis          |         |             | JN000TEST5    | QFX3500            |
| Routing Engine 0 |         | BUILTIN     | BUILTIN       | QFX Routing Engine |
| FPC 0            | REV 05  | 750-036931  | EE0823        | QFX3500-48S4Q-AFI  |

| CPU     |        | BUILTIN    | BUILTIN    | FPC CPU       |
|---------|--------|------------|------------|---------------|
| PIC 0   |        | BUILTIN    | BUILTIN    | 48x 10G-SFP+  |
| Xcvr 0  | REV 01 | 740-030589 | S99E270079 | SFP+-10G-LPBK |
| Xcvr 1  | REV 01 | 740-030589 | S9AK450099 | SFP+-10G-LPBK |
| Xcvr 2  | REV 01 | 740-030589 | S99E270078 | SFP+-10G-LPBK |
| Xcvr 3  | REV 01 | 740-030589 | S9AK450098 | SFP+-10G-LPBK |
| Xcvr 4  | REV 01 | 740-030589 | S99E270075 | SFP+-10G-LPBK |
| Xcvr 5  | REV 01 | 740-030589 | S9AK450093 | SFP+-10G-LPBK |
| Xcvr 6  | REV 01 | 740-030589 | S9AK450097 | SFP+-10G-LPBK |
| Xcvr 7  | REV 01 | 740-030589 | S9AK450095 | SFP+-10G-LPBK |
| Xcvr 8  | REV 01 | 740-030589 | S99E270072 | SFP+-10G-LPBK |
| Xcvr 9  | REV 01 | 740-030589 | S99E270073 | SFP+-10G-LPBK |
| Xcvr 10 | REV 01 | 740-030589 | S99E270080 | SFP+-10G-LPBK |
| Xcvr 11 | REV 01 | 740-030589 | S9AK450169 | SFP+-10G-LPBK |
| Xcvr 12 | REV 01 | 740-030589 | S99E270076 | SFP+-10G-LPBK |
| Xcvr 13 | REV 01 | 740-030589 | S9AK450167 | SFP+-10G-LPBK |
| Xcvr 14 | REV 01 | 740-030589 | S9AK450170 | SFP+-10G-LPBK |
| Xcvr 15 | REV 01 | 740-030589 | S9AK450166 | SFP+-10G-LPBK |
| Xcvr 16 | REV 01 | 740-030589 | S9AK450092 | SFP+-10G-LPBK |
| Xcvr 17 | REV 01 | 740-030589 | S9AK450163 | SFP+-10G-LPBK |
| Xcvr 18 | REV 01 | 740-030589 | S9AK450094 | SFP+-10G-LPBK |
| Xcvr 19 | REV 01 | 740-030589 | S9AK450100 | SFP+-10G-LPBK |
| Xcvr 20 | REV 01 | 740-030589 | S9AK450168 | SFP+-10G-LPBK |
| Xcvr 21 | REV 01 | 740-030589 | S9AK450165 | SFP+-10G-LPBK |
| Xcvr 22 | REV 01 | 740-030589 | S9AK450073 | SFP+-10G-LPBK |
| Xcvr 23 | REV 01 | 740-030589 | S9AK450164 | SFP+-10G-LPBK |
| Xcvr 24 | REV 01 | 740-030589 | S9AK450074 | SFP+-10G-LPBK |
| Xcvr 25 | REV 01 | 740-030589 | SA62270195 | SFP+-10G-LPBK |
| Xcvr 26 | REV 01 | 740-030589 | S9AK450078 | SFP+-10G-LPBK |
| Xcvr 27 | REV 01 | 740-030589 | S9AK450024 | SFP+-10G-LPBK |
| Xcvr 28 | REV 01 | 740-030589 | S9AK450027 | SFP+-10G-LPBK |
| Xcvr 29 | REV 01 | 740-030589 | S9AK450080 | SFP+-10G-LPBK |
| Xcvr 30 | REV 01 | 740-030589 | S9AK450030 | SFP+-10G-LPBK |
| Xcvr 31 | REV 01 | 740-030589 | S9AK450025 | SFP+-10G-LPBK |
| Xcvr 32 | REV 01 | 740-030589 | S9AK450023 | SFP+-10G-LPBK |
| Xcvr 33 | REV 01 | 740-030589 | S9AK450075 | SFP+-10G-LPBK |
| Xcvr 34 | REV 01 | 740-030589 | S9AK450161 | SFP+-10G-LPBK |
| Xcvr 35 | REV 01 | 740-030589 | S9AK450071 | SFP+-10G-LPBK |
| Xcvr 36 | REV 01 | 740-030589 | S9AK450072 | SFP+-10G-LPBK |
| Xcvr 37 | REV 01 | 740-030589 | S9AK450022 | SFP+-10G-LPBK |
| Xcvr 38 | REV 01 | 740-030589 | S9AK450021 | SFP+-10G-LPBK |
| Xcvr 39 | REV 01 | 740-030589 | S9AK450175 | SFP+-10G-LPBK |

|                |        |            |            |                |
|----------------|--------|------------|------------|----------------|
| Xcvr 40        | REV 01 | 740-030589 | S9AK450162 | SFP+-10G-LPBK  |
| Xcvr 41        | REV 01 | 740-030589 | S99E270074 | SFP+-10G-LPBK  |
| Xcvr 42        | REV 01 | 740-030589 | S9AK450174 | SFP+-10G-LPBK  |
| Xcvr 43        | REV 01 | 740-030589 | S9AK450077 | SFP+-10G-LPBK  |
| Xcvr 44        | REV 01 | 740-030589 | S9AK450076 | SFP+-10G-LPBK  |
| Xcvr 45        | REV 01 | 740-030589 | S9AK450026 | SFP+-10G-LPBK  |
| Xcvr 46        | REV 01 | 740-030589 | S9AK450079 | SFP+-10G-LPBK  |
| Xcvr 47        | REV 01 | 740-030589 | S9AK450029 | SFP+-10G-LPBK  |
| PIC 1          |        | BUILTIN    | BUILTIN    | 15x 10G-SFP+   |
| Xcvr 1         | REV 01 | 740-032986 | QA170087   | QSFP+-40G-SR4  |
| Xcvr 4         | REV 01 | 740-032986 | QA360442   | QSFP+-40G-SR4  |
| Xcvr 8         | REV 01 | 740-032986 | QA170091   | QSFP+-40G-SR4  |
| Xcvr 12        | REV 01 | 740-032986 | QA170042   | QSFP+-40G-SR4  |
| MGMT BRD       | REV 08 | 750-036946 | EE0731     | QFX3500-MB     |
| Power Supply 0 | Rev 04 | 740-032091 | UI00690    | QFX PS 650W AC |
| Power Supply 1 | Rev 04 | 740-032091 | UI00679    | QFX PS 650W AC |
| Fan Tray 0     |        |            |            | QFX Fan Tray   |
| Fan Tray 1     |        |            |            | QFX Fan Tray   |

### show chassis hardware models (QFX3500 Switches)

```

user@switch> show chassis hardware models
Hardware inventory:
Item Version Part number Serial number FRU model number
Routing Engine 0 BUILTIN BUILTIN
FPC 0 REV 02 711-032234 EC4074
Power Supply 0 PSMI 2C 11-d65800 --

```

### show chassis hardware clei-models (QFX3500 Switches)

```

user@switch> show chassis hardware clei-models
Hardware inventory:
Item Version Part number CLEI code FRU model number
Routing Engine 0 BUILTIN
FPC 0 REV 02 711-032234
Power Supply 0 PSMI 2C 11-d65800

```

### show chassis hardware clei-models (QFX5100 Switches)

```

user@switch> show chassis hardware clei-models
Hardware inventory:
Item Version Part number CLEI code FRU model number
Routing Engine 0 BUILTIN CMMNV10BRA
FPC 0 REV 01 611-053010 CMMNV10BRA
PIC 0 BUILTIN CMMNV10BRA
Power Supply 0 REV 03 740-053352 MUPABHBAA JPSU-850W-AC-AFO
Power Supply 1 REV 03 740-053352 MUPABHBAA JPSU-850W-AC-AFO
Fan Tray 0 QFX5100-96S-FANAFO
Fan Tray 1 QFX5100-96S-FANAFO
Fan Tray 2 QFX5100-96S-FANAFO

```

### show chassis hardware interconnect-device (QFabric Systems)

```

user@switch> show chassis hardware interconnect-device interconnect1
Hardware inventory:
Item Version Part number Serial number Description
Chassis REV 07 QFX_olive
Midplane REV 07 750-021261 BH0208188289 QFX Midplane
CB 0 REV 07 750-021261 BH0208188289 QFXIC08-CB4S

```

**show chassis hardware node-device (QFabric Systems)**

```

user@switch> show chassis hardware node-device node1
Routing Engine 0 BUILTIN BUILTIN QFX Routing Engine
node1 REV 05 711-032234 ED3694 QFX3500-48S4Q-AFI

CPU
PIC 0 BUILTIN BUILTIN
Xcvr 8 REV 01 740-030658 AD0946A028B FPC CPU
 48x 10G-SFP+
 SFP+-10G-USR
...

```

**show chassis hardware (PTX5000 Packet Transport Router)**

```

user@host> show chassis hardware
Hardware inventory:
Item Version Part number Serial number Description
Chassis JN11D1FD7AJA PTX5000
Midplane REV 03 711-031896 ABAC5589 Midplane-8S
FPM REV 08 760-030647 EG1679 Front Panel Display
PDU 0 Rev 05 740-032019 ZE00006 DC Power Dist Unit
 PSM 0 Rev 05 740-032022 ZJ00018 DC 12V Power Supply
 PSM 1 Rev 04 740-032022 ZC00052 DC 12V Power Supply
 PSM 2 Rev 04 740-032022 ZD00051 DC 12V Power Supply
 PSM 3 Rev 05 740-032022 ZJ00060 DC 12V Power Supply
CCG 0 REV 04 750-030653 EG3703 Clock Generator
CCG 1 REV 04 750-030653 EG3698 Clock Generator
Routing Engine 0 REV 05 740-026942 P737A-002231 RE-DUO-2600
Routing Engine 1 REV 06 740-026942 P737A-002438 RE-DUO-2600
CB 0 REV 08 750-030625 EG5519 Control Board
CB 1 REV 08 750-030625 EG5516 Control Board
FPC 0 REV 18 750-036844 EJ3080 FPC
 CPU REV 12 711-030686 EJ3260 SNG PMB
FPC 2 REV 13 750-036844 EG5065 FPC
 CPU REV 09 711-030686 EG4082 SNG PMB
 PIC 0 REV 14 750-031913 EG5127 24x 10GE(LAN) SFP+
 Xcvr 0 REV 01 740-031980 143363A00240 SFP+-10G-SR
 Xcvr 1 REV 01 740-031981 UK90PZ1 SFP+-10G-LR
 Xcvr 2 REV 01 740-031980 AD1141A04XH SFP+-10G-SR
 Xcvr 3 REV 01 740-031981 UK90Q46 SFP+-10G-LR
 Xcvr 4 REV 01 740-031980 AD1141A04X4 SFP+-10G-SR
 Xcvr 6 REV 01 740-031980 B11H02560 SFP+-10G-SR
 Xcvr 7 REV 01 740-031980 B11C01589 SFP+-10G-SR
 Xcvr 8 REV 01 740-031980 AD1141A04XF SFP+-10G-SR
 Xcvr 10 REV 01 740-031980 123363A01094 SFP+-10G-SR
 Xcvr 11 REV 01 740-031980 AK80LKF SFP+-10G-SR
 Xcvr 12 REV 01 740-031980 183363A01528 SFP+-10G-SR
 Xcvr 14 REV 01 740-031980 193363A01079 SFP+-10G-SR
 Xcvr 15 REV 01 740-031980 AK80MC8 SFP+-10G-SR
 Xcvr 16 REV 01 740-031980 AJC0BHC SFP+-10G-SR
 Xcvr 19 REV 01 740-021309 J08D26856 SFP+-10G-LR
 Xcvr 21 REV 01 740-031980 AK80KCT SFP+-10G-SR
 Xcvr 22 REV 01 740-031981 UK90PZL SFP+-10G-LR
 Xcvr 23 REV 01 740-031980 AK80N1V SFP+-10G-SR
FPC 3 REV 13 750-036844 EG5074 FPC
 CPU REV 09 711-030686 EG4064 SNG PMB
 PIC 1 REV 10 750-031903 EG0325 SNG Load
FPC 5 REV 06 750-036844 EH3198 FPC
 CPU
 PIC 0 REV 14 750-031913 EG5134 24x 10GE(LAN) SFP+
 Xcvr 0 REV 01 740-031980 AK80LBH SFP+-10G-SR

```

|            |        |            |              |                     |
|------------|--------|------------|--------------|---------------------|
| Xcvr 1     | REV 01 | 740-031980 | B11B03724    | SFP+-10G-SR         |
| Xcvr 2     | REV 01 | 740-031980 | AK80FMH      | SFP+-10G-SR         |
| Xcvr 5     | REV 01 | 740-031980 | B11J00818    | SFP+-10G-SR         |
| Xcvr 6     | REV 01 | 740-031980 | 193363A00743 | SFP+-10G-SR         |
| Xcvr 7     | REV 01 | 740-031980 | B11B06125    | SFP+-10G-SR         |
| Xcvr 10    | REV 01 | 740-031980 | B11H02529    | SFP+-10G-SR         |
| Xcvr 11    | REV 01 | 740-031980 | AK80LFB      | SFP+-10G-SR         |
| Xcvr 12    | REV 01 | 740-031980 | 193363A01061 | SFP+-10G-SR         |
| Xcvr 15    | REV 01 | 740-031980 | B11J00687    | SFP+-10G-SR         |
| Xcvr 16    | REV 01 | 740-031980 | 193363A00738 | SFP+-10G-SR         |
| Xcvr 18    | REV 01 | 740-031980 | AK80MQX      | SFP+-10G-SR         |
| Xcvr 19    | REV 01 | 740-021309 | J08C17257    | SFP+-10G-LR         |
| Xcvr 22    | REV 01 | 740-031980 | B11J00730    | SFP+-10G-SR         |
| Xcvr 23    | REV 01 | 740-031980 | AK80KEE      | SFP+-10G-SR         |
| PIC 1      | REV 08 | 750-036710 | EG3105       | 2x 40GE CFP         |
| Xcvr 0     | REV 01 | 740-034554 | B260HLT      | CFP-40G-LR4         |
| Xcvr 1     | REV 01 | 740-034554 | B11C02847    | CFP-40G-LR4         |
| FPC 6      | REV 18 | 750-036844 | EJ4391       | FPC                 |
| CPU        | REV 12 | 711-030686 | EJ3257       | SNG PMB             |
| FPC 7      | REV 18 | 750-036844 | EJ4382       | FPC                 |
| CPU        | REV 12 | 711-030686 | EJ3238       | SNG PMB             |
| SPMB 0     | REV 10 | 711-030686 | EG5418       | SNG PMB             |
| SPMB 1     | REV 09 | 711-030686 | EG5373       | SNG PMB             |
| SIB 0      | REV 07 | 750-030631 | EG4858       | SIB-I-8S            |
| SIB 1      | REV 07 | 750-030631 | EG4872       | SIB-I-8S            |
| SIB 2      | REV 07 | 750-030631 | EG4866       | SIB-I-8S            |
| SIB 3      | REV 07 | 750-030631 | EG6011       | SIB-I-8S            |
| SIB 4      | REV 07 | 750-030631 | EG4907       | SIB-I-8S            |
| SIB 5      | REV 07 | 750-030631 | EG4879       | SIB-I-8S            |
| SIB 6      | REV 07 | 750-030631 | EG4864       | SIB-I-8S            |
| SIB 7      | REV 07 | 750-030631 | EG4899       | SIB-I-8S            |
| SIB 8      | REV 07 | 750-030631 | EG4880       | SIB-I-8S            |
| Fan Tray 0 | REV 04 | 760-032784 | EG1496       | Vertical Fan Tray   |
| Fan Tray 1 | REV 04 | 760-030642 | EG1335       | Horizontal Fan Tray |
| Fan Tray 2 | REV 02 | 760-030642 | ED4952       | Horizontal Fan Tray |

#### show chassis hardware (PTX5000 Packet Transport Router with FPC2-PTX-P1A)

```

user@host> show chassis hardware
Hardware inventory:
Item Version Part number Serial number Description
Chassis JN1204FC0AJA PTX5000
Midplane REV 11 750-035893 ACAB8038 Midplane-8S
FPM REV 12 760-030647 BBBD5619 Front Panel
Display
PDU 0 Rev 04 740-048336 1GB93470043 High Capacity DC PDU
 PSM 0 Rev 04 740-046988 1GB63500184 High Capacity DC PSM
 PSM 2 Rev 04 740-046988 1GB63500169 High Capacity DC PSM
 PSM 4 Rev 04 740-046988 1GB63500306 High Capacity DC PSM
 PSM 6 Rev 04 740-046988 1GB63500074 High Capacity DC PSM
PDU 1 Rev 04 740-048336 1GB93470045 High Capacity DC PDU
 PSM 1 Rev 04 740-046988 1GB63500193 High Capacity DC PSM
 PSM 3 Rev 04 740-046988 1GB63500143 High Capacity DC PSM
 PSM 5 Rev 04 740-046988 1GB63500146 High Capacity DC PSM
 PSM 7 Rev 04 740-046988 1GB63500192 High Capacity DC PSM
CCG 0 REV 09 750-030653 BBBC1909 Clock Generator
CCG 1 REV 09 750-030653 BBBD2970 Clock Generator
...

```

**show chassis hardware clei-models (PTX5000 Packet Transport Router)**

```

user@host> show chassis hardware clei-models
Hardware inventory:
Item Version Part number CLEI code FRU model number
FPM REV 08 760-030647 PROTOXCLEI CRAFT-PTX5000-S
PDU 0 Rev 05 740-032019 IPUPAHLKAA PWR-SAN-PDU-DC
 PSM 0 Rev 05 740-032022 IPUPAHNKAA PSM-PTX-DC-120-S
 PSM 1 Rev 04 740-032022 032022XXXX PWR-SAN-12-DC
 PSM 2 Rev 04 740-032022 032022XXXX PWR-SAN-12-DC
 PSM 3 Rev 05 740-032022 IPUPAHNKAA PSM-PTX-DC-120-S
CCG 0 REV 04 750-030653 PROTOXCLEI CCG-PTX-S
CCG 1 REV 04 750-030653 PROTOXCLEI CCG-PTX-S
Routing Engine 0 REV 05 740-026942 RE-DUO-C2600-16G-S
Routing Engine 1 REV 06 740-026942 RE-DUO-C2600-16G-S
CB 0 REV 08 750-030625 PROTOXCLEI CB-PTX-S
CB 1 REV 08 750-030625 PROTOXCLEI CB-PTX-S
FPC 0 REV 18 750-036844 PROTOXCLEI FPC-PTX-P1-A
FPC 2 REV 13 750-036844 PROTOXCLEI FPC-PTX-P1-A
 PIC 0 REV 14 750-031913 PROTOXCLEI P1-PTX-24-10GE-SFPP
FPC 3 REV 13 750-036844 PROTOXCLEI FPC-PTX-P1-A
FPC 5
 PIC 0 REV 14 750-031913 PROTOXCLEI P1-PTX-24-10GE-SFPP
FPC 6 REV 18 750-036844 PROTOXCLEI FPC-PTX-P1-A
FPC 7 REV 18 750-036844 PROTOXCLEI FPC-PTX-P1-A
SIB 0 REV 07 750-030631 PROTOXCLEI SIB-I-PTX5008
SIB 1 REV 07 750-030631 PROTOXCLEI SIB-I-PTX5008
SIB 2 REV 07 750-030631 PROTOXCLEI SIB-I-PTX5008
SIB 3 REV 07 750-030631 PROTOXCLEI SIB-I-PTX5008
SIB 4 REV 07 750-030631 PROTOXCLEI SIB-I-PTX5008
SIB 5 REV 07 750-030631 PROTOXCLEI SIB-I-PTX5008
SIB 6 REV 07 750-030631 PROTOXCLEI SIB-I-PTX5008
SIB 7 REV 07 750-030631 PROTOXCLEI SIB-I-PTX5008
SIB 8 REV 07 750-030631 PROTOXCLEI SIB-I-PTX5008
Fan Tray 1 REV 04 760-030642 PROTOXCLEI FAN-PTX-H-S

```

**show chassis hardware clei-models (PTX5000 Packet Transport Router with FPC2-PTX-P1A)**

```

user@host> show chassis hardware clei-models
Hardware inventory:
Item Version Part number CLEI code FRU model number
Midplane REV 11 750-035893 IPMUN00ARA CHAS-MP-PTX5000-S
FPM REV 12 760-030647 IPUCA7SCAA CRAFT-PTX5000-S
PDU 0 Rev 04 740-048336 IPUPAL7KAA PDU2-PTX-DC-S
 PSM 0 Rev 04 740-046988 IPUPAL8KAA PSM2-PTX-DC-S
 PSM 2 Rev 04 740-046988 IPUPAL8KAA PSM2-PTX-DC-S
 PSM 4 Rev 04 740-046988 IPUPAL8KAA PSM2-PTX-DC-S
 PSM 6 Rev 04 740-046988 IPUPAL8KAA PSM2-PTX-DC-S
PDU 1 Rev 04 740-048336 IPUPAL7KAA PDU2-PTX-DC-S
 PSM 1 Rev 04 740-046988 IPUPAL8KAA PSM2-PTX-DC-S
 PSM 3 Rev 04 740-046988 IPUPAL8KAA PSM2-PTX-DC-S
 PSM 5 Rev 04 740-046988 IPUPAL8KAA PSM2-PTX-DC-S
 PSM 7 Rev 04 740-046988 IPUPAL8KAA PSM2-PTX-DC-S
CCG 0 REV 09 750-030653 IPUCA7DCAA CCG-PTX-S
CCG 1 REV 09 750-030653 IPUCA7DCAA CCG-PTX-S
...

```

**show chassis hardware detail (PTX5000 Packet Transport Router)**

```

user@host> show chassis hardware detail

```

## Hardware inventory:

| Item             | Version               | Part number | Serial number        | Description         |
|------------------|-----------------------|-------------|----------------------|---------------------|
| Chassis          |                       |             | JN11D1FD7AJA         | PTX5000             |
| Midplane         | REV 03                | 711-031896  | ABAC5589             | Midplane-8S         |
| FPM              | REV 08                | 760-030647  | EG1679               | Front Panel Display |
| PDU 0            | Rev 05                | 740-032019  | ZE00006              | DC Power Dist Unit  |
| PSM 0            | Rev 05                | 740-032022  | ZJ00018              | DC 12V Power Supply |
| PSM 1            | Rev 04                | 740-032022  | ZC00052              | DC 12V Power Supply |
| PSM 2            | Rev 04                | 740-032022  | ZD00051              | DC 12V Power Supply |
| PSM 3            | Rev 05                | 740-032022  | ZJ00060              | DC 12V Power Supply |
| CCG 0            | REV 04                | 750-030653  | EG3703               | Clock Generator     |
| CCG 1            | REV 04                | 750-030653  | EG3698               | Clock Generator     |
| Routing Engine 0 | REV 05                | 740-026942  | P737A-002231         | RE-DUO-2600         |
| ad0 3823 MB      | SMART CF              |             | 201006190039C02DC02D | Compact Flash       |
| ad1 62720 MB     | SMART Lite SATA Drive |             | 2011042300CF4C6B4C6B | Disk 1              |
| Routing Engine 1 | REV 06                | 740-026942  | P737A-002438         | RE-DUO-2600         |
| ad0 3823 MB      | SMART CF              |             | 20100619053455F055F0 | Compact Flash       |
| ad1 62720 MB     | SMART Lite SATA Drive |             | 20110423000AE8E7E8E7 | Disk 1              |
| CB 0             | REV 08                | 750-030625  | EG5519               | Control Board       |
| CB 1             | REV 08                | 750-030625  | EG5516               | Control Board       |
| FPC 0            | REV 18                | 750-036844  | EJ3080               | FPC                 |
| CPU              | REV 12                | 711-030686  | EJ3260               | SNG PMB             |
| FPC 2            | REV 13                | 750-036844  | EG5065               | FPC                 |
| CPU              | REV 09                | 711-030686  | EG4082               | SNG PMB             |
| PIC 0            | REV 14                | 750-031913  | EG5127               | 24x 10GE(LAN) SFP+  |
| Xcvr 0           | REV 01                | 740-031980  | 143363A00240         | SFP+-10G-SR         |
| Xcvr 1           | REV 01                | 740-031981  | UK90PZ1              | SFP+-10G-LR         |
| Xcvr 2           | REV 01                | 740-031980  | AD1141A04XH          | SFP+-10G-SR         |
| Xcvr 3           | REV 01                | 740-031981  | UK90Q46              | SFP+-10G-LR         |
| Xcvr 4           | REV 01                | 740-031980  | AD1141A04X4          | SFP+-10G-SR         |
| Xcvr 6           | REV 01                | 740-031980  | B11H02560            | SFP+-10G-SR         |
| Xcvr 7           | REV 01                | 740-031980  | B11C01589            | SFP+-10G-SR         |
| Xcvr 8           | REV 01                | 740-031980  | AD1141A04XF          | SFP+-10G-SR         |
| Xcvr 10          | REV 01                | 740-031980  | 123363A01094         | SFP+-10G-SR         |
| Xcvr 11          | REV 01                | 740-031980  | AK80LKF              | SFP+-10G-SR         |
| Xcvr 12          | REV 01                | 740-031980  | 183363A01528         | SFP+-10G-SR         |
| Xcvr 14          | REV 01                | 740-031980  | 193363A01079         | SFP+-10G-SR         |
| Xcvr 15          | REV 01                | 740-031980  | AK80MC8              | SFP+-10G-SR         |
| Xcvr 16          | REV 01                | 740-031980  | AJC0BHC              | SFP+-10G-SR         |
| Xcvr 19          | REV 01                | 740-021309  | J08D26856            | SFP+-10G-LR         |
| Xcvr 21          | REV 01                | 740-031980  | AK80KCT              | SFP+-10G-SR         |
| Xcvr 22          | REV 01                | 740-031981  | UK90PZL              | SFP+-10G-LR         |
| Xcvr 23          | REV 01                | 740-031980  | AK80N1V              | SFP+-10G-SR         |
| FPC 3            | REV 13                | 750-036844  | EG5074               | FPC                 |
| CPU              | REV 09                | 711-030686  | EG4064               | SNG PMB             |
| PIC 1            | REV 10                | 750-031903  | EG0325               | SNG Load            |
| FPC 5            | REV 06                | 750-036844  | EH3198               | FPC                 |
| CPU              |                       |             |                      |                     |
| PIC 0            | REV 14                | 750-031913  | EG5134               | 24x 10GE(LAN) SFP+  |
| Xcvr 0           | REV 01                | 740-031980  | AK80LBH              | SFP+-10G-SR         |
| Xcvr 1           | REV 01                | 740-031980  | B11B03724            | SFP+-10G-SR         |
| Xcvr 2           | REV 01                | 740-031980  | AK80FMH              | SFP+-10G-SR         |
| Xcvr 5           | REV 01                | 740-031980  | B11J00818            | SFP+-10G-SR         |
| Xcvr 6           | REV 01                | 740-031980  | 193363A00743         | SFP+-10G-SR         |
| Xcvr 7           | REV 01                | 740-031980  | B11B06125            | SFP+-10G-SR         |
| Xcvr 10          | REV 01                | 740-031980  | B11H02529            | SFP+-10G-SR         |
| Xcvr 11          | REV 01                | 740-031980  | AK80LFB              | SFP+-10G-SR         |
| Xcvr 12          | REV 01                | 740-031980  | 193363A01061         | SFP+-10G-SR         |
| Xcvr 15          | REV 01                | 740-031980  | B11J00687            | SFP+-10G-SR         |
| Xcvr 16          | REV 01                | 740-031980  | 193363A00738         | SFP+-10G-SR         |
| Xcvr 18          | REV 01                | 740-031980  | AK80MQX              | SFP+-10G-SR         |

|            |        |            |           |                     |
|------------|--------|------------|-----------|---------------------|
| Xcvr 19    | REV 01 | 740-021309 | J08C17257 | SFP+-10G-LR         |
| Xcvr 22    | REV 01 | 740-031980 | B11J00730 | SFP+-10G-SR         |
| Xcvr 23    | REV 01 | 740-031980 | AK80KEE   | SFP+-10G-SR         |
| PIC 1      | REV 08 | 750-036710 | EG3105    | 2x 40GE CFP         |
| Xcvr 0     | REV 01 | 740-034554 | B260HLT   | CFP-40G-LR4         |
| Xcvr 1     | REV 01 | 740-034554 | B11C02847 | CFP-40G-LR4         |
| FPC 6      | REV 18 | 750-036844 | EJ4391    | FPC                 |
| CPU        | REV 12 | 711-030686 | EJ3257    | SNG PMB             |
| FPC 7      | REV 18 | 750-036844 | EJ4382    | FPC                 |
| CPU        | REV 12 | 711-030686 | EJ3238    | SNG PMB             |
| SPMB 0     | REV 10 | 711-030686 | EG5418    | SNG PMB             |
| SPMB 1     | REV 09 | 711-030686 | EG5373    | SNG PMB             |
| SIB 0      | REV 07 | 750-030631 | EG4858    | SIB-I-8S            |
| SIB 1      | REV 07 | 750-030631 | EG4872    | SIB-I-8S            |
| SIB 2      | REV 07 | 750-030631 | EG4866    | SIB-I-8S            |
| SIB 3      | REV 07 | 750-030631 | EG6011    | SIB-I-8S            |
| SIB 4      | REV 07 | 750-030631 | EG4907    | SIB-I-8S            |
| SIB 5      | REV 07 | 750-030631 | EG4879    | SIB-I-8S            |
| SIB 6      | REV 07 | 750-030631 | EG4864    | SIB-I-8S            |
| SIB 7      | REV 07 | 750-030631 | EG4899    | SIB-I-8S            |
| SIB 8      | REV 07 | 750-030631 | EG4880    | SIB-I-8S            |
| Fan Tray 0 | REV 04 | 760-032784 | EG1496    | Vertical Fan Tray   |
| Fan Tray 1 | REV 04 | 760-030642 | EG1335    | Horizontal Fan Tray |
| Fan Tray 2 | REV 02 | 760-030642 | ED4952    | Horizontal Fan Tray |

#### show chassis hardware detail (PTX5000 Packet Transport Router with FPC2-PTX-P1A)

```

user@host> show chassis hardware detail
Hardware inventory:
Item Version Part number Serial number Description
Chassis JN1204FC0AJA PTX5000
Midplane REV 11 750-035893 ACAB8038 Midplane-8S
FPM REV 12 760-030647 BBBD5619 Front Panel
Display
PDU 0 Rev 04 740-048336 1GB93470043 High Capacity DC PDU
PSM 0 Rev 04 740-046988 1GB63500184 High Capacity DC PSM
PSM 2 Rev 04 740-046988 1GB63500169 High Capacity DC PSM
PSM 4 Rev 04 740-046988 1GB63500306 High Capacity DC PSM
PSM 6 Rev 04 740-046988 1GB63500074 High Capacity DC PSM
PDU 1 Rev 04 740-048336 1GB93470045 High Capacity DC PDU
PSM 1 Rev 04 740-046988 1GB63500193 High Capacity DC PSM
PSM 3 Rev 04 740-046988 1GB63500143 High Capacity DC PSM
PSM 5 Rev 04 740-046988 1GB63500146 High Capacity DC PSM
PSM 7 Rev 04 740-046988 1GB63500192 High Capacity DC PSM
CCG 0 REV 09 750-030653 BBBC1909 Clock Generator
CCG 1 REV 09 750-030653 BBBD2970 Clock Generator
...

```

#### show chassis hardware models (PTX5000 Packet Transport Router)

```

user@host> show chassis hardware models
Hardware inventory:
Item Version Part number Serial number FRU model number
FPM REV 08 760-030647 EG1679 CRAFT-PTX5000-S
PDU 0 Rev 05 740-032019 ZE00006 PWR-SAN-PDU-DC
PSM 0 Rev 05 740-032022 ZJ00018 PSM-PTX-DC-120-S
PSM 1 Rev 04 740-032022 ZC00052 PWR-SAN-12-DC
PSM 2 Rev 04 740-032022 ZD00051 PWR-SAN-12-DC
PSM 3 Rev 05 740-032022 ZJ00060 PSM-PTX-DC-120-S
CCG 0 REV 04 750-030653 EG3703 CCG-PTX-S
CCG 1 REV 04 750-030653 EG3698 CCG-PTX-S

```

|                  |        |            |              |                     |
|------------------|--------|------------|--------------|---------------------|
| Routing Engine 0 | REV 05 | 740-026942 | P737A-002231 | RE-DUO-C2600-16G-S  |
| Routing Engine 1 | REV 06 | 740-026942 | P737A-002438 | RE-DUO-C2600-16G-S  |
| CB 0             | REV 08 | 750-030625 | EG5519       | CB-PTX-S            |
| CB 1             | REV 08 | 750-030625 | EG5516       | CB-PTX-S            |
| FPC 0            | REV 18 | 750-036844 | EJ3080       | FPC-PTX-P1-A        |
| FPC 2            | REV 13 | 750-036844 | EG5065       | FPC-PTX-P1-A        |
| PIC 0            | REV 14 | 750-031913 | EG5127       | P1-PTX-24-10GE-SFPP |
| FPC 3            | REV 13 | 750-036844 | EG5074       | FPC-PTX-P1-A        |
| FPC 5            |        |            |              |                     |
| PIC 0            | REV 14 | 750-031913 | EG5134       | P1-PTX-24-10GE-SFPP |
| FPC 6            | REV 18 | 750-036844 | EJ4391       | FPC-PTX-P1-A        |
| FPC 7            | REV 18 | 750-036844 | EJ4382       | FPC-PTX-P1-A        |
| SIB 0            | REV 07 | 750-030631 | EG4858       | SIB-I-PTX5008       |
| SIB 1            | REV 07 | 750-030631 | EG4872       | SIB-I-PTX5008       |
| SIB 2            | REV 07 | 750-030631 | EG4866       | SIB-I-PTX5008       |
| SIB 3            | REV 07 | 750-030631 | EG6011       | SIB-I-PTX5008       |
| SIB 4            | REV 07 | 750-030631 | EG4907       | SIB-I-PTX5008       |
| SIB 5            | REV 07 | 750-030631 | EG4879       | SIB-I-PTX5008       |
| SIB 6            | REV 07 | 750-030631 | EG4864       | SIB-I-PTX5008       |
| SIB 7            | REV 07 | 750-030631 | EG4899       | SIB-I-PTX5008       |
| SIB 8            | REV 07 | 750-030631 | EG4880       | SIB-I-PTX5008       |
| Fan Tray 1       | REV 04 | 760-030642 | EG1335       | FAN-PTX-H-S         |

#### show chassis hardware models (PTX5000 Packet Transport Router with FPC2-PTX-P1A)

```

user@host> show chassis hardware models
Hardware inventory:
Item Version Part number Serial number FRU model number
Midplane REV 11 750-035893 ACAB8038 CHAS-MP-PTX5000-S
FPM REV 12 760-030647 BBBD5619 CRAFT-PTX5000-S
PDU 0 Rev 04 740-048336 1GB93470043 PDU2-PTX-DC-S
 PSM 0 Rev 04 740-046988 1GB63500184 PSM2-PTX-DC-S
 PSM 2 Rev 04 740-046988 1GB63500169 PSM2-PTX-DC-S
 PSM 4 Rev 04 740-046988 1GB63500306 PSM2-PTX-DC-S
 PSM 6 Rev 04 740-046988 1GB63500074 PSM2-PTX-DC-S
PDU 1 Rev 04 740-048336 1GB93470045 PDU2-PTX-DC-S
 PSM 1 Rev 04 740-046988 1GB63500193 PSM2-PTX-DC-S
 PSM 3 Rev 04 740-046988 1GB63500143 PSM2-PTX-DC-S
 PSM 5 Rev 04 740-046988 1GB63500146 PSM2-PTX-DC-S
 PSM 7 Rev 04 740-046988 1GB63500192 PSM2-PTX-DC-S
CCG 0 REV 09 750-030653 BBBC1909 CCG-PTX-S
CCG 1 REV 09 750-030653 BBBD2970 CCG-PTX-S
...

```

#### show chassis hardware extensive (PTX5000 Packet Transport Router)

```

user@host> show chassis hardware extensive
Hardware inventory:
Item Version Part number Serial number Description
.....
PDU 0 Rev 04 740-032019 UE0003 DC Power Dist Unit
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-032019 S/N: UE0003
Assembly ID: 0x043d Assembly Version: 04.00
Date: 11-29-2010 Assembly Flags: 0x00
Version: Rev 04 CLEI Code: 032022XXXX
ID: DC Power Dist Unit FRU Model Number: PWR-SAN-PDU-DC
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 3d 04 00 52 65 76 20 30 34 00 00

```



```

Address 0x10: 00 00 00 00 37 34 30 2d 30 33 32 30 31 39 00 00
Address 0x20: 53 2f 4e 20 55 45 30 30 30 33 00 00 00 1d 0b 07
Address 0x30: da ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 30 33 32 30 32 32 58 58 58 58 50
Address 0x50: 57 52 2d 53 41 4e 2d 50 44 55 2d 44 43 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 a3 ff ff ff ff ff ff ff ff ff ff ff ff
PSM 0 Rev 04 740-032022 YG00065 DC 12V Power Supply
Module
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-032022 S/N: YG00065
Assembly ID: 0x0440 Assembly Version: 04.00
Date: 07-30-2010 Assembly Flags: 0x00
Version: Rev 04 CLEI Code: 032022XXXX
ID: DC 12V Power Supply Module FRU Model Number: PWR-SAN-12-DC
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 40 04 00 52 65 76 20 30 34 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 33 32 30 32 32 00 00
Address 0x20: 53 2f 4e 20 59 47 30 30 30 36 35 00 00 1e 07 07
Address 0x30: da ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 30 33 32 30 32 32 58 58 58 58 50
Address 0x50: 57 52 2d 53 41 4e 2d 31 32 2d 44 43 20 20 20 20
Address 0x60: 20 20 20 20 20 20 20 01 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 0c ff ff ff ff ff ff ff ff ff ff ff ff

```

#### show chassis hardware (MX Routers with Media Services Blade [MSB])

```

user@switch> show chassis hardware
Hardware inventory:
Item Version Part number Serial number Description
Chassis JN1100FB1AFB MX480
Midplane REV 05 710-017414 TR3310 MX480 Midplane
FPM Board REV 02 710-017254 KG1872 Front Panel Display
PEM 2 Rev 02 740-017343 QCS0812A00N DC Power Entry Module
PEM 3 Rev 02 740-017343 QCS0812A00U DC Power Entry Module
Routing Engine 0 REV 07 740-015113 1000740938 RE-S-1300
CB 0 REV 03 710-021523 KF4630 MX SCB
FPC 1 REV 11 750-037207 ZW9726 AS-MCC
CPU REV 04 711-038173 ZW4819 AS-MCC PMB
MIC 0 REV 06 750-037214 ZW3574 AS-MSC
PIC 0 BUILTIN BUILTIN AS-MSC
MIC 1 REV 00 750-037211 AS-MXC
PIC 2 BUILTIN BUILTIN AS-MXC

```

#### show chassis hardware extensive (MX Routers with Media Services Blade [MSB])

```

user@switch> show chassis hardware extensive
FPC 1 REV 11 750-037207 ZW9726 AS-MCC
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 750-037207 S/N: ZW9726
Assembly ID: 0x0b37 Assembly Version: 01.11
Date: 02-17-2012 Assembly Flags: 0x00
Version: REV 11 CLEI Code: PROTOXCLEI
ID: AS-MCC FRU Model Number: 750-037207
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 37 01 0b 52 45 56 20 31 31 00 00

```

```

Address 0x10: 00 00 00 00 37 35 30 2d 30 33 37 32 30 37 00 00
Address 0x20: 53 2f 4e 20 5a 57 39 37 32 36 00 00 00 11 02 07
Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 37
Address 0x50: 35 30 2d 30 33 37 32 30 37 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 31 31 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 5e ff ff ff ff ff ff ff ff ff ff ff ff
CPU REV 04 711-038173 ZW4819 AS-MCC-PMB
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 711-038173 S/N: ZW4819
Assembly ID: 0x0b38 Assembly Version: 01.04
Date: 12-30-2011 Assembly Flags: 0x00
Version: REV 04
ID: AS-MCC PMB
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 38 01 04 52 45 56 20 30 34 00 00
Address 0x10: 00 00 00 00 37 31 31 2d 30 33 38 31 37 33 00 00
Address 0x20: 53 2f 4e 20 5a 57 34 38 31 39 00 00 00 1e 0c 07
Address 0x30: db ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 00 50 52 4f 54 4f 58 43 4c 45 49 37
Address 0x50: 31 31 2d 30 33 38 31 37 33 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 30 34 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 60 00 00 00 00 00 00 00 00 00 00 00 00
MIC 0 REV 06 750-037214 ZW3574 AS-MS
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 750-037214 S/N: ZW3574
Assembly ID: 0x0a44 Assembly Version: 01.06
Date: 02-19-2012 Assembly Flags: 0x00
Version: REV 06 CLEI Code: PROTOXCLEI
ID: AS-MS FRU Model Number: 750-037214
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0a 44 01 06 52 45 56 20 30 36 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 33 37 32 31 34 00 00
Address 0x20: 53 2f 4e 20 5a 57 33 35 37 34 00 00 00 13 02 07
Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 37
Address 0x50: 35 30 2d 30 33 37 32 31 34 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 30 36 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 60 c0 03 e5 f4 00 00 00 00 00 00 00 00
PIC 0 BUILTIN BUILTIN AS-MS
MIC 1 REV 00 750-037211 AS-MXC
Jedec Code: 0x7fb0 EEPROM Version: 0x01
P/N: 750-037211
Assembly ID: 0x0a43 Assembly Version: 01.00
Date: 255-255-65535 Assembly Flags: 0x00
Version: REV 00
ID: AS-MXC
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 01 ff 0a 43 01 00 52 45 56 20 30 30 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 33 37 32 31 31 00 00
Address 0x20: 00 00 00 00 00 00 00 00 00 00 00 00 00 ff ff ff
Address 0x30: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff

```

```

Address 0x70: ff ff ff ff c0 02 e6 6c 7f b0 02 ff 0a 44 01 06
PIC 2 BUILTIN BUILTIN AS-MXC

```

### show chassis hardware (QFX3500 Switch running Enhanced Layer 2 Software)

```

user@switch> show chassis hardware
Hardware inventory:
Item Version Part number Serial number Description
Chassis P3566 QFX3500
Pseudo CB 0
Routing Engine 0 BUILTIN BUILTIN QFX Routing Engine
FPC 0 REV 16 750-036931 P3566-C QFX3500-48S4Q
 CPU BUILTIN BUILTIN FPC CPU
 PIC 0 BUILTIN BUILTIN 48x 10G-SFP+
 Xcvr 12 REV 01 740-030658 AD1125A0438 SFP+-10G-USR
 Xcvr 13 REV 01 740-030658 AD1125A02GN SFP+-10G-USR
 PIC 1 BUILTIN BUILTIN 4x 40G-QSFP+
 PIC 2
 MGMT BRD REV 10 750-036946 BBAW0328 QFX3500-MGMT-RJ45-AFI
Power Supply 0 Rev 05 740-032091 WA13035 JPSU-650W-AC-AFI
Power Supply 1
Fan Tray 0 QFX3500 Fan Tray, Front
 to Back Airflow
Fan Tray 1 QFX3500 Fan Tray, Front
 to Back Airflow
Fan Tray 2 QFX3500 Fan Tray, Front
 to Back Airflow

```

### show chassis hardware (QFX5100 Switch running Enhanced Layer 2 Software)

```

user@switch> show chassis hardware
Hardware inventory:
Item Version Part number Serial number Description
Chassis TB3113280048 QFX5100-24Q-2P
Pseudo CB 0
Routing Engine 0 BUILTIN BUILTIN QFX Routing Engine
FPC 0 REV 02 650-049942 TB3113280048 QFX5100-24Q-2P
 CPU BUILTIN BUILTIN FPC CPU
 PIC 0 BUILTIN BUILTIN 24x 40G-QSFP
 Xcvr 8 REV 01 740-032986 QA470143 QSFP+-40G-SR4
 Xcvr 14 REV 01 740-032986 QB500525 QSFP+-40G-SR4
 PIC 1 REV 02 611-049555 RR3113310169 QFX-EM-4Q
 Xcvr 0 REV 01 740-032986 QC440904 QSFP+-40G-SR4
 Xcvr 1 REV 01 740-032986 QB240154 QSFP+-40G-SR4
 Xcvr 2 REV 01 740-035085 018110105 QSFP+-40G-LPBK
 PIC 2 REV 02 611-049555 RR3113310209 QFX-EM-4Q
 Xcvr 0 REV 01 740-032986 QB190270 QSFP+-40G-SR4
 Xcvr 1 REV 01 740-035085 018110063 QSFP+-40G-LPBK
 Xcvr 2 REV 01 740-032986 QB210034 QSFP+-40G-SR4
Power Supply 0 REV 03 740-041741 1GA23110973 JPSU-650W-AC-AFO
Power Supply 1 REV 03 740-041741 1GA23090878 JPSU-650W-AC-AFO
Fan Tray 0 QFX5100 Fan Tray 0, Front
 to Back Airflow - AFO
Fan Tray 1 QFX5100 Fan Tray 1, Front
 to Back Airflow - AFO
Fan Tray 2 QFX5100 Fan Tray 2, Front
 to Back Airflow - AFO
Fan Tray 3 QFX5100 Fan Tray 3, Front
 to Back Airflow - AFO

```

Fan Tray 4  
to Back Airflow - AFO

QFX5100 Fan Tray 4, Front

## show chassis lcd

|                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                | <a href="#">show chassis lcd (EX Series) on page 933</a><br><a href="#">show chassis lcd (QFX Series) on page 933</a><br><a href="#">show chassis lcd (OCX Series) on page 933</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>show chassis lcd (EX Series)</b>  | <pre>show chassis lcd &lt;fpc-slot <i>fpc-slot-number</i>&gt; &lt;menu &lt;(all-members   local   member <i>member-id</i>)&gt;&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>show chassis lcd (QFX Series)</b> | <pre>show chassis lcd &lt;fpc-slot <i>fpc-slot-number</i>&gt; &lt;interconnect-device <i>device-id</i>&gt; &lt;node-device <i>device-id</i>&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>show chassis lcd (OCX Series)</b> | <pre>show chassis lcd &lt;fpc-slot <i>fpc-slot-number</i>&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Release Information</b>           | <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p><b>menu</b> option introduced in Junos OS Release 10.2 for EX Series switches.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 13.1 for QFabric systems.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Description</b>                   | <p>Display the information that appears on the LCD panel of EX3200, EX3300, EX4200, EX4500, EX6200, and EX8200 switches, XRE200 External Routing Engines, QFX Series standalone switches, OCX Series switches, and Interconnect devices and Node devices within a QFabric system. Display the status of the currently selected port parameter of the Status LED for each network port on the device.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Options</b>                       | <p><b>none</b>—Display the information that appears on the LCD panel (for any EX Series member switch in a Virtual Chassis or for XRE200 External Routing Engines, display the information for all Virtual Chassis members). Display the status of the currently selected port parameter of the Status LED for each network port.</p> <p><b>fpc-slot &lt;<i>fpc-slot-number</i>&gt;</b>—(Optional) Display the information as follows:</p> <ul style="list-style-type: none"> <li>(EX3200, EX3300, EX4200, and EX4500 switches, QFX Series, or OCX Series)<br/>Display the information that appears on the LCD panel for either an FPC slot with no <i>fpc-slot-number</i> value specified or for the FPC slot specified by <b>fpc-slot 0</b>. <b>fpc-slot</b> refers to the switch itself and <b>0</b> is the only valid value for <i>fpc-slot-number</i>. Output for these options is the same as for the <b>none</b> option.</li> </ul> <p>Also display the status of the currently selected port parameter of the Status LED for each network port.</p> <ul style="list-style-type: none"> <li>(EX Series Virtual Chassis member switches or XRE200 External Routing Engines)<br/>If no <i>fpc-slot-number</i> value is specified, display the information that appears on the LCD panel for all members of the Virtual Chassis. Output for this option is the same as for the <b>none</b> option. If the <i>fpc-slot-number</i> value is specified (it equals the <i>member-id</i> value), display the information for the specified member.</li> </ul> |

Also display the status of the currently selected port parameter of the Status LED for each network port.

- (EX6200 or EX8200 switches)—Display the information that appears on the LCD panel for the line card in the line-card slot specified by the *fpc-slot-number* value.

Also display the status of the currently selected port parameter of the Status LED for each network port.

**interconnect-device *device-id***—(QFabric systems only) (Optional) Display the front panel contents and LED status of all the ports on the Interconnect device.

**menu**—(Optional) Display the names of the menus and menu options that are currently enabled on the LCD panel.

**menu all-members**—(EX Series Virtual Chassis member switches or XRE200 External Routing Engines) (Optional) Display the names of the menus and menu options that are currently enabled on the LCD panel for all Virtual Chassis members.

**menu local**—(EX Series Virtual Chassis member switches or XRE200 External Routing Engines) (Optional) Display the names of the menus and menu options that are currently enabled on the LCD panel for the Virtual Chassis member from which you issued the command.

**menu member *member-id***—(EX Series Virtual Chassis member switches or XRE200 External Routing Engines) (Optional) Display the names of the menus and menu options that are currently enabled on the LCD panel for the specified Virtual Chassis member.

**node-device *device-id***—(QFabric systems only) (Optional) Display the front panel contents and LED status of all the ports on the Node device.

**Required Privilege Level**

view

**Related Documentation**

- *LCD Panel in EX3200 Switches*
- *LCD Panel in EX4200 Switches*
- *LCD Panel in EX4500 Switches*
- *LCD Panel in an EX8200 Switch*
- *LCD Panel in an XRE200 External Routing Engine*
- *Configuring the LCD Panel on EX Series Switches (CLI Procedure)*
- *set chassis display message*

**List of Sample Output**

[show chassis lcd \(Two-Member EX4200 Virtual Chassis\) on page 936](#)  
[show chassis lcd fpc-slot 1 \(EX4200 Virtual Chassis\) on page 937](#)  
[show chassis lcd \(EX8200 Switch\) on page 937](#)  
[show chassis lcd fpc-slot 2 \(EX8200 Switch\) on page 939](#)  
[show chassis lcd menu \(EX4200 Switch\) on page 939](#)

[show chassis lcd menu \(EX8200 Switch\) on page 940](#)

[show chassis lcd \(QFX3500 Switches\) on page 940](#)

[show chassis lcd \(XRE200 External Routing Engine in EX8200 Virtual Chassis\) on page 940](#)

[show chassis lcd interconnect-device \(QFabric Systems\) on page 943](#)

[show chassis lcd node-device \(QFabric Systems\) on page 945](#)

**Output Fields** [Table 57 on page 935](#) lists the output fields for the **show chassis lcd** command. Output fields are listed in the approximate order in which they appear.

**Table 57: show chassis lcd Output Fields**

| Field Name                                                                                                                                      | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>membernumber</b> (XRE200 External Routing Engine)                                                                                            | Member ID of the device whose content is being displayed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Front panel contents for slot</b><br><br><b>Front panel contents</b> (EX6200, EX8200 switch, XRE200 External Routing Engine, and QFX Series) | <p>FPC slot number of the switch whose content is being displayed. The number is always <b>0</b>, except for EX4200 switches in a Virtual Chassis, where it is the member ID value.</p> <p>On EX6200 switches, EX8200 switches, and XRE200 External Routing Engines, no slot number is displayed.</p> <p>On XRE200 External Routing Engines, this field appears under the <b>member number</b> field for each member device in the EX8200 Virtual Chassis.</p>                                                                                               |
| <b>LCD screen</b>                                                                                                                               | <p>The first line displays the hostname (for Virtual Chassis members, displays the member ID, the current role, and hostname; for EX8200 switches, displays <b>RE</b> and the hostname). The second line displays the currently selected port parameter of the Status LED and the alarms counter. The Status LED port parameters are:</p> <ul style="list-style-type: none"> <li>• <b>ADM</b>—Administrative</li> <li>• <b>SPD</b>—Speed</li> <li>• <b>DPX</b>—Duplex</li> <li>• <b>POE</b>—Power over Ethernet (EX3200 and EX4200 switches only)</li> </ul> |
| <b>LEDs status</b>                                                                                                                              | Current state of the Alarms, System, and Master LEDs (chassis status LEDs).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Interface</b>                                                                                                                                | Names of the interfaces on the switch.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>LED (ADM/SPD/DPX/POE)</b>                                                                                                                    | <p>State of the currently selected port parameter of the Status LED for the interface. The Status LED port parameters are:</p> <p><b>NOTE:</b> The XRE200 External Routing Engine always displays the <b>NA</b> parameter. The QFX Series products do not have any of the port parameters listed below.</p> <ul style="list-style-type: none"> <li>• <b>ADM</b>—Administrative</li> <li>• <b>SPD</b>—Speed</li> <li>• <b>DPX</b>—Duplex</li> <li>• <b>NA</b>—Not applicable.</li> <li>• <b>POE</b>—Power over Ethernet</li> </ul>                            |
| <b>fpcx</b>                                                                                                                                     | On standalone EX Series and QFX Series switches, always <b>0</b> . On EX Series Virtual Chassis member switches, member ID of the Virtual Chassis member whose LCD menu is displayed.                                                                                                                                                                                                                                                                                                                                                                        |

## Sample Output

### show chassis lcd (Two-Member EX4200 Virtual Chassis)

```

user@switch> show chassis lcd
Front panel contents for slot: 0

LCD screen:
 00:BK switch1
 LED:SPD ALARM 00
LEDs status:
 Alarms LED: Off
 System LED: Green
 Master LED: Off
Interface LED(ADM/SPD/DPX/POE)

ge-0/0/0 Off
ge-0/0/1 Off
ge-0/0/2 Off
ge-0/0/3 Off
ge-0/0/4 Off
ge-0/0/5 Off
ge-0/0/6 Off
ge-0/0/7 Off
ge-0/0/8 Off
ge-0/0/9 Off
ge-0/0/10 Off
ge-0/0/11 Off
ge-0/0/12 Off
ge-0/0/13 Off
ge-0/0/14 Off
ge-0/0/15 Off
ge-0/0/16 Off
ge-0/0/17 Off
ge-0/0/18 Off
ge-0/0/19 Off
ge-0/0/20 Off
ge-0/0/21 Off
ge-0/0/22 Off
ge-0/0/23 Off
Front panel contents for slot: 1

LCD screen:
 01:RE switch2
 LED:SPD ALARM 01
LEDs status:
 Alarms LED: Yellow
 System LED: Green
 Master LED: Green
Interface LED(ADM/SPD/DPX/POE)

ge-1/0/0 Off
ge-1/0/1 Off
ge-1/0/2 Off
ge-1/0/3 Off
ge-1/0/4 Off
ge-1/0/5 Off
ge-1/0/6 Off
ge-1/0/7 Off
ge-1/0/8 Off
ge-1/0/9 Off

```



```

ge-1/0/10 Off
ge-1/0/11 Off
ge-1/0/12 Off
ge-1/0/13 Off
ge-1/0/14 Off
ge-1/0/15 Off
ge-1/0/16 Off
ge-1/0/17 Off
ge-1/0/18 Off
ge-1/0/19 Off
ge-1/0/20 Off
ge-1/0/21 Off
ge-1/0/22 Off
ge-1/0/23 Off

```

The output for the **show chassis lcd fpc-slot** command is the same as the output for the **show chassis lcd** command.

#### show chassis lcd fpc-slot 1 (EX4200 Virtual Chassis)

```

user@switch> show chassis lcd fpc-slot 1
Front panel contents for slot: 1

LCD screen:
 01:RE switch2
 LED:SPD ALARM 01
LEDs status:
 Alarms LED: Yellow
 System LED: Green
 Master LED: Green
Interface LED (ADM/SPD/DPX/POE)

ge-1/0/0 Off
ge-1/0/1 Off
ge-1/0/2 Off
ge-1/0/3 Off
ge-1/0/4 Off
ge-1/0/5 Off
ge-1/0/6 Off
ge-1/0/7 Off
ge-1/0/8 Off
ge-1/0/9 Off
ge-1/0/10 Off
ge-1/0/11 Off
ge-1/0/12 Off
ge-1/0/13 Off
ge-1/0/14 Off
ge-1/0/15 Off
ge-1/0/16 Off
ge-1/0/17 Off
ge-1/0/18 Off
ge-1/0/19 Off
ge-1/0/20 Off
ge-1/0/21 Off
ge-1/0/22 Off
ge-1/0/23 Off

```

#### show chassis lcd (EX8200 Switch)

```

user@switch> show chassis lcd

```

Front panel contents:

-----  
LCD screen:

RE st-8200-r

LED:ADM ALARM 01

LEDs status:

Alarms LED: Yellow

System LED: Yellow

Master LED: Green

Interface LED(ADM/SPD/DPX)

-----  
ge-0/0/0 Off  
ge-0/0/1 Off  
ge-0/0/2 Off  
ge-0/0/3 Off  
ge-0/0/4 Off  
ge-0/0/5 Off  
ge-0/0/6 Off  
ge-0/0/7 Off  
ge-0/0/8 Off  
ge-0/0/9 Off  
ge-0/0/10 Off  
ge-0/0/11 Off  
ge-0/0/12 Off  
ge-0/0/13 Off  
ge-0/0/14 Off  
ge-0/0/15 Off  
ge-0/0/16 Off  
ge-0/0/17 Off  
ge-0/0/18 Off  
ge-0/0/19 Off  
ge-0/0/20 Off  
ge-0/0/21 Off  
ge-0/0/22 Off  
ge-0/0/23 Off  
ge-0/0/24 Off  
ge-0/0/25 Off  
ge-0/0/26 Off  
ge-0/0/27 Off  
ge-0/0/28 Off  
ge-0/0/29 Off  
ge-0/0/30 Off  
ge-0/0/31 Off  
ge-0/0/32 Off  
ge-0/0/33 Off  
ge-0/0/34 Off  
ge-0/0/35 Off  
ge-0/0/36 Off  
ge-0/0/37 Off  
ge-0/0/38 Off  
ge-0/0/39 Off  
ge-0/0/40 Off  
ge-0/0/41 Off  
ge-0/0/42 Off  
ge-0/0/43 Off  
ge-0/0/44 Off  
ge-0/0/45 Off  
ge-0/0/46 Off  
ge-0/0/47 Off  
xe-2/0/0 Off  
xe-2/0/1 Off

```

xe-2/0/2 Off
xe-2/0/3 Off
xe-2/0/4 Off
xe-2/0/5 Off
xe-2/0/6 Off
xe-2/0/7 Off
xe-3/0/0 Off
xe-3/0/1 Off
xe-3/0/2 Off
xe-3/0/3 Off
xe-3/0/4 Off
xe-3/0/5 Off
xe-3/0/6 Off
xe-3/0/7 Off
xe-5/0/0 Off
xe-5/0/1 Off
xe-5/0/2 Off
xe-5/0/3 Off
xe-5/0/4 Off
xe-5/0/5 Off
xe-5/0/6 On
xe-5/0/7 On
xe-7/0/5 Off

```

#### show chassis lcd fpc-slot 2 (EX8200 Switch)

```
show chassis lcd fpc-slot 2
```

| Interface | LED (ADM/SPD/DPX) |
|-----------|-------------------|
| xe-2/0/0  | Off               |
| xe-2/0/1  | Off               |
| xe-2/0/2  | Off               |
| xe-2/0/3  | Off               |
| xe-2/0/4  | Off               |
| xe-2/0/5  | Off               |
| xe-2/0/6  | Off               |
| xe-2/0/7  | Off               |

#### show chassis lcd menu (EX4200 Switch)

```
user@switch> show chassis lcd menu
fpc0:
```

```

status-menu
status-menu vcp-status
status-menu power-status
status-menu environ-menu
status-menu show-version
maintenance-menu
maintenance-menu halt-menu
maintenance-menu system-reboot
maintenance-menu rescue-config
maintenance-menu vc-uplink-config
maintenance-menu factory-default

```

On an EX4200 switch in a Virtual Chassis, the output for the **show chassis lcd menu** **all-members** command is the same as the output for the **show chassis lcd menu** command.

### show chassis lcd menu (EX8200 Switch)

```
user@switch> show chassis lcd menu
status-menu
status-menu sf-status1-menu
status-menu sf-status2-menu
status-menu psu-status1-menu
status-menu psu-status2-menu
status-menu environ-menu
status-menu show-version
maintenance-menu
maintenance-menu halt-menu
maintenance-menu system-reboot
maintenance-menu rescue-config
maintenance-menu factory-default
```

### show chassis lcd (QFX3500 Switches)

```
user@switch> show chassis lcd
Front panel contents for slot: 0

LCD screen:
00:RE switch
ALARM 01
LEDs status:
Status/Beacon LED: Yellow Blinking
Interface STATUS LED ACTIVITY LED

fte-0/1/0 Off Off
```

### show chassis lcd (XRE200 External Routing Engine in EX8200 Virtual Chassis)

```
user@external-routing-engine> show chassis lcd
member0:

Front panel contents:

LCD screen:
 RE ex8200-member0
 LED:ADM ALARM 04
LEDs status:
 Alarms LED: Red
 System LED: Yellow
 Master LED: Green

member1:

member8:

Front panel contents:

LCD screen:
 BACKUP

member9:

Front panel contents:

LCD screen:
 09:RE xre200-member9
```

LED: NA ALARM 01

| Interface | LED(ADM/SPD/DPX/POE) |
|-----------|----------------------|
|-----------|----------------------|

|           |     |
|-----------|-----|
| ge-0/0/0  | On  |
| ge-0/0/1  | On  |
| ge-0/0/2  | On  |
| ge-0/0/3  | On  |
| ge-0/0/4  | Off |
| ge-0/0/5  | Off |
| ge-0/0/6  | Off |
| ge-0/0/7  | Off |
| ge-0/0/8  | Off |
| ge-0/0/9  | Off |
| ge-0/0/10 | On  |
| ge-0/0/11 | Off |
| ge-0/0/12 | Off |
| ge-0/0/13 | Off |
| ge-0/0/14 | Off |
| ge-0/0/15 | Off |
| ge-0/0/16 | Off |
| ge-0/0/17 | Off |
| ge-0/0/18 | Off |
| ge-0/0/19 | Off |
| ge-0/0/20 | Off |
| ge-0/0/21 | Off |
| ge-0/0/22 | Off |
| ge-0/0/23 | Off |
| ge-0/0/24 | Off |
| ge-0/0/25 | Off |
| ge-0/0/26 | Off |
| ge-0/0/27 | Off |
| ge-0/0/28 | Off |
| ge-0/0/29 | Off |
| ge-0/0/30 | Off |
| ge-0/0/31 | Off |
| ge-0/0/32 | Off |
| ge-0/0/33 | Off |
| ge-0/0/34 | Off |
| ge-0/0/35 | Off |
| ge-0/0/36 | Off |
| ge-0/0/37 | Off |
| ge-0/0/38 | Off |
| ge-0/0/39 | Off |
| ge-0/0/40 | On  |
| ge-0/0/41 | On  |
| ge-0/0/42 | On  |
| ge-0/0/43 | On  |
| ge-0/0/44 | On  |
| ge-0/0/45 | On  |
| ge-0/0/46 | On  |
| ge-0/0/47 | On  |
| ge-16/0/0 | On  |
| ge-16/0/1 | Off |
| ge-16/0/2 | On  |
| ge-16/0/3 | Off |
| ge-16/0/4 | On  |
| ge-16/0/5 | Off |
| ge-16/0/6 | On  |
| ge-16/0/7 | Off |
| ge-16/0/8 | Off |
| ge-16/0/9 | Off |

|            |     |
|------------|-----|
| ge-16/0/10 | Off |
| ge-16/0/11 | Off |
| ge-16/0/12 | Off |
| ge-16/0/13 | On  |
| ge-16/0/14 | Off |
| ge-16/0/15 | On  |
| ge-16/0/16 | Off |
| ge-16/0/17 | On  |
| ge-16/0/18 | On  |
| ge-16/0/19 | On  |
| ge-16/0/20 | On  |
| ge-16/0/21 | Off |
| ge-16/0/22 | On  |
| ge-16/0/23 | Off |
| ge-16/0/24 | Off |
| ge-16/0/25 | Off |
| ge-16/0/26 | On  |
| ge-16/0/27 | Off |
| ge-16/0/28 | Off |
| ge-16/0/29 | Off |
| ge-16/0/30 | On  |
| ge-16/0/31 | Off |
| ge-16/0/32 | On  |
| ge-16/0/33 | On  |
| ge-16/0/34 | On  |
| ge-16/0/35 | Off |
| ge-16/0/36 | On  |
| ge-16/0/37 | Off |
| ge-16/0/38 | Off |
| ge-16/0/39 | Off |
| ge-16/0/40 | Off |
| ge-16/0/41 | Off |
| ge-16/0/42 | On  |
| ge-16/0/43 | Off |
| ge-16/0/44 | Off |
| ge-16/0/45 | Off |
| ge-16/0/46 | Off |
| ge-16/0/47 | Off |
| xe-19/0/0  | Off |
| xe-19/0/1  | On  |
| xe-19/0/2  | On  |
| xe-19/0/3  | On  |
| xe-19/0/4  | On  |
| xe-19/0/5  | On  |
| ge-22/0/0  | Off |
| ge-22/0/1  | Off |
| ge-22/0/2  | On  |
| ge-22/0/3  | Off |
| ge-22/0/4  | On  |
| ge-22/0/5  | On  |
| ge-22/0/6  | On  |
| ge-22/0/7  | On  |
| ge-22/0/8  | Off |
| ge-22/0/9  | Off |
| ge-22/0/10 | Off |
| ge-22/0/11 | Off |
| ge-22/0/12 | Off |
| ge-22/0/13 | Off |
| ge-22/0/14 | Off |
| ge-22/0/15 | Off |
| ge-22/0/16 | On  |

```

ge-22/0/17 Off
ge-22/0/18 On
ge-22/0/19 Off
ge-22/0/20 On
ge-22/0/21 Off
ge-22/0/22 On
ge-22/0/23 Off
ge-22/0/24 On
ge-22/0/25 Off
ge-22/0/26 Off
ge-22/0/27 Off
ge-22/0/28 Off
ge-22/0/29 Off
ge-22/0/30 Off
ge-22/0/31 Off
ge-22/0/32 On
ge-22/0/33 Off
ge-22/0/34 On
ge-22/0/35 Off
ge-22/0/36 Off
ge-22/0/37 Off
ge-22/0/38 Off
ge-22/0/39 Off
ge-22/0/40 Off
ge-22/0/41 Off
ge-22/0/42 Off
ge-22/0/43 Off
ge-22/0/44 Off
ge-22/0/45 Off
ge-22/0/46 Off
ge-22/0/47 Off

```

### show chassis lcd interconnect-device (QFabric Systems)

```

show chassis lcd interconnect-device IC-F1012
 Front Panel Module Information

 LCD screen:
 IC-F1012 3 Alarms active

LEDs status:
 Status LED: Green
 Power LED : Green
 Major Alarm LED: off
 Minor Alarm LED: Yellow
 Fan 0 LED : Green
 Fan 1 LED : Green
 Fan 2 LED : Green
 Fan 3 LED : Green
 Fan 4 LED : Green
 Fan 5 LED : Green
 Fan 6 LED : Green
 Fan 7 LED : Green
 Fan 8 LED : Green
 Fan 9 LED : Green
 PEM 0 LED : Green
 PEM 1 LED : Green
 PEM 2 LED : Green
 PEM 3 LED : off
 PEM 4 LED : off
 PEM 5 LED : off

```

LED info for: CB - 0

LEDs status:

Status LED: Green  
Mastership LED: Green

| Interface       | STATUS LED | LINK/ACTIVITY LED |
|-----------------|------------|-------------------|
| IC-F1012:pme0 : | Green      | N/A               |
| IC-F1012:pme1 : | Green      | N/A               |
| IC-F1012:pme2 : | off        | N/A               |
| IC-F1012:pme3 : | off        | N/A               |

LED info for: CB - 1

LEDs status:

Status LED: Green  
Mastership LED: Amber

| Interface       | STATUS LED | LINK/ACTIVITY LED |
|-----------------|------------|-------------------|
| IC-F1012:pme0 : | Green      | N/A               |
| IC-F1012:pme1 : | Green      | N/A               |
| IC-F1012:pme2 : | off        | N/A               |
| IC-F1012:pme3 : | off        | N/A               |

LED info for: FC 0 FPC - 0

LEDs status:

Status LED: Green

| Interface          | STATUS LED | LINK/ACTIVITY LED |
|--------------------|------------|-------------------|
| IC-F1012:fte-0/0/0 | Green      | N/A               |
| IC-F1012:fte-0/0/1 | Green      | N/A               |
| IC-F1012:fte-0/0/2 | Green      | N/A               |
| IC-F1012:fte-0/0/3 | Green      | N/A               |
| IC-F1012:fte-0/0/4 | Green      | N/A               |

LED info for: FC 1 FPC - 1

LEDs status:

Status LED: Green

| Interface          | STATUS LED | LINK/ACTIVITY LED |
|--------------------|------------|-------------------|
| IC-F1012:fte-1/0/0 | Green      | N/A               |
| IC-F1012:fte-1/0/1 | Green      | N/A               |
| IC-F1012:fte-1/0/2 | Green      | N/A               |
| IC-F1012:fte-1/0/3 | Green      | N/A               |
| IC-F1012:fte-1/0/4 | Green      | N/A               |

LED info for: RC 0 FPC - 8

LEDs status:

Status LED: Green

LED info for: RC 1 FPC - 9

LEDs status:

Status LED: Green



```

LED info for: RC 2 FPC - 10

LEDs status:
 Status LED: Green

LED info for: RC 3 FPC - 11

LEDs status:
 Status LED: Green

LED info for: RC 4 FPC - 12

LEDs status:
 Status LED: Green

LED info for: RC 5 FPC - 13

LEDs status:
 Status LED: Green

LED info for: RC 6 FPC - 14

LEDs status:
 Status LED: Green

LED info for: RC 7 FPC - 15

LEDs status:
 Status LED: Green

```

### show chassis lcd node-device (QFabric Systems)

```

show chassis lcd node-device P3774-C
 Front panel contents for: P3774-C

 LCD screen:
 P3774-C

LEDs status:
 Status/Beacon LED: Yellow Blinking

```

| Interface         | STATUS LED | LINK/ACTIVITY LED |
|-------------------|------------|-------------------|
| P3774-C:xe-0/0/6  | Green      | Green             |
| P3774-C:xe-0/0/7  | Green      | Green             |
| P3774-C:ge-0/0/10 | Green      | Green             |
| P3774-C:ge-0/0/11 | Green      | Green Blinking    |
| P3774-C:ge-0/0/12 | Green      | Off               |
| P3774-C:ge-0/0/13 | Green      | Green Blinking    |
| P3774-C:ge-0/0/20 | Green      | Green             |
| P3774-C:ge-0/0/21 | Green      | Green             |
| P3774-C:ge-0/0/22 | Green      | Green Blinking    |
| P3774-C:ge-0/0/23 | Green      | Off               |
| P3774-C:ge-0/0/30 | Green      | Green             |
| P3774-C:ge-0/0/31 | Green      | Green             |
| P3774-C:ge-0/0/32 | Green      | Green Blinking    |
| P3774-C:ge-0/0/33 | Green      | Green Blinking    |
| P3774-C:fte-0/1/0 | Green      | Green             |
| P3774-C:fte-0/1/1 | Green      | Green Blinking    |
| P3774-C:fte-0/1/2 | Green      | Green Blinking    |
| P3774-C:fte-0/1/3 | Green      | Green             |



## show chassis led

|                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                | <a href="#">show chassis led (EX Series) on page 947</a><br><a href="#">show chassis led (QFX Series) on page 947</a><br><a href="#">Syntax (OCX Series) on page 947</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>show chassis led (EX Series)</b>  | <pre>show chassis led &lt;fpc-slot &lt;fpc-slot-number&gt;&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>show chassis led (QFX Series)</b> | <pre>show chassis led &lt;fpc-slot &lt;fpc-slot-number&gt;&gt; interconnect-device name node-device name</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Syntax (OCX Series)</b>           | <pre>show chassis led &lt;fpc-slot &lt;fpc-slot-number&gt;&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Release Information</b>           | <p>Command introduced in Junos OS Release 10.1 for EX Series switches.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Description</b>                   | <p>Display the status and colors of the chassis LEDs on the front panel of the switch. A major alarm (red) indicates a critical error condition that requires immediate action. A minor alarm (yellow) indicates a noncritical condition that requires monitoring or maintenance. A minor alarm that is left unchecked might cause interruption in service or performance degradation.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Options</b>                       | <p><b>none</b>—Display the status of the chassis status LEDs (for EX4200 switches configured as a Virtual Chassis, display the information for all Virtual Chassis members).</p> <p><b>fpc-slot &lt;fpc-slot-number&gt;</b>—(Optional) (Not on EX2200 switches) Display the information as follows:</p> <ul style="list-style-type: none"> <li>(EX3200, standalone EX4200, standalone QFX3500, EX4500, and OCX Series switches) Display the status of the chassis status LEDs for either an FPC slot with no <b>fpc-slot-number</b> value specified or for the FPC slot specified by <b>fpc-slot 0</b>. <b>fpc-slot</b> refers to the switch itself and <b>0</b> is the only valid value for <b>fpc-slot-number</b>. Output for these options is the same as for the <b>none</b> option.</li> <li>(EX4200 switches in a Virtual Chassis with two or more members) If no <b>fpc-slot-number</b> value is specified, display the status of the chassis status LEDs for all members of the Virtual Chassis. Output for this option is the same as for the <b>none</b> option. If the <b>fpc-slot-number</b> value is specified (it equals the <b>member-id</b> value), display the status of the chassis status LEDs for the specified member.</li> <li>(EX8200 switches)—Display the status of the chassis status LEDs for the line card in the line-card slot specified by the <b>fpc-slot-number</b> value.</li> </ul> <p><b>interconnect-device name</b>—</p> <p>— (QFabric systems only) (Optional) Display the status of the chassis and interface status LEDs for the Interconnect device.</p> |

**node-device *name***— (QFabric systems only) (Optional) Display the status of the chassis and interface status LEDs for the Node device.

**Required Privilege Level** view

**Related Documentation**

- *Chassis Status LEDs in EX2200 Switches*
- *Chassis Status LEDs in EX3200 Switches*
- *Chassis Status LEDs in EX4200 Switches*
- *Chassis Status LEDs in EX4500 Switches*
- *Chassis Status LEDs in an EX8200 Switch*
- *Chassis Status LEDs on a QFX3500 Device*
- *Chassis Status LEDs in the QFX3600 and QFX3600-I Device*
- *Management Port LEDs on a QFX3500 Device*
- *Management Port LEDs in the QFX3600 and QFX3600-I Device*
- *Chassis Status LEDs on a QFX3008-I Interconnect Device*
- *Control Board LEDs on a QFX3008-I Interconnect Device*

**List of Sample Output**

[show chassis led \(EX2200 Switch\) on page 951](#)  
[show chassis led on page 952](#)  
[show chassis led fpc-slot 0 on page 953](#)  
[show chassis led \(EX Series\) on page 953](#)  
[show chassis led node-device \(QFabric System Node Device\) on page 954](#)  
[show chassis led interconnect-device \(QFabric System - QFX3600-I Interconnect Device\) on page 954](#)  
[show chassis led interconnect-device \(QFabric System - QFX3008-I Interconnect Device\) on page 955](#)

**Output Fields** [Table 47 on page 590](#) lists the output fields for the **show chassis led** command. Output fields are listed in the approximate order in which they appear.

**Table 58: show chassis led Output Fields**

| Field Name                                                                                       | Field Description                                                                                                                                                         |
|--------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Front panel contents for slot</b>                                                             | FPC slot number of the device whose content is being displayed. The number is always 0, except for EX4200 switches in a Virtual Chassis, where it is the member ID value. |
| <b>Front panel contents</b> (EX8200 Switches)                                                    |                                                                                                                                                                           |
| <b>Front Panel Module Information</b> (QFabric system QFX3008-I Interconnect device)             | On EX8200 switches, no slot number is displayed.                                                                                                                          |
| <b>Front panel contents for</b> (QFabric system Node devices and QFX3600-I Interconnect devices) | On QFabric system Node devices, the name of the Node device whose content is being displayed.                                                                             |

Table 58: show chassis led Output Fields (*continued*)

| Field Name               | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Alarms LED</b>        | <p>(EX Series switches only) Displays status of the ALM LED:</p> <ul style="list-style-type: none"> <li>• Off—No alarm has been configured.</li> <li>• Green—No alarm has been triggered.</li> <li>• Red—Major alarm.</li> <li>• Yellow—Minor alarm</li> </ul>                                                                                                                                                                                                                                                                                                                                                                               |
| <b>System LED</b>        | <p>(EX Series switches only) Displays status of the SYS LED:</p> <ul style="list-style-type: none"> <li>• Off—Switch is powered off.</li> <li>• Green—Switch is operating normally.</li> <li>• Yellow—Switch is booting.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Master LED:</b>       | <p>Displays status of the MST LED (on EX3200, EX4200, and EX8200 switches):</p> <ul style="list-style-type: none"> <li>• Green—On an EX4200 Virtual Chassis switch, indicates the switch is the master in the Virtual Chassis configuration. On other switches, indicates that the Routing Engine is operational.</li> <li>• Off <ul style="list-style-type: none"> <li>• On an EX4200 Virtual Chassis switch, indicates that this switch is not the master in the Virtual Chassis configuration.</li> <li>• On EX3200, standalone EX4200, and EX8200 switches, indicates that the Routing Engine is not operational.</li> </ul> </li> </ul> |
| <b>Mode LED:</b>         | <p>(EX Series switches only) On an EX2200 switch only, displays the currently selected port parameter of the Status LED:</p> <ul style="list-style-type: none"> <li>• <b>ADM</b>—Administrative</li> <li>• <b>SPD</b>—Speed</li> <li>• <b>DPX</b>—Duplex</li> <li>• <b>POE</b>—Power over Ethernet</li> </ul>                                                                                                                                                                                                                                                                                                                                |
| <b>Status/Beacon LED</b> | <p>(QFX Series and OCX Series) Displays the system status as indicated by the Status LED on the chassis. For more information, see:</p> <ul style="list-style-type: none"> <li>• <i>Chassis Status LEDs on a QFX3500 Device</i></li> <li>• <i>Chassis Status LEDs in the QFX3600 and QFX3600-I Device</i></li> </ul>                                                                                                                                                                                                                                                                                                                         |
| <b>LINK/SPEED LED</b>    | <p>(QFX Series and OCX Series) Displays the link status and speed of a management port. For more information, see:</p> <ul style="list-style-type: none"> <li>• <i>Management Port LEDs on a QFX3500 Device</i></li> <li>• <i>Management Port LEDs in the QFX3600 and QFX3600-I Device</i></li> </ul>                                                                                                                                                                                                                                                                                                                                        |
| <b>ACTIVITY LED</b>      | <p>(QFX Series and OCX Series) Displays the activity status of a management port. For more information, see:</p> <ul style="list-style-type: none"> <li>• <i>Management Port LEDs on a QFX3500 Device</i></li> <li>• <i>Management Port LEDs in the QFX3600 and QFX3600-I Device</i></li> </ul>                                                                                                                                                                                                                                                                                                                                              |

Table 58: show chassis led Output Fields (*continued*)

| Field Name               | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>STATUS LED</b>        | <p>(QFX Series and OCX Series) Displays the link status of an interface as indicated by the ST LED. For more information, see:</p> <ul style="list-style-type: none"> <li>Control Board LEDs on a QFX3008-I Interconnect Device</li> <li>Access Port and Uplink Port LEDs on a QFX3500 Device</li> <li>Access Port and Uplink Port LEDs on a QFX3600 or QFX3600-I Device</li> </ul>                                                                                              |
| <b>LINK/ACTIVITY LED</b> | <p>(QFX Series and OCX Series) Displays link activity or faults on an interface as indicated by the LA LED. For more information, see:</p> <ul style="list-style-type: none"> <li>Access Port and Uplink Port LEDs on a QFX3500 Device</li> <li>Access Port and Uplink Port LEDs on a QFX3600 or QFX3600-I Device</li> </ul>                                                                                                                                                     |
| <b>Status LED</b>        | <p>(QFX3008-I Interconnect device only)</p> <ul style="list-style-type: none"> <li>Displays the system status as indicated by the STATUS LED on the front panel of the chassis. For more information, see <i>Chassis Status LEDs on a QFX3008-I Interconnect Device</i>.</li> <li>Displays the status of a Control Board as indicated by the STATUS LED on the Control Board. For more information, see <i>Control Board LEDs on a QFX3008-I Interconnect Device</i>.</li> </ul> |
| <b>Power LED</b>         | <p>(QFX3008-I Interconnect device only) Displays the status of system power on the device. For more information, see <i>Chassis Status LEDs on a QFX3008-I Interconnect Device</i>.</p>                                                                                                                                                                                                                                                                                          |
| <b>Major Alarm LED</b>   | <p>(QFX3008-I Interconnect device only) Displays whether a critical error condition that requires immediate action exists on the device. For more information, see <i>Chassis Status LEDs on a QFX3008-I Interconnect Device</i>.</p>                                                                                                                                                                                                                                            |
| <b>Minor Alarm LED</b>   | <p>(QFX3008-I Interconnect device only) Displays whether a noncritical condition that requires monitoring or maintenance exists on the device. For more information, see <i>Chassis Status LEDs on a QFX3008-I Interconnect Device</i>.</p>                                                                                                                                                                                                                                      |
| <b>Fan 0 LED</b>         | <p>(QFX3008-I Interconnect device only) Displays the status of fan trays on the device. For more information, see <i>Chassis Status LEDs on a QFX3008-I Interconnect Device</i>.</p>                                                                                                                                                                                                                                                                                             |
| <b>Fan 1 LED</b>         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Fan 2 LED</b>         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Fan 3 LED</b>         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Fan 4 LED</b>         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Fan 5 LED</b>         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Fan 6 LED</b>         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Fan 7 LED</b>         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Fan 8 LED</b>         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

Table 58: show chassis led Output Fields (*continued*)

| Field Name            | Field Description                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PEM 0 LED             | (QFX3008-I Interconnect device only) Displays the status of power supplies on the device. For more information, see <i>Chassis Status LEDs on a QFX3008-I Interconnect Device</i> .                                                                                                                                                                                                                                          |
| PEM 1 LED             |                                                                                                                                                                                                                                                                                                                                                                                                                              |
| PEM 2 LED             |                                                                                                                                                                                                                                                                                                                                                                                                                              |
| PEM 3 LED             |                                                                                                                                                                                                                                                                                                                                                                                                                              |
| PEM 4 LED             |                                                                                                                                                                                                                                                                                                                                                                                                                              |
| LED info for          | (QFX3008-I Interconnect device only) Displays the LED information for a Control Board.                                                                                                                                                                                                                                                                                                                                       |
| Mastership LED        | (QFX3008-I Interconnect device only) Displays status of the MASTER LED on a Control Board. For more information, see <i>Control Board LEDs on a QFX3008-I Interconnect Device</i> .                                                                                                                                                                                                                                          |
| Interface             | Names of the interfaces on the device.                                                                                                                                                                                                                                                                                                                                                                                       |
| LED (ADM/SPD/DPX/POE) | <p>(EX Series switches only) State of the currently selected port parameter of the Status LED for the interface. The Status LED port parameters are:</p> <p><b>NOTE:</b> EX4500 and EX8200 switches do not have the POE port parameter.</p> <ul style="list-style-type: none"> <li>• <b>ADM</b>—Administrative</li> <li>• <b>SPD</b>—Speed</li> <li>• <b>DPX</b>—Duplex</li> <li>• <b>POE</b>—Power over Ethernet</li> </ul> |

## Sample Output

### show chassis led (EX2200 Switch)

```

user@switch> show chassis led
Front panel contents for slot: 0

LEDs status:
 Alarms LED: Amber
 System LED: Green
 Mode LED : Duplex
Interface LED(ADM/SPD/DPX/POE)

ge-0/0/0 Off
ge-0/0/1 Full Duplex
ge-0/0/2 Full Duplex
ge-0/0/3 Off
ge-0/0/4 Off
ge-0/0/5 Full Duplex
ge-0/0/6 Full Duplex
ge-0/0/7 Full Duplex
ge-0/0/8 Full Duplex
ge-0/0/9 Full Duplex
ge-0/0/10 Full Duplex
ge-0/0/11 Full Duplex

```

```

ge-0/0/12 Full Duplex
ge-0/0/13 Full Duplex
ge-0/0/14 Full Duplex
ge-0/0/15 Full Duplex
ge-0/0/16 Full Duplex
ge-0/0/17 Full Duplex
ge-0/0/18 Full Duplex
ge-0/0/19 Full Duplex
ge-0/0/20 Full Duplex
ge-0/0/21 Full Duplex
ge-0/0/22 Off
ge-0/0/23 Off
ge-0/0/24 Full Duplex
ge-0/0/25 Full Duplex
ge-0/0/26 Off
ge-0/0/27 Off
ge-0/0/28 Full Duplex
ge-0/0/29 Full Duplex

```

### show chassis led

```
user@switch> show chassis led
```

```
Front panel contents for slot: 0
```

```

LEDs status:
```

```
 Alarms LED: Off
```

```
 System LED: Green
```

```
 Master LED: Green
```

```
Interface LED (ADM/SPD/DPX/POE)
```

```

ge-0/0/0 Off
ge-0/0/1 Full Duplex
ge-0/0/2 Full Duplex
ge-0/0/3 Off
ge-0/0/4 Off
ge-0/0/5 Full Duplex
ge-0/0/6 Full Duplex
ge-0/0/7 Full Duplex
ge-0/0/8 Full Duplex
ge-0/0/9 Full Duplex
ge-0/0/10 Full Duplex
ge-0/0/11 Full Duplex
ge-0/0/12 Full Duplex
ge-0/0/13 Full Duplex
ge-0/0/14 Full Duplex
ge-0/0/15 Full Duplex
ge-0/0/16 Full Duplex
ge-0/0/17 Full Duplex
ge-0/0/18 Full Duplex
ge-0/0/19 Full Duplex
ge-0/0/20 Full Duplex
ge-0/0/21 Full Duplex
ge-0/0/22 Off
ge-0/0/23 Off
ge-0/0/24 Full Duplex
ge-0/0/25 Full Duplex
ge-0/0/26 Off
ge-0/0/27 Off
ge-0/0/28 Full Duplex
ge-0/0/29 Full Duplex

```



**show chassis led fpc-slot 0**

```

user@switch> show chassis led fpc-slot 0
Front panel contents for slot: 0

LEDs status:
 Alarms LED: Red
 System LED: Green
 Master LED: Green
Interface LED(ADM/SPD/DPX/POE)

ge-0/0/0 Off
ge-0/0/1 Off
ge-0/0/2 Off
ge-0/0/3 Off
ge-0/0/4 Off
ge-0/0/5 Off
ge-0/0/6 Off
ge-0/0/7 Off
ge-0/0/8 Off
ge-0/0/9 Off
ge-0/0/10 Off
ge-0/0/11 Off
ge-0/0/12 Off
ge-0/0/13 Off
ge-0/0/14 Off
ge-0/0/15 Off
ge-0/0/16 Off
ge-0/0/17 Off
ge-0/0/18 Off
ge-0/0/19 Off
ge-0/0/20 Off
ge-0/0/21 Off
ge-0/0/22 Off
ge-0/0/23 Off

```

**show chassis led (EX Series)**

```

user@switch> show chassis led
Front panel contents for slot: 0

LEDs status:
 Alarms LED: Amber
 Status LED: Green
 Mode LED : Duplex
Interface LED(ADM/SPD/DPX/POE)

ge-0/0/0 Off
ge-0/0/1 Full Duplex
ge-0/0/2 Full Duplex
ge-0/0/3 Off
ge-0/0/4 Off
ge-0/0/5 Full Duplex
ge-0/0/6 Full Duplex
ge-0/0/7 Full Duplex
ge-0/0/8 Full Duplex
ge-0/0/9 Full Duplex
ge-0/0/10 Full Duplex
ge-0/0/11 Full Duplex
ge-0/0/12 Full Duplex
ge-0/0/13 Full Duplex

```

```

ge-0/0/14 Full Duplex
ge-0/0/15 Full Duplex
ge-0/0/16 Full Duplex
ge-0/0/17 Full Duplex
ge-0/0/18 Full Duplex
ge-0/0/19 Full Duplex
ge-0/0/20 Full Duplex
ge-0/0/21 Full Duplex
ge-0/0/22 Off
ge-0/0/23 Off
ge-0/0/24 Full Duplex
ge-0/0/25 Full Duplex
ge-0/0/26 Off
ge-0/0/27 Off
ge-0/0/28 Full Duplex
ge-0/0/29 Full Duplex

```

#### show chassis led node-device (QFabric System Node Device)

```

user@switch> show chassis led node-device node1
Front panel contents for: node1
LEDs status:
Status/Beacon LED: Yellow Blinking

```

| Interface | LINK/SPEED LED | ACTIVITY LED |
|-----------|----------------|--------------|
| node1:me5 | Green          | N/A          |
| node1:me6 | Green          | N/A          |

| Interface       | STATUS LED | LINK/ACTIVITY LED |
|-----------------|------------|-------------------|
| node1:xe-0/0/8  | Green      | Green             |
| node1:ge-0/0/10 | Green      | Green             |
| node1:ge-0/0/12 | Green      | Green             |
| node1:ge-0/0/24 | Green      | Green             |
| node1:ge-0/0/25 | Green      | Green             |
| node1:ge-0/0/26 | Green      | Green             |
| node1:ge-0/0/27 | Green      | Green             |
| node1:ge-0/0/28 | Green      | Green             |
| node1:ge-0/0/29 | Green      | Green             |
| node1:ge-0/0/30 | Green      | Green             |
| node1:ge-0/0/31 | Green      | Green             |
| node1:ge-0/0/32 | Green      | Green             |
| node1:ge-0/0/33 | Green      | Green             |
| node1:ge-0/0/34 | Green      | Green             |
| node1:ge-0/0/35 | Green      | Green             |
| node1:ge-0/0/36 | Green      | Green             |
| node1:ge-0/0/37 | Green      | Green             |
| node1:ge-0/0/38 | Green      | Green             |
| node1:ge-0/0/39 | Green      | Green             |
| node1:fte-0/1/0 | Green      | Green Blinking    |
| node1:fte-0/1/2 | Green      | Green Blinking    |

#### show chassis led interconnect-device (QFabric System - QFX3600-I Interconnect Device)

```

user@switch> show chassis led interconnect-device IC-EG0712
Front panel contents for: FPC 0

LEDs status:
Status/Beacon LED: Yellow Blinking

```

| Interface     | LINK/SPEED LED | ACTIVITY LED |
|---------------|----------------|--------------|
| IC-EG0712:me5 | Green          | N/A          |
| IC-EG0712:me6 | Green          | N/A          |

| Interface            | STATUS LED | LINK/ACTIVITY LED |
|----------------------|------------|-------------------|
| IC-EG0712:fte-0/1/0  | Green      | Green             |
| IC-EG0712:fte-0/1/1  | Green      | Green Blinking    |
| IC-EG0712:fte-0/1/2  | Green      | Green             |
| IC-EG0712:fte-0/1/3  | Green      | Green Blinking    |
| IC-EG0712:fte-0/1/4  | Green      | Green             |
| IC-EG0712:fte-0/1/5  | Green      | Green Blinking    |
| IC-EG0712:fte-0/1/6  | Green      | Green             |
| IC-EG0712:fte-0/1/7  | Green      | Green             |
| IC-EG0712:fte-0/1/8  | Green      | Green Blinking    |
| IC-EG0712:fte-0/1/9  | Green      | Green Blinking    |
| IC-EG0712:fte-0/1/10 | Green      | Green Blinking    |

### show chassis led interconnect-device (QFabric System - QFX3008-I Interconnect Device)

```
user@switch> show chassis led interconnect-device IC-EG0712
Front Panel Module Information
```

#### LEDs status:

```
Status LED: Green
Power LED : Yellow Blinking
Major Alarm LED: Red
Minor Alarm LED: Yellow
Fan 0 LED : Green
Fan 1 LED : Green
Fan 2 LED : Green
Fan 3 LED : Green
Fan 4 LED : Green
Fan 5 LED : Green
Fan 6 LED : Green
Fan 7 LED : Green
Fan 8 LED : Green
Fan 9 LED : Green
PEM 0 LED : Green
PEM 1 LED : Green
PEM 2 LED : Green
PEM 3 LED : off
PEM 4 LED : Yellow Blinking
PEM 5 LED : off
```

```
LED info for: CB - 0
```

#### LEDs status:

```
Status LED: Green
Mastership LED: Green
```

| Interface       | STATUS LED | LINK/ACTIVITY LED |
|-----------------|------------|-------------------|
| IC-F4899:pme0 : | Green      | N/A               |
| IC-F4899:pme1 : | off        | N/A               |
| IC-F4899:pme2 : | off        | N/A               |
| IC-F4899:pme3 : | off        | N/A               |

```
LED info for: CB - 1
```

```
LEDs status:
 Status LED: Green
 Mastership LED: Amber
```

| Interface       | STATUS LED | LINK/ACTIVITY LED |
|-----------------|------------|-------------------|
| IC-F4899:pme0 : | Green      | N/A               |
| IC-F4899:pme1 : | off        | N/A               |
| IC-F4899:pme2 : | off        | N/A               |
| IC-F4899:pme3 : | off        | N/A               |

```
LED info for: FC 0 FPC - 0
```

```
LEDs status:
 Status LED: Green
```

| Interface           | STATUS LED | LINK/ACTIVITY LED |
|---------------------|------------|-------------------|
| IC-F4899:fte-0/0/0  | Green      | N/A               |
| IC-F4899:fte-0/0/1  | Green      | N/A               |
| IC-F4899:fte-0/0/2  | Green      | N/A               |
| IC-F4899:fte-0/0/3  | Green      | N/A               |
| IC-F4899:fte-0/0/4  | Green      | N/A               |
| IC-F4899:fte-0/0/5  | Green      | N/A               |
| IC-F4899:fte-0/0/6  | Green      | N/A               |
| IC-F4899:fte-0/0/7  | Green      | N/A               |
| IC-F4899:fte-0/0/8  | Green      | N/A               |
| IC-F4899:fte-0/0/9  | Green      | N/A               |
| IC-F4899:fte-0/0/10 | Green      | N/A               |
| IC-F4899:fte-0/0/11 | Green      | N/A               |
| IC-F4899:fte-0/0/12 | Green      | N/A               |
| IC-F4899:fte-0/0/13 | Green      | N/A               |
| IC-F4899:fte-0/0/14 | Green      | N/A               |
| IC-F4899:fte-0/0/15 | Green      | N/A               |

```
LED info for: FC 1 FPC - 1
```

```
LEDs status:
 Status LED: Green
```

| Interface          | STATUS LED | LINK/ACTIVITY LED |
|--------------------|------------|-------------------|
| IC-F4899:fte-1/0/0 | Green      | N/A               |
| IC-F4899:fte-1/0/1 | Green      | N/A               |

```
LED info for: RC 2 FPC - 10
```

```
LEDs status:
 Status LED: Green
```

```
LED info for: RC 3 FPC - 11
```

```
LEDs status:
 Status LED: Green
```

## show chassis location

|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                 | <a href="#">Syntax on page 957</a><br><a href="#">Syntax (TX Matrix Router) on page 957</a><br><a href="#">Syntax (TX Matrix Plus Router) on page 957</a><br><a href="#">Syntax (MX Series Router) on page 957</a><br><a href="#">Syntax (QFX Series) on page 957</a><br><a href="#">Syntax (OCX Series) on page 957</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Syntax</b>                         | show chassis location                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Syntax (TX Matrix Router)</b>      | show chassis location<br><fpc   interface (by-name <i>name</i>   by-slot fpc number lcc number)   lcc number   scc>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Syntax (TX Matrix Plus Router)</b> | show chassis location<br><fpc   interface (by-name <i>name</i>   by-slot fpc number lcc number)   lcc number   sfc number>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Syntax (MX Series Router)</b>      | show chassis location<br><all-members><br><local><br><member <i>member-id</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Syntax (QFX Series)</b>            | show chassis location<br><interconnect-device <i>name</i> ><br><node-device <i>name</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Syntax (OCX Series)</b>            | show chassis location                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Release Information</b>            | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br><b>sfc</b> option introduced for the TX Matrix Plus router in Junos OS Release 9.6.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Description</b>                    | Display the physical location of the chassis. This command can only be used on the master Routing Engine.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Options</b>                        | <p><b>none</b>—Display all information about the physical location of the chassis. On a TX Matrix router, display all information about the physical location of the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display all information about the physical location of the TX Matrix Plus router and its attached routers.</p> <p><b>all-members</b>—(MX Series routers only) (Optional) Display the physical location of the chassis for all the member routers in the Virtual Chassis configuration.</p> <p><b>fpc</b>—(TX Matrix router and TX Matrix Plus router only) (Optional) Display the physical location of all Flexible PIC Concentrators (FPCs).</p> <p><b>interconnect-device <i>name</i></b>—(QFabric systems only) (Optional) Display the physical location of the Interconnect device.</p> |

**interface by-name *name***—(TX Matrix and TX Matrix Plus routers only) (Optional) Display the physical location of a specified interface name. On a TX Matrix router, this option displays the FPC number and T640 router (line-card chassis) number associated with the specified interface. On a TX Matrix Plus router, this option displays the FPC number and router (line-card chassis) number associated with the specified interface.

**interface by-slot *fpc number lcc number***—(TX Matrix and TX Matrix Plus router only) (Optional) On a TX Matrix router, display the global FPC number of an interface by specifying its local FPC number and T640 router (line-card chassis) number. On a TX Matrix Plus router, display the global FPC number of an interface by specifying its local FPC number and router (line-card chassis) number.

- The global FPC number is the FPC slot number when all the FPC slots in the routing matrix are considered: **0** through **31**. On TX Matrix Plus router with 3D SIBs, the value is **0** through **63**. The local FPC number is the FPC slot number on a particular T640 router.
- For **fpc**, replace *number* with a value from **0** through **7**.
- For **lcc**, replace *number* with a value from **0** through **7**.

**lcc *number***—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display the physical location of a specified T640 router (line-card chassis) that is connected to a TX Matrix router. On a TX Matrix Plus router, display the physical location of a specified router (line-card chassis) that is connected to a TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(MX Series routers only) (Optional) Display the physical location of the chassis for the local Virtual Chassis member.

**member *member-id***—(MX Series routers only) (Optional) Display the physical location of the chassis for the specified member of the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

**node-device *name***—(QFabric systems only) (Optional) Display the physical location of the Node device.

**scc**—(TX Matrix routers only) (Optional) Display the physical location of the TX Matrix router (switch-card chassis).

**sfc**—(TX Matrix Plus routers only) (Optional) Display the physical location of the TX Matrix Plus router (or switch-fabric chassis).

**Required Privilege Level** view

**Related Documentation** • *Displaying Chassis Physical Locations for a Routing Matrix with a TX Matrix Plus Router*

**List of Sample Output** [show chassis location on page 959](#)  
[show chassis location fpc \(TX Matrix Router\) on page 960](#)  
[show chassis location interface by-slot \(TX Matrix Router\) on page 960](#)  
[show chassis location fpc \(TX Matrix Plus Router\) on page 960](#)  
[show chassis location interface by-slot \(TX Matrix Plus Router\) on page 960](#)  
[show chassis location \(QFX Series and OCX Series\) on page 960](#)  
[show chassis location \(QFabric Systems\) on page 960](#)

**Output Fields** [Table 59 on page 959](#) lists the output fields for the **show chassis location** command. Output fields are listed in the approximate order in which they appear.

**Table 59: show chassis location Output Fields**

| Field Name   | Field Description                                                                                                                                                                                                                |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| country-code | Country code information.                                                                                                                                                                                                        |
| postal-code  | Postal code information.                                                                                                                                                                                                         |
| Building     | Building information.                                                                                                                                                                                                            |
| Floor        | Floor information.                                                                                                                                                                                                               |
| Global FPC   | Global FPC number. The FPC slot number, when all FPC slots in the routing matrix are considered. The range of values is 0 through 31. On TX Matrix Plus router with 3D SIBs the value is 0 through 63.                           |
| LATA         | Local access transport area information.                                                                                                                                                                                         |
| LCC          | Line-card chassis number. On a TX Matrix router, the number of a particular T640 router connected to the TX Matrix router. On a TX Matrix Plus router, the number of a particular router connected to the TX Matrix Plus router. |
| Local FPC    | Local FPC number. On a TX Matrix router, the FPC slot number on a particular T640 router. On a TX Matrix Plus router, the FPC slot number on a particular router.                                                                |

## Sample Output

**show chassis location**

```
user@host> show chassis location
```

```
country-code: US
postal-code: 94404
Building: Building 2, Floor: 2
```

#### show chassis location fpc (TX Matrix Router)

```
user@host> show chassis location fpc
Global FPC LCC Local FPC
 17 2 1
 21 2 5
```

#### show chassis location interface by-slot (TX Matrix Router)

```
user@host> show chassis location interface by-slot fpc 1 lcc 1
Global FPC: 9
```

#### show chassis location fpc (TX Matrix Plus Router)

```
user@host> show chassis location fpc
Global FPC LCC Local FPC
 0 0 0
 1 0 1
```

#### show chassis location interface by-slot (TX Matrix Plus Router)

```
user@host> show chassis location interface by-slot fpc 2 lcc 1
Global FPC: 10
```

#### show chassis location (QFX Series and OCX Series)

```
user@switch> show chassis location
country-code: US
postal-code: 94404
Building: Building 2, Floor: 2
```

#### show chassis location (QFabric Systems)

```
user@switch> show chassis location interconnect-device interconnect1
country-code: US
postal-code: 94404
Building: Building 2, Floor: 2
```



## show chassis mac-addresses

|                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                                               | <a href="#">Syntax on page 961</a><br><a href="#">Syntax (TX Matrix Router) on page 961</a><br><a href="#">Syntax (TX Matrix Plus Router) on page 961</a><br><a href="#">Syntax (MX Series Router) on page 961</a><br><a href="#">Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers) on page 961</a><br><a href="#">Syntax (QFX Series) on page 961</a><br><a href="#">Syntax (OCX Series) on page 961</a><br><a href="#">Syntax (ACX Series Universal Access Routers) on page 961</a>                                                                                                                                                                                                                                          |
| <b>Syntax</b>                                                       | show chassis mac-addresses                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Syntax (TX Matrix Router)</b>                                    | show chassis mac-addresses<br><lcc <i>number</i>   scc>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Syntax (TX Matrix Plus Router)</b>                               | show chassis mac-addresses<br><lcc <i>number</i>   sfc <i>number</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Syntax (MX Series Router)</b>                                    | show chassis mac-addresses<br><all-members><br><local><br><member <i>member-id</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers)</b> | show chassis mac-addresses                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Syntax (QFX Series)</b>                                          | show chassis mac-addresses<br><interconnect-device <i>name</i> ><br><node-group <i>name</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Syntax (OCX Series)</b>                                          | show chassis mac-addresses                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Syntax (ACX Series Universal Access Routers)</b>                 | show chassis mac-addresses                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Release Information</b>                                          | <p>Command introduced before JUNOS Release 7.4.</p> <p>Command introduced in JUNOS Release 9.0 for EX Series switches.</p> <p><b>sfc</b> option introduced for the TX Matrix Plus router in JUNOS Release 9.6.</p> <p>Command introduced in Junos OS Release 11.1 for QFX Series.</p> <p>Command introduced in Junos OS Release 12.2 for ACX Series Universal Access Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> |
| <b>Description</b>                                                  | Display the media access control (MAC) addresses for the router, switch chassis, or switch.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

**Options** **none**—(TX Matrix, TX Matrix Plus routers, QFX Series, and OCX Series Switches) Display the MAC addresses for the router chassis or switch. On a TX Matrix router, display MAC addresses on the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display MAC addresses on the TX Matrix Plus router and its attached routers.

**all-members**—(MX Series routers only) (Optional) Display the MAC addresses for all the member routers of the Virtual Chassis configuration.

**interconnect-device *name***—(QFabric systems only) (Optional) Display the MAC addresses for the Interconnect device.

**lcc *number***—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display MAC addresses for a specified T640 router (line-card chassis) that is connected to the TX Matrix Plus router. On a TX Matrix Plus router, display MAC addresses for a specified router (line-card chassis) that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(MX Series routers only) (Optional) Display the MAC addresses for the local Virtual Chassis member.

**member *member-id***—(MX Series routers only) (Optional) Display the MAC addresses for the specified member of the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

**node-group *name***—(QFabric systems only) (Optional) Display the MAC addresses for the specified Node group.

**scc**—(TX Matrix routers only) (Optional) Display MAC addresses for the TX Matrix router (switch-card chassis).

**sfc *number***—(TX Matrix Plus routers only) (Optional) Display MAC addresses for the TX Matrix Plus router (or switch-fabric chassis).

**Required Privilege Level** view

**Related Documentation**

- *ACX2000 and ACX2100 Routers Hardware and CLI Terminology Mapping*

- List of Sample Output**
- [show chassis mac-addresses on page 963](#)
  - [show chassis mac-addresses \(MX104 Router\) on page 963](#)
  - [show chassis mac-addresses \(MX2010 Router\) on page 963](#)
  - [show chassis mac-addresses \(MX2020 Router\) on page 964](#)
  - [show chassis mac-addresses \(TX Matrix Router\) on page 964](#)
  - [show chassis mac-addresses \(TX Matrix Plus Router\) on page 964](#)
  - [show chassis mac-addresses \(QFX Series and OCX Series \) on page 965](#)
  - [show chassis mac-addresses interconnect-device \(QFabric Systems\) on page 965](#)
  - [show chassis mac-addresses node-group \(QFabric Systems\) on page 965](#)
  - [show chassis mac-addresses \(ACX2000 Universal Access Router\) on page 965](#)

**Output Fields** [Table 60 on page 963](#) lists the output fields for the **show chassis mac-addresses** command. Output fields are listed in the approximate order in which they appear.

**Table 60: show chassis mac-addresses Output Fields**

| Field Name                     | Field Description                                                             |
|--------------------------------|-------------------------------------------------------------------------------|
| <b>MAC address information</b> |                                                                               |
| <b>Public base address</b>     | Base address of the MAC addresses allocated to this router or switch.         |
| <b>Public count</b>            | Number of allocated public addresses.                                         |
| <b>Private base address</b>    | Base address of the private MAC addresses allocated to this router or switch. |
| <b>Private count</b>           | Number of allocated private addresses.                                        |

## Sample Output

### show chassis mac-addresses

```
user@host> show chassis mac-addresses
MAC address information
 Public base address 0:90:69:0:4:0
 Public count 1008
 Private base address 0:90:69:0:7:f0
 Private count 16
```

### show chassis mac-addresses (MX104 Router)

```
user@host > show chassis mac-addresses
MAC address information:
 Public base address b0:a8:6e:a1:e8:58
 Public count 2032
 Private base address b0:a8:6e:a1:f0:48
 Private count 16
```

### show chassis mac-addresses (MX2010 Router)

```
user@host> show chassis mac-addresses
MAC address information:
 Public base address 64:87:88:04:50:00
 Public count 1984
```

```
Private base address 64:87:88:04:57:c0
Private count 64
```

#### show chassis mac-addresses (MX2020 Router)

```
user@host> show chassis mac-addresses
MAC address information:
 Public base address 2c:21:72:70:20:00
 Public count 4032
 Private base address 2c:21:72:70:2f:c0
 Private count 64
```

#### show chassis mac-addresses (TX Matrix Router)

```
user@host> show chassis mac-addresses
scc-re0:

MAC address information:
 Public base address 00:05:85:9e:cc:00
 Public count 8064
 Private base address 00:05:85:9e:eb:80
 Private count 128
lcc0-re0:

MAC address information:
 Public base address 00:05:85:68:98:00
 Public count 2032
 Private base address 00:05:85:68:9f:f0
 Private count 16
lcc2-re0:

MAC address information:
 Public base address 00:05:85:68:78:00
 Public count 2032
 Private base address 00:05:85:68:7f:f0
 Private count 16
```

#### show chassis mac-addresses (TX Matrix Plus Router)

```
user@host> show chassis mac-addresses
sfc0-re0:

MAC address information:
 Public base address 00:1d:b5:14:00:00
 Public count 65023
 Private base address 00:1d:b5:14:fd:ff
 Private count 512
lcc0-re0:

MAC address information:
 Public base address 00:1f:12:7a:84:00
 Public count 2032
 Private base address 00:1f:12:7a:8b:f0
 Private count 16
lcc1-re0:

MAC address information:
 Public base address 00:22:83:42:48:00
 Public count 2032
 Private base address 00:22:83:42:4f:f0
```

```

Private count 16

lcc2-re0:

MAC address information:
Public base address 00:1f:12:c3:58:00
Public count 2032
Private base address 00:1f:12:c3:5f:f0
Private count 16

```

```

lcc3-re0:

MAC address information:
Public base address 00:21:59:ef:b8:00
Public count 2032
Private base address 00:21:59:ef:bf:f0
Private count 16

```

#### show chassis mac-addresses (QFX Series and OCX Series )

```

user@switch> show chassis mac-addresses
MAC address information:
Public base address 02:00:08:00:00:00
Public count 512
Private base address 02:00:00:00:00:00
Private count 64

```

#### show chassis mac-addresses interconnect-device (QFabric Systems)

```

user@switch> show chassis mac-addresses interconnect-device interconnect1
MAC address information:
Public base address 00:1f:12:30:9c:c0
Public count 58
Private base address 00:1f:12:30:9c:fa
Private count 6

```

#### show chassis mac-addresses node-group (QFabric Systems)

```

user@switch> show chassis mac-addresses node-group NW-NG-0
MAC address information:

RE:
FC MAC base 00:11:00:00:00:00
FC MAC count 2
VLAN MAC 00:11:00:00:00:09
EC6007
Base address 00:00:01:76:00:00
Count 64
EC6008
Base address 00:22:83:22:52:ae
Count 260

```

#### show chassis mac-addresses (ACX2000 Universal Access Router)

```

user@switch> show chassis mac-addresses
MAC address information:
Public base address 84:18:88:c0:2b:00
Public count 112
Private base address 84:18:88:c0:2b:70
Private count 16

```

## show chassis pic

|                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                                              | <a href="#">Syntax on page 966</a><br><a href="#">Syntax (TX Matrix and TX Matrix Plus Routers) on page 966</a><br><a href="#">Syntax (MX Series Routers) on page 966</a><br><a href="#">Syntax (MX104, MX2010 and MX2020 3D Universal Edge Routers) on page 966</a><br><a href="#">Syntax (PTX Series Packet Transport Router) on page 966</a><br><a href="#">Syntax (QFX Series) on page 966</a><br><a href="#">Syntax (OCX Series) on page 966</a><br><a href="#">Syntax (ACX Series Universal Access Routers) on page 966</a>                                                                                                                                                                                                                   |
| <b>Syntax</b>                                                      | <code>show chassis pic fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i></code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Syntax (TX Matrix and TX Matrix Plus Routers)</b>               | <code>show chassis pic fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i> &lt;lcc <i>number</i>&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Syntax (MX Series Routers)</b>                                  | <code>show chassis pic fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i> &lt;all-members&gt;<br/>&lt;local&gt;<br/>&lt;member <i>member-id</i>&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Syntax (MX104, MX2010 and MX2020 3D Universal Edge Routers)</b> | <code>show chassis pic fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i></code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Syntax (PTX Series Packet Transport Router)</b>                 | <code>show chassis pic transport fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i></code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Syntax (QFX Series)</b>                                         | <code>show chassis pic fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i> &lt;interconnect-device <i>name</i> (fpc-slot <i>slot-number</i>   pic-slot <i>slot-number</i>)&gt;<br/>&lt;node-device <i>name</i> pic-slot <i>slot-number</i>&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Syntax (OCX Series)</b>                                         | <code>show chassis pic fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i></code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Syntax (ACX Series Universal Access Routers)</b>                | <code>show chassis pic fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i></code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Release Information</b>                                         | <p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS Release 11.1 for QFX Series.</p> <p>Command introduced in Junos OS Release 12.2 for ACX Series Universal Access Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 13.2 for PTX Series Packet Transport Routers.</p> <p>Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> |

**Description** Display status information about the PIC installed in the specified Flexible PIC Concentrator (FPC) and PIC slot.

**Options** **fpc-slot *slot-number***—Display information about the PIC in this particular FPC slot:

- On a TX Matrix router, if you specify the number of the T640 router by using the **lcc *number*** option (the recommended method), replace ***slot-number*** with a value from 0 through 7. Otherwise, replace ***slot-number*** with a value from 0 through 31.

Likewise, on a TX Matrix Plus router, if you specify the number of the T1600 router by using the **lcc *number*** option (the recommended method), replace ***slot-number*** with a value from 0 through 7. Otherwise, replace ***slot-number*** with a value from 0 through 31. For example, the following commands have the same result:

```
user@host> show chassis pic fpc-slot 1 lcc 1 pic-slot 1
user@host> show chassis pic fpc-slot 9 pic-slot 1
```

- M120 routers only—Replace ***slot-number*** with a value from 0 through 5.
- MX80 routers only—Replace ***slot-number*** with a value from 0 through 1.
- MX104 routers only—Replace ***slot-number*** with a value from 0 through 2.
- MX240 routers only—Replace ***slot-number*** with a value from 0 through 2.
- MX480 routers only—Replace ***slot-number*** with a value from 0 through 5.
- MX960 routers only—Replace ***slot-number*** with a value from 0 through 11.
- MX2010 routers only—Replace ***slot-number*** with a value from 0 through 9.
- MX2020 routers only—Replace ***slot-number*** with a value from 0 through 19.
- Other routers—Replace ***slot-number*** with a value from 0 through 7.
- EX Series switches:
  - EX3200 switches and EX4200 standalone switches—Replace ***slot-number*** with 0.
  - EX4200 switches in a Virtual Chassis configuration—Replace ***slot-number*** with a value from 0 through 9 (switch's member ID).
  - EX8208 switches—Replace ***slot-number*** with a value from 0 through 7 (line card).
  - EX8216 switches—Replace ***slot-number*** with a value from 0 through 15 (line card).
- QFX Series:
  - QFX3500, QFX3600, QFX5100, and OCX Series standalone switches—Replace ***slot-number*** with 0. In the command output, FPC refers to a line card. The FPC number equals the slot number for the line card.
  - QFabric systems—Replace ***slot-number*** with any number between 0 and 15. In the command output, FPC refers to a line card. The FPC number equals the slot number for the line card.

**all-members**—(MX Series routers and EX Series switches only) (Optional) Display PIC information for all member routers in the Virtual Chassis configuration.

**interconnect-device *name***—(QFabric systems only) (Optional) Display PIC information for a specified Interconnect device.

**lcc *number***—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display PIC information for a specified T640 router (line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, display PIC information for a specified router (line-card chassis) that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(MX Series routers and EX Series switches only) (Optional) Display PIC information for the local Virtual Chassis member.

**member *member-id***—(MX Series routers and EX Series switches only) (Optional) Display PIC information for the specified member of the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

**node-device *name***—(QFabric systems only) (Optional) Display PIC information for a specified Node device.

**pic-slot *slot-number***—Display information about the PIC in this particular PIC slot. For routers, replace *slot-number* with a value from 0 through 3. For EX3200 and EX4200 switches, replace *slot-number* with 0 for built-in network interfaces and 1 for interfaces on uplink modules. For EX8208 and EX8216 switches, replace *slot-number* with 0. For the QFX3500, QFX3600, and OCX Series standalone switches, replace *slot-number* with 0.

**transport**—Display PIC information for optical transport network.

**Required Privilege Level**

view

**Related Documentation**

- [request chassis pic on page 457](#)
- [show chassis hardware on page 758](#)
- [Configuring the PIC Type](#)



- *100-Gigabit Ethernet Type 4 PIC with CFP Overview*

## List of Sample Output

[show chassis pic fpc-slot pic-slot on page 971](#)  
[show chassis pic fpc-slot pic-slot \(PIC Offline\) on page 972](#)  
[show chassis pic fpc-slot pic-slot \(FPC Offline\) on page 972](#)  
[show chassis pic fpc-slot pic-slot \(FPC Not Present\) on page 972](#)  
[show chassis pic fpc-slot pic-slot \(PIC Not Present\) on page 972](#)  
[show chassis pic fpc-slot pic-slot \(M120 Router\) on page 972](#)  
[show chassis pic fpc-slot pic-slot \(MX104 Router\) on page 972](#)  
[show chassis pic fpc-slot pic-slot \(MX960 Router Bidirectional Optics\) on page 973](#)  
[show chassis pic fpc-slot pic-slot \(MX480 Router with 100-Gigabit Ethernet MIC\) on page 973](#)  
[show chassis pic fpc-slot pic-slot \(MX240, MX480, MX960 Routers with Application Services Modular Line Card\) on page 973](#)  
[show chassis pic fpc-slot pic-slot \(MX960 Router with MPC5EQ\) on page 974](#)  
[show chassis pic fpc-slot pic-slot \(MX480 Routers with MPC4E\) on page 974](#)  
[show chassis pic fpc-slot pic-slot \(MX480 routers with OTN Interfaces\) on page 974](#)  
[show chassis pic fpc-slot pic-slot \(MX2010 Routers with OTN Interfaces\) on page 974](#)  
[show chassis pic fpc-slot pic-slot \(MX2010 Routers\) on page 975](#)  
[show chassis pic fpc-slot pic-slot \(MX2020 Routers\) on page 975](#)  
[show chassis pic fpc-slot pic-slot \(MX2020 Routers with MPC5EQ and MPC6E\) on page 975](#)  
[show chassis pic fpc-slot pic-slot \(MX2020 Routers with MPC6E and OTN MIC\) on page 976](#)  
[show chassis pic fpc-slot pic-slot \(MX2020 Routers with MPC4E\) on page 976](#)  
[show chassis pic fpc-slot pic-slot \(T1600 Router with 100-Gigabit Ethernet PIC\) on page 976](#)  
[show chassis pic fpc-slot pic-slot lcc \(TX Matrix Router\) on page 977](#)  
[show chassis pic fpc-slot pic-slot lcc \(TX Matrix Plus Router\) on page 977](#)  
[show chassis pic fpc-slot pic-slot \(Next-Generation SONET/SDH SFP\) on page 977](#)  
[show chassis pic fpc-slot pic-slot \(12-Port T1/E1\) on page 977](#)  
[show chassis pic fpc-slot pic-slot \(4x CHOC3 SONET CE SFP\) on page 978](#)  
[show chassis pic fpc-slot pic-slot \(SONET/SDH OC3/STM1 \[Multi-Rate\] MIC with SFP\) on page 978](#)  
[show chassis pic fpc-slot pic-slot \(8-port Channelized SONET/SDH OC3/STM1 \[Multi-Rate\] MIC with SFP\) on page 978](#)  
[show chassis pic fpc-slot pic-slot \(4-port Channelized SONET/SDH OC3/STM1 \[Multi-Rate\] MIC with SFP\) on page 979](#)  
[show chassis pic fpc-slot pic-slot \(1-port OC192/STM64 MIC with XFP\) on page 979](#)  
[show chassis pic fpc-slot 1 pic-slot 2 \(8-port DS3/E3 MIC\) on page 979](#)  
[show chassis pic fpc-slot pic-slot \(OTN\) on page 979](#)  
[show chassis pic fpc-slot pic-slot \(QFX3500 Switch\) on page 979](#)  
[show chassis pic fpc-slot pic-slot \(QFX5100 Switches and OCX Series \) on page 980](#)  
[show chassis pic interconnect-device fpc-slot pic-slot \(QFabric Systems\) on page 980](#)  
[show chassis pic node-device fpc-slot pic-slot \(QFabric System\) on page 980](#)  
[show chassis pic fpc-slot pic-slot \(ACX2000 Universal Access Router\) on page 981](#)  
[show chassis pic fpc-slot pic-slot \(MX Routers with Media Services Blade \[MSB\]\) on page 981](#)

[show chassis pic fpc slot PIC slot \(MX Routers with Media Services Blade \[MSB\]\) on page 981](#)

[show chassis pic transport fpc-slot pic-slot \(PTX Series Packet Transport Routers\) on page 981](#)

**Output Fields** [Table 61 on page 970](#) lists the output fields for the **show chassis pic** command. Output fields are listed in the approximate order in which they appear.

**Table 61: show chassis pic Output Fields**

| Field Name                                                   | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type                                                         | PIC type.<br><br><b>NOTE:</b> On the 1-port OC192/STM64 MICs with the SDH framing mode, the type is displayed as <b>MIC-3D-1STM64-XFP</b> and with the SONET framing mode, the type is displayed as <b>MIC-3D-1OC192-XFP</b> . By default, the 1-port OC192/STM64 MICs displays the type as <b>MIC-3D-1OC192-XFP</b> .                                                                                                                                                                              |
| Account Layer2 Overhead                                      | (MX Series routers) Indicates whether functionality to count the Layer 2 overhead bytes in the interface statistics at the PIC level is enabled or disabled.                                                                                                                                                                                                                                                                                                                                        |
| ASIC type                                                    | Type of ASIC on the PIC.                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| State                                                        | Status of the PIC. State is displayed only when a PIC is in the slot. <ul style="list-style-type: none"> <li>• <b>Online</b>— PIC is online and running.</li> <li>• <b>Offline</b>—PIC is powered down.</li> </ul>                                                                                                                                                                                                                                                                                  |
| PIC version                                                  | PIC hardware version.                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Uptime                                                       | How long the PIC has been online.                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Package                                                      | (Multiservices PICs only) Services package supported: <b>Layer-2</b> or <b>Layer-3</b> .                                                                                                                                                                                                                                                                                                                                                                                                            |
| Port Number                                                  | Port number for the PIC.                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Cable Type                                                   | Type of cable connected to the port: <b>LH</b> , <b>LX</b> , or <b>SX</b> .                                                                                                                                                                                                                                                                                                                                                                                                                         |
| PIC Port Information (MX480 Router 100-Gigabit Ethernet CFP) | Port-level information for the PIC. <ul style="list-style-type: none"> <li>• Port—Port number</li> <li>• Cable type—Type of optical transceiver installed.</li> <li>• Fiber type—Type of fiber. SM is single-mode.</li> <li>• Xcvr vendor—Transceiver vendor name.</li> <li>• Xcvr vendor part number—Transceiver vendor part number.</li> <li>• Wavelength—Wavelength of the transmitted signal. Uplinks and downlinks are always 1550 nm. There is a separate fiber for each direction</li> </ul> |

Table 61: show chassis pic Output Fields (*continued*)

| Field Name                                                       | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>PIC Port Information (MX960 Router Bidirectional Optics )</b> | <p>Port-level information for the PIC.</p> <ul style="list-style-type: none"> <li>• Port—Port number</li> <li>• Cable type—Type of small form-factor pluggable (SFP) optical transceiver installed. Uplink interfaces display -U. Down link interfaces display -D.</li> <li>• Fiber type—Type of fiber. SM is single-mode.</li> <li>• Xcvr vendor—Transceiver vendor name.</li> <li>• Xcvr vendor part number—Transceiver vendor part number. <ul style="list-style-type: none"> <li>• BX10-10-km bidirectional optics.</li> <li>• BX40-40-km bidirectional optics.</li> <li>• SFP-LX-40-km SFP optics.</li> </ul> </li> <li>• Wavelength—Wavelength of the transmitted signal. Uplinks are always 1310 nm. Downlinks are either 1490 nm or 1550 nm.</li> </ul> |
| <b>PIC Port Information (Next-Generation SONET/SDH SFP)</b>      | <p>Port-level information for the next-generation SONET/SDH SFP PIC.</p> <ul style="list-style-type: none"> <li>• Port—Port number.</li> <li>• Cable type—Type of small form-factor pluggable (SFP) optical transceiver installed.</li> <li>• Fiber type—Type of fiber: <b>SM</b> (single-mode) or <b>MM</b> (multimode).</li> <li>• Xcvr vendor—Transceiver vendor name.</li> <li>• Xcvr vendor part number—Transceiver vendor part number.</li> <li>• Wavelength—Wavelength of the transmitted signal. Next-generation SONET/SDH SFPs use 1310 nm.</li> </ul>                                                                                                                                                                                                 |
| <b>Pic port information (MX104 router)</b>                       | <p>Port-level information for the PIC.</p> <ul style="list-style-type: none"> <li>• Port—Port number</li> <li>• Cable type—Type of optical transceiver installed.</li> <li>• Fiber type—Type of fiber. SM is single-mode.</li> <li>• Xcvr vendor—Transceiver vendor name.</li> <li>• Xcvr vendor part number—Transceiver vendor part number.</li> <li>• Wavelength—Wavelength of the transmitted signal.</li> <li>• Xcvr Firmware—Firmware version of the transceiver.</li> </ul>                                                                                                                                                                                                                                                                               |
| <b>Multirate Mode</b>                                            | Rate-selectability status for the MIC: <b>Enabled</b> or <b>Disabled</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Channelization</b>                                            | Indicates whether channelization is enabled or disabled on the DS3/E3 MIC.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

## Sample Output

### show chassis pic fpc-slot pic-slot

```

user@host> show chassis pic fpc-slot 2 pic-slot 0
PIC fpc slot 2 pic slot 0 information:
Type 10x 1GE(LAN), 1000 BASE

```

```

ASIC type H chip
State Online
PIC version 1.1
Uptime 1 day, 50 minutes, 58 seconds
PIC Port Information:
Port Cable Xcvr Xcvr Vendor
Number Type Vendor Name Part Number
0 GIGE 1000EX FINISAR CORP. FTRJ8519P1BNL-J3
1 GIGE 1000EX FINISAR CORP. FTRJ-8519-7D-JUN

```

#### show chassis pic fpc-slot pic-slot (PIC Offline)

```

user@host> show chassis pic fpc-slot 1 pic-slot 0
PIC fpc slot 1 pic slot 0 information:
State Offline

```

#### show chassis pic fpc-slot pic-slot (FPC Offline)

```

user@host> show chassis pic fpc-slot 1 pic-slot 0
FPC 1 is not online

```

#### show chassis pic fpc-slot pic-slot (FPC Not Present)

```

user@host> show chassis pic fpc-slot 4 pic-slot 0
FPC slot 4 is empty

```

#### show chassis pic fpc-slot pic-slot (PIC Not Present)

```

user@host> show chassis pic fpc-slot 5 pic-slot 2
FPC 5, PIC 2 is empty

```

#### show chassis pic fpc-slot pic-slot (M120 Router)

```

user@host> show chassis pic fpc-slot 3 pic-slot 0
PC slot 3, PIC slot 0 information:
Type 2x G/E IQ, 1000 BASE
ASIC type IQ GE 2 VLAN-TAG FPGA
State Online
PIC version 1.16
Uptime 3 hours, 3 minutes

PIC Port Information:
Port Cable Xcvr Xcvr Vendor
Number Type Vendor Name Part Number
0 GIGE 1000SX FINISAR CORP. FTRJ8519P1BNL-J3
1 GIGE 1000SX FINISAR CORP. FTRJ-8519-7D-JUN

```

#### show chassis pic fpc-slot pic-slot (MX104 Router)

```

user@host> show chassis pic fpc-slot 1 pic-slot 1
FPC slot 1, PIC slot 1 information:
Type 10x 1GE(LAN) -E SFP
State Online
PIC version 1.1
Uptime 1 hour, 30 minutes, 59 seconds

PIC port information:
Fiber Xcvr vendor Wave- Xcvr
Port Cable type type Xcvr vendor part number length
Firmware
3 GIGE 1000T n/a Methode Elec. SP7041-M1-JN n/a 0.0

```

|   |               |     |               |                  |         |     |
|---|---------------|-----|---------------|------------------|---------|-----|
| 6 | GIGE 1000LX10 | SM  | FINISAR CORP. | FTLF1318P2BTL-J1 | 1310 nm | 0.0 |
| 8 | GIGE 1000T    | n/a | Methode Elec. | SP7041-M1-JN     | n/a     | 0.0 |
| 9 | GIGE 1000T    | n/a | Methode Elec. | SP7041-M1-JN     | n/a     | 0.0 |

### show chassis pic fpc-slot pic-slot (MX960 Router Bidirectional Optics)

```

user@host> show chassis pic fpc-slot 4 pic-slot 1
FPC slot 4, PIC slot 1 information:
 Type 10x 1GE(LAN)
 Account Layer2 Overhead Enabled
 State Online
 PIC version 0.0
 Uptime 18 days, 5 hours, 41 minutes, 54 seconds

PIC port information:

```

| Port | Cable type          | Fiber type | Xcvr vendor      | Xcvr vendor part number | Wavelength |
|------|---------------------|------------|------------------|-------------------------|------------|
| 0    | SFP-1000BASE-BX10-D | SM         | SumitomoElectric | SBP6H44-J3-BW-49        | 1490 nm    |
| 1    | SFP-1000BASE-BX10-D | SM         | SumitomoElectric | SBP6H44-J3-BW-49        | 1490 nm    |
| 2    | SFP-1000BASE-BX10-D | SM         | SumitomoElectric | SBP6H44-J3-BW-49        | 1490 nm    |
| 3    | SFP-1000BASE-BX10-D | SM         | OCF              | TRXBG1LXDBVM2-JW        | 1490 nm    |
| 4    | SFP-1000BASE-BX10-D | SM         | OCF              | TRXBG1LXDBVM2-JW        | 1490 nm    |
| 5    | SFP-1000BASE-BX10-U | SM         | SumitomoElectric | SBP6H44-J3-BW-31        | 1310 nm    |
| 6    | SFP-1000BASE-BX10-U | SM         | SumitomoElectric | SBP6H44-J3-BW-31        | 1310 nm    |
| 7    | SFP-1000BASE-BX10-U | SM         | OCF              | TRXBG1LXDBBMH-J1        | 1310 nm    |
| 8    | SFP-1000BASE-BX10-U | SM         | OCF              | TRXBG1LXDBBMH-J1        | 1310 nm    |
| 9    | SFP-1000BASE-BX10-U | SM         | SumitomoElectric | SBP6H44-J3-BW-31        | 1310 nm    |

### show chassis pic fpc-slot pic-slot (MX480 Router with 100-Gigabit Ethernet MIC)

```

user@host> show chassis pic fpc-slot 1 pic-slot 2
FPC slot 1, PIC slot 2 information:
 Type 1X100GE CFP
 State Online
 PIC version 2.10
 Uptime 4 minutes, 48 seconds

PIC port information:
 Fiber

```

| Port | Cable type   | Fiber type | Xcvr vendor   | Xcvr vendor part number | Wavelength |
|------|--------------|------------|---------------|-------------------------|------------|
| 0    | 100GBASE LR4 | SM         | FINISAR CORP. | FTLC1181RDN3-J3         | 1310 nm    |

```

 Xcvr vendor
 firmware version
 1.8

```

### show chassis pic fpc-slot pic-slot (MX240, MX480, MX960 Routers with Application Services Modular Line Card)

```

user@host> show chassis pic fpc-slot 1 pic-slot 2
FPC slot 1, PIC slot 2 information:
 Type AS-MXC
 State Online
 PIC version 1.0
 Uptime 11 hours, 18 minutes, 3 seconds

```

**show chassis pic fpc-slot pic-slot (MX960 Router with MPC5EQ)**

```

user@host> show chassis pic fpc-slot 0 pic-slot 3
FPC slot 0, PIC slot 3 information:
 Type 1X100GE CFP2 OTN
 State Online
 PIC version 0.0
 Uptime 1 hour, 22 minutes, 42 seconds

PIC port information:

```

|          |             | Fiber |             | Xcvr vendor      | Wave-   | Xcvr |
|----------|-------------|-------|-------------|------------------|---------|------|
| Port     | Cable type  | type  | Xcvr vendor | part number      | length  |      |
| Firmware |             |       |             |                  |         |      |
| 0        | 10GBASE LR4 | n/a   | Oclaro Inc. | TRB5E20FNF-LF150 | 1309 nm | 1.0  |

**show chassis pic fpc-slot pic-slot (MX480 Routers with MPC4E)**

```

user@host> show chassis pic fpc-slot 3 pic-slot 0
FPC slot 3, PIC slot 0 information:
 Type 4x10GE SFPP
 State Online
 PIC version 0.0
 Uptime 41 seconds

PIC port information:

```

|          |            | Fiber |              | Xcvr vendor    | Wave-  | Xcvr |
|----------|------------|-------|--------------|----------------|--------|------|
| Port     | Cable type | type  | Xcvr vendor  | part number    | length |      |
| Firmware |            |       |              |                |        |      |
| 0        | 10GBASE SR | MM    | OPNEXT, INC. | TRS2001EM-0014 | 850 nm | 0.0  |
| 1        | 10GBASE SR | MM    | OPNEXT, INC. | TRS2001EM-0014 | 850 nm | 0.0  |

**show chassis pic fpc-slot pic-slot (MX480 routers with OTN Interfaces)**

```

user@host> show chassis pci fpc-slot 4 pic-slot 0
FPC slot 4, PIC slot 0 information:
 Type 12X10GE SFPP OTN
 State Online
 PIC version 0.0
 Uptime 5 hours, 28 minutes, 23 seconds

PIC port information:

```

|          |            | Fiber |               | Xcvr vendor      | Wave-  | Xcvr |
|----------|------------|-------|---------------|------------------|--------|------|
| Port     | Cable type | type  | Xcvr vendor   | part number      | length |      |
| Firmware |            |       |               |                  |        |      |
| 0        | 10GBASE SR | MM    | FINISAR CORP. | FTLX8571D3BNL-J1 | 850 nm | 0.0  |
| 1        | 10GBASE SR | MM    | FINISAR CORP. | FTLX8571D3BCL-J1 | 850 nm | 0.0  |
| 2        | 10GBASE SR | MM    | OPNEXT, INC.  | TRS2001EM-0014   | 850 nm | 0.0  |

**show chassis pic fpc-slot pic-slot (MX2010 Routers with OTN Interfaces)**

```

user@host> show chassis pic fpc-slot 9 pic-slot 0

```

```
FPC slot 9, PIC slot 0 information:
Type 2X100GE CFP2 OTN
State Online
PIC version 1.9
Uptime 3 hours, 56 minutes, 16 seconds
```

```
PIC port information:

Fiber Xcvr vendor Wave- Xcvr
Port Cable type type Xcvr vendor part number length
Firmware
0 100GBASE LR4-D SM FUJITSU FIM37300/222 1310 nm 1.3
1 100GBASE SR10 MM AVAGO AFBR-8420Z n/a 1.0
```

#### show chassis pic fpc-slot pic-slot (MX2010 Routers)

```
user@host> show chassis pic fpc-slot 9 pic-slot 3
FPC slot 9, PIC slot 3 information:
Type 1X100GE CFP
Account Layer2 Overhead Enabled
State Online
PIC version 0.0
Uptime 14 hours, 51 seconds
```

#### show chassis pic fpc-slot pic-slot (MX2020 Routers)

```
user@host> show chassis pic fpc-slot 19 pic-slot 3
FPC slot 19, PIC slot 3 information:
Type 4x 10GE(LAN) SFP+
Account Layer2 Overhead Enabled
State Online
PIC version 0.0
Uptime 1 day, 11 hours, 26 minutes, 36 seconds

PIC port information:

Fiber Xcvr vendor Wave- Xcvr
Port Cable type type Xcvr vendor part number length
Firmware
0 10GBASE SR MM SumitomoElectric SPP5200SR-J6-M 850 nm 0.0
1 10GBASE SR MM SumitomoElectric SPP5200SR-J6-M 850 nm 0.0
2 10GBASE SR MM SumitomoElectric SPP5200SR-J6-M 850 nm 0.0
3 10GBASE SR MM SumitomoElectric SPP5200SR-J6-M 850 nm 0.0
```

#### show chassis pic fpc-slot pic-slot (MX2020 Routers with MPC5EQ and MPC6E)

```
user@host> show chassis pic fpc-slot 18 pic-slot 2
FPC slot 18, PIC slot 2 information:
Type 3X40GE QSFP
State Online
PIC version 0.0
Uptime 6 minutes, 31 seconds

PIC port information:

Fiber Xcvr vendor Wave- Xcvr
Port Cable type type Xcvr vendor part number length
```

```

Firmware
0 40GBASE SR4 MM AVAGO AFBR-79E4Z-D-JU2 850 nm 0.0
1 40GBASE SR4 MM AVAGO AFBR-79E4Z-D-JU2 850 nm 0.0
2 40GBASE SR4 MM AVAGO AFBR-79E4Z-D-JU2 850 nm 0.0

```

### show chassis pic fpc-slot pic-slot (MX2020 Routers with MPC6E and OTN MIC)

```

user@host> show chassis pic fpc-slot 3 pic-slot 0
FPC slot 0, PIC slot 1 information:
 Type 24X10GE SFPP OTN
 State Online
 PIC version 1.1
 Uptime 1 hour, 33 minutes, 59 seconds

PIC port information:

```

|          | Port | Cable type | Fiber type | Xcvr vendor      | part number      | Wave-length | Xcvr |
|----------|------|------------|------------|------------------|------------------|-------------|------|
| Firmware | 7    | 10GBASE SR | MM         | SumitomoElectric | SPP5200SR-J6-M   | 850 nm      | 0.0  |
|          | 9    | 10GBASE SR | MM         | FINISAR CORP.    | FTLX8571D3BNL-J1 | 850 nm      | 0.0  |
|          | 12   | 10GBASE LR | SM         | FINISAR CORP.    | FTLX1472M3BNL-J3 | 1310 nm     | 0.0  |
|          | 20   | 10GBASE ZR | SM         | FINISAR CORP.    | FTLX1871M3BNL-J3 | 1550 nm     | 0.0  |
|          | 21   | 10GBASE ER | SM         | FINISAR CORP.    | FTLX1671D3BTL-J4 | 1550 nm     | 0.0  |
|          | 22   | 10GBASE LR | SM         | SOURCEPHOTONICS  | SPP10SLREDFCJNP  | 1310 nm     | 0.0  |
|          | 23   | 10GBASE LR | SM         | FINISAR CORP.    | FTLX1471D3BNL-J1 | 1310 nm     | 0.0  |

### show chassis pic fpc-slot pic-slot (MX2020 Routers with MPC4E)

```

user@host> show chassis pic fpc-slot 14 pic-slot 0
FPC slot 14, PIC slot 2 information:
 Type 4x10GE SFPP
 State Online
 PIC version 0.0
 Uptime 1 day, 14 hours, 49 minutes, 9 seconds

PIC port information:

```

|          | Port | Cable type | Fiber type | Xcvr vendor      | part number  | Wave-length | Xcvr |
|----------|------|------------|------------|------------------|--------------|-------------|------|
| Firmware | 0    | 10GBASE SR | MM         | SumitomoElectric | SPP5100SR-J3 | 850 nm      | 0.0  |
|          | 1    | 10GBASE SR | MM         | SumitomoElectric | SPP5100SR-J3 | 850 nm      | 0.0  |
|          | 3    | 10GBASE SR | MM         | SumitomoElectric | SPP5100SR-J3 | 850 nm      | 0.0  |

### show chassis pic fpc-slot pic-slot (T1600 Router with 100-Gigabit Ethernet PIC)

```

user@host> run show chassis pic fpc-slot 3 pic-slot 1
FPC slot 3, PIC slot 1 information:
 Type 100GE SLOT1

```



```

ASIC type Brooklyn 100GE FPGA
State Online
PIC version 1.3
Uptime 10 minutes, 44 seconds

```

#### PIC port information:

| Port | Cable type   | Fiber type | Xcvr vendor | Xcvr vendor part number | Wavelength |
|------|--------------|------------|-------------|-------------------------|------------|
| 0    | 100GBASE LR4 | SM         | Opnext Inc. | TRC5E20ENFSF000F        | 1310 nm    |

### show chassis pic fpc-slot pic-slot lcc (TX Matrix Router)

```

user@host> show chassis pic fpc-slot 1 pic-slot 1 lcc 0
lcc0-re0:

```

#### PIC fpc slot 1 pic slot 1 information:

```

Type 4x OC-3 SONET, SMIR
ASIC type D chip
State Online
PIC version 1.2
Uptime 5 days, 2 hours, 12 minutes, 8 seconds

```

### show chassis pic fpc-slot pic-slot lcc (TX Matrix Plus Router)

```

user@host> show chassis pic pic-slot 0 fpc-slot 8
lcc0-re0:

```

#### FPC slot 8, PIC slot 0 information:

```

Type 1x 10GE(LAN/WAN)
State Online
Uptime 2 hours, 46 minutes, 23 seconds

```

#### PIC port information:

| Port | Cable type | Fiber type | Xcvr vendor   | part number     | Wavelength |
|------|------------|------------|---------------|-----------------|------------|
| 0    | 10GBASE ZR | SM         | Opnext Inc.   | TRF7061BN-LF150 | 1550 nm    |
| 0    | 10GBASE ZR | SM         | FINISAR CORP. | FTRX-1811-3-J2  | 1550 nm    |

### show chassis pic fpc-slot pic-slot (Next-Generation SONET/SDH SFP)

```

user@host> show chassis pic fpc-slot 4 pic-slot 0

```

#### FPC slot 4, PIC slot 0 information:

```

Type 4x OC-3 1x OC-12 SFP
ASIC type D FPGA
State Online
PIC version 1.3
Uptime 1 day, 50 minutes, 4 seconds

```

#### PIC port information:

| Port | Cable type       | Fiber type | Xcvr vendor   | Xcvr vendor part number | Wavelength |
|------|------------------|------------|---------------|-------------------------|------------|
| 0    | OC48 short reach | SM         | FINISAR CORP. | FTRJ1321P18TL-J2        | 1310 nm    |
| 1    | OC3 short reach  | MM         | OCP           | TRPA03MM3BAS-JE         | 1310 nm    |
| 2    | OC3 short reach  | MM         | OCP           | TRXA03MM3BAS-JW         | 1310 nm    |
| 3    | OC12 inter reach | SM         | FINISAR CORP. | FTLF1322P18TR           | 1310 nm    |

### show chassis pic fpc-slot pic-slot (12-Port T1/E1)

```

user@host> show chassis pic fpc-slot 0 pic-slot 3

```

FPC slot 0, PIC slot 3 information:

```
Type 12x T1/E1 CE
State Online
PIC version 1.1
CPU load average 1 percent
Interrupt load average 0 percent
Total DRAM size 128 MB
Memory buffer utilization 100 percent
Memory heap utilization 4 percent
Uptime 1 day, 22 hours, 28 minutes, 12 seconds
Internal Clock Synchronization Normal
```

#### show chassis pic fpc-slot pic-slot (4x CHOC3 SONET CE SFP)

user@host> show chassis pic fpc-slot 0 pic-slot 1

FPC slot 0, PIC slot 1 information:

```
Type 4x CHOC3 SONET CE SFP
State Online
PIC version 1.3
CPU load average 1 percent
Interrupt load average 0 percent
Total DRAM size 128 MB
Memory buffer utilization 99 percent
Memory heap utilization 4 percent
Uptime 1 day, 22 hours, 55 minutes, 37 seconds
Internal Clock Synchronization Normal
```

PIC port information:

| Port | Cable type      | Fiber type | Xcvr vendor | Xcvr vendor part number | Wavelength |
|------|-----------------|------------|-------------|-------------------------|------------|
| 0    | OC3 short reach | MM         | AVAGO       | HFBR-57E0P-JU2          | n/a        |
| 1    | OC3 short reach | MM         | AVAGO       | HFBR-57E0P-JU2          | n/a        |
| 3    | OC3 long reach  | SM         | OPNEXT INC  | TRF5456AVLB314          | 1310 nm    |

#### show chassis pic fpc-slot pic-slot (SONET/SDH OC3/STM1 [Multi-Rate] MIC with SFP)

user@host> show chassis pic fpc-slot 0 pic-slot 0

FPC slot 0, PIC slot 0 information:

```
Type MIC-3D-80C30C12-40C48
State Online
PIC version 1.8
Uptime 3 days, 22 hours, 3 minutes, 50 seconds
```

PIC port information:

| Port | Cable type       | Fiber type | Xcvr vendor  | Xcvr vendor part number | Wavelength |
|------|------------------|------------|--------------|-------------------------|------------|
| 1    | OC12 inter reach | SM         | FINISAR CORP | FTRJ1322P1BTR-J3        | 1310 nm    |
| 7    | OC12 inter reach | SM         | FINISAR CORP | FTRJ1322P1BTR-J3        | 1310 nm    |

Multirate Mode Enabled

#### show chassis pic fpc-slot pic-slot (8-port Channelized SONET/SDH OC3/STM1 [Multi-Rate] MIC with SFP)

user@host> show chassis pic fpc-slot 3 pic-slot 0

FPC slot 3, PIC slot 0 information:

```
Type MIC-3D-8CHOC3-4CHOC12
State Online
PIC version 1.9
Uptime 1 hour, 21 minutes, 24 seconds
```

PIC port information:

| Port | Cable type | Fiber type | Xcvr vendor | Xcvr vendor part number | Wavelength |
|------|------------|------------|-------------|-------------------------|------------|
|------|------------|------------|-------------|-------------------------|------------|

|   |                  |    |               |                  |         |
|---|------------------|----|---------------|------------------|---------|
| 0 | OC12 short reach | SM | FINISAR CORP. | FTRJ1322P1BTR-J3 | 1310 nm |
| 1 | OC12 short reach | SM | FINISAR CORP. | FTRJ1322P1BTR-J3 | 1310 nm |
| 2 | OC12 inter reach | SM | FINISAR CORP. | FTRJ1322P1BTR-J2 | 1310 nm |
| 4 | OC12 short reach | SM | FINISAR CORP. | FTRJ1322P1BTR-J3 | 1310 nm |
| 5 | OC12 short reach | SM | FINISAR CORP. | FTRJ1322P1BTR-J3 | 1310 nm |
| 6 | OC12 short reach | SM | FINISAR CORP. | FTRJ1322P1BTR-J3 | 1310 nm |
| 7 | OC12 short reach | SM | FINISAR CORP. | FTRJ1322P1BTR-J3 | 1310 nm |

#### show chassis pic fpc-slot pic-slot (4-port Channelized SONET/SDH OC3/STM1 [Multi-Rate] MIC with SFP)

```
user@host> show chassis pic fpc-slot 5 pic-slot 0
```

```
FPC slot 5, PIC slot 0 information:
```

|             |                       |
|-------------|-----------------------|
| Type        | MIC-3D-4CHOC3-2CHOC12 |
| State       | Online                |
| PIC version | 1.9                   |
| Uptime      | 1 hour, 21 minutes    |

```
PIC port information:
```

| Port | Cable type       | Fiber type | Xcvr vendor   | Xcvr vendor part number | Wavelength |
|------|------------------|------------|---------------|-------------------------|------------|
| 1    | OC12 inter reach | SM         | FINISAR CORP. | FTRJ1322P1BTR-J3        | 1310 nm    |
| 2    | OC12 inter reach | SM         | FINISAR CORP. | FTRJ1322P1BTR-J3        | 1310 nm    |
| 3    | OC12 short reach | SM         | FINISAR CORP. | FTRJ1322P1BTR-J3        | 1310 nm    |

#### show chassis pic fpc-slot pic-slot (1-port OC192/STM64 MIC with XFP)

```
user@host> show chassis pic fpc-slot 1 pic-slot 0
```

```
FPC slot 1, PIC slot 0 information:
```

|             |                                       |
|-------------|---------------------------------------|
| Type        | MIC-3D-10C192-XFP                     |
| State       | Online                                |
| PIC version | 1.2                                   |
| Uptime      | 1 day, 11 hours, 4 minutes, 6 seconds |

```
PIC port information:
```

| Port | Cable type        | Fiber type | Xcvr vendor   | Xcvr vendor part number | Wavelength |
|------|-------------------|------------|---------------|-------------------------|------------|
| 0    | OC192 short reach | n/a        | FINISAR CORP. | FTLX1412M3BCL-J3        | 1310 nm    |

#### show chassis pic fpc-slot 1 pic-slot 2 (8-port DS3/E3 MIC)

```
user@host> show chassis pic fpc-slot 1 pic-slot 2
```

```
FPC slot 1, PIC slot 2 information:
```

|                     |                                        |
|---------------------|----------------------------------------|
| Type                | MIC-3D-8DS3-E3                         |
| State               | Online                                 |
| PIC version         | 1.10                                   |
| Uptime              | 4 days, 1 hour, 29 minutes, 19 seconds |
| Channelization Mode | Disabled                               |

#### show chassis pic fpc-slot pic-slot (OTN)

```
user@host> show chassis pic fpc-slot 5 pic-slot 0
```

```
PIC fpc slot 5 pic slot 0 information:
```

|             |                       |
|-------------|-----------------------|
| Type        | 1x10GE(LAN),OTN       |
| ASIC type   | H chip                |
| State       | Online                |
| PIC version | 1.0                   |
| Uptime      | 5 minutes, 50 seconds |

#### show chassis pic fpc-slot pic-slot (QFX3500 Switch)

```
user@switch> show chassis pic fpc-slot 0 pic-slot 0
```

```
FPC slot 0, PIC slot 0 information:
Type 48x 10G-SFP+ Builtin
State Online
Uptime 3 days, 3 hours, 5 minutes, 20 seconds
```

### show chassis pic fpc-slot pic-slot (QFX5100 Switches and OCX Series )

```
user@switch> show chassis pic fpc-slot 0 pic-slot 0
FPC slot 0, PIC slot 0 information:
Type Unknown Builtin
State Online
Uptime 1 day, 17 hours, 5 minutes, 9 seconds
```

### show chassis pic interconnect-device fpc-slot pic-slot (QFabric Systems)

```
user@switch> show chassis pic interconnect-device interconnect1 fpc-slot 9 pic-slot 0
FPC slot 9, PIC slot 0 information:
Type 16x 40G-GE Builtin
State Online
Uptime 2 hours, 47 minutes, 40 seconds
```

### show chassis pic node-device fpc-slot pic-slot (QFabric System)

```
user@switch> show chassis pic node-device node1 pic-slot 0
FPC slot node1, PIC slot 0 information:
Type 48x 10G-SFP+ Builtin
State Online
Uptime 2 hours, 52 minutes, 37 seconds
```

#### PIC port information:

| Port | Cable type | Fiber type | Xcvr vendor      | Xcvr vendor part number | Wavelength |
|------|------------|------------|------------------|-------------------------|------------|
| 0    | 10GBASE SR | MM         | SumitomoElectric | SPP5101SR-J3            | 850 nm     |
| 1    | 10GBASE SR | MM         | SumitomoElectric | SPP5101SR-J3            | 850 nm     |
| 2    | 10GBASE SR | MM         | SumitomoElectric | SPP5101SR-J3            | 850 nm     |
| 3    | 10GBASE SR | MM         | SumitomoElectric | SPP5101SR-J3            | 850 nm     |
| 4    | 10GBASE SR | MM         | SumitomoElectric | SPP5101SR-J3            | 850 nm     |
| 5    | 10GBASE SR | MM         | SumitomoElectric | SPP5101SR-J3            | 850 nm     |
| 6    | 10GBASE SR | MM         | SumitomoElectric | SPP5101SR-J3            | 850 nm     |
| 7    | 10GBASE SR | MM         | SumitomoElectric | SPP5101SR-J3            | 850 nm     |
| 8    | 10GBASE SR | MM         | SumitomoElectric | SPP5101SR-J3            | 850 nm     |
| 9    | 10GBASE SR | MM         | SumitomoElectric | SPP5101SR-J3            | 850 nm     |
| 10   | 10GBASE SR | MM         | SumitomoElectric | SPP5101SR-J3            | 850 nm     |
| 11   | 10GBASE SR | MM         | SumitomoElectric | SPP5101SR-J3            | 850 nm     |
| 12   | 10GBASE SR | MM         | SumitomoElectric | SPP5101SR-J3            | 850 nm     |
| 13   | 10GBASE SR | MM         | SumitomoElectric | SPP5101SR-J3            | 850 nm     |
| 14   | 10GBASE SR | MM         | SumitomoElectric | SPP5101SR-J3            | 850 nm     |
| 15   | 10GBASE SR | MM         | SumitomoElectric | SPP5101SR-J3            | 850 nm     |
| 16   | 10GBASE SR | MM         | SumitomoElectric | SPP5101SR-J3            | 850 nm     |
| 17   | 10GBASE SR | MM         | SumitomoElectric | SPP5101SR-J3            | 850 nm     |
| 18   | 10GBASE SR | MM         | SumitomoElectric | SPP5101SR-J3            | 850 nm     |
| 19   | 10GBASE SR | MM         | SumitomoElectric | SPP5101SR-J3            | 850 nm     |
| 20   | 10GBASE SR | MM         | SumitomoElectric | SPP5101SR-J3            | 850 nm     |
| 21   | 10GBASE SR | MM         | SumitomoElectric | SPP5101SR-J3            | 850 nm     |
| 22   | 10GBASE SR | MM         | SumitomoElectric | SPP5101SR-J3            | 850 nm     |
| 23   | 10GBASE SR | MM         | SumitomoElectric | SPP5101SR-J3            | 850 nm     |
| 24   | 10GBASE SR | MM         | SumitomoElectric | SPP5101SR-J3            | 850 nm     |
| 25   | 10GBASE SR | MM         | SumitomoElectric | SPP5101SR-J3            | 850 nm     |
| 26   | 10GBASE SR | MM         | SumitomoElectric | SPP5101SR-J3            | 850 nm     |
| 27   | 10GBASE SR | MM         | SumitomoElectric | SPP5101SR-J3            | 850 nm     |
| 28   | 10GBASE SR | MM         | SumitomoElectric | SPP5101SR-J3            | 850 nm     |
| 29   | 10GBASE SR | MM         | SumitomoElectric | SPP5101SR-J3            | 850 nm     |

|    |            |    |                  |              |        |
|----|------------|----|------------------|--------------|--------|
| 30 | 10GBASE SR | MM | SumitomoElectric | SPP5101SR-J3 | 850 nm |
| 31 | 10GBASE SR | MM | SumitomoElectric | SPP5101SR-J3 | 850 nm |
| 32 | 10GBASE SR | MM | SumitomoElectric | SPP5101SR-J3 | 850 nm |
| 33 | 10GBASE SR | MM | SumitomoElectric | SPP5101SR-J3 | 850 nm |
| 34 | 10GBASE SR | MM | SumitomoElectric | SPP5101SR-J3 | 850 nm |
| 35 | 10GBASE SR | MM | SumitomoElectric | SPP5101SR-J3 | 850 nm |
| 36 | 10GBASE SR | MM | SumitomoElectric | SPP5101SR-J3 | 850 nm |
| 37 | 10GBASE SR | MM | SumitomoElectric | SPP5101SR-J3 | 850 nm |
| 38 | 10GBASE SR | MM | SumitomoElectric | SPP5101SR-J3 | 850 nm |
| 39 | 10GBASE SR | MM | SumitomoElectric | SPP5101SR-J3 | 850 nm |
| 40 | 10GBASE SR | MM | SumitomoElectric | SPP5101SR-J3 | 850 nm |
| 41 | 10GBASE SR | MM | SumitomoElectric | SPP5101SR-J3 | 850 nm |
| 42 | 10GBASE SR | MM | SumitomoElectric | SPP5101SR-J3 | 850 nm |
| 43 | 10GBASE SR | MM | SumitomoElectric | SPP5101SR-J3 | 850 nm |
| 44 | 10GBASE SR | MM | SumitomoElectric | SPP5101SR-J3 | 850 nm |
| 45 | 10GBASE SR | MM | SumitomoElectric | SPP5101SR-J3 | 850 nm |
| 46 | 10GBASE SR | MM | SumitomoElectric | SPP5101SR-J3 | 850 nm |
| 47 | 10GBASE SR | MM | SumitomoElectric | SPP5101SR-J3 | 850 nm |

#### show chassis pic fpc-slot pic-slot (ACX2000 Universal Access Router)

```

user@host> show chassis pic fpc-slot 0 pic-slot 1
FPC slot 0, PIC slot 1 information:
 Type 8x 1GE(LAN) RJ45 Built-in
 State Online
 Uptime 6 days, 2 hours, 51 minutes, 11 seconds

```

#### show chassis pic fpc-slot pic-slot (MX Routers with Media Services Blade [MSB])

```

user@switch> show chassis pic fpc-slot 1 pic-slot 0
FPC slot 1, PIC slot 0 information:
 Type AS-MSC
 State Online
 PIC version 1.6
 Uptime 11 hours, 17 minutes, 56 seconds

```

#### show chassis pic FPC slot PIC slot (MX Routers with Media Services Blade [MSB])

```

user@switch> show chassis pic fpc-slot 1 pic-slot 2
 Type AS-MXC
 State Online
 PIC version 1.0
 Uptime 11 hours, 18 minutes, 3 seconds

```

#### show chassis pic transport fpc-slot pic-slot (PTX Series Packet Transport Routers)

```

user@host> show chassis pic transport fpc-slot 2 pic-slot 0
Administrative State: In Service
Operational State: Normal

```

## show chassis routing-engine

- List of Syntax**
- Syntax on page 982
  - Syntax (EX Series Switches) on page 982
  - Syntax (T Series routers) on page 982
  - Syntax (TX Matrix Routers) on page 982
  - Syntax (TX Matrix Plus Routers) on page 982
  - Syntax (QFX Series) on page 982
  - Syntax (OCX Series) on page 982
  - Syntax (MX Series Routers) on page 982
  - Syntax (MX2010 3D Universal Edge Routers) on page 982
  - Syntax (MX2020 3D Universal Edge Routers) on page 982
  - Syntax (MX104 3D Universal Edge Routers) on page 983
  - Syntax (ACX Series Universal Access Routers) on page 983

**Syntax** show chassis routing-engine  
<bios | *slot*>

**Syntax (EX Series Switches)** show chassis routing-engine  
<*slot*>

**Syntax (T Series routers)** show chassis routing-engine  
<bios | *slot*>

**Syntax (TX Matrix Routers)** show chassis routing-engine  
<bios | *slot*>  
<lcc *number* | scc>

**Syntax (TX Matrix Plus Routers)** show chassis routing-engine  
<bios | *slot*>  
<lcc *number* | sfc *number*>

**Syntax (QFX Series)** show chassis routing-engine  
<interconnect-device *name*>  
<node-device *name*>

**Syntax (OCX Series)** show chassis routing-engine

**Syntax (MX Series Routers)** show chassis routing-engine  
<bios | *slot*>  
<all-members>  
<local>  
<member *member-id*>

**Syntax (MX2010 3D Universal Edge Routers)** show chassis routing-engine  
<bios | *slot*>

**Syntax (MX2020 3D Universal Edge Routers)** show chassis routing-engine  
<bios | *slot*>

|                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax (MX104 3D Universal Edge Routers)</b>     | show chassis routing-engine                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Syntax (ACX Series Universal Access Routers)</b> | show chassis routing-engine                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Release Information</b>                          | <p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p><b>sfc</b> option introduced for the TX Matrix Plus router in Junos OS Release in 9.6.</p> <p>Command introduced in Junos OS Release 11.1 for QFX Series.</p> <p>Command introduced in Junos OS Release 12.2 for ACX Series Universal Access Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Description</b>                                  | Display the status of the Routing Engine.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Options</b>                                      | <p><b>none</b>—Display information about one or more Routing Engines. On a TX Matrix router, display information about all Routing Engines on the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display information about all Routing Engines on the TX Matrix Plus router and its attached routers.</p> <p><b>all-members</b>—(MX Series routers only) (Optional) Display Routing Engine information for all members of the Virtual Chassis configuration.</p> <p><b>bios</b>—(Optional) Display the (BIOS) firmware version.</p> <p><b>interconnect-device <i>number</i></b>—(QFabric systems only) (Optional) Display Routing Engine information for a specified Interconnect device.</p> <p><b>lcc <i>number</i></b>—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display Routing Engine information for a specified T640 router (line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, display Routing Engine information for a specified router (line-card chassis) that is connected to the TX Matrix Plus router.</p> <p>Replace <i>number</i> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none"> <li>• 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.</li> <li>• 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.</li> <li>• 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.</li> <li>• 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.</li> </ul> |

**local**—(MX Series routers only) (Optional) Display Routing Engine information for the local Virtual Chassis member.

**member *member-id***—(MX Series routers only) (Optional) Display Routing Engine information for the specified member of the Virtual Chassis configuration. For an MX Series Virtual Chassis, replace *member-id* with a value of 0 or 1.

**node-device *number***—(QFabric systems only) (Optional) Display Routing Engine information for a specified Node device.

**scc**—(TX Matrix routers only) (Optional) Display Routing Engine information for the TX Matrix router (switch-card chassis).

**sfc *number***—(TX Matrix Plus routers only) (Optional) Display Routing Engine information for the TX Matrix Plus router (or switch-fabric chassis). Replace *number* with 0.

**slot**—(Systems with multiple Routing Engines) (Optional) Display information for an individual Routing Engine. Replace *slot* with 0 or 1. For QFX3500 switches, there is only one Routing Engine, so you do not need to specify the slot number.

**Required Privilege Level**

view

**Related Documentation**

- [request chassis routing-engine master on page 461](#)
- *Configuring Routing Engine Redundancy*
- *Switching the Global Master and Backup Roles in a Virtual Chassis Configuration*

**List of Sample Output**

[show chassis routing-engine \(M5 Router\) on page 986](#)  
[show chassis routing-engine \(M10 Router\) on page 987](#)  
[show chassis routing-engine \(M20 Router\) on page 987](#)  
[show chassis routing-engine \(M40 Router\) on page 988](#)  
[show chassis routing-engine \(M120 Router\) on page 988](#)  
[show chassis routing-engine \(M160 Router\) on page 989](#)  
[show chassis routing-engine \(MX104 Router\) on page 989](#)  
[show chassis routing-engine \(MX240 Router\) on page 990](#)  
[show chassis routing-engine \(MX480 Router\) on page 991](#)  
[show chassis routing-engine \(MX960 Router\) on page 991](#)  
[show chassis routing-engine \(MX2010 Router\) on page 991](#)  
[show chassis routing-engine \(MX2020 Router\) on page 992](#)  
[show chassis routing-engine \(T320 router\) on page 993](#)  
[show chassis routing-engine \(T640 router\) on page 994](#)  
[show chassis routing-engine \(T1600 router\) on page 994](#)  
[show chassis routing-engine \(T4000 router\) on page 995](#)  
[show chassis routing-engine \(TX Matrix Router\) on page 996](#)  
[show chassis routing-engine lcc \(TX Matrix Router\) on page 997](#)  
[show chassis routing-engine bios \(TX Matrix Router\) on page 997](#)  
[show chassis routing-engine \(TX Matrix Plus Router\) on page 998](#)  
[show chassis routing-engine lcc \(TX Matrix Plus Router\) on page 999](#)  
[show chassis routing-engine bios \(TX Matrix Plus Router\) on page 1000](#)



[show chassis routing-engine \(QFX Series\) on page 1000](#)  
[show chassis routing-engine \(OCX Series\) on page 1000](#)  
[show chassis routing-engine interconnect-device \(QFabric systems\) on page 1001](#)  
[show chassis routing-engine \(PTX Series Packet Transport Switch\) on page 1001](#)  
[show chassis routing-engine \(EX9200 Switch\) on page 1002](#)  
[show chassis routing-engine \(ACX2000 Universal Access Router\) on page 1003](#)  
[show chassis routing-engine \(ACX1000 Universal Access Router\) on page 1003](#)

**Output Fields** [Table 62 on page 985](#) lists the output fields for the **show chassis routing-engine** command. Output fields are listed in the approximate order in which they appear.

**Table 62: show chassis routing-engine Output Fields**

| Field Name                         | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Slot</b>                        | (Systems with single and multiple Routing Engines) Slot number.                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Current state</b>               | (Systems with multiple Routing Engines) Current state of the Routing Engine: <b>Master</b> , <b>Backup</b> , or <b>Disabled</b> .                                                                                                                                                                                                                                                                                                                                                             |
| <b>Election priority</b>           | (Systems with multiple Routing Engines) Election priority for the Routing Engine: <b>Master</b> or <b>Backup</b> .                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Temperature</b>                 | Temperature of the air flowing past the Routing Engine.                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>CPU Temperature</b>             | Temperature of the CPU.                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>DRAM</b>                        | Total DRAM available to the Routing Engine's processor.<br><br>Starting with Junos OS Release 12.3R1, the DRAM field displays both available memory and installed memory.                                                                                                                                                                                                                                                                                                                     |
| <b>Memory utilization</b>          | Percentage of Routing Engine memory being used.                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>CPU utilization</b>             | Information about the Routing Engine's CPU utilization: <ul style="list-style-type: none"> <li>• <b>User</b>—Percentage of CPU time being used by user processes.</li> <li>• <b>Background</b>—Percentage of CPU time being used by background processes.</li> <li>• <b>Kernel</b>—Percentage of CPU time being used by kernel processes.</li> <li>• <b>Interrupt</b>—Percentage of CPU time being used by interrupts.</li> <li>• <b>Idle</b>—Percentage of CPU time that is idle.</li> </ul> |
| <b>Model</b>                       | Routing Engine model number.                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Serial ID</b>                   | (Systems with multiple Routing Engines) Identification number of the Routing Engine in this slot.                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Start time</b>                  | Time at which the Routing Engine started running.                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Uptime</b>                      | How long the Routing Engine has been running.                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Routing Engine BIOS Version</b> | BIOS version being run by the Routing Engine.                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

Table 62: show chassis routing-engine Output Fields (*continued*)

| Field Name         | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Last reboot reason | <p>Reason for last reboot, including:</p> <ul style="list-style-type: none"> <li><b>power cycle/failure</b>—Halt of the Routing Engine using the <b>halt</b> command, powering down using the power button on the chassis or any other method (such as removal of the control board or Routing Engine), and then powering back the Routing Engine. A halt of the operating system also occurs if you enter the <b>request system halt</b> command. You can enter this command to halt the system operations on the chassis or specific Routing Engines. To restart the software, press any key on the keyboard.</li> <li><b>watchdog</b>—Reboot due to a hardware watchdog. A watchdog is a hardware monitoring process that examines the health and performance of the router to enable the device to recover from failures. A watchdog checks for problems at certain intervals, and reboots the routing engine if a problem is encountered.</li> <li><b>reset-button reset</b>—(Not available on the J Series router or EX Series switch) Reboot due to pressing of the reset button on the Routing Engine.</li> <li><b>power-button hard power off</b>—Reboot due to pressing of the power button on the chassis. A powering down of the software also occurs if you enter the <b>request system power-off</b> command. You can enter this command to power down the chassis or specific Routing Engines; you can then restart the software.</li> <li><b>misc hardware reason</b>—Reboot due to miscellaneous hardware reasons.</li> <li><b>thermal shutdown</b>—Reboot due to the router or switch reaching a critical temperature at which point it is unsafe to continue operations.</li> <li><b>hard disk failure</b>—Reboot due to a hard disk or solid-state drive (SSD) failure.</li> <li><b>reset from debugger</b>—Reboot due to reset from the debugger.</li> <li><b>chassis control reset</b>—Restart the chassis process that manages PICs, FPCs, and other hardware components. The chassis control module that runs the Routing Engine performs management and monitoring functions, and it provides a single access point for operational and maintenance functions. A reset of the chassis management process occurs when you enter the <b>restart chassis-control</b> command.</li> <li><b>bios auto recovery reset</b>—Reboot due to a BIOS auto-recovery reset.</li> <li><b>could not be determined</b>—Reboot due to an undetermined reason.</li> <li><b>Router rebooted after a normal shutdown</b>—Reboot due to a normal shutdown. This reason is displayed if the Routing Engine is powered down by pushing and holding the online/offline button on the Routing Engine faceplate for 30 seconds, and then powered back. A reboot of the software also occurs if you enter the <b>request system reboot</b> command. You can enter this command to reboot the chassis or specific Routing Engines.</li> </ul> |
| Load averages      | Routing Engine load averages for the last 1, 5, and 15 minutes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

## Sample Output

### show chassis routing-engine (M5 Router)

```

user@host> show chassis routing-engine
Routing Engine status:
 Temperature 25 degrees C / 77 degrees F
 DRAM 768 MB
 Memory utilization 21 percent
 CPU utilization:
 User 0 percent
 Background 0 percent
 Kernel 0 percent
 Interrupt 0 percent

```

```

Idle 100 percent
Model RE-2.0
Serial ID 31000007349bf701
Start time 2003-12-04 09:42:17 PST
Uptime 26 days, 1 hour, 12 minutes, 27 seconds
Last reboot reason Router rebooted after a normal shutdown
Load averages: 1 minute 5 minute 15 minute
 0.00 0.01 0.00

```

### show chassis routing-engine (M10 Router)

```

user@host> show chassis routing-engine
Routing Engine status:
 Temperature 25 degrees C / 77 degrees F
 DRAM 768 MB
 Memory utilization 21 percent
 CPU utilization:
 User 0 percent
 Background 0 percent
 Kernel 0 percent
 Interrupt 0 percent
 Idle 100 percent
 Model RE-2.0
 Serial ID 31000007349bf701
 Start time 2003-12-04 09:42:17 PST
 Uptime 26 days, 1 hour, 12 minutes, 27 seconds
 Last reboot reason Router rebooted after a normal shutdown
 Load averages: 1 minute 5 minute 15 minute
 0.00 0.01 0.00

```

### show chassis routing-engine (M20 Router)

```

user@host> show chassis routing-engine
Routing Engine status:
 Slot 0:
 Current state Master
 Election priority Master (default)
 Temperature 29 degrees C / 84 degrees F
 DRAM 768 MB
 Memory utilization 20 percent
 CPU utilization:
 User 1 percent
 Background 0 percent
 Kernel 2 percent
 Interrupt 0 percent
 Idle 97 percent
 Model RE-2.0
 Serial ID 58000007348d9a01
 Start time 2003-12-30 07:05:47 PST
 Uptime 3 hours, 41 minutes, 14 seconds
 Last reboot reason Router rebooted after a normal shutdown
 Load averages: 1 minute 5 minute 15 minute
 0.00 0.02 0.00

 Routing Engine status:
 Slot 1:
 Current state Backup
 Election priority Backup (default)
 Temperature 29 degrees C / 84 degrees F
 DRAM 768 MB
 Memory utilization 0 percent
 CPU utilization:

```

```

User 0 percent
Background 0 percent
Kernel 1 percent
Interrupt 0 percent
Idle 99 percent
Model RE-2.0
Serial ID d800000734745701
Start time 2003-06-17 16:37:33 PDT
Uptime 195 days, 18 hours, 47 minutes, 9 seconds
Last reboot reason Router rebooted after a normal shutdown

```

### show chassis routing-engine (M40 Router)

```

user@host> show chassis routing-engine
Routing Engine status:
 Temperature 25 degrees C / 77 degrees F
 DRAM 768 MB
 Memory utilization 21 percent
 CPU utilization:
 User 0 percent
 Background 0 percent
 Kernel 0 percent
 Interrupt 0 percent
 Idle 100 percent
 Model RE-2.0
 Serial ID 31000007349bf701
 Start time 2003-12-04 09:42:17 PST
 Uptime 26 days, 1 hour, 12 minutes, 27 seconds
 Last reboot reason Router rebooted after a normal shutdown
 Load averages: 1 minute 5 minute 15 minute
 0.00 0.01 0.00

```

### show chassis routing-engine (M120 Router)

```

user@host> show chassis routing-engine
Routing Engine status:
Slot 0:
 Current state Master
 Election priority Master (default)
 Temperature 46 degrees C / 114 degrees F
 CPU temperature 44 degrees C / 111 degrees F
 DRAM 2048 MB
 Memory utilization 18 percent
 CPU utilization:
 User 0 percent
 Background 0 percent
 Kernel 5 percent
 Interrupt 0 percent
 Idle 95 percent
 Model RE-A-1000
 Serial ID 1000621154
 Start time 2006-10-31 17:10:05 PST
 Uptime 14 minutes, 31 seconds
 Last reboot reason Router rebooted after a normal shutdown
 Load averages: 1 minute 5 minute 15 minute
 0.02 0.07 0.07

Routing Engine status:
Slot 1:
 Current state Backup
 Election priority Backup (default)
 Temperature 45 degrees C / 113 degrees F

```

```

CPU temperature 42 degrees C / 107 degrees F
DRAM 2048 MB
Memory utilization 15 percent
CPU utilization:
 User 0 percent
 Background 0 percent
 Kernel 0 percent
 Interrupt 0 percent
 Idle 100 percent
Model RE-A-1000
Serial ID 1000621151
Start time 2006-10-31 17:10:04 PST
Uptime 14 minutes, 30 seconds
Last reboot reason Router rebooted after a normal shutdown

```

### show chassis routing-engine (M160 Router)

```

user@host> show chassis routing-engine
Routing Engine status:
Slot 0:
 Current state Master
 Election priority Master (default)
 Temperature 43 degrees C / 109 degrees F
 DRAM 2048 MB
 Memory utilization 11 percent
 CPU utilization:
 User 1 percent
 Background 0 percent
 Kernel 2 percent
 Interrupt 0 percent
 Idle 97 percent
 Model RE-3.0
 Serial ID 210865700403
 Start time 2003-12-23 12:25:55 PST
 Uptime 6 days, 22 hours, 33 minutes, 24 seconds
 Last reboot reason Router rebooted after a normal shutdown
 Load averages: 1 minute 5 minute 15 minute
 0.24 0.13 0.04

Routing Engine status:
Slot 1:
 Current state Backup
 Election priority Backup (default)
 Temperature 40 degrees C / 104 degrees F
 DRAM 2048 MB
 Memory utilization 9 percent
 CPU utilization:
 User 0 percent
 Background 0 percent
 Kernel 0 percent
 Interrupt 0 percent
 Idle 100 percent
 Model RE-3.0
 Serial ID 210865700332
 Start time 2003-12-23 12:25:55 PST
 Uptime 6 days, 22 hours, 33 minutes, 21 seconds
 Last reboot reason Router rebooted after a normal shutdown

```

### show chassis routing-engine (MX104 Router)

```

user@host> show chassis routing-engine

```

```

Routing Engine status:
Slot 0:
 Current state Master
 Election priority Master (default)
 Temperature 32 degrees C / 89 degrees F
 CPU temperature 42 degrees C / 107 degrees F
 DRAM 3840 MB (3840 MB installed)
 Memory utilization 18 percent
 CPU utilization:
 User 0 percent
 Background 0 percent
 Kernel 3 percent
 Interrupt 2 percent
 Idle 94 percent
 Model RE-MX-104
 Serial ID CAAR5925
 Start time 2013-06-05 13:17:08 IST
 Uptime 1 hour, 15 minutes, 8 seconds
 Last reboot reason 0x200:normal shutdown
 Load averages: 1 minute 5 minute 15 minute
 0.87 0.90 0.41

Routing Engine status:
Slot 1:
 Current state Backup
 Election priority Backup (default)
 Temperature 32 degrees C / 89 degrees F
 CPU temperature 38 degrees C / 100 degrees F
 DRAM 3840 MB (3840 MB installed)
 Memory utilization 13 percent
 CPU utilization:
 User 0 percent
 Background 0 percent
 Kernel 1 percent
 Interrupt 2 percent
 Idle 97 percent
 Model RE-MX-104
 Serial ID CAAM6369
 Start time 2013-06-05 13:07:37 IST
 Uptime 1 hour, 24 minutes, 34 seconds
 Last reboot reason 0x200:normal shutdown
 Load averages: 1 minute 5 minute 15 minute
 0.19 0.15 0.06

```

### show chassis routing-engine (MX240 Router)

```

user@host> show chassis routing-engine
Routing Engine status:
Slot 0:
 Current state Backup
 Election priority Master (default)
 Temperature 40 degrees C / 104 degrees F
 CPU temperature 47 degrees C / 116 degrees F
 DRAM 3584 MB
 Memory utilization 7 percent
 CPU utilization:
 User 0 percent
 Background 0 percent
 Kernel 0 percent
 Interrupt 0 percent
 Idle 100 percent
 Model RE-S-2000

```

```

Serial ID 1000703522
Start time 2007-12-19 10:35:40 PST
Uptime 16 days, 3 hours, 15 minutes, 23 seconds
Last reboot reason Router rebooted after a normal shutdown

```

### show chassis routing-engine (MX480 Router)

```

user@host> show chassis routing-engine
Routing Engine status:
Slot 0:
 Current state Master
 Election priority Master (default)
 Temperature 41 degrees C / 105 degrees F
 CPU temperature 38 degrees C / 100 degrees F
 DRAM 2048 MB
 Memory utilization 13 percent
 CPU utilization:
 User 0 percent
 Background 0 percent
 Kernel 2 percent
 Interrupt 0 percent
 Idle 98 percent
 Model RE-S-1300
 Serial ID 1000697044
 Start time 2008-01-04 06:46:08 PST
 Uptime 8 hours, 17 minutes, 16 seconds
 Last reboot reason Router rebooted after a normal shutdown

```

### show chassis routing-engine (MX960 Router)

```

user@host> show chassis routing-engine
Routing Engine status:
Slot 0:
 Current state Master
 Election priority Master (default)
 Temperature 37 degrees C / 98 degrees F
 CPU temperature 37 degrees C / 98 degrees F
 DRAM 2048 MB
 Memory utilization 18 percent
 CPU utilization:
 User 0 percent
 Background 0 percent
 Kernel 4 percent
 Interrupt 0 percent
 Idle 96 percent
 Model RE-S-1300
 Serial ID 1000617944
 Start time 2006-10-26 12:37:13 PDT
 Uptime 6 days, 4 hours, 59 minutes, 40 seconds
 Last reboot reason Router rebooted after a normal shutdown
 Load averages: 1 minute 5 minute 15 minute
 0.16 0.08 0.02

```

### show chassis routing-engine (MX2010 Router)

```

user@host> show chassis routing-engine

Routing Engine status:
Slot 0:
 Current state Master
 Election priority Master (default)
 Temperature 3 degrees C / 37 degrees F

```

```

CPU temperature 3 degrees C / 37 degrees F
DRAM 17152 MB
Memory utilization 13 percent
CPU utilization:
 User 0 percent
 Background 0 percent
 Kernel 4 percent
 Interrupt 2 percent
 Idle 95 percent
Model RE-S-1800x4
Serial ID 9009099704
Start time 2012-10-02 14:33:32 PDT
Uptime 14 hours, 39 minutes, 39 seconds
Last reboot reason Router rebooted after a normal shutdown.
Load averages: 1 minute 5 minute 15 minute
 0.06 0.05 0.01

Routing Engine status:
Slot 1:
 Current state Backup
 Election priority Backup (default)
 Temperature 1 degrees C / 33 degrees F
 CPU temperature 2 degrees C / 35 degrees F
 DRAM 17152 MB
 Memory utilization 11 percent
 CPU utilization:
 User 0 percent
 Background 0 percent
 Kernel 0 percent
 Interrupt 0 percent
 Idle 100 percent
 Model RE-S-1800x4
 Serial ID 9009099706
 Start time 2012-10-02 10:36:06 PDT
 Uptime 18 hours, 36 minutes, 57 seconds
 Last reboot reason Router rebooted after a normal shutdown.
 Load averages: 1 minute 5 minute 15 minute
 0.01 0.00 0.00

```

### show chassis routing-engine (MX2020 Router)

```

user@host> show chassis routing-engine
Routing Engine status:
Slot 0:
 Current state Master
 Election priority Master (default)
 Temperature 6 degrees C / 42 degrees F
 CPU temperature 6 degrees C / 42 degrees F
 DRAM 17152 MB
 Memory utilization 14 percent
 CPU utilization:
 User 1 percent
 Background 0 percent
 Kernel 7 percent
 Interrupt 2 percent
 Idle 91 percent
 Model RE-S-1800x4
 Serial ID 9009089704
 Start time 2012-10-02 11:05:24 PDT
 Uptime 2 days, 15 hours, 49 minutes, 13 seconds
 Last reboot reason Router rebooted after a normal shutdown.
 Load averages: 1 minute 5 minute 15 minute

```



```

 0.10 0.05 0.01
Routing Engine status:
Slot 1:
 Current state Backup
 Election priority Backup (default)
 Temperature 7 degrees C / 44 degrees F
 CPU temperature 5 degrees C / 41 degrees F
 DRAM 17152 MB
 Memory utilization 12 percent
 CPU utilization:
 User 0 percent
 Background 0 percent
 Kernel 0 percent
 Interrupt 0 percent
 Idle 99 percent
 Model RE-S-1800x4
 Serial ID 9009094138
 Start time 2012-10-02 11:09:57 PDT
 Uptime 2 days, 15 hours, 44 minutes, 27 seconds
 Last reboot reason Router rebooted after a normal shutdown.
 Load averages: 1 minute 5 minute 15 minute
 0.00 0.00 0.00

```

### show chassis routing-engine (T320 router)

```

user@host> show chassis routing-engine
Slot 0:
 Current state Master
 Election priority Master (default)
 Temperature 51 degrees C / 123 degrees F
 CPU temperature 55 degrees C / 131 degrees F
 DRAM 3584 MB
 Memory utilization 11 percent
 CPU utilization:
 User 0 percent
 Background 0 percent
 Kernel 2 percent
 Interrupt 0 percent
 Idle 97 percent
 Model RE-A-2000
 Serial ID 9009010618
 Start time 2012-10-10 01:24:05 PDT
 Uptime 5 days, 10 hours, 49 minutes, 23 seconds
 Last reboot reason 0x1:power cycle/failure
 Load averages: 1 minute 5 minute 15 minute
 0.00 0.05 0.04

Routing Engine status:
Slot 1:
 Current state Backup
 Election priority Backup (default)
 Temperature 45 degrees C / 113 degrees F
 CPU temperature 48 degrees C / 118 degrees F
 DRAM 3584 MB
 Memory utilization 9 percent
 CPU utilization:
 User 0 percent
 Background 0 percent
 Kernel 0 percent
 Interrupt 0 percent
 Idle 100 percent
 Model RE-A-2000

```

```

Serial ID 9009003642
Start time 2012-10-10 01:24:04 PDT
Uptime 5 days, 10 hours, 49 minutes, 28 seconds
Last reboot reason 0x1:power cycle/failure

```

### show chassis routing-engine (T640 router)

```

user@host> show chassis routing-engine
Routing Engine status:
Slot 0:
 Current state Master
 Election priority Master (default)
 Temperature 50 degrees C / 122 degrees F
 CPU temperature 58 degrees C / 136 degrees F
 DRAM 3584 MB
 Memory utilization 14 percent
 CPU utilization:
 User 1 percent
 Background 0 percent
 Kernel 4 percent
 Interrupt 1 percent
 Idle 95 percent
 Model RE-A-2000
 Serial ID 1000686556
 Start time 2012-10-10 01:24:02 PDT
 Uptime 5 days, 10 hours, 50 minutes, 27 seconds
 Last reboot reason 0x1:power cycle/failure
 Load averages: 1 minute 5 minute 15 minute
 1.24 0.33 0.12

Routing Engine status:
Slot 1:
 Current state Backup
 Election priority Backup (default)
 Temperature 44 degrees C / 111 degrees F
 CPU temperature 49 degrees C / 120 degrees F
 DRAM 3584 MB
 Memory utilization 12 percent
 CPU utilization:
 User 0 percent
 Background 0 percent
 Kernel 0 percent
 Interrupt 1 percent
 Idle 99 percent
 Model RE-A-2000
 Serial ID 1000702739
 Start time 2012-10-10 01:24:02 PDT
 Uptime 5 days, 10 hours, 50 minutes, 26 seconds
 Last reboot reason 0x1:power cycle/failure

```

### show chassis routing-engine (T1600 router)

```

user@host> show chassis routing-engine
Routing Engine status:
Slot 0:
 Current state Master
 Election priority Master (default)
 Temperature 48 degrees C / 118 degrees F
 CPU temperature 58 degrees C / 136 degrees F
 DRAM 3584 MB
 Memory utilization 13 percent
 CPU utilization:

```

```

User 0 percent
Background 0 percent
Kernel 3 percent
Interrupt 1 percent
Idle 96 percent
Model RE-A-2000
Serial ID 1000704521
Start time 2012-10-10 01:23:41 PDT
Uptime 5 days, 10 hours, 46 minutes, 56 seconds
Last reboot reason 0x1:power cycle/failure
Load averages: 1 minute 5 minute 15 minute
 0.05 0.03 0.01

Routing Engine status:
Slot 1:
 Current state Backup
 Election priority Backup (default)
 Temperature 44 degrees C / 111 degrees F
 CPU temperature 48 degrees C / 118 degrees F
 DRAM 3584 MB
 Memory utilization 12 percent
 CPU utilization:
 User 0 percent
 Background 0 percent
 Kernel 0 percent
 Interrupt 0 percent
 Idle 100 percent
 Model RE-A-2000
 Serial ID 9009006579
 Start time 2012-10-10 01:23:42 PDT
 Uptime 5 days, 10 hours, 46 minutes, 54 seconds
 Last reboot reason 0x1:power cycle/failure

```

#### show chassis routing-engine (T4000 router)

```

user@host> show chassis routing-engine
Routing Engine status:
Slot 0:
 Current state Master
 Election priority Master (default)
 Temperature 33 degrees C / 91 degrees F
 CPU temperature 50 degrees C / 122 degrees F
 DRAM 8960 MB
 Memory utilization 18 percent
 CPU utilization:
 User 0 percent
 Background 0 percent
 Kernel 4 percent
 Interrupt 1 percent
 Idle 95 percent
 Model RE-DUO-1800
 Serial ID P737F-002248
 Start time 2012-02-09 22:49:53 PST
 Uptime 2 hours, 21 minutes, 35 seconds
 Last reboot reason Router rebooted after a normal shutdown.
 Load averages: 1 minute 5 minute 15 minute
 0.00 0.04 0.00

Routing Engine status:
Slot 1:
 Current state Backup
 Election priority Backup (default)
 Temperature 32 degrees C / 89 degrees F

```

```

CPU temperature 46 degrees C / 114 degrees F
DRAM 8960 MB
Memory utilization 24 percent
CPU utilization:
 User 0 percent
 Background 0 percent
 Kernel 0 percent
 Interrupt 0 percent
 Idle 99 percent
Model RE-DU0-1800
Serial ID P737F-002653
Start time 2012-02-08 20:12:51 PST
Uptime 1 day, 4 hours, 58 minutes, 28 seconds
Last reboot reason Router rebooted after a normal shutdown.

```

### show chassis routing-engine (TX Matrix Router)

```

user@host> show chassis routing-engine
scc-re0:

```

#### Routing Engine status:

##### Slot 0:

```

Current state Master
Election priority Master (default)
Temperature 34 degrees C / 93 degrees F
CPU temperature 33 degrees C / 91 degrees F
DRAM 2048 MB
Memory utilization 12 percent
CPU utilization:
 User 0 percent
 Background 0 percent
 Kernel 2 percent
 Interrupt 0 percent
 Idle 98 percent
Model RE-4.0
Serial ID P11123900153
Start time 2004-08-05 18:42:05 PDT
Uptime 9 days, 22 hours, 49 minutes, 50 seconds
Last reboot reason Router rebooted after a normal shutdown
Load averages: 1 minute 5 minute 15 minute
 0.00 0.08 0.07

```

```

lcc0-re0:

```

#### Routing Engine status:

##### Slot 0:

```

Current state Master
Election priority Master (default)
Temperature 33 degrees C / 91 degrees F
CPU temperature 30 degrees C / 86 degrees F
DRAM 2048 MB
Memory utilization 12 percent
CPU utilization:
 User 0 percent
 Background 0 percent
 Kernel 1 percent
 Interrupt 0 percent
 Idle 98 percent
Model RE-3.0
Serial ID 210865700363
Start time 2004-08-05 18:42:05 PDT

```

```

Uptime 9 days, 22 hours, 48 minutes, 20 seconds
Last reboot reason Router rebooted after a normal shutdown
Load averages: 1 minute 5 minute 15 minute
 0.00 0.02 0.00

```

```
lcc2-re0:
```

```

Routing Engine status:
```

```
Slot 0:
```

```

Current state Master
Election priority Master (default)
Temperature 34 degrees C / 93 degrees F
CPU temperature 35 degrees C / 95 degrees F
DRAM 2048 MB
Memory utilization 12 percent
CPU utilization:
 User 0 percent
 Background 0 percent
 Kernel 2 percent
 Interrupt 0 percent
 Idle 98 percent
Model RE-4.0
Serial ID P11123900126
Start time 2004-08-05 18:42:05 PDT
Uptime 9 days, 22 hours, 49 minutes, 4 seconds
Last reboot reason Router rebooted after a normal shutdown
Load averages: 1 minute 5 minute 15 minute
 0.01 0.01 0.0

```

### show chassis routing-engine lcc (TX Matrix Router)

```
user@host> show chassis routing-engine 0 lcc 0
```

```
lcc0-re0:
```

```

Routing Engine status:
```

```
Slot 0:
```

```

Current state Master
Election priority Master (default)
Temperature 33 degrees C / 91 degrees F
CPU temperature 30 degrees C / 86 degrees F
DRAM 2048 MB
Memory utilization 12 percent
CPU utilization:
 User 0 percent
 Background 0 percent
 Kernel 1 percent
 Interrupt 0 percent
 Idle 98 percent
Model RE-3.0
Serial ID 210865700363
Start time 2004-08-05 18:42:05 PDT
Uptime 7 days, 22 hours, 49 minutes, 6 seconds
Last reboot reason Router rebooted after a normal shutdown
Load averages: 1 minute 5 minute 15 minute
 0.00 0.00 0.00

```

### show chassis routing-engine bios (TX Matrix Router)

```
user@host> show chassis routing-engine bios
```

```
scc-re0:
```

```
Routing Engine BIOS Version: V1.0.0
1cc0-re0:
```

```

Routing Engine BIOS Version: V1.0.17
1cc2-re0:
```

```

Routing Engine BIOS Version: V1.0.0
```

### show chassis routing-engine (TX Matrix Plus Router)

```
user@host> show chassis routing-engine
sfc0-re0:
```

```

Routing Engine status:
```

```
Slot 0:
```

|                    |                                          |
|--------------------|------------------------------------------|
| Current state      | Master                                   |
| Election priority  | Master (default)                         |
| Temperature        | 27 degrees C / 80 degrees F              |
| CPU temperature    | 42 degrees C / 107 degrees F             |
| DRAM               | 3327 MB                                  |
| Memory utilization | 12 percent                               |
| CPU utilization:   |                                          |
| User               | 0 percent                                |
| Background         | 0 percent                                |
| Kernel             | 2 percent                                |
| Interrupt          | 0 percent                                |
| Idle               | 98 percent                               |
| Model              | RE-TXP-SFC                               |
| Serial ID          | 737A-1024                                |
| Start time         | 2009-05-11 17:39:49 PDT                  |
| Uptime             | 3 hours, 45 minutes, 25 seconds          |
| Last reboot reason | Router rebooted after a normal shutdown. |
| Load averages:     | 1 minute    5 minute    15 minute        |
|                    | 0.00            0.00            0.00     |

```
Routing Engine status:
```

```
Slot 1:
```

|                    |                                 |
|--------------------|---------------------------------|
| Current state      | Backup                          |
| Election priority  | Backup (default)                |
| Temperature        | 29 degrees C / 84 degrees F     |
| CPU temperature    | 43 degrees C / 109 degrees F    |
| DRAM               | 3327 MB                         |
| Memory utilization | 11 percent                      |
| CPU utilization:   |                                 |
| User               | 0 percent                       |
| Background         | 0 percent                       |
| Kernel             | 0 percent                       |
| Interrupt          | 0 percent                       |
| Idle               | 100 percent                     |
| Model              | RE-TXP-SFC                      |
| Serial ID          | 737A-1024                       |
| Start time         | 2009-05-11 17:08:54 PDT         |
| Uptime             | 4 hours, 16 minutes, 52 seconds |
| Last reboot reason | 0x1:power cycle/failure         |

```
1cc0-re0:
```

```

Routing Engine status:
```

```
Slot 0:
```

|                   |                             |
|-------------------|-----------------------------|
| Current state     | Master                      |
| Election priority | Master (default)            |
| Temperature       | 30 degrees C / 86 degrees F |

```

CPU temperature 43 degrees C / 109 degrees F
DRAM 3327 MB
Memory utilization 9 percent
CPU utilization:
 User 0 percent
 Background 0 percent
 Kernel 2 percent
 Interrupt 0 percent
 Idle 98 percent
Model RE-TXP-LCC
Serial ID 737F-1024
Start time 2009-05-11 17:40:32 PDT
Uptime 3 hours, 44 minutes, 51 seconds
Last reboot reason Router rebooted after a normal shutdown.
Load averages: 1 minute 5 minute 15 minute
 0.00 0.00 0.00

Routing Engine status:
Slot 1:
 Current state Backup
 Election priority Backup (default)
 Temperature 30 degrees C / 86 degrees F
 CPU temperature 43 degrees C / 109 degrees F
 DRAM 3327 MB
 Memory utilization 9 percent
 CPU utilization:
 User 0 percent
 Background 0 percent
 Kernel 0 percent
 Interrupt 0 percent
 Idle 100 percent
 Model RE-TXP-LCC
 Serial ID 737F-1024
 Start time 2009-05-06 17:31:32 PDT
 Uptime 5 days, 3 hours, 54 minutes, 19 seconds
 Last reboot reason Router rebooted after a normal shutdown.

```

### show chassis routing-engine lcc (TX Matrix Plus Router)

```

user@host> show chassis routing-engine 0 lcc 0
1cc0-re0:

Routing Engine status:
Slot 0:
 Current state Master
 Election priority Master (default)
 Temperature 30 degrees C / 86 degrees F
 CPU temperature 43 degrees C / 109 degrees F
 DRAM 3327 MB
 Memory utilization 9 percent
 CPU utilization:
 User 0 percent
 Background 0 percent
 Kernel 2 percent
 Interrupt 0 percent
 Idle 98 percent
 Model RE-TXP-LCC
 Serial ID 737F-1024
 Start time 2009-05-11 17:40:32 PDT
 Uptime 3 hours, 45 minutes, 26 seconds
 Last reboot reason Router rebooted after a normal shutdown.
 Load averages: 1 minute 5 minute 15 minute

```

```

0.00 0.00 0.00
Routing Engine status:
Slot 1:
 Current state Backup
 Election priority Backup (default)
 Temperature 30 degrees C / 86 degrees F
 CPU temperature 43 degrees C / 109 degrees F
 DRAM 3327 MB
 Memory utilization 9 percent
 CPU utilization:
 User 0 percent
 Background 0 percent
 Kernel 0 percent
 Interrupt 0 percent
 Idle 100 percent
 Model RE-TXP-LCC
 Serial ID 737F-1024
 Start time 2009-05-06 17:31:32 PDT
 Uptime 5 days, 3 hours, 54 minutes, 59 seconds
 Last reboot reason Router rebooted after a normal shutdown.

```

#### show chassis routing-engine bios (TX Matrix Plus Router)

```

user@host> show chassis routing-engine bios
sfc0-re0:

```

```

Routing Engine BIOS Version: V0.0.Z

```

```

lcc0-re0:

```

```

Routing Engine BIOS Version: V0.0.N

```

#### show chassis routing-engine (QFX Series)

```

user@switch> show chassis routing-engine
Routing Engine status:
Slot 0:
 Current state Master
 Election priority Master (default)
 DRAM 2820 MB
 Memory utilization 49 percent
 CPU utilization:
 User 1 percent
 Background 0 percent
 Kernel 1 percent
 Interrupt 0 percent
 Idle 97 percent
 Model QFX3500-48S4Q
 Serial ID S/N ED3709
 Uptime 3 days, 4 hours, 29 minutes, 42 seconds
 Last reboot reason 0x200:chassis control reset
 Load averages: 1 minute 5 minute 15 minute
0.37 0.26 0.19

```

#### show chassis routing-engine (OCX Series)

```

user@switch> show chassis routing-engine
Routing Engine status:
Slot 0:
 Current state Master
 Election priority Master (default)
 DRAM 2820 MB

```



```

Memory utilization 49 percent
CPU utilization:
User 1 percent
Background 0 percent
Kernel 1 percent
Interrupt 0 percent
Idle 97 percent
Model OCX-1100-48SX-AFI
Serial ID S/N ED3709
Uptime 3 days, 4 hours, 29 minutes, 42 seconds
Last reboot reason 0x200:chassis control reset
Load averages: 1 minute 5 minute 15 minute
0.37 0.26 0.19

```

### show chassis routing engine interconnect-device (QFabric systems)

```

user@switch> show chassis routing-engine
Routing Engine status:
Slot 0:
 Current state Master
 Election priority Master (default)
 Temperature 48 degrees C / 118 degrees F
 DRAM 3312 MB
 Memory utilization 63 percent
 CPU utilization:
 User 14 percent
 Background 0 percent
 Kernel 5 percent
 Interrupt 0 percent
 Idle 81 percent
 Model RE-QFXC08-CB4S
 Serial ID BUILTIN
 Start time 2011-07-06 13:26:15 UTC
 Uptime 11 hours, 24 minutes, 57 seconds
 Last reboot reason 0x4:reset-button reset
 Load averages: 1 minute 5 minute 15 minute
 2.62 2.31 2.28

Routing Engine status:
Slot 1:
 Current state Backup
 Election priority Backup (default)
 Temperature 39 degrees C / 102 degrees F
 DRAM 3312 MB
 Memory utilization 59 percent
 CPU utilization:
 User 9 percent
 Background 0 percent
 Kernel 1 percent
 Interrupt 0 percent
 Idle 91 percent
 Model RE-QFXC08-CB4S
 Serial ID BUILTIN
 Start time 2011-07-06 13:24:58 UTC
 Uptime 11 hours, 26 minutes, 18 seconds
 Last reboot reason 0x4:reset-button reset

```

### show chassis routing-engine (PTX Series Packet Transport Switch)

```

user@switch> show chassis routing-engine

```

```

Routing Engine status:
Slot 0:
 Current state Master
 Election priority Master (default)
 Temperature 60 degrees C / 140 degrees F
 CPU temperature 76 degrees C / 168 degrees F
 DRAM 17152 MB
 Memory utilization 11 percent
 CPU utilization:
 User 0 percent
 Background 0 percent
 Kernel 4 percent
 Interrupt 0 percent
 Idle 95 percent
 Model RE-DUO-2600
 Serial ID P737A-002231
 Start time 2011-12-21 16:54:37 PST
 Uptime 25 minutes, 44 seconds
 Last reboot reason Router rebooted after a normal shutdown.
 Load averages: 1 minute 5 minute 15 minute
 0.01 0.02 0.06

Routing Engine status:
Slot 1:
 Current state Backup
 Election priority Backup (default)
 Temperature 50 degrees C / 122 degrees F
 CPU temperature 64 degrees C / 147 degrees F
 DRAM 17152 MB
 Memory utilization 10 percent
 CPU utilization:
 User 0 percent
 Background 0 percent
 Kernel 0 percent
 Interrupt 0 percent
 Idle 99 percent
 Model RE-DUO-2600
 Serial ID P737A-002438
 Start time 2011-12-21 16:52:26 PST
 Uptime 27 minutes, 49 seconds
 Last reboot reason Router rebooted after a normal shutdown.

```

### show chassis routing-engine (EX9200 Switch)

```

user@switch> show chassis routing-engine
Routing Engine status:
Slot 0:
 Current state Master
 Election priority Master (default)
 Temperature 35 degrees C / 95 degrees F
 CPU temperature 33 degrees C / 91 degrees F
 DRAM 8157 MB
 Installed Memory 8192 MB
 Memory utilization 18 percent
 CPU utilization:
 User 1 percent
 Background 0 percent
 Kernel 4 percent
 Interrupt 1 percent
 Idle 94 percent
 Model RE-S-EX9200-1800X4
 Serial ID 9009119555

```

```

Start time 2014-03-12 14:58:05 UTC
Uptime 1 hour, 41 minutes, 51 seconds
Last reboot reason Router rebooted after a normal shutdown.
Load averages: 1 minute 5 minute 15 minute
 0.02 0.02 0.00

Routing Engine status:
Slot 1:
 Current state Backup
 Election priority Backup (default)

[...Output truncated...]

```

### show chassis routing-engine (ACX2000 Universal Access Router)

```

user@host> show chassis routing-engine
Routing Engine status:
 Temperature 53 degrees C / 127 degrees F
 DRAM 1536 MB
 Memory utilization 25 percent
 CPU utilization:
 User 0 percent
 Background 0 percent
 Kernel 0 percent
 Interrupt 1 percent
 Idle 99 percent
 Model RE-ACX-2000
 Start time 2012-05-09 00:57:07 PDT
 Uptime 5 days, 3 hours, 16 minutes, 15 seconds
 Last reboot reason Router rebooted after a normal shutdown.
 Load averages: 1 minute 5 minute 15 minute
 0.00 0.03 0.05

```

### show chassis routing-engine (ACX1000 Universal Access Router)

```

user@host> show chassis routing-engine
Routing Engine status:
 Temperature 36 degrees C / 96 degrees F
 DRAM 768 MB
 Memory utilization 50 percent
 CPU utilization:
 User 3 percent
 Background 0 percent
 Kernel 6 percent
 Interrupt 0 percent
 Idle 91 percent
 Model RE-ACX-1000
 Start time 2012-05-10 07:12:23 PDT
 Uptime 4 days, 10 hours, 46 minutes, 53 seconds
 Last reboot reason Router rebooted after a normal shutdown.
 Load averages: 1 minute 5 minute 15 minute
 0.00 0.00 0.00

```

## show chassis temperature-thresholds

|                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                                               | <a href="#">Syntax on page 1004</a><br><a href="#">Syntax (TX Matrix Routers) on page 1004</a><br><a href="#">Syntax (TX Matrix Plus Routers) on page 1004</a><br><a href="#">Syntax (MX Series Routers) on page 1004</a><br><a href="#">Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers) on page 1004</a><br><a href="#">Syntax (QFX Series) on page 1004</a><br><a href="#">Syntax (PTX Series) on page 1004</a>                                                                                                                                                                                                                                                                                                                  |
| <b>Syntax</b>                                                       | show chassis temperature-thresholds                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Syntax (TX Matrix Routers)</b>                                   | show chassis temperature-thresholds<br><fcc number   scc>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Syntax (TX Matrix Plus Routers)</b>                              | show chassis temperature-thresholds<br><fcc number   sfc number>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Syntax (MX Series Routers)</b>                                   | show chassis temperature-thresholds<br><all-members><br><local><br><member member-id>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers)</b> | show chassis temperature-thresholds                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Syntax (QFX Series)</b>                                          | show chassis temperature-thresholds<br><interconnect-device name><br><node-device name>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Syntax (PTX Series)</b>                                          | show chassis temperature-thresholds                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Release Information</b>                                          | <p>Command introduced in Junos OS Release 8.0.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p><b>sfc</b> command introduced for the TX Matrix Plus router in Junos OS Release 9.6.</p> <p>Command introduced in Junos OS Release 11.1 for QFX Series.</p> <p>Command introduced in Junos OS Release 12.1 for T4000 Core Routers.</p> <p>Command introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.</p> |
| <b>Description</b>                                                  | Display chassis temperature threshold settings, in degrees Celsius.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Options</b>                                                      | <p><b>none</b>—Display the temperature threshold details.</p> <p><b>all-members</b>—(MX Series routers only) (Optional) Display the chassis temperature threshold settings of all member routers in the Virtual Chassis configuration.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

**interconnect-device *name***—(QFabric systems only) (Optional) Display the chassis temperature threshold settings of the Interconnect device.

**lcc *number***—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display the temperature threshold details of a specified T640 router (line-card chassis) that is connected to a TX Matrix router. On a TX Matrix Plus router, display the temperature threshold details of a specified router (line-card chassis) that is connected to a TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(MX Series routers only) (Optional) Display the chassis temperature threshold settings of the local Virtual Chassis member.

**member *member-id***—(MX Series routers only) (Optional) Display the chassis temperature threshold settings of the specified member of the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

**node-device *name***—(QFabric systems only) (Optional) Display the chassis temperature threshold settings of the Node device.

**scc**—(TX Matrix routers only) (Optional) Display the temperature threshold details of the TX Matrix router (switch-card chassis).

**sfc *number***—(TX Matrix Plus routers only) (Optional) On TX Matrix Plus routers, display the temperature threshold details of the TX Matrix Plus router, which is the switch-fabric chassis. Replace *number* with 0.

**Required Privilege Level** view

**Related Documentation** • *Defining Alarm Thresholds for System Temperature Sensors*

**List of Sample Output** [show chassis temperature-thresholds on page 1007](#)  
[show chassis temperature-thresholds \(MX104 Router\) on page 1007](#)  
[show chassis temperature-thresholds \(MX240, MX480, MX960 Routers with Application Services Modular Line Card\) on page 1007](#)  
[show chassis temperature-thresholds \(MX480 Router with MPC4E\) on page 1008](#)  
[show chassis temperature-thresholds \(MX2010 Router\) on page 1008](#)  
[show chassis temperature-thresholds \(MX2020 Router\) on page 1010](#)

[show chassis temperature-thresholds \(MX2020 Router with MPC4E\) on page 1014](#)  
[show chassis temperature-thresholds \(T4000 Core Routers\) on page 1015](#)  
[show chassis temperature-thresholds \(TX Matrix Plus Router\) on page 1016](#)  
[show chassis temperature-thresholds lcc \(TX Matrix Plus Router\) on page 1017](#)  
[show chassis temperature-thresholds sfc \(TX Matrix Plus Router\) on page 1017](#)  
[show chassis temperature-thresholds \(TX Matrix Plus routers with 3D SIBs\) on page 1018](#)  
[show chassis temperature-thresholds \(QFX3500 Switch and QFX3600\) on page 1019](#)  
[show chassis temperature-thresholds interconnect-device \(QFabric System\) on page 1020](#)  
[show chassis temperature-thresholds \(PTX5000 Packet Transport Router\) on page 1020](#)  
[show chassis temperature-thresholds \(MX Routers with Media Services Blade \[MSB\]\) on page 1021](#)

**Output Fields** Table 63 on page 1006 lists the output fields for the **show chassis temperature-thresholds** command. Output fields are listed in the approximate order in which they appear.

**Table 63: show chassis temperature-thresholds Output Fields**

| Field name          | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Item</b>         | Chassis component. If per FRU per slot thresholds are configured, the components about which information is displayed include the chassis, the Routing Engines, FPCs, and FEBs. If per FRU per slot thresholds are not configured, the components about which information is displayed include the chassis and the Routing Engines.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Fan speed</b>    | <p><b>NOTE:</b> On the QFX3500 switch and QFX3600 switch, there are four fan speeds: <b>low</b>, <b>medium-low</b>, <b>medium-high</b>, and <b>high</b>. The fan speed changes at the threshold when going from a low speed to a higher speed. When the fan speed changes from a higher speed to a lower speed, the temperature changes two degrees below the threshold.</p> <p>Temperature threshold settings, in degrees Celsius, for the fans to operate at normal and high speeds.</p> <ul style="list-style-type: none"> <li><b>Normal</b>—The fans operate at normal speed if the component is at or below this temperature and all the fans are present and functioning normally.</li> </ul> <p><b>NOTE:</b> On a TX Matrix Plus router with 3D SIBs, the threshold temperature at the XF junction is set to 70°C for <b>Normal</b> fan speed, which is less than or equal to 4800 RPM.</p> <ul style="list-style-type: none"> <li><b>High</b>—The fans operate at high speed if the component has exceeded this temperature or a fan has failed or is missing.</li> </ul> <p><b>NOTE:</b> On a TX Matrix Plus router with 3D SIBs, the threshold temperature at the XF junction is set to 75°C for <b>High</b> fan speed, which is greater than or equal to 5000 RPM.</p> <p><b>NOTE:</b> For MX480 Routers, there are three fan speeds: <b>Low</b>, <b>Medium</b>, and <b>High</b>.</p> <p>An alarm is not triggered until the temperature exceeds the threshold settings for a yellow alarm or a red alarm.</p> |
| <b>Yellow alarm</b> | <p>Temperature threshold settings, in degrees Celsius, that trigger a yellow alarm.</p> <ul style="list-style-type: none"> <li><b>Normal</b>—The temperature that must be exceeded on the component to trigger a yellow alarm when the fans are running at full speed.</li> <li><b>Bad fan</b>—The temperature that must be exceeded on the component to trigger a yellow alarm when one or more fans have failed or are missing.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

Table 63: show chassis temperature-thresholds Output Fields (*continued*)

| Field name    | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Red alarm     | <p>Temperature threshold settings, in degrees Celsius, that trigger a red alarm.</p> <ul style="list-style-type: none"> <li><b>Normal</b>—The temperature that must be exceeded on the component to trigger a red alarm when the fans are running at full speed.</li> <li><b>Bad fan</b>—The temperature that must be exceeded on the component to trigger a red alarm when one or more fans have failed or are missing.</li> </ul> |
| Fire Shutdown | (T4000 routers, TX Matrix Plus router with 3D SIBs, and PTX Series Packet Transport Routers only)—Temperature threshold settings, in degrees Celsius, for the network device to shut down.                                                                                                                                                                                                                                          |

## Sample Output

### show chassis temperature-thresholds

```
user@host> show chassis temperature-thresholds
```

| Item             | Fan speed<br>(degrees C) |      | Yellow alarm<br>(degrees C) |         | Red alarm<br>(degrees C) |         |
|------------------|--------------------------|------|-----------------------------|---------|--------------------------|---------|
|                  | Normal                   | High | Normal                      | Bad fan | Normal                   | Bad fan |
| Chassis default  | 48                       | 54   | 65                          | 55      | 75                       | 65      |
| Routing Engine 0 | 70                       | 80   | 95                          | 95      | 110                      | 110     |
| Routing Engine 1 | 70                       | 80   | 95                          | 95      | 110                      | 110     |
| FPC 0            | 55                       | 60   | 75                          | 65      | 90                       | 80      |
| FPC 1            | 55                       | 60   | 75                          | 65      | 90                       | 80      |
| FPC 2            | 55                       | 60   | 75                          | 65      | 90                       | 80      |
| FPC 3            | 55                       | 60   | 75                          | 65      | 90                       | 80      |
| FPC 4            | 55                       | 60   | 75                          | 65      | 90                       | 80      |
| FPC 5            | 55                       | 60   | 75                          | 65      | 90                       | 80      |
| FPC 6            | 55                       | 60   | 75                          | 65      | 90                       | 80      |
| FPC 7            | 55                       | 60   | 75                          | 65      | 90                       | 80      |
| FPC 8            | 55                       | 60   | 75                          | 65      | 90                       | 80      |
| FPC 9            | 55                       | 60   | 75                          | 65      | 90                       | 80      |
| FPC 10           | 55                       | 60   | 75                          | 65      | 90                       | 80      |
| FPC 11           | 55                       | 60   | 75                          | 65      | 90                       | 80      |

### show chassis temperature-thresholds (MX104 Router)

```
user@host> show chassis temperature-thresholds
```

| Item             | Fan speed<br>(degrees C) |      | Yellow alarm<br>(degrees C) |         | Red alarm<br>(degrees C) |         | Fire Shutdown<br>(degrees C) |         |
|------------------|--------------------------|------|-----------------------------|---------|--------------------------|---------|------------------------------|---------|
|                  | Normal                   | High | Normal                      | Bad fan | Normal                   | Bad fan | Normal                       | Bad fan |
| Chassis default  | 48                       | 54   | 65                          | 55      | 75                       | 65      |                              |         |
| Routing Engine 0 | 55                       | 80   | 95                          | 95      | 105                      | 100     |                              |         |

### show chassis temperature-thresholds (MX240, MX480, MX960 Routers with Application Services Modular Line Card)

```
user@host> show chassis temperature-thresholds
```

| Item | Fan speed<br>(degrees C) |      | Yellow alarm<br>(degrees C) |         | Red alarm<br>(degrees C) |         | Fire Shutdown<br>(degrees C) |         |
|------|--------------------------|------|-----------------------------|---------|--------------------------|---------|------------------------------|---------|
|      | Normal                   | High | Normal                      | Bad fan | Normal                   | Bad fan | Normal                       | Bad fan |

| Item             | Normal | High | Normal | Bad fan | Normal | Bad fan |
|------------------|--------|------|--------|---------|--------|---------|
| Normal           |        |      |        |         |        |         |
| Chassis default  | 48     | 54   | 65     | 55      | 75     | 65      |
| 100              |        |      |        |         |        |         |
| Routing Engine 0 | 70     | 80   | 95     | 95      | 110    | 110     |
| 112              |        |      |        |         |        |         |
| Routing Engine 1 | 70     | 80   | 95     | 95      | 110    | 110     |
| 112              |        |      |        |         |        |         |
| FPC 0            | 55     | 60   | 75     | 65      | 90     | 80      |
| 95               |        |      |        |         |        |         |
| FPC 1            | 55     | 60   | 75     | 65      | 90     | 80      |
| 95               |        |      |        |         |        |         |
| FPC 2            | 55     | 60   | 75     | 65      | 90     | 80      |
| 95               |        |      |        |         |        |         |
| FPC 4            | 55     | 60   | 75     | 65      | 90     | 80      |
| 95               |        |      |        |         |        |         |
| FPC 5            | 55     | 60   | 75     | 65      | 90     | 80      |
| 95               |        |      |        |         |        |         |

#### show chassis temperature-thresholds (MX480 Router with MPC4E)

```
user@ host> show chassis temperature-thresholds
```

|                  | Fan speed | Yellow alarm |      | Red alarm   |         | Fire Shutdown |         |
|------------------|-----------|--------------|------|-------------|---------|---------------|---------|
|                  |           | (degrees C)  |      | (degrees C) |         | (degrees C)   |         |
| (degrees C)      |           |              |      |             |         |               |         |
| Item             |           | Normal       | High | Normal      | Bad fan | Normal        | Bad fan |
| Normal           |           |              |      |             |         |               |         |
| Chassis default  |           | 48           | 54   | 65          | 55      | 75            | 65      |
| 100              |           |              |      |             |         |               |         |
| Routing Engine 0 |           | 70           | 80   | 95          | 95      | 110           | 110     |
| 112              |           |              |      |             |         |               |         |
| Routing Engine 1 |           | 70           | 80   | 95          | 95      | 110           | 110     |
| 112              |           |              |      |             |         |               |         |
| FPC 2            |           | 55           | 60   | 75          | 65      | 95            | 80      |
| 100              |           |              |      |             |         |               |         |
| FPC 3            |           | 55           | 60   | 75          | 65      | 95            | 80      |
| 100              |           |              |      |             |         |               |         |
| FPC 4            |           | 55           | 60   | 75          | 65      | 90            | 80      |
| 95               |           |              |      |             |         |               |         |

#### show chassis temperature-thresholds (MX2010 Router)

```
user@host> show chassis temperature-thresholds
```

|                     | Fan speed   |      | Yellow alarm |         | Red alarm   |         | Fire Shutdown |         |
|---------------------|-------------|------|--------------|---------|-------------|---------|---------------|---------|
|                     | (degrees C) |      | (degrees C)  |         | (degrees C) |         | (degrees C)   |         |
| Item                | Normal      | High | Normal       | Bad fan | Normal      | Bad fan | Normal        | Bad fan |
| Routing Engine 0    | 70          | 80   | 95           | 95      | 110         | 110     | 112           | 112     |
| Routing Engine 1    | 70          | 80   | 95           | 95      | 110         | 110     | 112           | 112     |
| CB 0 IntakeA-Zone0  | 60          | 65   | 78           | 75      | 85          | 80      | 95            | 95      |
| CB 0 IntakeB-Zone1  | 60          | 65   | 78           | 75      | 85          | 80      | 95            | 95      |
| CB 0 IntakeC-Zone0  | 60          | 65   | 78           | 75      | 85          | 80      | 95            | 95      |
| CB 0 ExhaustA-Zone0 | 60          | 65   | 78           | 75      | 85          | 80      | 95            | 95      |
| CB 0 ExhaustB-Zone1 | 60          | 65   | 78           | 75      | 85          | 80      | 95            | 95      |
| CB 0 TCBC-Zone0     | 60          | 65   | 78           | 75      | 85          | 80      | 95            | 95      |
| CB 1 IntakeA-Zone0  | 60          | 65   | 78           | 75      | 85          | 80      | 95            | 95      |
| CB 1 IntakeB-Zone1  | 60          | 65   | 78           | 75      | 85          | 80      | 95            | 95      |
| CB 1 IntakeC-Zone0  | 60          | 65   | 78           | 75      | 85          | 80      | 95            | 95      |
| CB 1 ExhaustA-Zone0 | 60          | 65   | 78           | 75      | 85          | 80      | 95            | 95      |
| CB 1 ExhaustB-Zone1 | 60          | 65   | 78           | 75      | 85          | 80      | 95            | 95      |
| CB 1 TCBC-Zone0     | 60          | 65   | 78           | 75      | 85          | 80      | 95            | 95      |
| SPMB 0 Intake       | 56          | 62   | 75           | 63      | 83          | 76      | 95            | 95      |



|                     |    |    |    |    |     |     |     |
|---------------------|----|----|----|----|-----|-----|-----|
| SPMB 1 Intake       | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| SFB 0 Intake-Zone0  | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 0 Exhaust-Zone1 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 0 IntakeA-Zone0 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 0 IntakeB-Zone1 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 0 Exhaust-Zone0 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 0 SFB-XF2-Zone1 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| SFB 0 SFB-XF1-Zone0 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| SFB 0 SFB-XF0-Zone0 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| SFB 1 Intake-Zone0  | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 1 Exhaust-Zone1 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 1 IntakeA-Zone0 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 1 IntakeB-Zone1 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 1 Exhaust-Zone0 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 1 SFB-XF2-Zone1 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| SFB 1 SFB-XF1-Zone0 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| SFB 1 SFB-XF0-Zone0 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| SFB 2 Intake-Zone0  | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 2 Exhaust-Zone1 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 2 IntakeA-Zone0 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 2 IntakeB-Zone1 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 2 Exhaust-Zone0 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 2 SFB-XF2-Zone1 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| SFB 2 SFB-XF1-Zone0 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| SFB 2 SFB-XF0-Zone0 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| SFB 3 Intake-Zone0  | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 3 Exhaust-Zone1 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 3 IntakeA-Zone0 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 3 IntakeB-Zone1 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 3 Exhaust-Zone0 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 3 SFB-XF2-Zone1 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| SFB 3 SFB-XF1-Zone0 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| SFB 3 SFB-XF0-Zone0 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| SFB 4 Intake-Zone0  | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 4 Exhaust-Zone1 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 4 IntakeA-Zone0 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 4 IntakeB-Zone1 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 4 Exhaust-Zone0 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 4 SFB-XF2-Zone1 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| SFB 4 SFB-XF1-Zone0 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| SFB 4 SFB-XF0-Zone0 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| SFB 5 Intake-Zone0  | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 5 Exhaust-Zone1 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 5 IntakeA-Zone0 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 5 IntakeB-Zone1 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 5 Exhaust-Zone0 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 5 SFB-XF2-Zone1 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| SFB 5 SFB-XF1-Zone0 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| SFB 5 SFB-XF0-Zone0 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| SFB 6 Intake-Zone0  | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 6 Exhaust-Zone1 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 6 IntakeA-Zone0 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 6 IntakeB-Zone1 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 6 Exhaust-Zone0 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 6 SFB-XF2-Zone1 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| SFB 6 SFB-XF1-Zone0 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| SFB 6 SFB-XF0-Zone0 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| SFB 7 Intake-Zone0  | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 7 Exhaust-Zone1 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 7 IntakeA-Zone0 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 7 IntakeB-Zone1 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |

|                     |    |    |    |    |     |     |     |
|---------------------|----|----|----|----|-----|-----|-----|
| SFB 7 Exhaust-Zone0 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 7 SFB-XF2-Zone1 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| SFB 7 SFB-XF1-Zone0 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| SFB 7 SFB-XF0-Zone0 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| FPC 0               | 55 | 60 | 75 | 65 | 95  | 80  | 100 |
| FPC 1               | 55 | 60 | 75 | 65 | 90  | 80  | 95  |
| FPC 2               | 55 | 60 | 75 | 65 | 95  | 80  | 100 |
| FPC 3               | 55 | 60 | 75 | 65 | 90  | 80  | 95  |
| FPC 4               | 55 | 60 | 75 | 65 | 90  | 80  | 95  |
| FPC 5               | 55 | 60 | 75 | 65 | 95  | 80  | 100 |
| FPC 6               | 55 | 60 | 75 | 65 | 90  | 80  | 95  |
| FPC 7               | 55 | 60 | 75 | 65 | 95  | 80  | 100 |
| FPC 8               | 55 | 60 | 75 | 65 | 90  | 80  | 95  |
| FPC 9               | 55 | 60 | 75 | 65 | 95  | 80  | 100 |
| ADC 0 Intake        | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 0 Exhaust       | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 0 ADC-XF1       | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 0 ADC-XF0       | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 1 Intake        | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 1 Exhaust       | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 1 ADC-XF1       | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 1 ADC-XF0       | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 2 Intake        | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 2 Exhaust       | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 2 ADC-XF1       | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 2 ADC-XF0       | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 3 Intake        | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 3 Exhaust       | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 3 ADC-XF1       | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 3 ADC-XF0       | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 4 Intake        | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 4 Exhaust       | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 4 ADC-XF1       | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 4 ADC-XF0       | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 5 Intake        | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 5 Exhaust       | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 5 ADC-XF1       | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 5 ADC-XF0       | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 6 Intake        | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 6 Exhaust       | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 6 ADC-XF1       | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 6 ADC-XF0       | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 7 Intake        | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 7 Exhaust       | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 7 ADC-XF1       | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 7 ADC-XF0       | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 8 Intake        | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 8 Exhaust       | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 8 ADC-XF1       | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 8 ADC-XF0       | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 9 Intake        | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 9 Exhaust       | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 9 ADC-XF1       | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 9 ADC-XF0       | 70 | 80 | 90 | 90 | 107 | 107 | 115 |

#### show chassis temperature-thresholds (MX2020 Router)

```

user@host> show chassis temperature-thresholds
Fan speed Yellow alarm Red alarm Fire Shutdown
(degrees C) (degrees C) (degrees C) (degrees C)

```

| Item                | Normal | High | Normal | Bad fan | Normal | Bad fan | Normal |
|---------------------|--------|------|--------|---------|--------|---------|--------|
| Routing Engine 0    | 70     | 80   | 95     | 95      | 110    | 110     | 112    |
| Routing Engine 1    | 70     | 80   | 95     | 95      | 110    | 110     | 112    |
| CB 0 IntakeA-Zone0  | 60     | 65   | 78     | 75      | 85     | 80      | 95     |
| CB 0 IntakeB-Zone1  | 60     | 65   | 78     | 75      | 85     | 80      | 95     |
| CB 0 IntakeC-Zone0  | 60     | 65   | 78     | 75      | 85     | 80      | 95     |
| CB 0 ExhaustA-Zone0 | 60     | 65   | 78     | 75      | 85     | 80      | 95     |
| CB 0 ExhaustB-Zone1 | 60     | 65   | 78     | 75      | 85     | 80      | 95     |
| CB 0 TCBC-Zone0     | 60     | 65   | 78     | 75      | 85     | 80      | 95     |
| CB 1 IntakeA-Zone0  | 60     | 65   | 78     | 75      | 85     | 80      | 95     |
| CB 1 IntakeB-Zone1  | 60     | 65   | 78     | 75      | 85     | 80      | 95     |
| CB 1 IntakeC-Zone0  | 60     | 65   | 78     | 75      | 85     | 80      | 95     |
| CB 1 ExhaustA-Zone0 | 60     | 65   | 78     | 75      | 85     | 80      | 95     |
| CB 1 ExhaustB-Zone1 | 60     | 65   | 78     | 75      | 85     | 80      | 95     |
| CB 1 TCBC-Zone0     | 60     | 65   | 78     | 75      | 85     | 80      | 95     |
| SPMB 0 Intake       | 56     | 62   | 75     | 63      | 83     | 76      | 95     |
| SPMB 1 Intake       | 56     | 62   | 75     | 63      | 83     | 76      | 95     |
| SFB 0 Intake-Zone0  | 56     | 62   | 75     | 63      | 82     | 70      | 87     |
| SFB 0 Exhaust-Zone1 | 56     | 62   | 75     | 63      | 82     | 70      | 87     |
| SFB 0 IntakeA-Zone0 | 56     | 62   | 75     | 63      | 82     | 70      | 87     |
| SFB 0 IntakeB-Zone1 | 56     | 62   | 75     | 63      | 82     | 70      | 87     |
| SFB 0 Exhaust-Zone0 | 56     | 62   | 75     | 63      | 82     | 70      | 87     |
| SFB 0 SFB-XF2-Zone1 | 70     | 80   | 90     | 90      | 107    | 107     | 115    |
| SFB 0 SFB-XF1-Zone0 | 70     | 80   | 90     | 90      | 107    | 107     | 115    |
| SFB 0 SFB-XF0-Zone0 | 70     | 80   | 90     | 90      | 107    | 107     | 115    |
| SFB 1 Intake-Zone0  | 56     | 62   | 75     | 63      | 82     | 70      | 87     |
| SFB 1 Exhaust-Zone1 | 56     | 62   | 75     | 63      | 82     | 70      | 87     |
| SFB 1 IntakeA-Zone0 | 56     | 62   | 75     | 63      | 82     | 70      | 87     |
| SFB 1 IntakeB-Zone1 | 56     | 62   | 75     | 63      | 82     | 70      | 87     |
| SFB 1 Exhaust-Zone0 | 56     | 62   | 75     | 63      | 82     | 70      | 87     |
| SFB 1 SFB-XF2-Zone1 | 70     | 80   | 90     | 90      | 107    | 107     | 115    |
| SFB 1 SFB-XF1-Zone0 | 70     | 80   | 90     | 90      | 107    | 107     | 115    |
| SFB 1 SFB-XF0-Zone0 | 70     | 80   | 90     | 90      | 107    | 107     | 115    |
| SFB 2 Intake-Zone0  | 56     | 62   | 75     | 63      | 82     | 70      | 87     |
| SFB 2 Exhaust-Zone1 | 56     | 62   | 75     | 63      | 82     | 70      | 87     |
| SFB 2 IntakeA-Zone0 | 56     | 62   | 75     | 63      | 82     | 70      | 87     |
| SFB 2 IntakeB-Zone1 | 56     | 62   | 75     | 63      | 82     | 70      | 87     |
| SFB 2 Exhaust-Zone0 | 56     | 62   | 75     | 63      | 82     | 70      | 87     |
| SFB 2 SFB-XF2-Zone1 | 70     | 80   | 90     | 90      | 107    | 107     | 115    |
| SFB 2 SFB-XF1-Zone0 | 70     | 80   | 90     | 90      | 107    | 107     | 115    |
| SFB 2 SFB-XF0-Zone0 | 70     | 80   | 90     | 90      | 107    | 107     | 115    |
| SFB 3 Intake-Zone0  | 56     | 62   | 75     | 63      | 82     | 70      | 87     |
| SFB 3 Exhaust-Zone1 | 56     | 62   | 75     | 63      | 82     | 70      | 87     |
| SFB 3 IntakeA-Zone0 | 56     | 62   | 75     | 63      | 82     | 70      | 87     |
| SFB 3 IntakeB-Zone1 | 56     | 62   | 75     | 63      | 82     | 70      | 87     |
| SFB 3 Exhaust-Zone0 | 56     | 62   | 75     | 63      | 82     | 70      | 87     |
| SFB 3 SFB-XF2-Zone1 | 70     | 80   | 90     | 90      | 107    | 107     | 115    |
| SFB 3 SFB-XF1-Zone0 | 70     | 80   | 90     | 90      | 107    | 107     | 115    |
| SFB 3 SFB-XF0-Zone0 | 70     | 80   | 90     | 90      | 107    | 107     | 115    |
| SFB 4 Intake-Zone0  | 56     | 62   | 75     | 63      | 82     | 70      | 87     |
| SFB 4 Exhaust-Zone1 | 56     | 62   | 75     | 63      | 82     | 70      | 87     |
| SFB 4 IntakeA-Zone0 | 56     | 62   | 75     | 63      | 82     | 70      | 87     |
| SFB 4 IntakeB-Zone1 | 56     | 62   | 75     | 63      | 82     | 70      | 87     |
| SFB 4 Exhaust-Zone0 | 56     | 62   | 75     | 63      | 82     | 70      | 87     |
| SFB 4 SFB-XF2-Zone1 | 70     | 80   | 90     | 90      | 107    | 107     | 115    |
| SFB 4 SFB-XF1-Zone0 | 70     | 80   | 90     | 90      | 107    | 107     | 115    |
| SFB 4 SFB-XF0-Zone0 | 70     | 80   | 90     | 90      | 107    | 107     | 115    |
| SFB 5 Intake-Zone0  | 56     | 62   | 75     | 63      | 82     | 70      | 87     |
| SFB 5 Exhaust-Zone1 | 56     | 62   | 75     | 63      | 82     | 70      | 87     |
| SFB 5 IntakeA-Zone0 | 56     | 62   | 75     | 63      | 82     | 70      | 87     |
| SFB 5 IntakeB-Zone1 | 56     | 62   | 75     | 63      | 82     | 70      | 87     |

|                     |    |    |    |    |     |     |     |
|---------------------|----|----|----|----|-----|-----|-----|
| SFB 5 Exhaust-Zone0 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 5 SFB-XF2-Zone1 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| SFB 5 SFB-XF1-Zone0 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| SFB 5 SFB-XF0-Zone0 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| SFB 6 Intake-Zone0  | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 6 Exhaust-Zone1 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 6 IntakeA-Zone0 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 6 IntakeB-Zone1 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 6 Exhaust-Zone0 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 6 SFB-XF2-Zone1 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| SFB 6 SFB-XF1-Zone0 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| SFB 6 SFB-XF0-Zone0 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| SFB 7 Intake-Zone0  | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 7 Exhaust-Zone1 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 7 IntakeA-Zone0 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 7 IntakeB-Zone1 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 7 Exhaust-Zone0 | 56 | 62 | 75 | 63 | 82  | 70  | 87  |
| SFB 7 SFB-XF2-Zone1 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| SFB 7 SFB-XF1-Zone0 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| SFB 7 SFB-XF0-Zone0 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| FPC 0               | 55 | 60 | 75 | 65 | 90  | 80  | 95  |
| FPC 1               | 55 | 60 | 75 | 65 | 90  | 80  | 95  |
| FPC 2               | 55 | 60 | 75 | 65 | 90  | 80  | 95  |
| FPC 3               | 55 | 60 | 75 | 65 | 90  | 80  | 95  |
| FPC 4               | 55 | 60 | 75 | 65 | 90  | 80  | 95  |
| FPC 5               | 55 | 60 | 75 | 65 | 90  | 80  | 95  |
| FPC 6               | 55 | 60 | 75 | 65 | 90  | 80  | 95  |
| FPC 7               | 55 | 60 | 75 | 65 | 90  | 80  | 95  |
| FPC 8               | 55 | 60 | 75 | 65 | 90  | 80  | 95  |
| FPC 9               | 55 | 60 | 75 | 65 | 90  | 80  | 95  |
| FPC 10              | 55 | 60 | 75 | 65 | 90  | 80  | 95  |
| FPC 11              | 55 | 60 | 75 | 65 | 90  | 80  | 95  |
| FPC 12              | 55 | 60 | 75 | 65 | 90  | 80  | 95  |
| FPC 13              | 55 | 60 | 75 | 65 | 90  | 80  | 95  |
| FPC 14              | 55 | 60 | 75 | 65 | 90  | 80  | 95  |
| FPC 15              | 55 | 60 | 75 | 65 | 90  | 80  | 95  |
| FPC 16              | 55 | 60 | 75 | 65 | 90  | 80  | 95  |
| FPC 17              | 55 | 60 | 75 | 65 | 90  | 80  | 95  |
| FPC 18              | 55 | 60 | 75 | 65 | 90  | 80  | 95  |
| FPC 19              | 55 | 60 | 75 | 65 | 90  | 80  | 95  |
| ADC 0 Intake        | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 0 Exhaust       | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 0 ADC-XF1       | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 0 ADC-XF0       | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 1 Intake        | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 1 Exhaust       | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 1 ADC-XF1       | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 1 ADC-XF0       | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 2 Intake        | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 2 Exhaust       | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 2 ADC-XF1       | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 2 ADC-XF0       | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 3 Intake        | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 3 Exhaust       | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 3 ADC-XF1       | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 3 ADC-XF0       | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 4 Intake        | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 4 Exhaust       | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 4 ADC-XF1       | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 4 ADC-XF0       | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 5 Intake        | 56 | 62 | 75 | 63 | 83  | 76  | 95  |

|                |    |    |    |    |     |     |     |
|----------------|----|----|----|----|-----|-----|-----|
| ADC 5 Exhaust  | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 5 ADC-XF1  | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 5 ADC-XF0  | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 6 Intake   | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 6 Exhaust  | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 6 ADC-XF1  | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 6 ADC-XF0  | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 7 Intake   | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 7 Exhaust  | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 7 ADC-XF1  | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 7 ADC-XF0  | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 8 Intake   | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 8 Exhaust  | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 8 ADC-XF1  | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 8 ADC-XF0  | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 9 Intake   | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 9 Exhaust  | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 9 ADC-XF1  | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 9 ADC-XF0  | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 10 Intake  | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 10 Exhaust | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 10 ADC-XF1 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 10 ADC-XF0 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 11 Intake  | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 11 Exhaust | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 11 ADC-XF1 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 11 ADC-XF0 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 12 Intake  | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 12 Exhaust | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 12 ADC-XF1 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 12 ADC-XF0 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 13 Intake  | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 13 Exhaust | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 13 ADC-XF1 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 13 ADC-XF0 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 14 Intake  | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 14 Exhaust | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 14 ADC-XF1 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 14 ADC-XF0 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 15 Intake  | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 15 Exhaust | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 15 ADC-XF1 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 15 ADC-XF0 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 16 Intake  | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 16 Exhaust | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 16 ADC-XF1 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 16 ADC-XF0 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 17 Intake  | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 17 Exhaust | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 17 ADC-XF1 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 17 ADC-XF0 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 18 Intake  | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 18 Exhaust | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 18 ADC-XF1 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 18 ADC-XF0 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 19 Intake  | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 19 Exhaust | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| ADC 19 ADC-XF1 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |
| ADC 19 ADC-XF0 | 70 | 80 | 90 | 90 | 107 | 107 | 115 |

## show chassis temperature-thresholds (MX2020 Router with MPC4E)

```

user@host> show chassis temperature-thresholds

```

|                     | Fan speed | Yellow alarm<br>(degrees C) |      | Red alarm<br>(degrees C) |         | Fire Shutdown<br>(degrees C) |         | (degrees C) |
|---------------------|-----------|-----------------------------|------|--------------------------|---------|------------------------------|---------|-------------|
| Item                |           | Normal                      | High | Normal                   | Bad fan | Normal                       | Bad fan | Normal      |
| Routing Engine 0    |           | 70                          | 80   | 95                       | 95      | 110                          | 110     | 112         |
| Routing Engine 1    |           | 70                          | 80   | 95                       | 95      | 110                          | 110     | 112         |
| CB 0 IntakeA-Zone0  |           | 60                          | 65   | 78                       | 75      | 85                           | 80      | 95          |
| CB 0 IntakeB-Zone1  |           | 60                          | 65   | 78                       | 75      | 85                           | 80      | 95          |
| CB 0 IntakeC-Zone0  |           | 60                          | 65   | 78                       | 75      | 85                           | 80      | 95          |
| CB 0 ExhaustA-Zone0 |           | 60                          | 65   | 78                       | 75      | 85                           | 80      | 95          |
| CB 0 ExhaustB-Zone1 |           | 60                          | 65   | 78                       | 75      | 85                           | 80      | 95          |
| CB 0 TCBC-Zone0     |           | 60                          | 65   | 78                       | 75      | 85                           | 80      | 95          |
| CB 1 IntakeA-Zone0  |           | 60                          | 65   | 78                       | 75      | 85                           | 80      | 95          |
| CB 1 IntakeB-Zone1  |           | 60                          | 65   | 78                       | 75      | 85                           | 80      | 95          |
| CB 1 IntakeC-Zone0  |           | 60                          | 65   | 78                       | 75      | 85                           | 80      | 95          |
| CB 1 ExhaustA-Zone0 |           | 60                          | 65   | 78                       | 75      | 85                           | 80      | 95          |
| CB 1 ExhaustB-Zone1 |           | 60                          | 65   | 78                       | 75      | 85                           | 80      | 95          |
| CB 1 TCBC-Zone0     |           | 60                          | 65   | 78                       | 75      | 85                           | 80      | 95          |
| SPMB 0 Intake       |           | 56                          | 62   | 75                       | 63      | 83                           | 76      | 95          |
| SPMB 1 Intake       |           | 56                          | 62   | 75                       | 63      | 83                           | 76      | 95          |
| SFB 0 Intake-Zone0  |           | 56                          | 62   | 70                       | 70      | 85                           | 85      | 89          |
| SFB 0 Exhaust-Zone1 |           | 56                          | 62   | 70                       | 70      | 85                           | 85      | 89          |
| SFB 0 IntakeA-Zone0 |           | 56                          | 62   | 70                       | 70      | 85                           | 85      | 89          |
| SFB 0 IntakeB-Zone1 |           | 56                          | 62   | 70                       | 70      | 85                           | 85      | 89          |
| SFB 0 Exhaust-Zone0 |           | 56                          | 62   | 70                       | 70      | 85                           | 85      | 89          |
| SFB 0 SFB-XF2-Zone1 |           | 70                          | 75   | 90                       | 85      | 95                           | 90      | 100         |
| SFB 0 SFB-XF1-Zone0 |           | 70                          | 75   | 90                       | 85      | 95                           | 90      | 100         |
| SFB 0 SFB-XF0-Zone0 |           | 70                          | 75   | 90                       | 85      | 95                           | 90      | 100         |
| SFB 1 Intake-Zone0  |           | 56                          | 62   | 70                       | 70      | 85                           | 85      | 89          |
| SFB 1 Exhaust-Zone1 |           | 56                          | 62   | 70                       | 70      | 85                           | 85      | 89          |
| SFB 1 IntakeA-Zone0 |           | 56                          | 62   | 70                       | 70      | 85                           | 85      | 89          |
| SFB 1 IntakeB-Zone1 |           | 56                          | 62   | 70                       | 70      | 85                           | 85      | 89          |
| SFB 1 Exhaust-Zone0 |           | 56                          | 62   | 70                       | 70      | 85                           | 85      | 89          |
| SFB 1 SFB-XF2-Zone1 |           | 70                          | 75   | 90                       | 85      | 95                           | 90      | 100         |
| SFB 1 SFB-XF1-Zone0 |           | 70                          | 75   | 90                       | 85      | 95                           | 90      | 100         |
| SFB 1 SFB-XF0-Zone0 |           | 70                          | 75   | 90                       | 85      | 95                           | 90      | 100         |
| SFB 2 Intake-Zone0  |           | 56                          | 62   | 70                       | 70      | 85                           | 85      | 89          |
| SFB 2 Exhaust-Zone1 |           | 56                          | 62   | 70                       | 70      | 85                           | 85      | 89          |
| SFB 2 IntakeA-Zone0 |           | 56                          | 62   | 70                       | 70      | 85                           | 85      | 89          |
| SFB 2 IntakeB-Zone1 |           | 56                          | 62   | 70                       | 70      | 85                           | 85      | 89          |
| SFB 2 Exhaust-Zone0 |           | 56                          | 62   | 70                       | 70      | 85                           | 85      | 89          |
| SFB 2 SFB-XF2-Zone1 |           | 70                          | 75   | 90                       | 85      | 95                           | 90      | 100         |
| SFB 2 SFB-XF1-Zone0 |           | 70                          | 75   | 90                       | 85      | 95                           | 90      | 100         |
| SFB 2 SFB-XF0-Zone0 |           | 70                          | 75   | 90                       | 85      | 95                           | 90      | 100         |
| SFB 3 Intake-Zone0  |           | 56                          | 62   | 70                       | 70      | 85                           | 85      | 89          |
| SFB 3 Exhaust-Zone1 |           | 56                          | 62   | 70                       | 70      | 85                           | 85      | 89          |
| SFB 3 IntakeA-Zone0 |           | 56                          | 62   | 70                       | 70      | 85                           | 85      | 89          |
| SFB 3 IntakeB-Zone1 |           | 56                          | 62   | 70                       | 70      | 85                           | 85      | 89          |
| SFB 3 Exhaust-Zone0 |           | 56                          | 62   | 70                       | 70      | 85                           | 85      | 89          |
| SFB 3 SFB-XF2-Zone1 |           | 70                          | 75   | 90                       | 85      | 95                           | 90      | 100         |
| SFB 3 SFB-XF1-Zone0 |           | 70                          | 75   | 90                       | 85      | 95                           | 90      | 100         |
| SFB 3 SFB-XF0-Zone0 |           | 70                          | 75   | 90                       | 85      | 95                           | 90      | 100         |
| SFB 4 Intake-Zone0  |           | 56                          | 62   | 70                       | 70      | 85                           | 85      | 89          |
| SFB 4 Exhaust-Zone1 |           | 56                          | 62   | 70                       | 70      | 85                           | 85      | 89          |
| SFB 4 IntakeA-Zone0 |           | 56                          | 62   | 70                       | 70      | 85                           | 85      | 89          |
| SFB 4 IntakeB-Zone1 |           | 56                          | 62   | 70                       | 70      | 85                           | 85      | 89          |
| SFB 4 Exhaust-Zone0 |           | 56                          | 62   | 70                       | 70      | 85                           | 85      | 89          |
| SFB 4 SFB-XF2-Zone1 |           | 70                          | 75   | 90                       | 85      | 95                           | 90      | 100         |

|                     |    |    |    |    |    |    |     |
|---------------------|----|----|----|----|----|----|-----|
| SFB 4 SFB-XF1-Zone0 | 70 | 75 | 90 | 85 | 95 | 90 | 100 |
| SFB 4 SFB-XF0-Zone0 | 70 | 75 | 90 | 85 | 95 | 90 | 100 |
| SFB 5 Intake-Zone0  | 56 | 62 | 70 | 70 | 85 | 85 | 89  |
| SFB 5 Exhaust-Zone1 | 56 | 62 | 70 | 70 | 85 | 85 | 89  |
| SFB 5 IntakeA-Zone0 | 56 | 62 | 70 | 70 | 85 | 85 | 89  |
| SFB 5 IntakeB-Zone1 | 56 | 62 | 70 | 70 | 85 | 85 | 89  |
| SFB 5 Exhaust-Zone0 | 56 | 62 | 70 | 70 | 85 | 85 | 89  |
| SFB 5 SFB-XF2-Zone1 | 70 | 75 | 90 | 85 | 95 | 90 | 100 |
| SFB 5 SFB-XF1-Zone0 | 70 | 75 | 90 | 85 | 95 | 90 | 100 |
| SFB 5 SFB-XF0-Zone0 | 70 | 75 | 90 | 85 | 95 | 90 | 100 |
| SFB 6 Intake-Zone0  | 56 | 62 | 70 | 70 | 85 | 85 | 89  |
| SFB 6 Exhaust-Zone1 | 56 | 62 | 70 | 70 | 85 | 85 | 89  |
| SFB 6 IntakeA-Zone0 | 56 | 62 | 70 | 70 | 85 | 85 | 89  |
| SFB 6 IntakeB-Zone1 | 56 | 62 | 70 | 70 | 85 | 85 | 89  |
| SFB 6 Exhaust-Zone0 | 56 | 62 | 70 | 70 | 85 | 85 | 89  |
| SFB 6 SFB-XF2-Zone1 | 70 | 75 | 90 | 85 | 95 | 90 | 100 |
| SFB 6 SFB-XF1-Zone0 | 70 | 75 | 90 | 85 | 95 | 90 | 100 |
| SFB 6 SFB-XF0-Zone0 | 70 | 75 | 90 | 85 | 95 | 90 | 100 |
| SFB 7 Intake-Zone0  | 56 | 62 | 70 | 70 | 85 | 85 | 89  |
| SFB 7 Exhaust-Zone1 | 56 | 62 | 70 | 70 | 85 | 85 | 89  |
| SFB 7 IntakeA-Zone0 | 56 | 62 | 70 | 70 | 85 | 85 | 89  |
| SFB 7 IntakeB-Zone1 | 56 | 62 | 70 | 70 | 85 | 85 | 89  |
| SFB 7 Exhaust-Zone0 | 56 | 62 | 70 | 70 | 85 | 85 | 89  |
| SFB 7 SFB-XF2-Zone1 | 70 | 75 | 90 | 85 | 95 | 90 | 100 |
| SFB 7 SFB-XF1-Zone0 | 70 | 75 | 90 | 85 | 95 | 90 | 100 |
| SFB 7 SFB-XF0-Zone0 | 70 | 75 | 90 | 85 | 95 | 90 | 100 |
| FPC 0               | 55 | 60 | 75 | 65 | 90 | 80 | 95  |
| FPC 9               | 55 | 60 | 75 | 65 | 90 | 80 | 95  |
| FPC 10              | 55 | 60 | 75 | 65 | 90 | 80 | 95  |
| FPC 14              | 55 | 60 | 75 | 65 | 95 | 80 | 100 |
| FPC 19              | 55 | 60 | 75 | 65 | 90 | 80 | 95  |
| ADC 0 Intake        | 50 | 55 | 60 | 60 | 65 | 65 | 80  |
| ADC 0 Exhaust       | 50 | 55 | 60 | 60 | 65 | 65 | 80  |
| ADC 0 ADC-XF1       | 70 | 75 | 90 | 85 | 95 | 90 | 100 |
| ADC 0 ADC-XF0       | 70 | 75 | 90 | 85 | 95 | 90 | 100 |
| ADC 9 Intake        | 50 | 55 | 60 | 60 | 65 | 65 | 80  |
| ADC 9 Exhaust       | 50 | 55 | 60 | 60 | 65 | 65 | 80  |
| ADC 9 ADC-XF1       | 70 | 75 | 90 | 85 | 95 | 90 | 100 |
| ADC 9 ADC-XF0       | 70 | 75 | 90 | 85 | 95 | 90 | 100 |
| ADC 10 Intake       | 50 | 55 | 60 | 60 | 65 | 65 | 80  |
| ADC 10 Exhaust      | 50 | 55 | 60 | 60 | 65 | 65 | 80  |
| ADC 10 ADC-XF1      | 70 | 75 | 90 | 85 | 95 | 90 | 100 |
| ADC 10 ADC-XF0      | 70 | 75 | 90 | 85 | 95 | 90 | 100 |
| ADC 14 Intake       | 50 | 55 | 60 | 60 | 65 | 65 | 80  |
| ADC 14 Exhaust      | 50 | 55 | 60 | 60 | 65 | 65 | 80  |
| ADC 14 ADC-XF1      | 70 | 75 | 90 | 85 | 95 | 90 | 100 |
| ADC 14 ADC-XF0      | 70 | 75 | 90 | 85 | 95 | 90 | 100 |
| ADC 19 Intake       | 50 | 55 | 60 | 60 | 65 | 65 | 80  |
| ADC 19 Exhaust      | 50 | 55 | 60 | 60 | 65 | 65 | 80  |
| ADC 19 ADC-XF1      | 70 | 75 | 90 | 85 | 95 | 90 | 100 |
| ADC 19 ADC-XF0      | 70 | 75 | 90 | 85 | 95 | 90 | 100 |

### show chassis temperature-thresholds (T4000 Core Routers)

```
user@host> show chassis temperature-thresholds
```

| Item            | Fan speed             |      | Yellow alarm          |         | Red alarm             |         | Fire Shutdown         |
|-----------------|-----------------------|------|-----------------------|---------|-----------------------|---------|-----------------------|
|                 | (degrees C)<br>Normal | High | (degrees C)<br>Normal | Bad fan | (degrees C)<br>Normal | Bad fan | (degrees C)<br>Normal |
| Chassis default | 48                    | 54   | 65                    | 55      | 75                    | 65      | 100                   |

|                  |    |    |    |    |     |     |     |
|------------------|----|----|----|----|-----|-----|-----|
| Routing Engine 0 | 55 | 65 | 85 | 85 | 100 | 100 | 102 |
| Routing Engine 1 | 55 | 65 | 85 | 85 | 100 | 100 | 102 |
| FPC 0            | 63 | 68 | 75 | 70 | 90  | 83  | 95  |
| FPC 3            | 63 | 68 | 75 | 70 | 90  | 83  | 95  |
| FPC 5            | 56 | 62 | 75 | 63 | 83  | 76  | 95  |
| FPC 6            | 63 | 68 | 75 | 70 | 90  | 83  | 95  |
| SIB 0            | 64 | 70 | 76 | 72 | 87  | 84  | 95  |
| SIB 1            | 64 | 70 | 76 | 72 | 87  | 84  | 95  |
| SIB 2            | 64 | 70 | 76 | 72 | 87  | 84  | 95  |
| SIB 3            | 64 | 70 | 76 | 72 | 87  | 84  | 95  |
| SIB 4            | 64 | 70 | 76 | 72 | 87  | 84  | 95  |

### show chassis temperature-thresholds (TX Matrix Plus Router)

```
user@host> show chassis temperature-thresholds
sfc0-re0:
```

| Item             | Fan speed<br>(degrees C) |      | Yellow alarm<br>(degrees C) |         | Red alarm<br>(degrees C) |         |
|------------------|--------------------------|------|-----------------------------|---------|--------------------------|---------|
|                  | Normal                   | High | Normal                      | Bad fan | Normal                   | Bad fan |
| Chassis default  | 48                       | 54   | 65                          | 55      | 75                       | 65      |
| Routing Engine 0 | 55                       | 65   | 85                          | 85      | 100                      | 100     |
| Routing Engine 1 | 55                       | 65   | 85                          | 85      | 100                      | 100     |
| SIB F13 0        | 64                       | 70   | 76                          | 72      | 90                       | 84      |
| SIB F13 3        | 64                       | 70   | 76                          | 72      | 90                       | 84      |
| SIB F13 6        | 64                       | 70   | 76                          | 72      | 90                       | 84      |
| SIB F13 8        | 64                       | 70   | 76                          | 72      | 90                       | 84      |
| SIB F13 11       | 64                       | 70   | 76                          | 72      | 90                       | 84      |
| SIB F13 12       | 64                       | 70   | 76                          | 72      | 90                       | 84      |
| SIB F2S 16       | 64                       | 70   | 76                          | 72      | 90                       | 84      |
| SIB F2S 17       | 64                       | 70   | 76                          | 72      | 90                       | 84      |
| SIB F2S 18       | 64                       | 70   | 76                          | 72      | 90                       | 84      |
| SIB F2S 19       | 64                       | 70   | 76                          | 72      | 90                       | 84      |
| SIB F2S 20       | 64                       | 70   | 76                          | 72      | 90                       | 84      |
| SIB F2S 21       | 64                       | 70   | 76                          | 72      | 90                       | 84      |
| SIB F2S 22       | 64                       | 70   | 76                          | 72      | 90                       | 84      |
| SIB F2S 23       | 64                       | 70   | 76                          | 72      | 90                       | 84      |
| SIB F2S 24       | 64                       | 70   | 76                          | 72      | 90                       | 84      |
| SIB F2S 25       | 64                       | 70   | 76                          | 72      | 90                       | 84      |
| SIB F2S 26       | 64                       | 70   | 76                          | 72      | 90                       | 84      |
| SIB F2S 27       | 64                       | 70   | 76                          | 72      | 90                       | 84      |
| SIB F2S 28       | 64                       | 70   | 76                          | 72      | 90                       | 84      |
| SIB F2S 29       | 64                       | 70   | 76                          | 72      | 90                       | 84      |
| SIB F2S 30       | 64                       | 70   | 76                          | 72      | 90                       | 84      |
| SIB F2S 31       | 64                       | 70   | 76                          | 72      | 90                       | 84      |
| SIB F2S 32       | 64                       | 70   | 76                          | 72      | 90                       | 84      |
| SIB F2S 33       | 64                       | 70   | 76                          | 72      | 90                       | 84      |
| SIB F2S 34       | 64                       | 70   | 76                          | 72      | 90                       | 84      |
| SIB F2S 35       | 64                       | 70   | 76                          | 72      | 90                       | 84      |

```
lcc0-re0:
```

| Item             | Fan speed<br>(degrees C) |      | Yellow alarm<br>(degrees C) |         | Red alarm<br>(degrees C) |         |
|------------------|--------------------------|------|-----------------------------|---------|--------------------------|---------|
|                  | Normal                   | High | Normal                      | Bad fan | Normal                   | Bad fan |
| Chassis default  | 48                       | 54   | 65                          | 55      | 75                       | 65      |
| Routing Engine 0 | 55                       | 65   | 85                          | 85      | 100                      | 100     |
| Routing Engine 1 | 55                       | 65   | 85                          | 85      | 100                      | 100     |
| FPC 1            | 56                       | 62   | 75                          | 63      | 83                       | 76      |
| FPC 3            | 56                       | 62   | 75                          | 63      | 83                       | 76      |
| FPC 4            | 56                       | 62   | 75                          | 63      | 83                       | 76      |



|       |    |    |    |    |    |    |
|-------|----|----|----|----|----|----|
| FPC 6 | 56 | 62 | 75 | 63 | 83 | 76 |
| FPC 7 | 56 | 62 | 75 | 63 | 83 | 76 |
| SIB 0 | 48 | 54 | 65 | 60 | 80 | 75 |
| SIB 1 | 48 | 54 | 65 | 60 | 80 | 75 |
| SIB 2 | 48 | 54 | 65 | 60 | 80 | 75 |
| SIB 3 | 48 | 54 | 65 | 60 | 80 | 75 |
| SIB 4 | 48 | 54 | 65 | 60 | 80 | 75 |

lcc1-re0:

| Item             | Fan speed<br>(degrees C) |      | Yellow alarm<br>(degrees C) |         | Red alarm<br>(degrees C) |         |
|------------------|--------------------------|------|-----------------------------|---------|--------------------------|---------|
|                  | Normal                   | High | Normal                      | Bad fan | Normal                   | Bad fan |
| Chassis default  | 48                       | 54   | 65                          | 55      | 75                       | 65      |
| Routing Engine 0 | 55                       | 65   | 85                          | 85      | 100                      | 100     |
| Routing Engine 1 | 55                       | 65   | 85                          | 85      | 100                      | 100     |
| FPC 1            | 56                       | 62   | 75                          | 63      | 83                       | 76      |
| FPC 3            | 56                       | 62   | 75                          | 63      | 83                       | 76      |
| FPC 4            | 56                       | 62   | 75                          | 63      | 83                       | 76      |
| FPC 6            | 56                       | 62   | 75                          | 63      | 83                       | 76      |
| ...              |                          |      |                             |         |                          |         |

#### show chassis temperature-thresholds lcc (TX Matrix Plus Router)

user@host> show chassis temperature-thresholds lcc 1

lcc1-re0:

| Item             | Fan speed<br>(degrees C) |      | Yellow alarm<br>(degrees C) |         | Red alarm<br>(degrees C) |         |
|------------------|--------------------------|------|-----------------------------|---------|--------------------------|---------|
|                  | Normal                   | High | Normal                      | Bad fan | Normal                   | Bad fan |
| Chassis default  | 48                       | 54   | 65                          | 55      | 75                       | 65      |
| Routing Engine 0 | 55                       | 65   | 85                          | 85      | 100                      | 100     |
| Routing Engine 1 | 55                       | 65   | 85                          | 85      | 100                      | 100     |
| FPC 1            | 56                       | 62   | 75                          | 63      | 83                       | 76      |
| FPC 3            | 56                       | 62   | 75                          | 63      | 83                       | 76      |
| FPC 4            | 56                       | 62   | 75                          | 63      | 83                       | 76      |
| FPC 6            | 56                       | 62   | 75                          | 63      | 83                       | 76      |
| SIB 0            | 48                       | 54   | 65                          | 60      | 80                       | 75      |
| SIB 1            | 48                       | 54   | 65                          | 60      | 80                       | 75      |
| SIB 2            | 48                       | 54   | 65                          | 60      | 80                       | 75      |
| SIB 3            | 48                       | 54   | 65                          | 60      | 80                       | 75      |
| SIB 4            | 48                       | 54   | 65                          | 60      | 80                       | 75      |

#### show chassis temperature-thresholds sfc (TX Matrix Plus Router)

user@host> show chassis temperature-thresholds sfc 0

sfc0-re0:

| Item             | Fan speed<br>(degrees C) |      | Yellow alarm<br>(degrees C) |         | Red alarm<br>(degrees C) |         |
|------------------|--------------------------|------|-----------------------------|---------|--------------------------|---------|
|                  | Normal                   | High | Normal                      | Bad fan | Normal                   | Bad fan |
| Chassis default  | 48                       | 54   | 65                          | 55      | 75                       | 65      |
| Routing Engine 0 | 55                       | 65   | 85                          | 85      | 100                      | 100     |
| Routing Engine 1 | 55                       | 65   | 85                          | 85      | 100                      | 100     |
| SIB F13 0        | 64                       | 70   | 76                          | 72      | 90                       | 84      |
| SIB F13 3        | 64                       | 70   | 76                          | 72      | 90                       | 84      |
| SIB F13 6        | 64                       | 70   | 76                          | 72      | 90                       | 84      |
| SIB F13 8        | 64                       | 70   | 76                          | 72      | 90                       | 84      |
| SIB F13 11       | 64                       | 70   | 76                          | 72      | 90                       | 84      |
| SIB F13 12       | 64                       | 70   | 76                          | 72      | 90                       | 84      |
| SIB F2S 16       | 64                       | 70   | 76                          | 72      | 90                       | 84      |

|            |    |    |    |    |    |    |
|------------|----|----|----|----|----|----|
| SIB F2S 17 | 64 | 70 | 76 | 72 | 90 | 84 |
| SIB F2S 18 | 64 | 70 | 76 | 72 | 90 | 84 |
| SIB F2S 19 | 64 | 70 | 76 | 72 | 90 | 84 |
| SIB F2S 20 | 64 | 70 | 76 | 72 | 90 | 84 |
| SIB F2S 21 | 64 | 70 | 76 | 72 | 90 | 84 |
| SIB F2S 22 | 64 | 70 | 76 | 72 | 90 | 84 |
| SIB F2S 23 | 64 | 70 | 76 | 72 | 90 | 84 |
| SIB F2S 24 | 64 | 70 | 76 | 72 | 90 | 84 |
| SIB F2S 25 | 64 | 70 | 76 | 72 | 90 | 84 |
| SIB F2S 26 | 64 | 70 | 76 | 72 | 90 | 84 |
| SIB F2S 27 | 64 | 70 | 76 | 72 | 90 | 84 |
| SIB F2S 28 | 64 | 70 | 76 | 72 | 90 | 84 |
| SIB F2S 29 | 64 | 70 | 76 | 72 | 90 | 84 |
| SIB F2S 30 | 64 | 70 | 76 | 72 | 90 | 84 |
| SIB F2S 31 | 64 | 70 | 76 | 72 | 90 | 84 |
| SIB F2S 32 | 64 | 70 | 76 | 72 | 90 | 84 |
| SIB F2S 33 | 64 | 70 | 76 | 72 | 90 | 84 |
| SIB F2S 34 | 64 | 70 | 76 | 72 | 90 | 84 |
| SIB F2S 35 | 64 | 70 | 76 | 72 | 90 | 84 |

### show chassis temperature-thresholds (TX Matrix Plus routers with 3D SIBs)

```
user@host> show chassis temperature-thresholds
sfc0-re0:
```

| Shutdown<br>(degrees C)<br>Item | Fan speed<br>(degrees C) |      | Yellow alarm<br>(degrees C) |         | Red alarm<br>(degrees C) |         | Fire |
|---------------------------------|--------------------------|------|-----------------------------|---------|--------------------------|---------|------|
|                                 | Normal                   | High | Normal                      | Bad fan | Normal                   | Bad fan |      |
| Chassis default                 | 48                       | 54   | 65                          | 55      | 75                       | 65      |      |
| Routing Engine 0                | 70                       | 75   | 90                          | 87      | 102                      | 97      |      |
| Routing Engine 1                | 70                       | 75   | 90                          | 87      | 102                      | 97      |      |
| SIB F13 0 Board                 | 60                       | 65   | 78                          | 75      | 85                       | 80      |      |
| SIB F13 0 XF Junction           | 70                       | 75   | 82                          | 74      | 105                      | 100     |      |
| SIB F13 4 Board                 | 60                       | 65   | 78                          | 75      | 85                       | 80      |      |
| SIB F13 4 XF Junction           | 70                       | 75   | 82                          | 74      | 105                      | 100     |      |
| SIB F13 6 Board                 | 60                       | 65   | 78                          | 75      | 85                       | 80      |      |
| SIB F13 6 XF Junction           | 70                       | 75   | 82                          | 74      | 105                      | 100     |      |
| SIB F2S 16 Board                | 60                       | 65   | 78                          | 75      | 85                       | 80      |      |
| SIB F2S 16 XF Junction          | 70                       | 75   | 82                          | 74      | 105                      | 100     |      |
| SIB F2S 17 Board                | 60                       | 65   | 78                          | 75      | 85                       | 80      |      |
| SIB F2S 17 XF Junction          | 70                       | 75   | 82                          | 74      | 105                      | 100     |      |
| SIB F2S 18 Board                | 60                       | 65   | 78                          | 75      | 85                       | 80      |      |
| SIB F2S 18 XF Junction          | 70                       | 75   | 82                          | 74      | 105                      | 100     |      |

|                               |    |    |    |    |     |     |
|-------------------------------|----|----|----|----|-----|-----|
| SIB F2S 19 Board<br>95        | 60 | 65 | 78 | 75 | 85  | 80  |
| SIB F2S 19 XF Junction<br>107 | 70 | 75 | 82 | 74 | 105 | 100 |
| SIB F2S 24 Board<br>95        | 60 | 65 | 78 | 75 | 85  | 80  |
| SIB F2S 24 XF Junction<br>107 | 70 | 75 | 82 | 74 | 105 | 100 |
| SIB F2S 25 Board<br>95        | 60 | 65 | 78 | 75 | 85  | 80  |
| SIB F2S 25 XF Junction<br>107 | 70 | 75 | 82 | 74 | 105 | 100 |
| SIB F2S 26 Board<br>95        | 60 | 65 | 78 | 75 | 85  | 80  |
| SIB F2S 26 XF Junction<br>107 | 70 | 75 | 82 | 74 | 105 | 100 |
| SIB F2S 27 Board<br>95        | 60 | 65 | 78 | 75 | 85  | 80  |
| SIB F2S 27 XF Junction<br>107 | 70 | 75 | 82 | 74 | 105 | 100 |

lcc0-re0:

| Shutdown            | Fan speed   |      | Yellow alarm |         | Red alarm   |         | Fire |
|---------------------|-------------|------|--------------|---------|-------------|---------|------|
| (degrees C)         | (degrees C) |      | (degrees C)  |         | (degrees C) |         |      |
| Item                | Normal      | High | Normal       | Bad fan | Normal      | Bad fan |      |
| Normal              |             |      |              |         |             |         |      |
| Chassis default     | 48          | 54   | 65           | 55      | 75          | 65      |      |
| 100                 |             |      |              |         |             |         |      |
| Routing Engine 0    | 55          | 65   | 85           | 85      | 100         | 100     |      |
| 102                 |             |      |              |         |             |         |      |
| FPC 0               | 63          | 68   | 75           | 70      | 90          | 83      |      |
| 95                  |             |      |              |         |             |         |      |
| FPC 1               | 56          | 62   | 75           | 63      | 83          | 76      |      |
| 95                  |             |      |              |         |             |         |      |
| FPC 7               | 56          | 62   | 75           | 63      | 83          | 76      |      |
| 95                  |             |      |              |         |             |         |      |
| SIB 0               | 64          | 70   | 76           | 72      | 87          | 84      |      |
| 95                  |             |      |              |         |             |         |      |
| SIB 0 ASIC Junction | 63          | 68   | 75           | 70      | 105         | 100     |      |
| 107                 |             |      |              |         |             |         |      |
| SIB 2               | 64          | 70   | 76           | 72      | 87          | 84      |      |
| 95                  |             |      |              |         |             |         |      |
| SIB 2 ASIC Junction | 63          | 68   | 75           | 70      | 105         | 100     |      |
| 107                 |             |      |              |         |             |         |      |
| SIB 3               | 64          | 70   | 76           | 72      | 87          | 84      |      |
| 95                  |             |      |              |         |             |         |      |
| SIB 3 ASIC Junction | 63          | 68   | 75           | 70      | 105         | 100     |      |
| 107                 |             |      |              |         |             |         |      |

#### show chassis temperature-thresholds (QFX3500 Switch and QFX3600)

user@switch> show chassis temperature-thresholds

| Item                  | Fan speed   |      | Yellow alarm |         | Red alarm   |         |
|-----------------------|-------------|------|--------------|---------|-------------|---------|
|                       | (degrees C) |      | (degrees C)  |         | (degrees C) |         |
|                       | Normal      | High | Normal       | Bad fan | Normal      | Bad fan |
| Normal                |             |      |              |         |             |         |
| FPC Sensor TopLeft I  | 48          | 56   | 53           | 43      | 56          | 46      |
| FPC Sensor TopRight I | 46          | 54   | 51           | 41      | 54          | 44      |

|                        |    |    |    |    |    |    |
|------------------------|----|----|----|----|----|----|
| FPC Sensor TopLeft E   | 58 | 65 | 62 | 52 | 65 | 55 |
| FPC Sensor TopRight E  | 56 | 64 | 61 | 51 | 64 | 54 |
| FPC Sensor TopMiddle I | 58 | 64 | 61 | 51 | 64 | 54 |
| FPC Sensor TopMiddle E | 67 | 74 | 71 | 61 | 74 | 64 |
| FPC Sensor Bottom I    | 59 | 67 | 64 | 54 | 67 | 57 |
| FPC Sensor Bottom E    | 66 | 73 | 70 | 60 | 73 | 63 |
| FPC Sensor Die Temp    | 69 | 75 | 72 | 62 | 75 | 65 |
| FPC Sensor Mgmt Brd I  | 46 | 54 | 51 | 41 | 54 | 44 |
| FPC Sensor Switch I    | 56 | 63 | 60 | 50 | 63 | 53 |

#### show chassis temperature-thresholds interconnect-device (QFabric System)

```

user@switch> show chassis temperature-thresholds interconnect-device interconnect1
temperature-thresholds interconnect-device interconnect1

```

| Item            | Fan speed |      | Yellow alarm |         | Red alarm |         |
|-----------------|-----------|------|--------------|---------|-----------|---------|
|                 | Normal    | High | Normal       | Bad fan | Normal    | Bad fan |
| Chassis default | 48        | 54   | 65           | 55      | 75        | 65      |

#### show chassis temperature-thresholds (PTX5000 Packet Transport Router)

```

user@switch> show chassis temperature-thresholds
user@switch> show chassis temperature-thresholds

```

| Shutdown<br>(degrees C)<br>Item | Fan speed<br>(degrees C) |      | Yellow alarm<br>(degrees C) |         | Red alarm<br>(degrees C) |         | Fire |
|---------------------------------|--------------------------|------|-----------------------------|---------|--------------------------|---------|------|
|                                 | Normal                   | High | Normal                      | Bad fan | Normal                   | Bad fan |      |
| Routing Engine 0                | 80                       | 90   | 95                          | 85      | 105                      | 95      |      |
| 115                             |                          |      |                             |         |                          |         |      |
| CB 0 Exhaust A                  | 60                       | 65   | 78                          | 75      | 85                       | 80      |      |
| 95                              |                          |      |                             |         |                          |         |      |
| CB 0 Exhaust B                  | 60                       | 65   | 78                          | 75      | 85                       | 80      |      |
| 95                              |                          |      |                             |         |                          |         |      |
| CB 1 Exhaust A                  | 60                       | 65   | 78                          | 75      | 85                       | 80      |      |
| 95                              |                          |      |                             |         |                          |         |      |
| CB 1 Exhaust B                  | 60                       | 65   | 78                          | 75      | 85                       | 80      |      |
| 95                              |                          |      |                             |         |                          |         |      |
| FPC 3 Exhaust A                 | 80                       | 90   | 95                          | 85      | 105                      | 95      |      |
| 115                             |                          |      |                             |         |                          |         |      |
| FPC 3 Exhaust B                 | 80                       | 90   | 95                          | 85      | 105                      | 95      |      |
| 115                             |                          |      |                             |         |                          |         |      |
| FPC 3 TL5                       | 80                       | 90   | 95                          | 85      | 105                      | 95      |      |
| 115                             |                          |      |                             |         |                          |         |      |
| FPC 3 TQ5                       | 80                       | 90   | 95                          | 85      | 105                      | 95      |      |
| 115                             |                          |      |                             |         |                          |         |      |
| FPC 3 TL6                       | 80                       | 90   | 95                          | 85      | 105                      | 95      |      |
| 115                             |                          |      |                             |         |                          |         |      |
| FPC 3 TQ6                       | 80                       | 90   | 95                          | 85      | 105                      | 95      |      |
| 115                             |                          |      |                             |         |                          |         |      |
| FPC 3 TL1                       | 80                       | 90   | 95                          | 85      | 105                      | 95      |      |
| 115                             |                          |      |                             |         |                          |         |      |
| FPC 3 TQ1                       | 80                       | 90   | 95                          | 85      | 105                      | 95      |      |
| 115                             |                          |      |                             |         |                          |         |      |
| FPC 3 TL2                       | 80                       | 90   | 95                          | 85      | 105                      | 95      |      |
| 115                             |                          |      |                             |         |                          |         |      |
| FPC 3 TQ2                       | 80                       | 90   | 95                          | 85      | 105                      | 95      |      |
| 115                             |                          |      |                             |         |                          |         |      |
| FPC 3 TL4                       | 80                       | 90   | 95                          | 85      | 105                      | 95      |      |
| 115                             |                          |      |                             |         |                          |         |      |

|                |    |    |    |    |     |    |
|----------------|----|----|----|----|-----|----|
| FPC 3 TQ4      | 80 | 90 | 95 | 85 | 105 | 95 |
| 115            |    |    |    |    |     |    |
| FPC 3 TL7      | 80 | 90 | 95 | 85 | 105 | 95 |
| 115            |    |    |    |    |     |    |
| FPC 3 TQ7      | 80 | 90 | 95 | 85 | 105 | 95 |
| 115            |    |    |    |    |     |    |
| FPC 3 TL0      | 80 | 90 | 95 | 85 | 105 | 95 |
| 115            |    |    |    |    |     |    |
| FPC 3 TQ0      | 80 | 90 | 95 | 85 | 105 | 95 |
| 115            |    |    |    |    |     |    |
| FPC 3 TL3      | 80 | 90 | 95 | 85 | 105 | 95 |
| 115            |    |    |    |    |     |    |
| FPC 3 TQ3      | 80 | 90 | 95 | 85 | 105 | 95 |
| 115            |    |    |    |    |     |    |
| SIB 0 Exhaust  | 60 | 65 | 78 | 75 | 85  | 80 |
| 95             |    |    |    |    |     |    |
| SIB 0 Junction | 75 | 80 | 90 | 85 | 105 | 95 |
| 115            |    |    |    |    |     |    |
| SIB 1 Exhaust  | 60 | 65 | 78 | 75 | 85  | 80 |
| 95             |    |    |    |    |     |    |
| SIB 1 Junction | 75 | 80 | 90 | 85 | 105 | 95 |
| 115            |    |    |    |    |     |    |
| SIB 2 Exhaust  | 60 | 65 | 78 | 75 | 85  | 80 |
| 95             |    |    |    |    |     |    |
| SIB 2 Junction | 75 | 80 | 90 | 85 | 105 | 95 |
| 115            |    |    |    |    |     |    |
| SIB 3 Exhaust  | 60 | 65 | 78 | 75 | 85  | 80 |
| 95             |    |    |    |    |     |    |
| SIB 3 Junction | 75 | 80 | 90 | 85 | 105 | 95 |
| 115            |    |    |    |    |     |    |
| SIB 4 Exhaust  | 60 | 65 | 78 | 75 | 85  | 80 |
| 95             |    |    |    |    |     |    |
| SIB 4 Junction | 75 | 80 | 90 | 85 | 105 | 95 |
| 115            |    |    |    |    |     |    |
| SIB 5 Exhaust  | 60 | 65 | 78 | 75 | 85  | 80 |
| 95             |    |    |    |    |     |    |
| SIB 5 Junction | 75 | 80 | 90 | 85 | 105 | 95 |
| 115            |    |    |    |    |     |    |
| SIB 6 Exhaust  | 60 | 65 | 78 | 75 | 85  | 80 |
| 95             |    |    |    |    |     |    |
| SIB 6 Junction | 75 | 80 | 90 | 85 | 105 | 95 |
| 115            |    |    |    |    |     |    |
| SIB 7 Exhaust  | 60 | 65 | 78 | 75 | 85  | 80 |
| 95             |    |    |    |    |     |    |
| SIB 7 Junction | 75 | 80 | 90 | 85 | 105 | 95 |
| 115            |    |    |    |    |     |    |
| SIB 8 Exhaust  | 60 | 65 | 78 | 75 | 85  | 80 |
| 95             |    |    |    |    |     |    |
| SIB 8 Junction | 75 | 80 | 90 | 85 | 105 | 95 |
| 115            |    |    |    |    |     |    |

### show chassis temperature-thresholds (MX Routers with Media Services Blade [MSB])

```

user@switch> show chassis temperature-thresholds
Fan speed Yellow alarm Red alarm Fire Shutdown
(degrees C) (degrees C) (degrees C) (degrees C)
Item Normal High Normal Bad fan Normal Bad fan
Normal

```

|                  |    |    |    |    |     |     |
|------------------|----|----|----|----|-----|-----|
| Chassis default  | 48 | 54 | 65 | 55 | 75  | 65  |
| 100              |    |    |    |    |     |     |
| Routing Engine 0 | 70 | 80 | 95 | 95 | 110 | 110 |
| 112              |    |    |    |    |     |     |
| Routing Engine 1 | 70 | 80 | 95 | 95 | 110 | 110 |
| 112              |    |    |    |    |     |     |
| FPC 0            | 55 | 60 | 75 | 65 | 90  | 80  |
| 95               |    |    |    |    |     |     |
| FPC 1            | 55 | 60 | 75 | 65 | 90  | 80  |
| 95               |    |    |    |    |     |     |
| FPC 2            | 55 | 60 | 75 | 65 | 90  | 80  |
| 95               |    |    |    |    |     |     |
| FPC 4            | 55 | 60 | 75 | 65 | 90  | 80  |
| 95               |    |    |    |    |     |     |
| FPC 5            | 55 | 60 | 75 | 65 | 90  | 80  |
| 95               |    |    |    |    |     |     |

## show chassis zones

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>           | <a href="#">Syntax on page 1023</a><br><a href="#">Syntax (QFX Series) on page 1023</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Syntax</b>                   | show chassis zones<br><detail>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Syntax (QFX Series)</b>      | show chassis zones<br><detail><br><interconnect-device <i>name</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Release Information</b>      | <p>Command introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Description</b>              | <p>(QFabric systems only) Display the status of the two cooling system zones on the Interconnect device. Zone 1 consists of eight (0 – 7) front cards, which are cooled by two fan trays. Zone 2 consists of two control boards and eight rear cards, which are cooled by eight (0 – 7) fan trays. On MX2010 and MX2020 routers, display the status of the cooling system zones of the chassis. Zone 0 consists of the Control Board, ten (0–9) FPCs, and their respective PICs, Switch Fabric Boards, and Adapter Cards. Zone 1 consists of the Routing Engine, Control Board, and Switch Processor Mezzanine Boards.</p>                                                                                                                 |
| <b>Options</b>                  | <p><b>detail</b>—(MX2010 and MX2020 routers only) (Optional) Display detailed status of the cooling system zones.</p> <p><b>detail <i>device-name</i></b>— (QFabric systems only) (Optional) Display detailed status of the two cooling systems on the Interconnect device.</p> <p><b>interconnect-device <i>name</i></b>— (QFabric systems only) (Optional) Display the status of the cooling zones on the Interconnect device.</p>                                                                                                                                                                                                                                                                                                       |
| <b>Required Privilege Level</b> | view                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">request chassis beacon on page 451</a></li> <li>• <a href="#">show chassis fan on page 696</a></li> <li>• <a href="#">show chassis temperature-thresholds on page 1004</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>List of Sample Output</b>    | <a href="#">show chassis zones interconnect-device (QFabric System) on page 1024</a><br><a href="#">show chassis zones (MX2010 Router) on page 1024</a><br><a href="#">show chassis zones detail (MX2010 Router) on page 1025</a><br><a href="#">show chassis zones (MX2020 Router) on page 1026</a><br><a href="#">show chassis zones detail (MX2020 Router) on page 1026</a><br><a href="#">show chassis beacon interconnect-device (QFabric System) on page 1027</a><br><a href="#">show chassis beacon interconnect-device fpc (QFabric System) on page 1028</a><br><a href="#">show chassis beacon node-device (QFabric System) on page 1028</a><br><a href="#">show chassis beacon node-device fpc (QFabric System) on page 1028</a> |

**Output Fields** Table 47 on page 590 lists the output fields for the **show chassis zones** command. Output fields are listed in the approximate order in which they appear.

**Table 64: show chassis zones Output Fields**

| Field Name                                                                     | Field Description                                                                                                                                                                                                                          |
|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Slot                                                                           | FPC slot number of the device whose content is being displayed. On QFX3500 standalone switches, the number is always 0.                                                                                                                    |
| Beacon State                                                                   | Status of the beacon state: <ul style="list-style-type: none"> <li>Off—The beacon is <b>OFF</b>.</li> <li>On—The beacon is <b>ON</b>.</li> </ul>                                                                                           |
| show chassis zones command output fields for MX2020 and MX2010 routers:        |                                                                                                                                                                                                                                            |
| Driving FRU                                                                    | Field replaceable unit (FRU).                                                                                                                                                                                                              |
| Temperature                                                                    | Temperature of the specified FRU in degrees Celsius and degrees Fahrenheit.                                                                                                                                                                |
| Condition                                                                      | Condition of the specified FRU. Condition can be <b>HIGH TEMP</b> , <b>WARM TEMP</b> , <b>OK</b> , and <b>Offline</b> .                                                                                                                    |
| Num Fans Missing                                                               | Number of fans or fan trays missing.                                                                                                                                                                                                       |
| Num Fans Failed                                                                | Number of fans or fan trays that have failed.                                                                                                                                                                                              |
| Fan Duty Cycle                                                                 | Fan duty cycle value.                                                                                                                                                                                                                      |
| show chassis zones detail command output fields for MX2020 and MX2010 routers: |                                                                                                                                                                                                                                            |
| Item                                                                           | Chassis component: <ul style="list-style-type: none"> <li>Information about the chassis, Routing Engines, Control Boards (CBs), Switch Fabric Boards (SFBs), PICs, Flexible PIC Concentrators (FPCs), and Adapter Cards (ADCs).</li> </ul> |
| Measurement                                                                    | Fan tray speed utilization in percentage.                                                                                                                                                                                                  |
| Status                                                                         | Status of the specified item. Status can be <b>OK</b> , <b>Absent</b> , or <b>Offline</b> .                                                                                                                                                |

## Sample Output

### show chassis zones interconnect-device (QFabric System)

```

user@switch> show chassis zones interconnect-device interconnect1
Slot Beacon State
FPC 0 OFF

```

### show chassis zones (MX2010 Router)

```

user@host> show chassis zones

```



```

ZONE 0 Status
 Driving FRU FPC 6
 Temperature 81 degrees C / 177 degrees F
 Condition HIGH TEMP
 Num Fans Missing 0
 Num Fans Failed 0
 Fan Duty Cycle 30

ZONE 1 Status
 Driving FRU SFB 0 Exhaust-Zone1
 Temperature 71 degrees C / 159 degrees F
 Condition WARM TEMP
 Num Fans Missing 0
 Num Fans Failed 0
 Fan Duty Cycle 30

```

#### show chassis zones detail (MX2010 Router)

```

user@host > show chassis zones
ZONE 0 Status
Item Status Measurement
CB 0 WARM TEMP
CB 1 WARM TEMP
FPC 0 HIGH TEMP
FPC 1 HIGH TEMP
FPC 2 WARM TEMP
FPC 3 HIGH TEMP
FPC 4 HIGH TEMP
FPC 5 HIGH TEMP
FPC 6 HIGH TEMP
FPC 7 HIGH TEMP
FPC 8 HIGH TEMP
FPC 9 HIGH TEMP
ADC 0 WARM TEMP
ADC 1 WARM TEMP
ADC 2 WARM TEMP
ADC 3 WARM TEMP
ADC 4 WARM TEMP
ADC 5 WARM TEMP
ADC 6 WARM TEMP
ADC 7 WARM TEMP
ADC 8 WARM TEMP
ADC 9 WARM TEMP
SFB 0 WARM TEMP
SFB 1 WARM TEMP
SFB 2 WARM TEMP
SFB 3 Offline
SFB 4 HIGH TEMP
SFB 5 WARM TEMP
SFB 6 HIGH TEMP
SFB 7 WARM TEMP
Fan Tray 0 OK Spinning at 98% fan tray speed
Fan Tray 1 OK Spinning at 98% fan tray speed

ZONE 1 Status
Item Status Measurement
CB 0 WARM TEMP
CB 1 WARM TEMP
Routing Engine 0 OK
Routing Engine 1 OK
SFB 0 WARM TEMP

```

|            |           |                                |
|------------|-----------|--------------------------------|
| SFB 1      | WARM TEMP |                                |
| SFB 2      | WARM TEMP |                                |
| SFB 3      | Offline   |                                |
| SFB 4      | HIGH TEMP |                                |
| SFB 5      | WARM TEMP |                                |
| SFB 6      | HIGH TEMP |                                |
| SFB 7      | WARM TEMP |                                |
| SPMB 0     | OK        |                                |
| SPMB 1     | OK        |                                |
| Fan Tray 2 | OK        | Spinning at 64% fan tray speed |
| Fan Tray 3 | OK        | Spinning at 64% fan tray speed |

### show chassis zones (MX2020 Router)

```

user@host> show chassis zones
ZONE 0 Status
 Driving FRU FPC 0
 Temperature 31 degrees C / 87 degrees F
 Condition OK
 Num Fans Missing 0
 Num Fans Failed 0
 Fan Duty Cycle 30

ZONE 1 Status
 Driving FRU FPC 19
 Temperature 32 degrees C / 89 degrees F
 Condition OK
 Num Fans Missing 0
 Num Fans Failed 0
 Fan Duty Cycle 30

```

### show chassis zones detail (MX2020 Router)

```

user@host> show chassis zones detail
ZONE 0 Status
Item Status Measurement
CB 0 OK
CB 1 OK
FPC 0 OK
FPC 1 OK
FPC 2 OK
FPC 3 OK
FPC 4 OK
FPC 5 OK
FPC 6 OK
FPC 7 OK
FPC 8 OK
FPC 9 OK
ADC 0 OK
ADC 1 OK
ADC 2 OK
ADC 3 OK
ADC 4 OK
ADC 5 OK
ADC 6 OK
ADC 7 OK
ADC 8 OK
ADC 9 OK
SFB 0 OK
SFB 1 OK
SFB 2 OK

```

|            |    |                                |
|------------|----|--------------------------------|
| SFB 3      | OK |                                |
| SFB 4      | OK |                                |
| SFB 5      | OK |                                |
| SFB 6      | OK |                                |
| SFB 7      | OK |                                |
| Fan Tray 0 | OK | Spinning at 38% fan tray speed |
| Fan Tray 1 | OK | Spinning at 37% fan tray speed |

## ZONE 1 Status

| Item             | Status | Measurement                    |
|------------------|--------|--------------------------------|
| CB 0             | OK     |                                |
| CB 1             | OK     |                                |
| Routing Engine 0 | OK     |                                |
| Routing Engine 1 | OK     |                                |
| FPC 10           | OK     |                                |
| FPC 11           | OK     |                                |
| FPC 12           | OK     |                                |
| FPC 13           | OK     |                                |
| FPC 14           | OK     |                                |
| FPC 15           | OK     |                                |
| FPC 16           | OK     |                                |
| FPC 17           | OK     |                                |
| FPC 18           | OK     |                                |
| FPC 19           | OK     |                                |
| ADC 10           | OK     |                                |
| ADC 11           | OK     |                                |
| ADC 12           | OK     |                                |
| ADC 13           | OK     |                                |
| ADC 14           | OK     |                                |
| ADC 15           | OK     |                                |
| ADC 16           | OK     |                                |
| ADC 17           | OK     |                                |
| ADC 18           | OK     |                                |
| ADC 19           | OK     |                                |
| SFB 0            | OK     |                                |
| SFB 1            | OK     |                                |
| SFB 2            | OK     |                                |
| SFB 3            | OK     |                                |
| SFB 4            | OK     |                                |
| SFB 5            | OK     |                                |
| SFB 6            | OK     |                                |
| SFB 7            | OK     |                                |
| SPMB 0           | OK     |                                |
| SPMB 1           | OK     |                                |
| Fan Tray 2       | OK     | Spinning at 38% fan tray speed |
| Fan Tray 3       | OK     | Spinning at 38% fan tray speed |

## show chassis beacon interconnect-device (QFabric System)

```

user@switch> show chassis beacon interconnect-device interconnect1
Chassis OFF
CB 0 OFF
CB 1 OFF
FC 0 FPC 0 OFF
FC 1 FPC 1 OFF
RC 0 FPC 8 OFF
RC 1 FPC 9 OFF

```

### show chassis beacon interconnect-device fpc (QFabric System)

```
user@switch> show chassis beacon interconnect-device interconnect1 fpc 0
FPC 0 ON
```

### show chassis beacon node-device (QFabric System)

```
user@switch> show chassis beacon node-device node1
node1 ON
```

### show chassis beacon node-device fpc (QFabric System)

```
user@switch> show chassis beacon node-device node1 fpc 0
FPC 0 ON
```

---

## show host

---

|                                 |                                                                                                                                                                                                                                                                    |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>show host <i>hostname</i></code>                                                                                                                                                                                                                             |
| <b>Release Information</b>      | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>              | Display Domain Name System (DNS) hostname information.                                                                                                                                                                                                             |
| <b>Options</b>                  | <i>hostname</i> —Hostname or address.                                                                                                                                                                                                                              |
| <b>Additional Information</b>   | The <code>show host</code> command displays the raw data received from the DNS server.                                                                                                                                                                             |
| <b>Required Privilege Level</b> | view                                                                                                                                                                                                                                                               |
| <b>List of Sample Output</b>    | <a href="#">show host on page 1029</a>                                                                                                                                                                                                                             |

### Sample Output

#### show host

```
user@host> show host snark
snark.boojum.net has address 192.168.1.254

user@host> show host 192.168.1.254
Name: snark.boojum.net
Address: 192.168.1.254
Aliases:
```

## show log

|                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                     | <a href="#">Syntax on page 1030</a><br><a href="#">Syntax (QFX Series and OCX Series) on page 1030</a><br><a href="#">Syntax (TX Matrix Routers) on page 1030</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Syntax</b>                             | <pre>show log &lt;filename   user &lt;username&gt;&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Syntax (QFX Series and OCX Series)</b> | <pre>show log filename &lt;device-type (device-id   device-alias)&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Syntax (TX Matrix Routers)</b>         | <pre>show log &lt;all-lcc   lcc number   scc&gt; &lt;filename   user &lt;username&gt;&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Release Information</b>                | <p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Option <i>device-type (device-id   device-alias)</i> is introduced in Junos OS Release 13.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Description</b>                        | List log files, display log file contents, or display information about users who have logged in to the router or switch.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Options</b>                            | <p><b>none</b>—List all log files.</p> <p><b>&lt;all-lcc   lcc number   scc&gt;</b>—(TX Matrix routers only) (Optional) Display logging information about all T640 routers (or line-card chassis) or a specific T640 router (replace <i>number</i> with a value from 0 through 3) connected to a TX Matrix router. Or, display logging information about the TX Matrix router (or switch-card chassis).</p> <p><b>device-type</b>—(QFabric system only) (Optional) Display log messages for only one of the following device types:</p> <ul style="list-style-type: none"> <li>• <b>director-device</b>—Display logs for Director devices.</li> <li>• <b>infrastructure-device</b>—Display logs for the logical components of the QFabric system infrastructure, including the diagnostic Routing Engine, fabric control Routing Engine, fabric manager Routing Engine, and the default network Node group and its backup (NW-NG-0 and NW-NG-0-backup).</li> <li>• <b>interconnect-device</b>—Display logs for Interconnect devices.</li> <li>• <b>node-device</b>—Display logs for Node devices.</li> </ul> |



**NOTE:** If you specify the **device-type** optional parameter, you must also specify either the **device-id** or **device-alias** optional parameter.

**(device-id | device-alias)**—If a device type is specified, display logs for a device of that type. Specify either the device ID or the device alias (if configured).

**filename**—(Optional) Display the log messages in the specified log file. For the routing matrix, the filename must include the chassis information.



**NOTE:** The *filename* parameter is mandatory for the QFabric system. If you did not configure a syslog filename, specify the default filename of messages.

**user <username>**—(Optional) Display logging information about users who have recently logged in to the router or switch. If you include *username*, display logging information about the specified user.

**Required Privilege Level** trace

**List of Sample Output** [show log on page 1031](#)  
[show log filename on page 1031](#)  
[show log filename \(QFabric System\) on page 1032](#)  
[show log user on page 1032](#)

## Sample Output

### show log

```
user@host> show log
total 57518
-rw-r--r-- 1 root bin 211663 Oct 1 19:44 dcd
-rw-r--r-- 1 root bin 999947 Oct 1 19:41 dcd.0
-rw-r--r-- 1 root bin 999994 Oct 1 17:48 dcd.1
-rw-r--r-- 1 root bin 238815 Oct 1 19:44 rpd
-rw-r--r-- 1 root bin 1049098 Oct 1 18:00 rpd.0
-rw-r--r-- 1 root bin 1061095 Oct 1 12:13 rpd.1
-rw-r--r-- 1 root bin 1052026 Oct 1 06:08 rpd.2
-rw-r--r-- 1 root bin 1056309 Sep 30 18:21 rpd.3
-rw-r--r-- 1 root bin 1056371 Sep 30 14:36 rpd.4
-rw-r--r-- 1 root bin 1056301 Sep 30 10:50 rpd.5
-rw-r--r-- 1 root bin 1056350 Sep 30 07:04 rpd.6
-rw-r--r-- 1 root bin 1048876 Sep 30 03:21 rpd.7
-rw-rw-r-- 1 root bin 19656 Oct 1 19:37 wtmp
```

### show log filename

```
user@host> show log rpd
Oct 1 18:00:18 trace_on: Tracing to ?/var/log/rpd? started
Oct 1 18:00:18 EVENT <MTU> ds-5/2/0.0 index 24 <Broadcast PointToPoint Multicast
Oct 1 18:00:18
Oct 1 18:00:19 KRT rcv len 56 V9 seq 148 op add Type route/if af 2 addr
13.13.13.21 nhop type local nhop 13.13.13.21
Oct 1 18:00:19 KRT rcv len 56 V9 seq 149 op add Type route/if af 2 addr
13.13.13.22 nhop type unicast nhop 13.13.13.22
Oct 1 18:00:19 KRT rcv len 48 V9 seq 150 op add Type ifaddr index 24 devindex
43
Oct 1 18:00:19 KRT rcv len 144 V9 seq 151 op chnge Type ifdev devindex 44
```

```

Oct 1 18:00:19 KRT recv len 144 V9 seq 152 op chnge Type ifdev devindex 45
Oct 1 18:00:19 KRT recv len 144 V9 seq 153 op chnge Type ifdev devindex 46
Oct 1 18:00:19 KRT recv len 1272 V9 seq 154 op chnge Type ifdev devindex 47
...

```

### show log filename (QFabric System)

```

user@qfabric> show log messages
Mar 28 18:00:06 qfabric chassisd: QFABRIC_INTERNAL_SYSLOG: Mar 28 18:00:06 ED1486
 chassisd: CHASSISD_SNMP_TRAP10: SNMP trap generated: FRU power on
(jnxFruContentsIndex 8, jnxFruL1Index 1, jnxFruL2Index 1, jnxFruL3Index 0,
jnxFruName PIC: 48x 10G-SFP+ @ 0/0/*, jnxFruType 11, jnxFruSlot 0,
jnxFruOfflineReason 2, jnxFruLastPowerOff 0, jnxFruLastPowerOn 2159)
Mar 28 18:00:07 qfabric chassisd: QFABRIC_INTERNAL_SYSLOG: Mar 28 18:00:07 ED1486
 chassisd: CHASSISD_SNMP_TRAP10: SNMP trap generated: FRU power on
(jnxFruContentsIndex 8, jnxFruL1Index 1, jnxFruL2Index 2, jnxFruL3Index 0,
jnxFruName PIC: @ 0/1/*, jnxFruType 11, jnxFruSlot 0, jnxFruOfflineReason 2,
jnxFruLastPowerOff 0, jnxFruLastPowerOn 2191)
Mar 28 18:00:07 qfabric chassisd: QFABRIC_INTERNAL_SYSLOG: Mar 28 18:00:07 ED1492
 chassisd: CHASSISD_SNMP_TRAP10: SNMP trap generated: FRU power on
(jnxFruContentsIndex 8, jnxFruL1Index 1, jnxFruL2Index 1, jnxFruL3Index 0,
jnxFruName PIC: 48x 10G-SFP+ @ 0/0/*, jnxFruType 11, jnxFruSlot 0,
jnxFruOfflineReason 2, jnxFruLastPowerOff 0, jnxFruLastPowerOn 242726)
Mar 28 18:00:07 qfabric chassisd: QFABRIC_INTERNAL_SYSLOG: Mar 28 18:00:07 ED1492
 chassisd: CHASSISD_SNMP_TRAP10: SNMP trap generated: FRU power on
(jnxFruContentsIndex 8, jnxFruL1Index 1, jnxFruL2Index 2, jnxFruL3Index 0,
jnxFruName PIC: @ 0/1/*, jnxFruType 11, jnxFruSlot 0, jnxFruOfflineReason 2,
jnxFruLastPowerOff 0, jnxFruLastPowerOn 242757)
Mar 28 18:00:16 qfabric file: QFABRIC_INTERNAL_SYSLOG: Mar 28 18:00:16 ED1486
file: UI_COMMIT: User 'root' requested 'commit' operation (comment: none)
Mar 28 18:00:27 qfabric file: QFABRIC_INTERNAL_SYSLOG: Mar 28 18:00:27 ED1486
file: UI_COMMIT: User 'root' requested 'commit' operation (comment: none)
Mar 28 18:00:50 qfabric file: QFABRIC_INTERNAL_SYSLOG: Mar 28 18:00:50
_DCF_default__NW-INE-0_REO_ file: UI_COMMIT: User 'root' requested 'commit'
operation (comment: none)
Mar 28 18:00:50 qfabric file: QFABRIC_INTERNAL_SYSLOG: Mar 28 18:00:50
_DCF_default__NW-INE-0_REO_ file: UI_COMMIT: User 'root' requested 'commit'
operation (comment: none)
Mar 28 18:00:55 qfabric file: QFABRIC_INTERNAL_SYSLOG: Mar 28 18:00:55 ED1492
file: UI_COMMIT: User 'root' requested 'commit' operation (comment: none)
Mar 28 18:01:10 qfabric file: QFABRIC_INTERNAL_SYSLOG: Mar 28 18:01:10 ED1492
file: UI_COMMIT: User 'root' requested 'commit' operation (comment: none)
Mar 28 18:02:37 qfabric chassisd: QFABRIC_INTERNAL_SYSLOG: Mar 28 18:02:37 ED1491
 chassisd: CHASSISD_SNMP_TRAP10: SNMP trap generated: FRU power on
(jnxFruContentsIndex 8, jnxFruL1Index 1, jnxFruL2Index 1, jnxFruL3Index 0,
jnxFruName PIC: 48x 10G-SFP+ @ 0/0/*, jnxFruType 11, jnxFruSlot 0,
jnxFruOfflineReason 2, jnxFruLastPowerOff 0, jnxFruLastPowerOn 33809)

```

### show log user

```

user@host> show log user
darius mg2546 Thu Oct 1 19:37 still logged in
darius mg2529 Thu Oct 1 19:08 - 19:36 (00:28)
darius mg2518 Thu Oct 1 18:53 - 18:58 (00:04)
root mg1575 Wed Sep 30 18:39 - 18:41 (00:02)
root ttyp2 jun.site.per Wed Sep 30 18:39 - 18:41 (00:02)
alex ttyp1 192.168.1.2 Wed Sep 30 01:03 - 01:22 (00:19)

```



## show subscribers

**Syntax** show subscribers  
 <detail | extensive | terse>  
 <aci-interface-set-name *aci-interface-set-name*>  
 <address *address*>  
 <agent-circuit-identifier *agent-circuit-identifier-substring*>  
 <client-type *client-type*>  
 <count>  
 <id>  
 <interface *interface*>  
 <logical-system *logical-system*>  
 <mac-address *mac-address*>  
 <physical-interface *physical-interface-name*>  
 <profile-name *profile-name*>  
 <routing-instance *routing-instance*>  
 <stacked-vlan-id *stacked-vlan-id*>  
 <subscriber-state *subscriber-state*>  
 <user-name *user-name*>  
 <vci *vci-identifier*>  
 <vpi *vpi-identifier*>  
 <vlan-id *vlan-id*>

**Release Information** Command introduced in Junos OS Release 9.3.  
 Command introduced in Junos OS Release 9.3 for EX Series switches.  
**client-type**, **mac-address**, **subscriber-state**, and **extensive** options introduced in Junos OS Release 10.2.  
**count** option usage with other options introduced in Junos OS Release 10.2.  
 Command introduced in Junos OS Release 11.1 for the QFX Series.  
 Options **aci-interface-set-name** and **agent-circuit-identifier** introduced in Junos OS Release 12.2.  
 The **physical-interface** and **user-name** options introduced in Junos OS Release 12.3.  
 Options **vci** and **vpi** introduced in Junos OS Release 12.3R3 and supported in later 12.3Rx releases.  
 Options **vci** and **vpi** supported in Junos OS Release 13.2 and later releases. (Not supported in Junos OS Release 13.1.)  
 Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

**Description** Display information for active subscribers.

**Options** **detail | extensive | terse**—(Optional) Display the specified level of output.

**aci-interface-set-name**—(Optional) Display all dynamic subscriber sessions that use the specified agent circuit identifier (ACI) interface set. Use the ACI interface set name generated by the router, such as aci-1003-ge-1/0/0.4001, and not the actual ACI value found in the DHCP or PPPoE control packets.

**address**—(Optional) Display subscribers whose IP address matches the specified address. You must specify the IPv4 or IPv6 address prefix without a netmask (for example, 192.168.17.1). If you specify the IP address as a prefix with a netmask (for example,

192.168.17.1/32), the router displays a message that the IP address is invalid, and rejects the command.

**agent-circuit-identifier-substring**—(Optional) Display all dynamic subscriber sessions whose ACI value matches the specified substring.

**client-type**—(Optional) Display subscribers whose client type matches the specified client type (DHCP, L2TP, PPP, PPPOE, VLAN, or static).

**count**—(Optional) Display the count of total subscribers and active subscribers for any specified option. You can use the **count** option alone or with the **address**, **client-type**, **interface**, **logical-system**, **mac-address**, **profile-name**, **routing-instance**, **stacked-vlan-id**, **subscriber-state**, or **vlan-id** options.

**id**—(Optional) Display a specific subscriber session whose session id matches the specified subscriber ID. You can display subscriber IDs by using the **show subscribers extensive** or the **show subscribers interface extensive** commands.

**interface**—(Optional) Display subscribers whose interface matches the specified interface.

**logical-system**—(Optional) Display subscribers whose logical system matches the specified logical system.

**mac-address**—(Optional) Display subscribers whose MAC address matches the specified MAC address.

**physical-interface-name**—(M120, M320, and MX Series routers only) (Optional) Display subscribers whose physical interface matches the specified physical interface.

**profile-name**—(Optional) Display subscribers whose dynamic profile matches the specified profile name.

**routing-instance**—(Optional) Display subscribers whose routing instance matches the specified routing instance.

**stacked-vlan-id**—(Optional) Display subscribers whose stacked VLAN ID matches the specified stacked VLAN ID.

**subscriber-state**—(Optional) Display subscribers whose subscriber state matches the specified subscriber state (ACTIVE, CONFIGURED, INIT, TERMINATED, or TERMINATING).

**user-name**—(M120, M320, and MX Series routers only) (Optional) Display subscribers whose username matches the specified subscriber name.

**vci-identifier**—(MX Series routers with MPCs and ATM MICs with SFP only) (Optional) Display active ATM subscribers whose ATM virtual circuit identifier (VCI) matches the specified VCI identifier. The range of values is **0** through **255**.

**vpi-identifier**—(MX Series routers with MPCs and ATM MICs with SFP only) (Optional) Display active ATM subscribers whose ATM virtual path identifier (VPI) matches the specified VPI identifier. The range of values is **0** through **65535**.

**vlan-id**—(Optional) Display subscribers whose VLAN ID matches the specified VLAN ID, regardless of whether the subscriber uses a single-tagged or double-tagged VLAN. For subscribers using a double-tagged VLAN, this option displays subscribers where the inner VLAN tag matches the specified VLAN ID. To display only subscribers where the specified value matches only double-tagged VLANs, use the **stacked-vlan-id** option to match the outer VLAN tag.



**NOTE:** Due to display limitations, logical system and routing instance output values are truncated when necessary.

**Required Privilege Level** view

**Related Documentation**

- [show subscribers summary](#)
- [Verifying and Managing Agent Circuit Identifier-Based Dynamic VLAN Configuration](#)

**List of Sample Output**

- [show subscribers \(IPv4\) on page 1039](#)
- [show subscribers \(IPv6\) on page 1039](#)
- [show subscribers \(IPv4 and IPv6 Dual Stack\) on page 1039](#)
- [show subscribers \(LNS on MX Series Routers\) on page 1040](#)
- [show subscribers \(L2TP Switched Tunnels\) on page 1040](#)
- [show subscribers client-type dhcp detail on page 1040](#)
- [show subscribers count on page 1040](#)
- [show subscribers address detail \(IPv6\) on page 1041](#)
- [show subscribers detail \(IPv4\) on page 1041](#)
- [show subscribers detail \(IPv6\) on page 1041](#)
- [show subscribers detail \(IPv6 Static Demux Interface\) on page 1042](#)
- [show subscribers detail \(L2TP LNS Subscribers on MX Series Routers\) on page 1042](#)
- [show subscribers detail \(L2TP Switched Tunnels\) on page 1042](#)
- [show subscribers detail \(Tunneled Subscriber\) on page 1043](#)
- [show subscribers detail \(IPv4 and IPv6 Dual Stack\) on page 1043](#)
- [show subscribers detail \(ACI Interface Set Session\) on page 1044](#)
- [show subscribers detail \(PPPoE Subscriber Session with ACI Interface Set\) on page 1044](#)
- [show subscribers extensive on page 1044](#)
- [show subscribers extensive \(RPF Check Fail Filter\) on page 1045](#)
- [show subscribers extensive \(L2TP LNS Subscribers on MX Series Routers\) on page 1045](#)
- [show subscribers extensive \(IPv4 and IPv6 Dual Stack\) on page 1045](#)
- [show subscribers extensive \(Effective Shaping-Rate\) on page 1046](#)
- [show subscribers aci-interface-set-name detail \(Subscriber Sessions Using Specified ACI Interface Set\) on page 1047](#)
- [show subscribers agent-circuit-identifier detail \(Subscriber Sessions Using Specified ACI Substring\) on page 1047](#)
- [show subscribers interface extensive on page 1048](#)
- [show subscribers logical-system terse on page 1048](#)
- [show subscribers physical-interface count on page 1049](#)
- [show subscribers routing-instance inst1 count on page 1049](#)

[show subscribers stacked-vlan-id detail on page 1049](#)

[show subscribers stacked-vlan-id vlan-id detail \(Combined Output\) on page 1049](#)

[show subscribers stacked-vlan-id vlan-id interface detail \(Combined Output for a Specific Interface\) on page 1049](#)

[show subscribers user-name detail on page 1049](#)

[show subscribers vlan-id on page 1050](#)

[show subscribers vlan-id detail on page 1050](#)

[show subscribers vpi vci extensive \(PPPoE-over-ATM Subscriber Session\) on page 1050](#)

**Output Fields** [Table 65 on page 1036](#) lists the output fields for the **show subscribers** command. Output fields are listed in the approximate order in which they appear.

**Table 65: show subscribers Output Fields**

| Field Name                    | Field Description                                                                                                                                                                                                                                   |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Interface</b>              | Interface associated with the subscriber. The router or switch displays subscribers whose interface matches or begins with the specified interface.<br><br>The * character indicates a continuation of addresses for the same session.              |
| <b>IP Address/VLAN ID</b>     | Subscriber IP address or VLAN ID associated with the subscriber in the form <i>tpid.vlan-id</i><br><br>No IP address or VLAN ID is assigned to an L2TP tunnel-switched session. For these subscriber sessions the value is <b>Tunnel-switched</b> . |
| <b>User Name</b>              | Name of subscriber.                                                                                                                                                                                                                                 |
| <b>LS:RI</b>                  | Logical system and routing instance associated with the subscriber.                                                                                                                                                                                 |
| <b>Type</b>                   | Subscriber client type (DHCP, L2TP, PPP, PPPoE, STATIC-INTERFACE, VLAN).                                                                                                                                                                            |
| <b>IP Address</b>             | Subscriber IPv4 address.                                                                                                                                                                                                                            |
| <b>IP Netmask</b>             | Subscriber IP netmask.                                                                                                                                                                                                                              |
| <b>Primary DNS Address</b>    | IP address of primary DNS server.                                                                                                                                                                                                                   |
| <b>Secondary DNS Address</b>  | IP address of secondary DNS server.                                                                                                                                                                                                                 |
| <b>Primary WINS Address</b>   | IP address of primary WINS server.                                                                                                                                                                                                                  |
| <b>Secondary WINS Address</b> | IP address of secondary WINS server.                                                                                                                                                                                                                |
| <b>IPv6 Address</b>           | Subscriber IPv6 address, or multiple addresses.                                                                                                                                                                                                     |
| <b>IPv6 Prefix</b>            | Subscriber IPv6 prefix. If you are using DHCPv6 prefix delegation, this is the delegated prefix.                                                                                                                                                    |
| <b>IPv6 User Prefix</b>       | IPv6 prefix obtained through ND/RA.                                                                                                                                                                                                                 |
| <b>IPv6 Address Pool</b>      | Subscriber IPv6 address pool. The IPv6 address pool is used to allocate IPv6 prefixes to the DHCPv6 clients.                                                                                                                                        |

Table 65: show subscribers Output Fields (*continued*)

| Field Name                 | Field Description                                                                                                                                                                                                                                                                   |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IPv6 Network Prefix Length | Length of the network portion of the IPv6 address.                                                                                                                                                                                                                                  |
| IPv6 Prefix Length         | Length of the subscriber IPv6 prefix.                                                                                                                                                                                                                                               |
| Logical System             | Logical system associated with the subscriber.                                                                                                                                                                                                                                      |
| Routing Instance           | Routing instance associated with the subscriber.                                                                                                                                                                                                                                    |
| Interface Type             | Whether the subscriber interface is <b>Static</b> or <b>Dynamic</b> .                                                                                                                                                                                                               |
| Interface Set              | Internally generated name of the dynamic ACI interface set used by the subscriber session.                                                                                                                                                                                          |
| Interface Set Type         | Interface type of the ACI interface set: <b>Dynamic</b> . This is the only ACI interface set type currently supported.                                                                                                                                                              |
| Interface Set Session ID   | Identifier of the dynamic ACI interface set entry in the session database.                                                                                                                                                                                                          |
| Underlying Interface       | Name of the underlying interface for the subscriber session.                                                                                                                                                                                                                        |
| Dynamic Profile Name       | Dynamic profile used for the subscriber.                                                                                                                                                                                                                                            |
| Dynamic Profile Version    | Version number of the dynamic profile used for the subscriber.                                                                                                                                                                                                                      |
| MAC Address                | MAC address associated with the subscriber.                                                                                                                                                                                                                                         |
| State                      | Current state of the subscriber session ( <b>Init</b> , <b>Configured</b> , <b>Active</b> , <b>Terminating</b> , <b>Tunneled</b> ).                                                                                                                                                 |
| L2TP State                 | Current state of the L2TP session, <b>Tunneled</b> or <b>Tunnel-switched</b> . When the value is <b>Tunnel-switched</b> , two entries are displayed for the subscriber; the first entry is at the LNS interface on the LTS and the second entry is at the LAC interface on the LTS. |
| Tunnel switch Profile Name | Name of the L2TP tunnel switch profile that initiates tunnel switching.                                                                                                                                                                                                             |
| Local IP Address           | IP address of the local gateway (LAC).                                                                                                                                                                                                                                              |
| Remote IP Address          | IP address of the remote peer (LNS).                                                                                                                                                                                                                                                |
| VLAN Id                    | VLAN ID associated with the subscriber in the form <i>tpid.vlan-id</i> .                                                                                                                                                                                                            |
| Stacked VLAN Id            | Stacked VLAN ID associated with the subscriber in the form <i>tpid.vlan-id</i> .                                                                                                                                                                                                    |
| RADIUS Accounting ID       | RADIUS accounting ID associated with the subscriber.                                                                                                                                                                                                                                |
| Agent Circuit ID           | Option 82 agent circuit ID associated with the subscriber. The ID is displayed as an ASCII string unless the value has nonprintable characters, in which case it is displayed in hexadecimal format.                                                                                |

Table 65: show subscribers Output Fields (*continued*)

| Field Name                                  | Field Description                                                                                                                                                                                   |
|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Agent Remote ID</b>                      | Option 82 agent remote ID associated with the subscriber. The ID is displayed as an ASCII string unless the value has nonprintable characters, in which case it is displayed in hexadecimal format. |
| <b>DHCP Relay IP Address</b>                | IP address used by the DHCP relay agent.                                                                                                                                                            |
| <b>ATM VPI</b>                              | (MX Series routers with MPCs and ATM MICs with SFP only) ATM virtual path identifier (VPI) on the subscriber's physical interface.                                                                  |
| <b>ATM VCI</b>                              | (MX Series routers with MPCs and ATM MICs with SFP only) ATM virtual circuit identifier (VCI) for each VPI configured on the subscriber interface.                                                  |
| <b>Login Time</b>                           | Date and time at which the subscriber logged in.                                                                                                                                                    |
| <b>Effective shaping-rate</b>               | Actual downstream traffic shaping rate for the subscriber, in kilobits per second.                                                                                                                  |
| <b>IPv4 rpf-check Fail Filter Name</b>      | Name of the filter applied by the dynamic profile to IPv4 packets that fail the RPF check.                                                                                                          |
| <b>IPv6 rpf-check Fail Filter Name</b>      | Name of the filter applied by the dynamic profile to IPv6 packets that fail the RPF check.                                                                                                          |
| <b>DHCP Options</b>                         | <b>len</b> = number of hex values in the message. The hex values specify the type, length, value (TLV) for DHCP options, as defined in RFC 2132.                                                    |
| <b>Session ID</b>                           | ID number for a subscriber service session.                                                                                                                                                         |
| <b>Underlying Session ID</b>                | For DHCPv6 subscribers on a PPPoE network, displays the session ID of the underlying PPPoE interface.                                                                                               |
| <b>Service Sessions</b>                     | Number of service sessions (that is, a service activated using RADIUS CoA) associated with the subscribers.                                                                                         |
| <b>Service Session Name</b>                 | Service session profile name.                                                                                                                                                                       |
| <b>Session Timeout (seconds)</b>            | Number of seconds of access provided to the subscriber before the session is automatically terminated.                                                                                              |
| <b>Idle Timeout (seconds)</b>               | Number of seconds subscriber can be idle before the session is automatically terminated.                                                                                                            |
| <b>IPv6 Delegated Address Pool</b>          | Name of the pool used for DHCPv6 prefix delegation.                                                                                                                                                 |
| <b>IPv6 Delegated Network Prefix Length</b> | Length of the prefix configured for the IPv6 delegated address pool.                                                                                                                                |
| <b>IPv6 Interface Address</b>               | Address assigned by the Framed-lpv6-Prefix AAA attribute.                                                                                                                                           |
| <b>IPv6 Framed Interface Id</b>             | Interface ID assigned by the Framed-Interface-Id AAA attribute.                                                                                                                                     |

Table 65: show subscribers Output Fields (*continued*)

| Field Name                         | Field Description                                                                                                                                                                                                                                      |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ADF IPv4 Input Filter Name</b>  | Name assigned to the Ascend-Data-Filter (ADF) interface IPv4 input filter (client or service session). The filter name is followed by the rules (in hexadecimal format) associated with the ADF filter and the decoded rule in Junos OS filter style.  |
| <b>ADF IPv4 Output Filter Name</b> | Name assigned to the Ascend-Data-Filter (ADF) interface IPv4 output filter (client or service session). The filter name is followed by the rules (in hexadecimal format) associated with the ADF filter and the decoded rule in Junos OS filter style. |
| <b>ADF IPv6 Input Filter Name</b>  | Name assigned to the Ascend-Data-Filter (ADF) interface IPv6 input filter (client or service session). The filter name is followed by the rules (in hexadecimal format) associated with the ADF filter and the decoded rule in Junos OS filter style.  |
| <b>ADF IPv6 Output Filter Name</b> | Name assigned to the Ascend-Data-Filter (ADF) interface IPv6 output filter (client or service session). The filter name is followed by the rules (in hexadecimal format) associated with the ADF filter and the decoded rule in Junos OS filter style. |
| <b>IPv4 Input Filter Name</b>      | Name assigned to the IPv4 input filter (client or service session).                                                                                                                                                                                    |
| <b>IPv4 Output Filter Name</b>     | Name assigned to the IPv4 output filter (client or service session).                                                                                                                                                                                   |
| <b>IPv6 Input Filter Name</b>      | Name assigned to the IPv6 input filter (client or service session).                                                                                                                                                                                    |
| <b>IPv6 Output Filter Name</b>     | Name assigned to the IPv6 output filter (client or service session).                                                                                                                                                                                   |
| <b>IFL Input Filter Name</b>       | Name assigned to the logical interface input filter (client or service session).                                                                                                                                                                       |
| <b>IFL Output Filter Name</b>      | Name assigned to the logical interface output filter (client or service session).                                                                                                                                                                      |

## Sample Output

### show subscribers (IPv4)

```

user@host> show subscribers
Interface IP Address/VLAN ID User Name LS:RI
ge-1/3/0.1073741824 100 WHOLESALE-CLIENT default:default
demux0.1073741824 10.0.0.10 RETAILER1-CLIENT test1:retailer1
demux0.1073741825 11.0.0.3 RETAILER2-CLIENT test1:retailer2
demux0.1073741826 12.0.0.3

```

### show subscribers (IPv6)

```

user@host> show subscribers
Interface IP Address/VLAN ID User Name LS:RI
ge-1/0/0.0 2001:db8::c0:0:0:0/74 WHOLESALE-CLIENT default:default
* 2001:db8::1/128 subscriber-25 default:default

```

### show subscribers (IPv4 and IPv6 Dual Stack)

```

user@host> show subscribers
Interface IP Address/VLAN ID User Name
LS:RI
demux0.1073741834 0x8100.1002 0x8100.1

```

```

default:default
demux0.1073741835 0x8100.1001 0x8100.1
default:default
pp0.1073741836 61.1.1.1 dualstackuser1@EXAMPLE1.com
default:ASP-1
* 2041:1:1::/48
* 2061:1:1:1::/64
pp0.1073741837 23.1.1.3 dualstackuser2@EXAMPLE1.com
default:ASP-1
* 2001:db8:1:2:5::/64

```

### show subscribers (LNS on MX Series Routers)

```

user@host> show subscribers
Interface IP Address/VLAN ID User Name LS:RI
si-4/0/0.1 192.168.4.1 xyz@example.com default:default

```

### show subscribers (L2TP Switched Tunnels)

```

user@host> show subscribers
Interface IP Address/VLAN ID User Name LS:RI
si-2/1/0.1073741842 Tunnel-switched ap@example.com default:default
si-2/1/0.1073741843 Tunnel-switched ap@example.com default:default

```

### show subscribers client-type dhcp detail

```

user@host> show subscribers client-type dhcp detail
Type: DHCP
IP Address: 10.20.9.7
IP Netmask: 255.255.0.0
Logical System: default
Routing Instance: default
Interface: demux0.1073744127
Interface type: Dynamic
Dynamic Profile Name: dhcp-demux-prof
MAC Address: 00:10:95:00:00:98
State: Active
Radius Accounting ID: jnpr :2304
Login Time: 2009-08-25 14:43:52 PDT

Type: DHCP
IP Address: 10.20.10.7
IP Netmask: 255.255.0.0
Logical System: default
Routing Instance: default
Interface: demux0.1073744383
Interface type: Dynamic
Dynamic Profile Name: dhcp-demux-prof
MAC Address: 00:10:94:00:01:f3
State: Active
Radius Accounting ID: jnpr :2560
Login Time: 2009-08-25 14:43:56 PDT

```

### show subscribers count

```

user@host> show subscribers count
Total Subscribers: 188, Active Subscribers: 188

```



**show subscribers address detail (IPv6)**

```

user@host> show subscribers address 10.16.12.137 detail
Type: PPPoE
User Name: pppoeTerV6User1Svc
IP Address: 10.16.12.137
IP Netmask: 255.0.0.0
IPv6 User Prefix: 1016:0:0:c88::/64
Logical System: default
Routing Instance: default
Interface: pp0.1073745151
Interface type: Dynamic
Underlying Interface: demux0.8201
Dynamic Profile Name: pppoe-client-profile
MAC Address: 00:0d:02:01:00:01
Session Timeout (seconds): 31622400
Idle Timeout (seconds): 86400
State: Active
Radius Accounting ID: jnpr demux0.8201:6544
Session ID: 6544
Agent Circuit ID: if13720
Agent Remote ID: if13720
Login Time: 2012-05-21 13:37:27 PDT
Service Sessions: 1

```

**show subscribers detail (IPv4)**

```

user@host> show subscribers detail
Type: DHCP
IP Address: 10.20.9.7
IP Netmask: 255.255.0.0
Primary DNS Address: 192.168.17.1
Secondary DNS Address: 192.168.17.2
Primary WINS Address: 192.168.22.1
Secondary WINS Address: 192.168.22.2
Logical System: default
Routing Instance: default
Interface: demux0.1073744127
Interface type: Dynamic
Dynamic Profile Name: dhcp-demux-prof
MAC Address: 00:10:95:00:00:98
State: Active
Radius Accounting ID: jnpr :2304
Idle Timeout (seconds): 600
Login Time: 2009-08-25 14:43:52 PDT
DHCP Options: len 52
35 01 01 39 02 02 40 3d 07 01 00 10 94 00 00 08 33 04 00 00
00 3c 0c 15 63 6c 69 65 6e 74 5f 50 6f 72 74 20 2f 2f 36 2f
33 2d 37 2d 30 37 05 01 06 0f 21 2c
Service Sessions: 2

```

**show subscribers detail (IPv6)**

```

user@host> show subscribers detail
Type: DHCP
User Name: pd-user1
IPv6 Prefix: 2001:db8:db2:ffff:1::/64
Logical System: default
Routing Instance: default
Interface: ge-3/1/3.2
Interface type: Static

```

```
MAC Address: 00:51:ff:ff:00:03
State: Active
Radius Accounting ID: 1
Session ID: 1
Login Time: 2011-08-25 12:12:26 PDT
DHCP Options: len 42
00 08 00 02 00 00 00 01 00 0a 00 03 00 01 00 51 ff ff 00 03
00 06 00 02 00 19 00 19 00 0c 00 00 00 00 00 00 00 00 00
00 00
```

#### show subscribers detail (IPv6 Static Demux Interface)

```
user@host> show subscribers detail
Type: STATIC-INTERFACE
User Name: demux0.1@example.net
IPv6 Prefix: 1:2:3:4:5:6:7:aa/128
Logical System: default
Routing Instance: default
Interface: demux0.1
Interface type: Static
Dynamic Profile Name: junos-default-profile
State: Active
Radius Accounting ID: 185
Login Time: 2010-05-18 14:33:56 EDT
```

#### show subscribers detail (L2TP LNS Subscribers on MX Series Routers)

```
user@host> show subscribers detail
Type: L2TP
User Name: user1@example.net
IP Address: 10.1.32.58
IP Netmask: 255.255.0.0
Logical System: default
Routing Instance: default
Interface: si-5/2/0.1073749824
Interface type: Dynamic
Dynamic Profile Name: dyn-lns-profile2
Dynamic Profile Version: 1
State: Active
Radius Accounting ID: 8001
Session ID: 8001
Login Time: 2011-04-25 20:27:50 IST
```

#### show subscribers detail (L2TP Switched Tunnels)

```
user@host> show subscribers detail
Type: L2TP
User Name: ap@example.com
Logical System: default
Routing Instance: default
Interface: si-2/1/0.1073741842
Interface type: Dynamic
Dynamic Profile Name: dyn-lts-profile
State: Active
L2TP State: Tunnel-switched
Tunnel switch Profile Name: ce-lts-profile
Local IP Address: 10.50.1.1
Remote IP Address: 192.168.20.3
Radius Accounting ID: 21
Session ID: 21
Login Time: 2013-01-18 03:01:11 PST
```

```

Type: L2TP
User Name: ap@example.com
Logical System: default
Routing Instance: default
Interface: si-2/1/0.1073741843
Interface type: Dynamic
Dynamic Profile Name: dyn-lts-profile
State: Active
L2TP State: Tunnel-switched
Tunnel switch Profile Name: ce-lts-profile
Local IP Address: 10.30.1.1
Remote IP Address: 172.20.1.10
Session ID: 22
Login Time: 2013-01-18 03:01:14 PST

```

#### show subscribers detail (Tunneled Subscriber)

```

user@host> show subscribers detail
Type: PPPoE
User Name: user1@example.com
Logical System: default
Routing Instance: default
Interface: pp0.1
State: Active, Tunneled
Radius Accounting ID: 512

```

#### show subscribers detail (IPv4 and IPv6 Dual Stack)

```

user@host> show subscribers detail
Type: VLAN
Logical System: default
Routing Instance: default
Interface: demux0.1073741824
Interface type: Dynamic
Dynamic Profile Name: svlanProfile
State: Active
Session ID: 1
Stacked VLAN Id: 0x8100.1001
VLAN Id: 0x8100.1
Login Time: 2011-11-30 00:18:04 PST

Type: PPPoE
User Name: dualstackuser1@EXAMPLE1.com
IP Address: 61.1.1.1
IPv6 Prefix: 2041:1:1::/48
IPv6 User Prefix: 2061:1:1:1::/64
Logical System: default
Routing Instance: ASP-1
Interface: pp0.1073741825
Interface type: Dynamic
Dynamic Profile Name: dualStack-Profile1
MAC Address: 00:00:64:03:01:02
State: Active
Radius Accounting ID: 2
Session ID: 2
Login Time: 2011-11-30 00:18:05 PST

Type: DHCP
IPv6 Prefix: 2041:1:1::/48
Logical System: default
Routing Instance: ASP-1

```

```
Interface: pp0.1073741825
Interface type: Static
MAC Address: 00:00:64:03:01:02
State: Active
Radius Accounting ID: jnpr :3
Session ID: 3
Underlying Session ID: 2
Login Time: 2011-11-30 00:18:35 PST
DHCP Options: len 42
00 08 00 02 0b b8 00 01 00 0a 00 03 00 01 00 00 64 03 01 02
00 06 00 02 00 19 00 19 00 0c 00 00 00 00 00 00 00 00 00 00
00 00
```

#### show subscribers detail (ACI Interface Set Session)

```
user@host> show subscribers detail
Type: VLAN
Logical System: default
Routing Instance: default
Interface: ge-1/0/0
Interface Set: aci-1001-ge-1/0/0.2800
Interface Set Session ID: 0
Underlying Interface: ge-1/0/0.2800
Dynamic Profile Name: aci-vlan-set-profile-2
Dynamic Profile Version: 1
State: Active
Session ID: 1
Agent Circuit ID: aci-ppp-dhcp-20
Login Time: 2012-05-26 01:54:08 PDT
```

#### show subscribers detail (PPPoE Subscriber Session with ACI Interface Set)

```
user@host> show subscribers detail
Type: PPPoE
User Name: ppphint2
IP Address: 10.10.1.5
Logical System: default
Routing Instance: default
Interface: pp0.1073741825
Interface type: Dynamic
Interface Set: aci-1001-demux0.1073741824
Interface Set Type: Dynamic
Interface Set Session ID: 2
Underlying Interface: demux0.1073741824
Dynamic Profile Name: aci-vlan-pppoe-profile
Dynamic Profile Version: 1
MAC Address: 00:00:64:39:01:02
State: Active
Radius Accounting ID: 3
Session ID: 3
Agent Circuit ID: aci-ppp-dhcp-dvlan-50
Login Time: 2012-03-07 13:46:53 PST
```

#### show subscribers extensive

```
user@host> show subscribers extensive
Type: DHCP
User Name: pd-user1
IPv6 Prefix: 2001:db8:db2:ffff:1::/64
Logical System: default
Routing Instance: default
```

```

Interface: ge-3/1/3.2
Interface type: Static
MAC Address: 00:51:ff:ff:00:03
State: Active
Radius Accounting ID: 1
Session ID: 1
Login Time: 2011-08-25 12:12:26 PDT
DHCP Options: len 42
00 08 00 02 00 00 00 01 00 0a 00 03 00 01 00 51 ff ff 00 03
00 06 00 02 00 19 00 19 00 0c 00 00 00 00 00 00 00 00
00 00
IPv6 Address Pool: pd_pool
IPv6 Network Prefix Length: 48

```

#### show subscribers extensive (RPF Check Fail Filter)

```

user@host> show subscribers extensive
...
Type: VLAN
Logical System: default
Routing Instance: default
Interface: ae0.1073741824
Interface type: Dynamic
Dynamic Profile Name: vlan-prof
State: Active
Session ID: 9
VLAN Id: 100
Login Time: 2011-08-26 08:17:00 PDT
IPv4 rpf-check Fail Filter Name: rpf-allow-dhcp
IPv6 rpf-check Fail Filter Name: rpf-allow-dhcpv6
...

```

#### show subscribers extensive (L2TP LNS Subscribers on MX Series Routers)

```

user@host> show subscribers extensive
Type: L2TP
User Name: user1@example.net
IP Address: 10.1.32.58
IP Netmask: 255.255.0.0
Logical System: default
Routing Instance: default
Interface: si-5/2/0.1073749824
Interface type: Dynamic
Dynamic Profile Name: dyn-lns-profile2
Dynamic Profile Version: 1
State: Active
Radius Accounting ID: 8001
Session ID: 8001
Login Time: 2011-04-25 20:27:50 IST
IPv4 Input Filter Name: classify-si-5/2/0.1073749824-in
IPv4 Output Filter Name: classify-si-5/2/0.1073749824-out

```

#### show subscribers extensive (IPv4 and IPv6 Dual Stack)

```

user@host> show subscribers extensive
Type: VLAN
Logical System: default
Routing Instance: default
Interface: demux0.1073741824
Interface type: Dynamic
Dynamic Profile Name: svlanProfile
State: Active

```

```

Session ID: 1
Stacked VLAN Id: 0x8100.1001
VLAN Id: 0x8100.1
Login Time: 2011-11-30 00:18:04 PST

Type: PPPoE
User Name: dualstackuser1@EXAMPLE1.com
IP Address: 61.1.1.1
IPv6 Prefix: 2041:1:1::/48
IPv6 User Prefix: 2061:1:1:1::/64
Logical System: default
Routing Instance: ASP-1
Interface: pp0.1073741825
Interface type: Dynamic
Dynamic Profile Name: dualStack-Profile1
MAC Address: 00:00:64:03:01:02
State: Active
Radius Accounting ID: 2
Session ID: 2
Login Time: 2011-11-30 00:18:05 PST
IPv6 Delegated Network Prefix Length: 48
IPv6 Interface Address: 2061:1:1:1::1/64
IPv6 Framed Interface Id: 1:1:2:2
IPv4 Input Filter Name: FILTER-IN-pp0.1073741825-in
IPv4 Output Filter Name: FILTER-OUT-pp0.1073741825-out
IPv6 Input Filter Name: FILTER-IN6-pp0.1073741825-in
IPv6 Output Filter Name: FILTER-OUT6-pp0.1073741825-out

Type: DHCP
IPv6 Prefix: 2041:1:1::/48
Logical System: default
Routing Instance: ASP-1
Interface: pp0.1073741825
Interface type: Static
MAC Address: 00:00:64:03:01:02
State: Active
Radius Accounting ID: jnpr :3
Session ID: 3
Underlying Session ID: 2
Login Time: 2011-11-30 00:18:35 PST
DHCP Options: len 42
00 08 00 02 0b b8 00 01 00 0a 00 03 00 01 00 00 64 03 01 02
00 06 00 02 00 19 00 19 00 0c 00 00 00 00 00 00 00 00 00 00
00 00
IPv6 Delegated Network Prefix Length: 48

```

#### show subscribers extensive (Effective Shaping-Rate)

```

user@host> show subscribers extensive
Type: VLAN
Logical System: default
Routing Instance: default
Interface: demux0.1073741837
Interface type: Dynamic
Interface Set: ifset-1
Underlying Interface: ae1
Dynamic Profile Name: svlan-dhcp-test
State: Active
Session ID: 1
Stacked VLAN Id: 0x8100.201

```

```
VLAN Id: 0x8100.201
Login Time: 2011-11-30 00:18:04 PST
Effective shaping-rate: 31000000k
...
```

#### show subscribers aci-interface-set-name detail (Subscriber Sessions Using Specified ACI Interface Set)

```
user@host> show subscribers aci-interface-set-name aci-1003-ge-1/0/0.4001 detail
Type: VLAN
Logical System: default
Routing Instance: default
Interface: ge-1/0/0.
Underlying Interface: ge-1/0/0.4001
Dynamic Profile Name: aci-vlan-set-profile
Dynamic Profile Version: 1
State: Active
Session ID: 13
Agent Circuit ID: aci-ppp-vlan-10
Login Time: 2012-03-12 10:41:56 PDT

Type: PPPoE
User Name: ppphint2
IP Address: 10.10.1.7
Logical System: default
Routing Instance: default
Interface: pp0.1073741834
Interface type: Dynamic
Interface Set: aci-1003-ge-1/0/0.4001
Interface Set Type: Dynamic
Interface Set Session ID: 13
Underlying Interface: ge-1/0/0.4001
Dynamic Profile Name: aci-vlan-pppoe-profile
Dynamic Profile Version: 1
MAC Address: 00:00:65:26:01:02
State: Active
Radius Accounting ID: 14
Session ID: 14
Agent Circuit ID: aci-ppp-vlan-10
Login Time: 2012-03-12 10:41:57 PDT
```

#### show subscribers agent-circuit-identifier detail (Subscriber Sessions Using Specified ACI Substring)

```
user@host> show subscribers agent-circuit-identifier aci-ppp-vlan detail
Type: VLAN
Logical System: default
Routing Instance: default
Interface: ge-1/0/0.
Underlying Interface: ge-1/0/0.4001
Dynamic Profile Name: aci-vlan-set-profile
Dynamic Profile Version: 1
State: Active
Session ID: 13
Agent Circuit ID: aci-ppp-vlan-10
Login Time: 2012-03-12 10:41:56 PDT

Type: PPPoE
User Name: ppphint2
IP Address: 10.10.1.7
Logical System: default
Routing Instance: default
Interface: pp0.1073741834
```

```
Interface type: Dynamic
Interface Set: aci-1003-ge-1/0/0.4001
Interface Set Type: Dynamic
Interface Set Session ID: 13
Underlying Interface: ge-1/0/0.4001
Dynamic Profile Name: aci-vlan-pppoe-profile
Dynamic Profile Version: 1
MAC Address: 00:00:65:26:01:02
State: Active
Radius Accounting ID: 14
Session ID: 14
Agent Circuit ID: aci-ppp-vlan-10
Login Time: 2012-03-12 10:41:57 PDT
```

#### show subscribers interface extensive

```
user@host> show subscribers interface demux0.1073741826 extensive
Type: VLAN
User Name: test1@test.com
Logical System: default
Routing Instance: testnet
Interface: demux0.1073741826
Interface type: Dynamic
Dynamic Profile Name: profile-vdemux-relay-23qos
MAC Address: 00:00:6e:56:01:04
State: Active
Radius Accounting ID: 12
Session ID: 12
Stacked VLAN Id: 0x8100.1500
VLAN Id: 0x8100.2902
Login Time: 2011-10-20 16:21:59 EST

Type: DHCP
User Name: test1@test.com
IP Address: 172.16.200.6
IP Netmask: 255.255.255.0
Logical System: default
Routing Instance: testnet
Interface: demux0.1073741826
Interface type: Static
MAC Address: 00:00:6e:56:01:04
State: Active
Radius Accounting ID: 21
Session ID: 21
Login Time: 2011-10-20 16:24:33 EST
Service Sessions: 2

Service Session ID: 25
Service Session Name: SUB-QOS
State: Active

Service Session ID: 26
Service Session Name: service-cb-content
State: Active
IPv4 Input Filter Name: content-cb-in-demux0.1073741826-in
IPv4 Output Filter Name: content-cb-out-demux0.1073741826-out
```

#### show subscribers logical-system terse

```
user@host> show subscribers logical-system test1 terse
```



| Interface         | IP Address/VLAN ID | User Name        | LS:RI           |
|-------------------|--------------------|------------------|-----------------|
| demux0.1073741825 | 11.0.0.3           | RETAILER1-CLIENT | test1:retailer1 |
| demux0.1073741826 | 12.0.0.3           | RETAILER2-CLIENT | test1:retailer2 |

#### show subscribers physical-interface count

```
user@host> show subscribers physical-interface ge-1/0/0 count
Total subscribers: 3998, Active Subscribers: 3998
```

#### show subscribers routing-instance inst1 count

```
user@host> show subscribers routing-instance inst1 count
Total Subscribers: 188, Active Subscribers: 183
```

#### show subscribers stacked-vlan-id detail

```
user@host> show subscribers stacked-vlan-id 101 detail
Type: VLAN
Interface: ge-1/2/0.1073741824
Interface type: Dynamic
Dynamic Profile Name: svlan-prof
State: Active
Stacked VLAN Id: 0x8100.101
VLAN Id: 0x8100.100
Login Time: 2009-03-27 11:57:19 PDT
```

#### show subscribers stacked-vlan-id vlan-id detail (Combined Output)

```
user@host> show subscribers stacked-vlan-id 101 vlan-id 100 detail
Type: VLAN
Interface: ge-1/2/0.1073741824
Interface type: Dynamic
Dynamic Profile Name: svlan-prof
State: Active
Stacked VLAN Id: 0x8100.101
VLAN Id: 0x8100.100
Login Time: 2009-03-27 11:57:19 PDT
```

#### show subscribers stacked-vlan-id vlan-id interface detail (Combined Output for a Specific Interface)

```
user@host> show subscribers stacked-vlan-id 101 vlan-id 100 interface ge-1/2/0.* detail
Type: VLAN
Interface: ge-1/2/0.1073741824
Interface type: Dynamic
Dynamic Profile Name: svlan-prof
State: Active
Stacked VLAN Id: 0x8100.101
VLAN Id: 0x8100.100
Login Time: 2009-03-27 11:57:19 PDT
```

#### show subscribers user-name detail

```
user@host> show subscribers user-name larry1 detail
Type: DHCP
User Name: larry1
IP Address: 100.0.0.37
IP Netmask: 255.255.0.0
Logical System: default
Routing Instance: default
Interface: ge-1/0/0.1
Interface type: Static
Dynamic Profile Name: foo
```

```
MAC Address: 00:10:94:00:00:01
State: Active
Radius Accounting ID: 1
Session ID: 1
Login Time: 2011-11-07 08:25:59 PST
DHCP Options: len 52
35 01 01 39 02 02 40 3d 07 01 00 10 94 00 00 01 33 04 00 00
00 3c 0c 15 63 6c 69 65 6e 74 5f 50 6f 72 74 20 2f 2f 32 2f
37 2d 30 2d 30 37 05 01 06 0f 21 2c
```

#### show subscribers vlan-id

```
user@host> show subscribers vlan-id 100
Interface IP Address User Name
ge-1/0/0.1073741824
ge-1/2/0.1073741825
```

#### show subscribers vlan-id detail

```
user@host> show subscribers vlan-id 100 detail
Type: VLAN
Interface: ge-1/0/0.1073741824
Interface type: Dynamic
Dynamic Profile Name: vlan-prof-tpid
State: Active
VLAN Id: 100
Login Time: 2009-03-11 06:48:54 PDT

Type: VLAN
Interface: ge-1/2/0.1073741825
Interface type: Dynamic
Dynamic Profile Name: vlan-prof-tpid
State: Active
VLAN Id: 100
Login Time: 2009-03-11 06:48:54 PDT
```

#### show subscribers vpi vci extensive (PPPoE-over-ATM Subscriber Session)

```
user@host> show subscribers vpi 40 vci 50 extensive
Type: PPPoE
User Name: testuser
IP Address: 100.0.0.2
IP Netmask: 255.255.0.0
Logical System: default
Routing Instance: default
Interface: pp0.0
Interface type: Static
MAC Address: 00:00:65:23:01:02
State: Active
Radius Accounting ID: 2
Session ID: 2
ATM VPI: 40
ATM VCI: 50
Login Time: 2012-12-03 07:49:26 PST
IP Address Pool: pool_1
IPv6 Framed Interface Id: 200:65ff:fe23:102
```

## show system alarms

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | show system alarms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Release Information</b>      | <p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Description</b>              | Display active system alarms.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Options</b>                  | This command has no options.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Additional Information</b>   | <p>System alarms are preset. They include a <i>configuration</i> alarm that appears when no rescue configuration alarm is set and a <i>license</i> alarm that appears when a software feature is configured and no valid license is configured for the feature. On EX6200 switches, an alarm can be triggered by an internal link error. For more information about system alarms, see the <i>Junos OS Administration Library for Routing Devices</i>.</p> <p>In Junos OS release 11.1 and later, alarms for fans also show the slot number of the malfunctioning fans in the CLI output.</p> <p>Starting with Junos OS Release 13.2, you can view degraded fabric alarms on a routing matrix based on TX Matrix Plus router with 3D SIBs. The alarm indicates that the source FPC is running with a degraded fabric condition. This alarm is an early warning of a possible fabric black-hole condition. When the degraded fabric alarm is raised on the source FPC, you can take remedial action to avoid a fabric black-hole condition. The degraded fabric alarm is raised on the source FPC if both the following conditions are met:</p> <ul style="list-style-type: none"> <li>• The active Packet Forwarding Engine destinations are reachable on one or no active switching planes.</li> <li>• At least one of the inactive switching planes has a fault that causes the destination Packet Forwarding Engine to become unreachable.</li> </ul> |
| <b>Required Privilege Level</b> | view                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">show chassis alarms on page 575</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>List of Sample Output</b>    | <p><a href="#">show system alarms on page 1052</a></p> <p><a href="#">show system alarms (Fan Tray) on page 1052</a></p> <p><a href="#">show system alarms (QFX Series and OCX Series) on page 1052</a></p> <p><a href="#">show system alarms (EX6200) on page 1052</a></p> <p><a href="#">show system alarms (TX Matrix Plus router with 3D SIBs) on page 1052</a></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Output Fields</b>            | Table 66 on page 1052 lists the output fields for the <b>show system alarms</b> command. Output fields are listed in the approximate order in which they appear.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

Table 66: show system alarms Output Fields

| Field Name  | Field Description                                             |
|-------------|---------------------------------------------------------------|
| Alarm time  | Date and time the alarm was first recorded.                   |
| Class       | Severity class for this alarm: <b>Minor</b> or <b>Major</b> . |
| Description | Information about the alarm.                                  |

## Sample Output

### show system alarms

```

user@host> show system alarms
2 alarms currently active
Alarm time Class Description
2005-02-24 17:29:34 UTC Minor IPsec VPN tunneling usage requires a
license
2005-02-24 17:29:34 UTC Minor Rescue configuration is not sent

```

### show system alarms (Fan Tray)

```

user@host> show system alarms
4 alarms currently active
Alarm time Class Description
2010-11-11 20:27:38 UTC Major Side Fan Tray 7 Failure
2010-11-11 20:27:13 UTC Minor Side Fan Tray 7 Overspeed
2010-11-11 20:27:13 UTC Major Side Fan Tray 5 Failure
2010-11-11 20:27:13 UTC Major Side Fan Tray 0 Failure

```

### show system alarms (QFX Series and OCX Series)

```

user@switch> show system alarms
2 alarms currently active
Alarm time Class Description
2005-02-24 17:29:34 UTC Minor Rescue configuration is not sent

```

### show system alarms (EX6200)

```

user@switch> show system alarms
2 alarms currently active
Alarm time Class Description
2013-04-05 16:51:41 PDT Major FPC 8 internal link errors detected
2013-04-04 18:05:35 PDT Minor Rescue configuration is not set

```

### show system alarms (TX Matrix Plus router with 3D SIBs)

```

user@router> show system alarms

sfc0-re0:

2 alarms currently active
Alarm time Class Description
2013-05-08 18:13:58 UTC Major LCC 0 Major Errors
2013-05-08 17:48:46 UTC Major LCC 7 Major Errors

lcc0-re1:

```

1 alarm currently active

| Alarm time              | Class | Description                              |
|-------------------------|-------|------------------------------------------|
| 2013-05-08 18:19:24 UTC | Major | FPC 1 degraded fabric condition detected |

lcc7-re0:

-----  
1 alarm currently active

| Alarm time              | Class | Description                              |
|-------------------------|-------|------------------------------------------|
| 2013-05-08 18:19:24 UTC | Major | FPC 7 degraded fabric condition detected |

## show system audit

|                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                                 | <a href="#">Syntax on page 1054</a><br><a href="#">Syntax (EX Series Switch and MX Series Router) on page 1054</a><br><a href="#">Syntax (TX Matrix Router) on page 1054</a><br><a href="#">Syntax (TX Matrix Plus Router) on page 1054</a><br><a href="#">Syntax (QFX Series) on page 1054</a><br><a href="#">Syntax (OCX Series) on page 1054</a>                                                                                                                                                                                                                                                                                               |
| <b>Syntax</b>                                         | show system audit<br><root-only>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Syntax (EX Series Switch and MX Series Router)</b> | show system audit<br><all-members><br><local><br><member <i>member-id</i> ><br><root-only>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Syntax (TX Matrix Router)</b>                      | show system audit<br><all-lcc   lcc <i>number</i>   scc><br><root-only>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Syntax (TX Matrix Plus Router)</b>                 | show system audit<br><all-chassis   all-lcc   lcc <i>number</i>   sfc <i>number</i> ><br><root-only>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Syntax (QFX Series)</b>                            | show system audit<br><infrastructure <i>name</i>   interconnect-device <i>name</i>   node-group <i>name</i>   root-only>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Syntax (OCX Series)</b>                            | show system audit<br><root-only>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Release Information</b>                            | <p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p><b>sfc</b> option introduced for the TX Matrix Plus router in Junos OS Release 9.6.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>                                                                                                                                                                                                                                                                  |
| <b>Description</b>                                    | Display the state and checksum values for file systems.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Options</b>                                        | <p><b>none</b>—Display the state and checksum values for all file systems.</p> <p><b>all-chassis</b>—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Display file system MD5 hash and permissions information for all of the chassis.</p> <p><b>all-lcc</b>—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display file system MD5 hash and permissions information for all T640 routers connected to the TX Matrix router. On a TX Matrix Plus router, display file system MD5 hash and permissions information for all T1600 or T4000 routers connected to the TX Matrix Plus router.</p> |

**all-members**—(EX4200 switch, QFX Series, and MX Series routers only) (Optional)

Display file system MD5 hash and permissions information on all members of the Virtual Chassis configuration.

**lcc *number***—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display file system MD5 hash and permissions information for a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, display file system MD5 hash and permissions information for a specific router that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**infrastructure *name***—(QFabric systems only) (Optional) Display file system MD5 hash and permissions information for a fabric control Routing Engine or a fabric control Routing Engine.

**interconnect-device *name***—(QFabric systems only) (Optional) Display file system MD5 hash and permissions information for the Interconnect device.

**local**—(EX4200 switch, QFX Series, and MX Series routers only) (Optional) Display file system MD5 hash and permissions information on the local Virtual Chassis member.

**member *member-id***—(EX4200 switch, QFX Series, and MX Series routers only) (Optional) Display file system MD5 hash and permissions information on the specified member of the Virtual Chassis configuration. For EX4200 switches, replace *member-id* with a value from 0 through 9. For an MX Series Virtual Chassis, replace *member-id* with a value of 0 or 1.

**node-group *name***—(QFabric systems only) (Optional) Display file system MD5 hash and permissions information for the Node group

**root-only**—(Optional) Check only the root (/) file system. On a QFabric system, you can check the root (/) file system on the infrastructure (fabric manager Routing Engine and fabric control Routing Engine), Interconnect device, or Node group.

**scc**—(TX Matrix routers only) (Optional) Display file system MD5 hash and permissions information for the TX Matrix router (or switch-card chassis).

**sfc *number***—(TX Matrix Plus routers only) (Optional) Display file system MD5 hash and permissions information for the TX Matrix Plus router (or switch-fabric chassis). Replace *number* with 0.

**Additional Information** To redirect the output to a file, issue the following command:

```
ssh device-name 'show system audit root-only' > output-file
```

If you save the output of the **show system audit root-only** command to a file, you can compare it to subsequent output from the command to determine whether anything has changed.

By default, when you issue the **show system audit** command on the master Routing Engine of a TX Matrix router or a TX Matrix Plus router, the command is broadcast to all the master Routing Engines of the LCCs connected to it in the routing matrix. Likewise, if you issue the same command on the backup Routing Engine of a TX Matrix or a TX Matrix Plus router, the command is broadcast to all backup Routing Engines of the LCCs that are connected to it in the routing matrix.

**Required Privilege Level** admin

**List of Sample Output** [show system audit root-only on page 1056](#)  
[show system audit lcc \(TX Matrix Router\) on page 1057](#)  
[show system audit lcc \(TX Matrix Plus Router\) on page 1059](#)  
[show system audit root-only \(QFX3500 Switch\) on page 1060](#)

## Sample Output

### show system audit root-only

```
user@host> show system audit root-only
user: root
machine: my-host
tree: /
date: Fri Feb 11 21:21:46 2000

.
/set type=file uid=0 gid=0 mode=0755 nlink=1
. type=dir nlink=23 size=1024 time=950252640.0
.cshrc uid=3 gid=7 mode=0644 size=177 time=939182975.0 \
 md5digest=f414e06fea6bd646244b98e13d6e6226
.kernel.jkernel.backup \
 mode=0744 size=1934552 time=944688902.0 \
 md5digest=2c343cf0bd9fea8f04f78604feed7aa4
.profile uid=3 gid=7 mode=0644 nlink=2 size=173 time=939182975.0 \
 md5digest=55a1e3c6c67789c9d3a1cce1ea39f670
COPYRIGHT uid=3 gid=7 mode=0444 size=3425 time=939182975.0 \
 md5digest=7df8bc77dcee71382ea73eb0ec6a9243
boot.config mode=0644 size=3 time=945902618.0 \
 md5digest=93d722493ed38477338a1405d7dcbb40
boot.help uid=3 gid=7 mode=0444 size=411 time=939182876.0 \
 md5digest=9b7126385734bcae753f4179ab59d8e5
compat type=link mode=0777 size=11 time=915149058.0 \
 link=/usr/compat
kernel mode=0444 size=1947607 time=950230892.0 \
 md5digest=1a2a8aff2fec678a918ba0d6bf063980
kernel.avr uid=1112 size=1947642 time=950252597.0 \
 md5digest=82e1637682d58ec28964dfee7fccb62e
kernel.config \
 mode=0644 size=0 time=915149058.0 \
 md5digest=d41d8cd98f00b204e9800998ecf8427e
```



```

sys type=link mode=0777 size=11 time=915149029.0 \
link=usr/src/sys

```

### show system audit lcc (TX Matrix Router)

```

user@host> show system audit lcc 2
lcc2-re0:

user: root
machine: rodin-lcc2
tree: /
date: Mon Sep 13 11:55:33 2004

.
/set type=file uid=0 gid=0 mode=0555 nlink=1 flags=none
. type=dir nlink=20 size=512 time=1094982121.0
 COPYRIGHT mode=0644 size=4735 time=986012708.0 \
 md5digest=78396df1404ad742e6eb1be28f0cd63b
 kernel type=link mode=0700 size=17 time=1090266262.0 \
 link=/packages/jkernel

./altconfig
altconfig type=dir nlink=2 size=512 time=1089801320.0
./altconfig
..

./altroot
altroot type=dir nlink=2 size=512 time=1089801320.0
./altroot
..

./b
b type=dir mode=0755 nlink=2 size=512 time=1093961429.0
./b
..

./bin
/set type=file uid=0 gid=0 mode=0700 nlink=1 flags=none
bin type=dir mode=0755 nlink=2 size=512 time=1089843059.0
 [type=link size=28 time=1090266270.0 \
 link=/packages/mnt/jbase/bin/test
 cat type=link size=27 time=1090266270.0 \
 link=/packages/mnt/jbase/bin/cat
 chmod type=link size=29 time=1090266270.0 \
 link=/packages/mnt/jbase/bin/chmod
 cp type=link size=26 time=1090266270.0 \
 link=/packages/mnt/jbase/bin/cp
 csh type=link size=27 time=1090266270.0 \
 link=/packages/mnt/jbase/bin/csh
 date type=link size=28 time=1090266270.0 \
 link=/packages/mnt/jbase/bin/date
 dd type=link size=26 time=1090266270.0 \
 link=/packages/mnt/jbase/bin/dd
 df type=link size=26 time=1090266270.0 \
 link=/packages/mnt/jbase/bin/df
 echo type=link size=28 time=1090266270.0 \
 link=/packages/mnt/jbase/bin/echo
 ed type=link size=26 time=1090266270.0 \
 link=/packages/mnt/jbase/bin/ed

```

```

expr type=link size=28 time=1090266270.0 \
link=/packages/mnt/jbase/bin/expr
hostname type=link size=32 time=1090266270.0 \
link=/packages/mnt/jbase/bin/hostname
kill type=link size=28 time=1090266270.0 \
link=/packages/mnt/jbase/bin/kill
ln type=link size=26 time=1090266270.0 \
link=/packages/mnt/jbase/bin/ln
ls type=link size=26 time=1090266270.0 \
link=/packages/mnt/jbase/bin/ls
mkdir type=link size=29 time=1090266270.0 \
link=/packages/mnt/jbase/bin/mkdir
mv type=link size=26 time=1090266270.0 \
link=/packages/mnt/jbase/bin/mv
ps type=link size=26 time=1090266270.0 \
link=/packages/mnt/jbase/bin/ps
pwd type=link size=27 time=1090266270.0 \
link=/packages/mnt/jbase/bin/pwd
rcp type=link size=27 time=1090266270.0 \
link=/packages/mnt/jbase/bin/rcp
red type=link size=26 time=1090266270.0 \
link=/packages/mnt/jbase/bin/red
rm type=link size=26 time=1090266270.0 \
link=/packages/mnt/jbase/bin/rm
rmdir type=link size=29 time=1090266270.0 \
link=/packages/mnt/jbase/bin/rmdir
sh type=link size=26 time=1090266270.0 \
link=/packages/mnt/jbase/bin/sh
sleep type=link size=29 time=1090266270.0 \
link=/packages/mnt/jbase/bin/sleep
stty type=link size=28 time=1090266270.0 \
link=/packages/mnt/jbase/bin/stty
sync type=link size=28 time=1090266270.0 \
link=/packages/mnt/jbase/bin/sync
tcsh type=link size=27 time=1090266270.0 \
link=/packages/mnt/jbase/bin/csh
test type=link size=28 time=1090266270.0 \
link=/packages/mnt/jbase/bin/test
./bin
..

./boot
/set type=file uid=0 gid=0 mode=0444 nlink=1 flags=none
boot type=dir mode=0555 nlink=3 size=512 time=1095069935.0
boot0 size=512 time=1094978286.0 \
md5digest=6f780822dd4ae482a20462b66e542cca
boot1 mode=0555 size=512 time=1094978294.0 \
md5digest=8d112b09df342cd0b60fdb9bdcde8e07
boot2 mode=0555 size=7680 time=1094978294.0 \
md5digest=28eb58c4068c6b85717e1484f9e028e4
cdboot mode=0555 size=165888 time=1094978298.0 \
md5digest=1474c6b800dfc82ba552d7c36116d07d
kgzldr.o size=5996 time=1094982121.0 \
md5digest=c53dc948eb07e2ea4eb0413e4c4634a3
loader mode=0555 size=163840 time=1094978298.0 \
md5digest=82d9dc2d31033476bfb61bb7264c4fed
loader.4th size=9237 time=986013631.0 \
md5digest=43144391465ad50267d31e0a320be1de
...

```

## show system audit lcc (TX Matrix Plus Router)

```

user@host> show system audit all-chassis

sfc0-re0:

user: root
machine: finalfive
tree: /
date: Mon May 18 00:13:16 2009

.
/set type=file uid=0 gid=0 mode=0755 nlink=1 flags=none
.
 type=dir nlink=23 size=512 time=1242347096.0
 COPYRIGHT mode=0644 size=6196 time=1168587741.0 \
 md5digest=bbad415e1c29bbdd9b383537100412c
 kernel type=link size=17 time=1242347011.0 link=/packages/jkernel
 staging type=link mode=0777 size=8 time=1242346935.0 link=/var/tmp

./snap
.snap type=dir mode=0775 nlink=2 size=512 time=1242346922.0
./snap
..

./altconfig
altconfig type=dir mode=0500 nlink=2 size=512 time=1242319843.0
./altconfig
..

./altroot
altroot type=dir mode=0500 nlink=2 size=512 time=1242319843.0
./altroot
..

./bin
bin type=dir nlink=2 size=512 time=1242346944.0
 \133 type=link size=28 time=1242346942.0 \
 link=/packages/mnt/jbase/bin/test
 cat type=link size=27 time=1242346941.0 \
 link=/packages/mnt/jbase/bin/cat
 chflags type=link size=31 time=1242346941.0 \
 link=/packages/mnt/jbase/bin/chflags
 chmod type=link size=29 time=1242346941.0 \
 link=/packages/mnt/jbase/bin/chmod
 cp type=link size=26 time=1242346941.0 \
 link=/packages/mnt/jbase/bin/cp
 csh type=link size=27 time=1242346941.0 \
 link=/packages/mnt/jbase/bin/csh
 date type=link size=28 time=1242346941.0 \
 link=/packages/mnt/jbase/bin/date
 dd type=link size=26 time=1242346941.0 \
 link=/packages/mnt/jbase/bin/dd
 df type=link size=26 time=1242346941.0 \
 link=/packages/mnt/jbase/bin/df
 echo type=link size=28 time=1242346941.0 \
 link=/packages/mnt/jbase/bin/echo
 ed type=link size=26 time=1242346941.0 \
 link=/packages/mnt/jbase/bin/ed

```

```

expr type=link size=28 time=1242346941.0 \
 link=/packages/mnt/jbase/bin/expr
hostname type=link size=32 time=1242346941.0 \
 link=/packages/mnt/jbase/bin/hostname
kill type=link size=28 time=1242346941.0 \
 link=/packages/mnt/jbase/bin/kill
ln type=link size=26 time=1242346941.0 \
 link=/packages/mnt/jbase/bin/ln
ls type=link size=26 time=1242346941.0 \
 link=/packages/mnt/jbase/bin/ls
mkdir type=link size=29 time=1242346941.0 \
 link=/packages/mnt/jbase/bin/mkdir
mv type=link size=26 time=1242346941.0 \
 link=/packages/mnt/jbase/bin/mv
pax type=link size=27 time=1242346944.0 \
 link=/packages/mnt/jbase/bin/pax
ps type=link size=26 time=1242346941.0 \
 link=/packages/mnt/jbase/bin/ps
pwd type=link size=27 time=1242346941.0 \
 link=/packages/mnt/jbase/bin/pwd
rcp type=link size=27 time=1242346942.0 \
 link=/packages/mnt/jbase/bin/rcp
red type=link size=26 time=1242346941.0 \
 link=/packages/mnt/jbase/bin/red
rm type=link size=26 time=1242346942.0 \
 link=/packages/mnt/jbase/bin/rm
rmdir type=link size=29 time=1242346942.0 \
 link=/packages/mnt/jbase/bin/rmdir
sh type=link size=26 time=1242346942.0 \
 link=/packages/mnt/jbase/bin/sh
sleep type=link size=29 time=1242346942.0 \
 link=/packages/mnt/jbase/bin/sleep
stty type=link size=28 time=1242346942.0 \
 link=/packages/mnt/jbase/bin/stty
sync type=link size=28 time=1242346942.0 \
 link=/packages/mnt/jbase/bin/sync
tcsh type=link size=27 time=1242346941.0 \
 link=/packages/mnt/jbase/bin/csh
test type=link size=28 time=1242346942.0 \
 link=/packages/mnt/jbase/bin/test
./bin
...

```

### show system audit root-only (QFX3500 Switch)

```

user@switch> show system audit root-only
user: root
machine: my-host
tree: /
date: Fri Feb 11 21:21:46 2000

.
/set type=file uid=0 gid=0 mode=0755 nlink=1
. type=dir nlink=23 size=1024 time=950252640.0
.cshrc uid=3 gid=7 mode=0644 size=177 time=939182975.0 \
 md5digest=f414e06fea6bd646244b98e13d6e6226
.kernel.jkernel.backup \
 mode=0744 size=1934552 time=944688902.0 \
 md5digest=2c343cf0bd9fea8f04f78604feed7aa4
.profile uid=3 gid=7 mode=0644 nlink=2 size=173 time=939182975.0 \
 md5digest=55a1e3c6c67789c9d3a1cce1ea39f670

```

```
COPYRIGHT uid=3 gid=7 mode=0444 size=3425 time=939182975.0 \
 md5digest=7df8bc77dcee71382ea73eb0ec6a9243
boot.config mode=0644 size=3 time=945902618.0 \
 md5digest=93d722493ed38477338a1405d7dcb40
boot.help uid=3 gid=7 mode=0444 size=411 time=939182876.0 \
 md5digest=9b7126385734bcae753f4179ab59d8e5
compat type=link mode=0777 size=11 time=915149058.0 \
 link=/usr/compat
kernel mode=0444 size=1947607 time=950230892.0 \
 md5digest=1a2a8aff2fec678a918ba0d6bf063980
kernel.avr uid=1112 size=1947642 time=950252597.0 \
 md5digest=82e1637682d58ec28964dfee7fccb62e
kernel.config \
 mode=0644 size=0 time=915149058.0 \
 md5digest=d41d8cd98f00b204e9800998ecf8427e
sys type=link mode=0777 size=11 time=915149029.0 \
 link=usr/src/sys
```

## show system boot-messages

|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                 | <a href="#">Syntax on page 1062</a><br><a href="#">Syntax (EX Series Switches) on page 1062</a><br><a href="#">Syntax (TX Matrix Router) on page 1062</a><br><a href="#">Syntax (TX Matrix Plus Router) on page 1062</a><br><a href="#">Syntax (MX Series Router) on page 1062</a><br><a href="#">Syntax (QFX Series) on page 1062</a>                                                                                                                                                                                                                                                                                                                   |
| <b>Syntax</b>                         | show system boot-messages                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Syntax (EX Series Switches)</b>    | show system boot-messages<br><all-members><br><local><br><member <i>member-id</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Syntax (TX Matrix Router)</b>      | show system boot-messages<br><all-chassis   all-lcc   lcc <i>number</i>   scc>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Syntax (TX Matrix Plus Router)</b> | show system boot-messages<br><all-chassis   all-lcc   lcc <i>number</i>   sfc <i>number</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Syntax (MX Series Router)</b>      | show system boot-messages<br><all-members><br><local><br><member <i>member-id</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Syntax (QFX Series)</b>            | show system boot-messages<br>infrastructure <i>name</i>   interconnect-device <i>name</i>   node-group <i>name</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Release Information</b>            | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br><b>sfc</b> option introduced for the TX Matrix Plus router in Junos OS Release 9.6.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                                                |
| <b>Description</b>                    | Display initial messages generated by the system kernel upon startup. These messages are the contents of <code>/var/run/dmesg.boot</code> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Options</b>                        | <b>none</b> —Display all boot time messages.<br><br><b>all-chassis</b> —(TX Matrix routers and TX Matrix Plus routers only) (Optional) Display boot time messages for all of the chassis.<br><br><b>all-lcc</b> —(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display boot time messages for all T640 routers connected to a TX Matrix router. On a TX Matrix Plus router, display boot time messages for all connected T1600 or T4000 LCCs.<br><br><b>all-members</b> —(EX4200 switches and MX Series routers only) (Optional) Display boot time messages on all members of the Virtual Chassis configuration. |

**infrastructure *name***—(QFabric systems only) (Optional) Display boot time messages on the fabric control Routing Engine or fabric manager Routing engines.

**interconnect-device *name***—(QFabric systems only) (Optional) Display boot time messages on the Interconnect device.

**lcc *number***—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display boot time messages for a specific T640 router connected to a TX Matrix router. On a TX Matrix Plus router, display boot time messages for a specific router connected to a TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(EX4200 switches and MX Series routers only) (Optional) Display boot time messages on the local Virtual Chassis member.

**member *member-id***—(EX4200 switches and MX Series routers only) (Optional) Display boot time messages on the specified member of the Virtual Chassis configuration. For EX4200 switches, replace *member-id* with a value from 0 through 9. For an MX Series Virtual Chassis, replace *member-id* with a value of 0 or 1.

**node-group *name***—(QFabric systems only) (Optional) Display boot time messages on the Node group.

**scc**—(TX Matrix routers only) (Optional) Display boot time messages for the TX Matrix router (or switch-card chassis).

**sfc *number***—(TX Matrix Plus routers only) (Optional) Display boot time messages for the TX Matrix Plus router. Replace *number* with 0.

**Additional Information** By default, when you issue the **show system boot-messages** command on the master Routing Engine of a TX Matrix router or a TX Matrix Plus router, the command is broadcast to all the master Routing Engines of the LCCs connected to it in the routing matrix. Likewise, if you issue the same command on the backup Routing Engine of a TX Matrix or a TX Matrix Plus router, the command is broadcast to all backup Routing Engines of the LCCs that are connected to it in the routing matrix.

**Required Privilege Level** view

## Related Documentation

- [Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

## List of Sample Output

[show system boot-messages \(TX Matrix Router\) on page 1064](#)  
[show system boot-messages lcc \(TX Matrix Router\) on page 1065](#)  
[show system boot-messages \(TX Matrix Plus Router\) on page 1066](#)  
[show system boot-messages \(QFX3500 Switch\) on page 1066](#)

## Sample Output

### show system boot-messages (TX Matrix Router)

```
user@host> show system boot-messages
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JUNOS 4.1-20000216-Zf8469 #0: 2000-02-16 12:57:28 UTC

tlim@single.device1.example.com:/p/build/20000216-0905/4.1/release_kernel/sys/compile/GENERIC
CPU: Pentium Pro (332.55-MHz 686-class CPU)
 Origin = "GenuineIntel" Id = 0x66a Stepping=10
 Features=0x183f9ff<FPU,VME,DE,PSE,TSC,MSR,PAE,MCE,CX8,SEP,MTRR,PGE,MCA,CMOV,<b16>,<b17>,MMX,<b24>>
Teknor CPU Card Recognized
real memory = 805306368 (786432K bytes)
avail memory = 786280448 (767852K bytes)
Probing for devices on PCI bus 0:
chip0 <generic PCI bridge (vendor=8086 device=7192 subclass=0)> rev 3 class 6000
0 on pci0:0:0
chip1 <Intel 82371AB PCI-ISA bridge> rev 1 class 60100 on pci0:7:0
chip2 <Intel 82371AB IDE interface> rev 1 class 10180 on pci0:7:1
chip3 <Intel 82371AB USB interface> rev 1 class c0300 int d irq 11 on pci0:7:2
smb0 <Intel 82371AB SMB controller> rev 1 class 68000 on pci0:7:3
pcic0 <TI PCI-1131 PCI-CardBus Bridge> rev 1 class 60700 int a irq 15 on pci0:13:0
TI1131 PCI Config Reg: [pci only][FUNC0 pci int]
pcic1 <TI PCI-1131 PCI-CardBus Bridge> rev 1 class 60700 int b irq 12 on pci0:13:1
TI1131 PCI Config Reg: [pci only][FUNC1 pci int]
fxp0 <Intel EtherExpress Pro 10/100B Ethernet> rev 8 class 20000 int a irq 12 on
pci0:16:0
chip4 <generic PCI bridge (vendor=1011 device=0022 subclass=4)> rev 4 class 6040
0 on pci0:17:0
fxp1 <Intel EtherExpress Pro 10/100B Ethernet> rev 8 class 20000 int a irq 10 on
pci0:19:0
Probing for devices on PCI bus 1:
mcs0 <Miscellaneous Control Subsystem> rev 12 class ff0000 int a irq 12 on pci1:13:0
fxp2 <Intel EtherExpress Pro 10/100B Ethernet> rev 8 class 20000 int a irq 10 on
pci1:14:0
Probing for devices on the ISA bus:
sc0 at 0x60-0x6f irq 1 on motherboard
sc0: EGA color <16 virtual consoles, flags=0x0>
```



```

ed0 not found at 0x300
ed1 not found at 0x280
ed2 not found at 0x340
psm0 not found at 0x60
sio0 at 0x3f8-0x3ff irq 4 flags 0x20010 on isa
sio0: type 16550A, console
sio1 at 0x3e8-0x3ef irq 5 flags 0x20000 on isa
sio1: type 16550A
sio2 at 0x2f8-0x2ff irq 3 flags 0x20000 on isa
sio2: type 16550A
pcic0 at 0x3e0-0x3e1 on isa
PC-Card ctlr(0) TI PCI-1131 [CardBus bridge mode] (5 mem & 2 I/O windows)
pcic0: slot 0 controller I/O address 0x3e0
npx0 flags 0x1 on motherboard
npx0: INT 16 interface
fdc0: direction bit not set
fdc0: cmd 3 failed at out byte 1 of 3
fdc0 not found at 0x3f0
wdc0 at 0x1f0-0x1f7 irq 14 on isa
wdc0: unit 0 (wd0): <SunDisk SQFXB-80>, single-sector-i/o
wd0: 76MB (156672 sectors), 612 cyls, 8 heads, 32 S/T, 512 B/S
wdc0: unit 1 (wd1): <IBM-DCXA-210000>
wd1: 8063MB (16514064 sectors), 16383 cyls, 16 heads, 63 S/T, 512 B/S
wdc1 not found at 0x170
wdc2 not found at 0x180
ep0 not found at 0x300
fxp0: Ethernet address 00:a0:a5:12:05:5a
fxp1: Ethernet address 00:a0:a5:12:05:59
fxp2: Ethernet address 02:00:00:00:00:01
swapon: adding /dev/wd1s1b as swap device
Automatic reboot in progress...
/dev/rwd0s1a: clean, 16599 free (95 frags, 2063 blocks, 0.1% fragmentation)
/dev/rwd0s1e: clean, 9233 free (9 frags, 1153 blocks, 0.1% fragmentation)
/dev/rwd0s1a: clean, 16599 free (95 frags, 2063 blocks, 0.1% fragmentation)
/dev/rwd1s1f: clean, 4301055 free (335 frags, 537590 blocks, 0.0% fragmentation)

```

### show system boot-messages lcc (TX Matrix Router)

```

user@host> show system boot-messages lcc 2
lcc2-re0:

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JUNOS 7.0-20040912.0 #0: 2004-09-12 09:16:32 UTC

builder@benten.host:/build/benten-b/7.0/20040912.0/obj-i386/sys/compile/JUNIPER
Timecounter "i8254" frequency 1193182 Hz
Timecounter "TSC" frequency 601368936 Hz
CPU: Pentium III/Pentium III Xeon/Celeron (601.37-MHz 686-class CPU)
 Origin = "GenuineIntel" Id = 0x68a Stepping = 10

Features=0x387f9ff<FPU,WE,DE,PSE,TSC,MSR,PAE,MCE,CX8,SEP,MTRR,PGE,MCA,CMOV,PAT,PSE36,PN,MMX,FXSR,SSE>
real memory = 2147467264 (2097136K bytes)
sio0: gdb debugging port
avail memory = 2084040704 (2035196K bytes)
Preloaded elf kernel "kernel" at 0xc06d9000.
DEVFS: ready for devices
Pentium Pro MTRR support enabled

```

```
md0: Malloc disk
DRAM Data Integrity Mode: ECC Mode with h/w scrubbing
npx0: <math processor> on motherboard
npx0: INT 16 interface
pcib0: <ServerWorks NB6635 3.0LE host to PCI bridge> on motherboard
pci0: <PCI bus> on pcib0
pcic-pci0: <TI PCI-1410 PCI-CardBus Bridge> irq 15 at device 1.0 on pci0
pcic-pci0: TI12XX PCI Config Reg: [pwr save][pci only]
fxp0: <Intel Embedded 10/100 Ethernet> port 0x1000-0x103f mem
0xfb800000-0xfb81ffff,0xfb820000-0xfb820fff irq 9 at device 3.0 on pci0
fxp1: <Intel Embedded 10/100 Ethernet> port 0x1040-0x107f mem
0xfb840000-0xfb85ffff,0xfb821000-0xfb821fff irq 11 at device 4.0 on pci0
...
```

### show system boot-messages (TX Matrix Plus Router)

```
user@host> show system boot-messages
sfc0-re0:

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JUNOS 9.6B3.3 #0: 2009-06-17 19:52:08 UTC

builder@device1.example.com:/volume/build/junos/9.6/release/9.6B3.3/obj-i386/bsd/sys/compile/JUNIPER
MPTable: Timecounter "i8254" frequency 1193182 Hz quality 0 CPU: Intel(R) Xeon(R)
CPU L5238 @ 2.66GHz (2660.01-MHz 686-class CPU) Origin =
"GenuineIntel" Id = 0x1067a Stepping = 10 Features=0xbfebfbff
...
lcc1-re0:

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JUNOS 9.6-20090617.0 #0: 2009-06-17 04:15:14 UTC

builder@device1.example.com:/volume/build/junos/9.6/production/20090617.0/obj-i386/bsd/sys/compile/JUNIPER
Timecounter "i8254" frequency 1193182 Hz quality 0
CPU: Intel(R) Xeon(R) CPU @ 1.86GHz (1862.01-MHz 686-class CPU)

 Origin = "GenuineIntel" Id = 0x1067a Stepping = 10
 Features=0xbfebfbff
...
```

### show system boot-messages (QFX3500 Switch)

```
user@switch> show sytem boot-messages
getmemsize: msgbufp[size=32768] = 0x81d07fe4

System physical memory distribution:

Total physical memory: 4160749568 (3968 MB)
Physical memory used: 3472883712 (3312 MB)
Physical memory allocated to kernel: 2130706432 (2032 MB)
Physical memory allocated to user BTLB: 1342177280 (1280 MB)

```

```

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JUNOS 11.1I #0: 2010-09-17 19:18:07 UTC
 ssiano@device.example.com:/c/ssiano/DEV_QFX_SI_BRANCH/03/20100917.399988/
obj-xlr/bsd/sys/compile/JUNIPER-DCTOR
WARNING: debug.mpsafenet forced to 0 as ipsec requires Giant
JUNOS 11.1I #0: 2010-09-17 19:18:07 UTC
 ssiano@svl-junos-pool125.d:/c/ssiano/DEV_QFX_SI_BRANCH/03/20100917.399988/
obj-xlr/bsd/sys/compile/JUNIPER-DCTOR
real memory = 3472883712 (3312MB)
avail memory = 1708171264 (1629MB)
cpuid: 0, btlb_cpumap:0xffffffff8
FreeBSD/SMP: Multiprocessor System Detected: 12 CPUs
ETHERNET SOCKET BRIDGE initialising
Initializing QFX platform properties ..
cpu0 on motherboard
: RMI's XLR CPU Rev. 0.3 with no FPU implemented
 L1 Cache: I size 32kb(32 line), D size 32kb(32 line), eight way.
 L2 Cache: Size 1024kb, eight way
pic_lbus0: <XLR Local Bus>
pic_lbus0: <XLR Local Bus> on motherboard
Enter qfx control ethernet probe addr:0xc5eeec00
gmac4: <XLR GMAC GE Ethernet> on pic_lbus0
me0: Ethernet address 00:1d:b5:f7:68:40
Enter qfx control ethernet probe addr:0xc5eeeb40
gmac5: <XLR GMAC GE Ethernet> on pic_lbus0
me1: Ethernet address 00:1d:b5:f7:68:41
Enter qfx control ethernet probe addr:0xc5eeea80
gmac6: <XLR GMAC GE Ethernet> on pic_lbus0
me1: Ethernet address 00:1d:b5:f7:68:42
sio0 on pic_lbus0
Entering sioattach
sio0: type 16550A, console
xls_setup_intr: skip irq 3, xlr regs are set up somewhere else.
gblmem0 on pic_lbus0
ehci0: <RMI XLS USB 2.0 controller> on pic_lbus0
ehci_bus_attach: allocated resource. tag=1, base=bef24000
xls_ehci_init: endian hardware swapping NOT enabled.
usb0: EHCI version 1.0
usb0 on ehci0
usb0: USB revision 2.0
uhub0: vendor 0x0000 EHCI root hub, class 9/0, rev 2.00/1.00, addr 1
uhub0: 2 ports with 2 removable, self powered
umass0: USB USBFlashDrive, rev 2.00/11.00, addr 2
pcib0: PCIe link 0 up
pcib0: PCIe link 2 up
pcib0: PCIe link 3 up
pcib0: <XLS PCI Host Controller> on pic_lbus0
pci0: <PCI bus> on pcib0
pcib1: <PCI-PCI bridge> at device 0.0 on pci0
pci1: <PCI bus> on pcib1
pci1: <network, ethernet> at device 0.0 (no driver attached)
pcib2: <PCI-PCI bridge> at device 1.0 on pci0
pcib3: <PCI-PCI bridge> at device 2.0 on pci0
pci2: <PCI bus> on pcib3
pci2: <network, ethernet> at device 0.0 (no driver attached)
pcib4: <PCI-PCI bridge> at device 3.0 on pci0
pci3: <PCI bus> on pcib4

```

```
pci3: <network, ethernet> at device 0.0 (no driver attached)
cfi device address space at 0xbc000000
cfi0: <AMD/Fujitsu - 8MB> on pic_lbus0
cfi device address space at 0xbc000000
i2c0: <I2C bus controller> on pic_lbus0
i2c1: <I2C bus controller> on pic_lbus0
qfx_fmn0 on pic_lbus0
pool offset 1503776768
xlr_lbus0: <XLR Local Bus Controller> on motherboard
qfx_bcpld_probe[124]
qfx_bcpld_probe[138]: dev_type=0x0
qfx_bcpld_probe[124]
qfx_bcpld0: QFX BCPLD probe success
qfx_bcpld0qfx_bcpld_attach[174]
qfx_bcpld_attach[207] : bus_space_tag=0x0, bus_space_handle=0xbd900000
qfx_bcpld_probe[124]
qfx_bcpld1: QFX BCPLD probe success
qfx_bcpld1qfx_bcpld_attach[174]
tor_bcpld_slave_attach[1245] : bus_space_tag=0x0, bus_space_handle=0xbda00000
Initializing product: 96 ..
bmeb: bmeb_lib_init done 0xc60a5000, addr 0x809c99a0
bme0:Virtual BME driver initializing
Timecounter "mips" frequency 1200000000 Hz quality 0
Timecounter "xlr_pic_timer" frequency 66666666 Hz quality 1
Timecounters tick every 1.000 msec
Loading the NETPFE fc module
IPsec: Initialized Security Association Processing.
SMP: AP CPU #3 Launched!
SMP: AP CPU #1 Launched!
SMP: AP CPU #2 Launched!
SMP: AP CPU #4 Launched!
SMP: AP CPU #5 Launched!
SMP: AP CPU #7 Launched!
SMP: AP CPU #6 Launched!
SMP: AP CPU #11 Launched!
SMP: AP CPU #10 Launched!
SMP: AP CPU #9 Launched!
SMP: AP CPU #8 Launched!
da0 at umass-sim0 bus 0 target 0 lun 0
da0: <USB USBFlashDrive 1100> Removable Direct Access SCSI-0 device
da0: 40.000MB/s transfers
da0: 3920MB (8028160 512 byte sectors: 255H 63S/T 499C)
Trying to mount root from ufs:/dev/da0s1a
```

## show system buffers

|                                       |                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                 | <a href="#">Syntax on page 1069</a><br><a href="#">Syntax (EX Series) on page 1069</a><br><a href="#">Syntax (TX Matrix Router) on page 1069</a><br><a href="#">Syntax (TX Matrix Plus Router) on page 1069</a><br><a href="#">Syntax (MX Series Router) on page 1069</a><br><a href="#">Syntax (QFX Series) on page 1069</a>                                               |
| <b>Syntax</b>                         | show system buffers                                                                                                                                                                                                                                                                                                                                                         |
| <b>Syntax (EX Series)</b>             | show system buffers<br><all-members><br><local><br><member <i>member-id</i> >                                                                                                                                                                                                                                                                                               |
| <b>Syntax (TX Matrix Router)</b>      | show system buffers<br><all-chassis   all-lcc   lcc <i>number</i>   scc>                                                                                                                                                                                                                                                                                                    |
| <b>Syntax (TX Matrix Plus Router)</b> | show system buffers<br><all-chassis   all-lcc   lcc <i>number</i>   sfc <i>number</i> >                                                                                                                                                                                                                                                                                     |
| <b>Syntax (MX Series Router)</b>      | show system buffers<br><all-members><br><local><br><member <i>member-id</i> >                                                                                                                                                                                                                                                                                               |
| <b>Syntax (QFX Series)</b>            | show system buffers<br><infrastructure <i>name</i>   interconnect-device <i>name</i>   node-group <i>name</i>   root-only (infrastructure <i>name</i>   interconnect-device <i>name</i>   node-group <i>name</i> )>                                                                                                                                                         |
| <b>Release Information</b>            | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br><b>sfc</b> option introduced for the TX Matrix Plus router in Junos OS Release 9.6.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                   |
| <b>Description</b>                    | Display information about the buffer pool that the Routing Engine uses for local traffic. Local traffic is the routing and management traffic that is exchanged between the Routing Engine and the Packet Forwarding Engine within the router or switch, as well as the routing and management traffic from IP (that is, from OSPF, BGP, SNMP, ping operations, and so on). |
| <b>Options</b>                        | <b>none</b> —Show all buffer statistics.<br><br><b>all-lcc</b> —(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, show buffer statistics for all T640 routers connected to the TX Matrix router. On a TX Matrix Plus router, show buffer statistics for all routers connected to the TX Matrix Plus router.                             |

**all-chassis**—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Show buffer statistics for all of the chassis.

**all-members**—(EX4200 switches and MX Series routers only) (Optional) Show buffer statistics for all members of the Virtual Chassis configuration.

**infrastructure *name***—(QFabric systems only) (Optional) Show buffer statistics for a fabric control Routing Engine or a fabric control Routing Engine.

**interconnect-device *name***—(QFabric systems only) (Optional) Show buffer statistics for the Interconnect device.

**lcc *number***—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, show buffer statistics for a specific T640 router (or line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, show buffer statistics for a specific router (line-card chassis) that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(EX4200 switches and MX Series routers only) (Optional) Show buffer statistics for the local Virtual Chassis member.

**member *member-id***—(EX4200 switches and MX Series routers only) (Optional) Show buffer statistics for the specified member of the Virtual Chassis configuration. For EX4200 switches, replace *member-id* with a value from 0 through 9. For an MX Series Virtual Chassis, replace *member-id* with a value of 0 or 1.

**node-group *name***—(QFabric systems only) (Optional) Show buffer statistics for the Node group

**sfc**—(TX Matrix Plus routers only) (Optional) Show buffer statistics for the TX Matrix Plus router. Replace *number* with 0.

**Additional Information** By default, when you issue the **show system buffers** command on the master Routing Engine of a TX Matrix router or a TX Matrix Plus router, the command is broadcast to all the master Routing Engines of the LCCs connected to it in the routing matrix. Likewise, if you issue the same command on the backup Routing Engine of a TX Matrix or a TX Matrix Plus router, the command is broadcast to all backup Routing Engines of the LCCs that are connected to it in the routing matrix.

A special type of memory buffer called a *cluster* is 2 KB in size. For more information, see *The Design and Implementation of the 4.4BSD Operation System* by McKusic, Bostic, Karels, and Quarterman.

|                          |                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Required Privilege Level | view                                                                                                                                                                                                                                                                                                                                                                                |
| Related Documentation    | <ul style="list-style-type: none"><li>• <a href="#">Routing Matrix with a TX Matrix Plus Router Solutions Page</a></li></ul>                                                                                                                                                                                                                                                        |
| List of Sample Output    | <a href="#">show system buffers on page 1072</a><br><a href="#">show system buffers scc (TX Matrix Router) on page 1073</a><br><a href="#">show system buffers sfc (TX Matrix Plus Router) on page 1073</a><br><a href="#">show system buffers all-chassis (TX Matrix Plus Router) on page 1073</a><br><a href="#">show system buffers node-group (QFabric System) on page 1074</a> |
| Output Fields            | <a href="#">Table 67 on page 1072</a> describes the output fields for the <b>show system buffers</b> command. Output fields are listed in the approximate order in which they appear.                                                                                                                                                                                               |

Table 67: show system buffers Output Fields

| Field Name                                           | Field Description                                                                                                                                                                                                                                      |
|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>mbufs in use</b>                                  | Memory buffers (mbufs) are 128-byte buffers that are used for various purposes inside the kernel. Each memory buffer has a type, and the output itemizes the amount allocated for each type. Types with no memory buffers allocated are not displayed. |
| <b>mbufs allocated to packet headers</b>             | Number of memory buffers currently holding packet headers                                                                                                                                                                                              |
| <b>mbufs allocated to control blocks</b>             | Number of memory buffers currently holding the state for sockets.                                                                                                                                                                                      |
| <b>mbufs allocated to send data</b>                  | Number of memory buffers currently holding socket send data.                                                                                                                                                                                           |
| <b>mbufs allocated to pfe refill data</b>            | Number of memory buffers currently holding Packet Forwarding Engine refill data.                                                                                                                                                                       |
| <b>mbufs allocated to fxp data</b>                   | Number of memory buffers currently holding fxp data.                                                                                                                                                                                                   |
| <b>mbufs allocated to socket names and addresses</b> | Number of memory buffers currently holding addresses for sockets.                                                                                                                                                                                      |
| <b>mbuf clusters in use</b>                          | Allocation statistics for memory buffer clusters.                                                                                                                                                                                                      |
| <b>allocated to network</b>                          | Total amount of memory in use by the networking and interprocess communication (IPC) code.                                                                                                                                                             |
| <b>requests for memory denied</b>                    | Number of times a memory allocation request within the IPC and networking code failed.                                                                                                                                                                 |
| <b>requests for memory delayed</b>                   | Number of times a memory allocation request within the IPC and networking code was postponed.                                                                                                                                                          |
| <b>calls to protocol drain routines</b>              | Number of times a memory allocation request within the IPC and networking code triggered a memory reclamation attempt.                                                                                                                                 |

## Sample Output

### show system buffers

```

user@host> show system buffers
397/893/1290 mbufs in use (current/cache/total)
395/331/726/30000 mbuf clusters in use (current/cache/total/max)
384/256 mbuf+clusters out of packet secondary zone in use (current/cache)
0/0/0/0 4k (page size) jumbo clusters in use (current/cache/total/max)
0/0/0/0 9k jumbo clusters in use (current/cache/total/max)
0/0/0/0 16k jumbo clusters in use (current/cache/total/max)
889K/885K/1774K bytes allocated to network (current/cache/total)
0/0/0 requests for mbufs denied (mbufs/clusters/mbuf+clusters)
0/0/0 requests for jumbo clusters denied (4k/9k/16k)
0/5/1024 sfbufs in use (current/peak/max)

```



```

0 requests for sbufs denied
0 requests for sbufs delayed
0 requests for I/O initiated by sendfile
0 calls to protocol drain routines

```

#### show system buffers scc (TX Matrix Router)

```

user@host> show system buffers scc
213 mbufs in use:
 11 mbufs allocated to packet headers
 26 mbufs allocated to socket names and addresses
 2 mbufs allocated to socket options
 17 mbufs allocated to socket send data
 2 mbufs allocated to pfe data
 155 mbufs allocated to fxp data (rx)
 511 mbufs allocated to <mbuf type 86>
 256 mbufs allocated to <mbuf type 92>
924/1162 mbuf clusters in use
2788 Kbytes allocated to network (75% in use)
0 requests for memory denied
0 requests for memory delayed
0 calls to protocol drain routines

```

#### show system buffers sfc (TX Matrix Plus Router)

```

user@host> show system buffers sfc 0

sfc0-re0:

4363/2807/7170 mbufs in use (current/cache/total)
4358/1968/6326/30000 mbuf clusters in use (current/cache/total/max)
256/128 mbuf+clusters out of packet secondary zone in use (current/cache)
0/0/0/0 4k (page size) jumbo clusters in use (current/cache/total/max)
0/0/0/0 9k jumbo clusters in use (current/cache/total/max)
0/0/0/0 16k jumbo clusters in use (current/cache/total/max)
9806K/4637K/14444K bytes allocated to network (current/cache/total)
0/0/0 requests for mbufs denied (mbufs/clusters/mbuf+clusters)
0/0/0 requests for jumbo clusters denied (4k/9k/16k)
0/10/1024 sbufs in use (current/peak/max)
0 requests for sbufs denied
0 requests for sbufs delayed
0 requests for I/O initiated by sendfile
0 calls to protocol drain routines

```

#### show system buffers all-chassis (TX Matrix Plus Router)

```

user@host> show system buffers all-chassis

sfc0-re0:

4363/2807/7170 mbufs in use (current/cache/total)
4358/1968/6326/30000 mbuf clusters in use (current/cache/total/max)
256/128 mbuf+clusters out of packet secondary zone in use (current/cache)
0/0/0/0 4k (page size) jumbo clusters in use (current/cache/total/max)
0/0/0/0 9k jumbo clusters in use (current/cache/total/max)
0/0/0/0 16k jumbo clusters in use (current/cache/total/max)
9806K/4637K/14444K bytes allocated to network (current/cache/total)
0/0/0 requests for mbufs denied (mbufs/clusters/mbuf+clusters)
0/0/0 requests for jumbo clusters denied (4k/9k/16k)
0/10/1024 sbufs in use (current/peak/max)
0 requests for sbufs denied
0 requests for sbufs delayed

```

```
0 requests for I/O initiated by sendfile
0 calls to protocol drain routines
```

```
lcc0-re0:
```

```

772/2558/3330 mbufs in use (current/cache/total)
772/598/1370/30000 mbuf clusters in use (current/cache/total/max)
768/512 mbuf+clusters out of packet secondary zone in use (current/cache)
0/0/0/0 4k (page size) jumbo clusters in use (current/cache/total/max)
0/0/0/0 9k jumbo clusters in use (current/cache/total/max)
0/0/0/0 16k jumbo clusters in use (current/cache/total/max)
1737K/1835K/3572K bytes allocated to network (current/cache/total)
0/0/0 requests for mbufs denied (mbufs/clusters/mbuf+clusters)
0/0/0 requests for jumbo clusters denied (4k/9k/16k)
0/4/1024 sfbuffers in use (current/peak/max)
0 requests for sfbuffers denied
0 requests for sfbuffers delayed
0 requests for I/O initiated by sendfile
0 calls to protocol drain routines
```

```
lcc1-re0:
```

```

773/2437/3210 mbufs in use (current/cache/total)
773/453/1226/30000 mbuf clusters in use (current/cache/total/max)
768/384 mbuf+clusters out of packet secondary zone in use (current/cache)
0/0/0/0 4k (page size) jumbo clusters in use (current/cache/total/max)
0/0/0/0 9k jumbo clusters in use (current/cache/total/max)
0/0/0/0 16k jumbo clusters in use (current/cache/total/max)
1739K/1515K/3254K bytes allocated to network (current/cache/total)
0/0/0 requests for mbufs denied (mbufs/clusters/mbuf+clusters)
0/0/0 requests for jumbo clusters denied (4k/9k/16k)
0/7/1024 sfbuffers in use (current/peak/max)
0 requests for sfbuffers denied
0 requests for sfbuffers delayed
0 requests for I/O initiated by sendfile
0 calls to protocol drain routines
```

```
lcc2-re0:
```

```

816/2514/3330 mbufs in use (current/cache/total)
816/554/1370/30000 mbuf clusters in use (current/cache/total/max)
768/512 mbuf+clusters out of packet secondary zone in use (current/cache)
0/0/0/0 4k (page size) jumbo clusters in use (current/cache/total/max)
0/0/0/0 9k jumbo clusters in use (current/cache/total/max)
0/0/0/0 16k jumbo clusters in use (current/cache/total/max)
1836K/1736K/3572K bytes allocated to network (current/cache/total)
0/0/0 requests for mbufs denied (mbufs/clusters/mbuf+clusters)
0/0/0 requests for jumbo clusters denied (4k/9k/16k)
0/4/1024 sfbuffers in use (current/peak/max)
0 requests for sfbuffers denied
0 requests for sfbuffers delayed
0 requests for I/O initiated by sendfile
```

### show system buffers node-group (QFabric System)

```
user@switch> show system buffers node-group node1
node-group node1:
```

```

2/2698/2700 mbufs in use (current/cache/total)
2/1520/1522/30000 mbuf clusters in use (current/cache/total/max)
0/1280 mbuf+clusters out of packet secondary zone in use (current/cache)
```

```

0/0/0/0 4k (page size) jumbo clusters in use (current/cache/total/max)
0/0/0/0 9k jumbo clusters in use (current/cache/total/max)
0/0/0/0 16k jumbo clusters in use (current/cache/total/max)
4K/3714K/3719K bytes allocated to network (current/cache/total)
0/0/0 requests for mbufs denied (mbufs/clusters/mbuf+clusters)
0/0/0 requests for jumbo clusters denied (4k/9k/16k)
0/6/6656 sbufs in use (current/peak/max)
0 requests for sbufs denied
0 requests for sbufs delayed
0 requests for I/O initiated by sendfile
0 calls to protocol drain routines

```

```
re0:
```

```

516/639/1155 mbufs in use (current/cache/total)
515/147/662/30000 mbuf clusters in use (current/cache/total/max)
512/128 mbuf+clusters out of packet secondary zone in use (current/cache)
0/0/0/0 4k (page size) jumbo clusters in use (current/cache/total/max)
0/0/0/0 9k jumbo clusters in use (current/cache/total/max)
0/0/0/0 16k jumbo clusters in use (current/cache/total/max)
1159K/453K/1612K bytes allocated to network (current/cache/total)
0/0/0 requests for mbufs denied (mbufs/clusters/mbuf+clusters)
0/0/0 requests for jumbo clusters denied (4k/9k/16k)
0/4/1024 sbufs in use (current/peak/max)
0 requests for sbufs denied
0 requests for sbufs delayed
0 requests for I/O initiated by sendfile
0 calls to protocol drain routines

```

```
re1:
```

```

519/771/1290 mbufs in use (current/cache/total)
518/176/694/30000 mbuf clusters in use (current/cache/total/max)
512/128 mbuf+clusters out of packet secondary zone in use (current/cache)
0/0/0/0 4k (page size) jumbo clusters in use (current/cache/total/max)
0/0/0/0 9k jumbo clusters in use (current/cache/total/max)
0/0/0/0 16k jumbo clusters in use (current/cache/total/max)
1165K/544K/1710K bytes allocated to network (current/cache/total)
0/0/0 requests for mbufs denied (mbufs/clusters/mbuf+clusters)
0/0/0 requests for jumbo clusters denied (4k/9k/16k)
0/4/1024 sbufs in use (current/peak/max)
0 requests for sbufs denied
0 requests for sbufs delayed
0 requests for I/O initiated by sendfile
0 calls to protocol drain routines

```

## show system certificate

|                                 |                                                                                                                                                                                                 |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>show system certificate</code><br><code>&lt;certificate-id&gt;</code>                                                                                                                     |
| <b>Release Information</b>      | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.    |
| <b>Description</b>              | (Encryption interface on M Series, T Series routers, QFX Series, and OCX Series switches only) Display installed certificates signed by the Juniper Networks certificate authority.             |
| <b>Options</b>                  | <b>none</b> —Display all installed certificates signed by the Juniper Networks certificate authority.<br><br><b>certificate-id</b> —(Optional) Display the details of a particular certificate. |
| <b>Required Privilege Level</b> | maintenance                                                                                                                                                                                     |
| <b>List of Sample Output</b>    | <a href="#">show system certificate on page 1077</a><br><a href="#">show system certificate (QFX Series) on page 1077</a>                                                                       |
| <b>Output Fields</b>            | <a href="#">Table 68 on page 1076</a> lists the output fields for the <b>show system certificate</b> command. Output fields are listed in the approximate order in which they appear.           |

**Table 68: show system certificate Output Fields**

| Field Name                      | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Certificate identifier</b>   | Unique identifier associated with a certificate. The certificate identifier is the common name of the subject.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Issuer</b><br><b>Subject</b> | Information about the certificate issuer and the distinguished name (DN) of the issuer, respectively: <ul style="list-style-type: none"> <li>• <b>Organization</b>—Name of the owner's organization.</li> <li>• <b>Organizational unit</b>—Name of the owner's department.</li> <li>• <b>Country</b>—Two-character country code in which the owner's system is located.</li> <li>• <b>State</b>—State in the USA in which the owner is using the certificate.</li> <li>• <b>Locality</b>—City in which the owner's system is located.</li> <li>• <b>Common name</b>—Name of the owner of the certificate.</li> <li>• <b>E-mail address</b>—E-mail address of the owner of the certificate.</li> </ul> |
| <b>Validity</b>                 | When a certificate is valid.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Signature algorithm</b>      | Encryption algorithm applied to the installed certificate.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Public key algorithm</b>     | Encryption algorithm applied to the public key.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## Sample Output

### show system certificate

```
user@host> show system certificate
Certificate identifier: Dallas-v3
Issuer:
Organization: Juniper Networks, Organizational unit: Juniper CA,
Country: US, State: CA, Locality: Sunnyvale, Common name: Dallas CA,
E-mail address:ca@juniper.net
Subject:
Organization: Juniper Networks, Organizational unit: Juniper CA,
Country: US, State: CA, Locality: Sunnyvale, Common name: Dallas-v3,
E-mail address:ca@juniper.net
Validity:
Not before: Mar 13 03:23:25 2004 GMT
Not after: Mar 24 03:23:25 2014 GMT
Signature algorithm: sha1WithRSAEncryption
Public key algorithm: dsaEncryption
```

### show system certificate (QFX Series)

```
user@host> show system certificate
Certificate identifier: Dallas-v3
Issuer:
Organization: Juniper Networks, Organizational unit: Juniper CA,
Country: US, State: CA, Locality: Sunnyvale, Common name: Dallas CA,
E-mail address:ca@juniper.net
Subject:
Organization: Juniper Networks, Organizational unit: Juniper CA,
Country: US, State: CA, Locality: Sunnyvale, Common name: Dallas-v3,
E-mail address:ca@juniper.net
Validity:
Not before: Mar 13 03:23:25 2004 GMT
Not after: Mar 24 03:23:25 2014 GMT
Signature algorithm: sha1WithRSAEncryption
Public key algorithm: dsaEncryption
```

## show system commit


|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <b>Syntax</b>                   | <pre>show system commit &lt;revision&gt; &lt;server&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                       |  |
| <b>Release Information</b>      | <p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Option <b>server</b> introduced in Junos OS Release 12.1 for the PTX Series router.</p> <p>Option <b>revision</b> introduced in Junos OS Release 14.1.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> |  |
| <b>Description</b>              | Display the system commit history and any pending commit operation.                                                                                                                                                                                                                                                                                                                                                                                 |  |
| <b>Options</b>                  | <p><b>none</b>—Display the last 50 commit operations listed, most recent to first.</p> <p><b>revision</b>—(Optional) Display the revision number of the active configuration of the Routing Engine(s).</p> <p><b>server</b>—(Optional) Display commit server status.</p>                                                                                                                                                                            |  |
|                                 | <div>  <p><b>NOTE:</b> By default, the status of the commit server is “Not running”. The commit server starts running only when a commit job is added to the batch.</p> </div>                                                                                                                                                                                   |  |
| <b>Required Privilege Level</b> | view                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li><a href="#">clear system commit on page 422</a></li> <li><a href="#">show system commit revision</a></li> </ul>                                                                                                                                                                                                                                                                                              |  |
| <b>List of Sample Output</b>    | <p><a href="#">show system commit on page 1080</a></p> <p><a href="#">show system commit (At a Particular Time) on page 1080</a></p> <p><a href="#">show system commit (At the Next Reboot) on page 1080</a></p> <p><a href="#">show system commit (Rollback Pending) on page 1080</a></p> <p><a href="#">show system commit (QFX Series) on page 1080</a></p>                                                                                      |  |
| <b>Output Fields</b>            | <p><a href="#">Table 69 on page 1078</a> describes the output fields for the <b>show system commit</b> command. Output fields are listed in the approximate order in which they appear.</p>                                                                                                                                                                                                                                                         |  |

Table 69: show system commit Output Fields

| Field Name            | Field Description                                                                                                                                                                                                            | Level of Output |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| <b>&lt;number&gt;</b> | Displays the last 50 commit operations listed, most recent to first. The identifier <b>&lt;number&gt;</b> designates a configuration created for recovery using the <b>request system configuration rescue save</b> command. | <b>none</b>     |

Table 69: show system commit Output Fields (*continued*)

| Field Name                                 | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Level of Output |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| <code>&lt;time-stamp&gt;</code>            | Date and time of the commit operation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | none            |
| <code>&lt;root&gt;/&lt;username&gt;</code> | User who executed the commit operation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | none            |
| <code>&lt;method&gt;</code>                | Method used to execute the commit operation: <ul style="list-style-type: none"> <li>• <b>CLI</b>—CLI interactive user performed the commit operation.</li> <li>• <b>Junos XML protocol</b>—Junos XML protocol client performed the commit operation.</li> <li>• <b>synchronize</b>—The <b>commit synchronize</b> command was performed on the other Routing Engine.</li> <li>• <b>snmp</b>—An SNMP <b>set</b> request caused the commit operation.</li> <li>• <b>button</b>—A button on the router or switch was pressed to commit a rescue configuration for recovery.</li> <li>• <b>autoinstall</b>—A configuration obtained through autoinstallation was committed.</li> <li>• <b>other</b>—When there is no login name associated with the session, the values for user and client default to root and other. For example, during a reboot after package installation, mgd commits the configuration as a system commit, and there is no login associated with the commit.</li> </ul> | none            |

## Sample Output

### show system commit

```
user@host> show system commit
0 2003-07-28 19:14:04 PDT by root via other
1 2003-07-25 22:01:36 PDT by user via cli
2 2003-07-25 22:01:32 PDT by user via cli
3 2003-07-25 21:30:13 PDT by root via button
4 2003-07-25 13:46:48 PDT by user via cli
5 2003-07-25 05:33:21 PDT by root via autoinstall
...
rescue 2002-05-10 15:32:03 PDT by root via other
```

### show system commit (At a Particular Time)

```
user@host> show system commit
commit requested by root via cli at Tue May 7 15:59:00 2002
```

### show system commit (At the Next Reboot)

```
user@host> show system commit
commit requested by root via cli at reboot
```

### show system commit (Rollback Pending)

```
user@host> show system commit
0 2005-01-05 15:00:37 PST by root via cli commit confirmed, rollback in 3mins
```

### show system commit (QFX Series)

```
user@switch> show system commit
0 2011-11-25 19:17:49 PST by root via cli
```



## show system configuration archival

**Syntax** show system configuration archival

**Release Information** Introduced in Junos OS Release 7.6.  
 Command introduced in Junos OS Release 9.0 for EX Series switches.  
 Command introduced in Junos OS Release 11.1 for the QFX Series.  
 Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

**Description** Display directory and number of files queued for archival transfer.



**NOTE:** The [edit system configuration] hierarchy is not available on QFabric systems.

**Options** This command has no options.

**Required Privilege Level** maintenance

**List of Sample Output** [show system configuration archival on page 1081](#)

### Sample Output

show system configuration archival

```
user@host> show system configuration archival
```

```
/var/transfer/config/:
total 8
```

## show system configuration rescue

**Syntax** show system configuration rescue

**Release Information** Command introduced before Junos OS Release 7.4.  
 Command introduced in Junos OS Release 9.0 for EX Series switches.  
 Command introduced in Junos OS Release 11.1 for the QFX Series.  
 Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

**Description** Display a rescue configuration, if one exists.



**NOTE:** The [edit system configuration] hierarchy is not available on QFabric systems.

**Options** This command has no options.

**Required Privilege Level** maintenance

**Related Documentation** • [show system configuration archival on page 1081](#)

**List of Sample Output** [show system configuration rescue on page 1082](#)

### Sample Output

#### show system configuration rescue

```
user@switch> show system configuration rescue
version "7.3"; groups {
 global {
 system {
 host-name router1;
 domain-name customer.net;
 domain-search [customer.net];
 backup-router 192.168.124.254;
 name-server {
 172.17.28.11;
 172.17.28.101;
 172.17.28.100;
 172.17.28.10;
 }
 login {
 user user1 {
 uid 928;
 class ;
 shell csh;
 authentication {
 encrypted-password "$ABC123"; ## SECRET-DATA
 }
 }
 }
 }
 }
}
services {
```

```
 ftp;
 rlogin;
 rsh;
 telnet;
 }
}
.....
```

## show system connections

---

|                                       |                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                 | <a href="#">Syntax on page 1084</a><br><a href="#">Syntax (EX Series) on page 1084</a><br><a href="#">Syntax (TX Matrix Router) on page 1084</a><br><a href="#">Syntax (TX Matrix Plus Router) on page 1084</a><br><a href="#">Syntax (MX Series Router) on page 1084</a><br><a href="#">Syntax (QFX Series) on page 1084</a><br><a href="#">Syntax (OCX Series) on page 1084</a> |
| <b>Syntax</b>                         | <pre>show system connections &lt;extensive&gt; &lt;all-chassis   all-lcc   lcc <i>number</i>   scc&gt; &lt;inet   inet6&gt; &lt;show-routing-instances&gt;</pre>                                                                                                                                                                                                                  |
| <b>Syntax (EX Series)</b>             | <pre>show system connections &lt;extensive&gt; &lt;all-members&gt; &lt;inet   inet6&gt; &lt;local&gt; &lt;member <i>member-id</i>&gt; &lt;show-routing-instances&gt;</pre>                                                                                                                                                                                                        |
| <b>Syntax (TX Matrix Router)</b>      | <pre>show system connections &lt;extensive&gt; &lt;all-chassis   all-lcc   lcc <i>number</i>   scc&gt; &lt;inet   inet6&gt; &lt;show-routing-instances&gt;</pre>                                                                                                                                                                                                                  |
| <b>Syntax (TX Matrix Plus Router)</b> | <pre>show system connections &lt;extensive&gt; &lt;all-chassis   all-lcc   lcc <i>number</i>   sfc <i>number</i>&gt; &lt;inet   inet6&gt; &lt;show-routing-instances&gt;</pre>                                                                                                                                                                                                    |
| <b>Syntax (MX Series Router)</b>      | <pre>show system connections &lt;extensive&gt; &lt;all-members&gt; &lt;inet   inet6&gt; &lt;local&gt; &lt;member <i>member-id</i>&gt; &lt;show-routing-instances&gt;</pre>                                                                                                                                                                                                        |
| <b>Syntax (QFX Series)</b>            | <pre>show system connections &lt;extensive&gt; &lt;inet&gt; &lt;infrastructure <i>name</i>&gt; &lt;interconnect-device <i>name</i>&gt; &lt;node-group <i>name</i>&gt; &lt;show-routing-instances&gt;</pre>                                                                                                                                                                        |
| <b>Syntax (OCX Series)</b>            | <pre>show system connections</pre>                                                                                                                                                                                                                                                                                                                                                |

<extensive>  
 <inet>  
 <show-routing-instances>

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Release Information</b> | <p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p><b>sfc</b> option introduced for the TX Matrix Plus router in Junos OS Release 9.6.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Description</b>         | <p>Display information about the active IP sockets on the Routing Engine. Use this command to verify which servers are active on a system and what connections are currently in progress.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Options</b>             | <p><b>none</b>—Display information about all active IP sockets on the Routing Engine.</p> <p><b>extensive</b>—(Optional) Display exhaustive system process information, which, for TCP connections, includes the TCP control block. This option is useful for debugging TCP connections.</p> <p><b>all-chassis</b>—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Display system connection activity for all the routers in the chassis.</p> <p><b>all-lcc</b>—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display system connection activity for all T640 routers connected to the TX Matrix router. On a TX Matrix Plus router, display system connection activity for all connected T1600 or T4000 LCCs</p> <p><b>all-members</b>—(EX4200 switches and MX Series routers only) (Optional) Display system connection activity for all members of the Virtual Chassis configuration.</p> <p><b>inet   inet6</b>—(Optional) Display IPv4 connections or IPv6 connections, respectively.</p> <p><b>infrastructure <i>name</i></b>—(QFabric systems only) (Optional) Display system connection activity for the fabric control Routing Engines or fabric manager Routing Engines.</p> <p><b>interconnect-device <i>name</i></b>—(QFabric systems only) (Optional) Display system connection activity for the Interconnect device.</p> <p><b>lcc <i>number</i></b>—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display system connection activity for a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, display system connection activity for a specific router that is connected to the TX Matrix Plus router. Replace <i>number</i> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none"> <li>• 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.</li> <li>• 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.</li> </ul> |

- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(EX4200 switches and MX Series routers only) (Optional) Display system connection activity for the local Virtual Chassis member.

**member *member-id***—(EX4200 switches and MX Series routers only) (Optional) Display system connection activity for the specified member of the Virtual Chassis configuration. For EX4200 switches, replace ***member-id*** with a value from 0 through 9. For an MX Series Virtual Chassis, replace ***member-id*** with a value of 0 or 1.

**node-group *name***—(QFabric systems only) (Optional) Display system connection activity for the Node group.

**scc**—(TX Matrix routers only) (Optional) Display system connection activity for the TX Matrix router (or switch-card chassis).

**sfc**—(TX Matrix routers only) (Optional) Display system connection activity for the TX Matrix Plus router.

**show-routing-instances**—(Optional) Display routing instances.

**Additional Information** By default, when you issue the **show system connections** command on the master Routing Engine of a TX Matrix router or a TX Matrix Plus router, the command is broadcast to all the master Routing Engines of the LCCs connected to it in the routing matrix. Likewise, if you issue the same command on the backup Routing Engine of a TX Matrix or a TX Matrix Plus router, the command is broadcast to all backup Routing Engines of the LCCs that are connected to it in the routing matrix.

**Required Privilege Level** view

**Related Documentation** • [Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

**List of Sample Output** [show system connections on page 1087](#)  
[show system connections extensive on page 1088](#)  
[show system connections lcc \(TX Matrix Router\) on page 1089](#)  
[show system connections show-routing-instances on page 1089](#)  
[show system connections \(TX Matrix Plus Router\) on page 1090](#)  
[show system connections sfc \(TX Matrix Plus Router\) on page 1093](#)  
[show system connections show-routing-instances \(TX Matrix Plus Router\) on page 1095](#)  
[show system connections \(QFX3500 Switch\) on page 1100](#)

**Output Fields** [Table 70 on page 1087](#) describes the output fields for the **show system connections** command. Output fields are listed in the approximate order in which they appear.

Table 70: show system connections Output Fields

| Field Name              | Field Description                                                                                                                                                                                                              |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Proto</b>            | Protocol of the socket: <b>IP</b> , <b>TCP</b> , or <b>UDP</b> for IPv4 or IPv6.                                                                                                                                               |
| <b>Recv-Q</b>           | Number of input packets received by the protocol and waiting to be processed by the application.                                                                                                                               |
| <b>Send-Q</b>           | Number of output packets sent by the application and waiting to be processed by the protocol.                                                                                                                                  |
| <b>Local Address</b>    | Local address and port of the socket, separated by a period. An asterisk (*) indicates that the bound address is the wildcard address. Server sockets typically have the wildcard address and a well-known port bound to them. |
| <b>Foreign Address</b>  | Foreign address and port of the socket, separated by a period. An asterisk (*) indicates that the address or port is a wildcard.                                                                                               |
| <b>Routing Instance</b> | (Displayed only when the <b>show-routing-instance</b> option is used.) Routing instances associated with active IP sockets on the Routing Engine.                                                                              |
| <b>(state)</b>          | For TCP, the protocol state of the socket.                                                                                                                                                                                     |

## Sample Output

### show system connections

```

user@host> show system connections
Active Internet connections (including servers)
Proto Recv-Q Send-Q Local Address Foreign Address (state)
tcp 0 2 192.168.4.16.513 208.197.169.254.894 ESTABLISHED
tcp 0 0 192.168.4.16.513 208.197.169.195.945 ESTABLISHED
tcp 0 0 *.23 *.* LISTEN
tcp 0 0 *.22 *.* LISTEN
tcp 0 0 *.513 *.* LISTEN
tcp00 *.514 *.* LISTEN
tcp 0 0*.21 *.* LISTEN
tcp00 *.79 *.* LISTEN
tcp 00 *.1023 *.* LISTEN
tcp 00 *.111 *.* LISTEN
udp00192.168.4.16.1634 208.197.169.249.2049
udp00192.168.4.16.1627 208.197.169.254.2049
udp00192.168.4.16.1371 208.197.169.195.2049
udp00*.* *.*
udp00*.9999 *.*
udp00 *.161 *.*
udp00192.168.4.16.1039 192.168.4.16.1023
udp00192.168.4.16.1038 192.168.4.16.1023
udp 00 192.168.4.16.1037 192.168.4.16.1023
udp00192.168.4.16.1036 192.168.4.16.1023
udp00*.1022 *.*
udp00*.1023 *.*
udp00*.111 *.*
udp00*.* *.*
```

## show system connections extensive

```
user@host> show system connections extensive
```

```
Active Internet connections (including servers)
Proto Recv-Q Send-Q Local Address Foreign Address
 (state)
tcp4 0 6 192.168.187.15.23
172.27.133.138.3013 ESTABLISHED
 sndsbcc: 6 sndsbmbcnt: 256 sndsbmbmax: 272000
 sndsblowat: 2048 sndsbhiwat: 34000
 rcvsbcc: 0 rcvsbmbcnt: 0 rcvsbmbmax: 533120
 rcvsblowat: 1 rcvsbhiwat: 66640
 proc id: 0 proc name:
 iss: 2566994072 sndup: 2566994491
 snduna: 2566994491 sndnxt: 2566994494 sndwnd: 64094
 sndmax: 2566994494 sndcwnd: 6589 sndssthresh: 2720
 irs: 236981199 rcvup: 236981325
 rcvnxt: 236981327 rcvadv: 237046862 rcvwnd: 66640
 rtt: 140058623 srtt: 15519 rttv: 908
 rxtcur: 1200 rxtshift: 0 rtseq: 2566994491
 rttmin: 1000 mss: 1360
 flags: SACK_PERMIT [0x2000200]
tcp4 0 0 10.255.165.93.179
10.255.165.203.65141 ESTABLISHED
 sndsbcc: 0 sndsbmbcnt: 0 sndsbmbmax: 131072
 sndsblowat: 2048 sndsbhiwat: 16384
 rcvsbcc: 0 rcvsbmbcnt: 0 rcvsbmbmax: 131072
 rcvsblowat: 1 rcvsbhiwat: 16384
 proc id: 0 proc name:
 iss: 2555995917 sndup: 2555995917
 snduna: 2555995917 sndnxt: 2555995917 sndwnd: 16384
 sndmax: 2555995917 sndcwnd: 1000 sndssthresh: 1073725440
 irs: 2123825753 rcvup: 2123860681
 rcvnxt: 2123860681 rcvadv: 2123877065 rcvwnd: 16384
 rtt: 0 srtt: 3309 rttv: 72
 rxtcur: 1200 rxtshift: 0 rtseq: 2555995898
 rttmin: 1000 mss: 500
 flags: REQ_SCALE RCVD_SCALE REQ_TSTMP RCVD_TSTMP SACK_PERMIT [0x3e0]
tcp4 0 0 10.255.165.93.179
10.255.165.203.65141 ESTABLISHED
 sndsbcc: 0 sndsbmbcnt: 0 sndsbmbmax: 131072
 sndsblowat: 2048 sndsbhiwat: 16384
 rcvsbcc: 0 rcvsbmbcnt: 0 rcvsbmbmax: 131072
 rcvsblowat: 1 rcvsbhiwat: 16384
 proc id: 5022 proc name: rpd
 iss: 2123825753 sndup: 2123860662
 snduna: 2123860681 sndnxt: 2123860681 sndwnd: 16384
 sndmax: 2123860681 sndcwnd: 1000 sndssthresh: 1073725440
 irs: 2555995917 rcvup: 2555995917
 rcvnxt: 2555995917 rcvadv: 2556012301 rcvwnd: 16384
 rtt: 0 srtt: 3279 rttv: 22
 rxtcur: 1200 rxtshift: 0 rtseq: 2123860662
 rttmin: 1000 mss: 500
 flags: REQ_SCALE RCVD_SCALE REQ_TSTMP RCVD_TSTMP SACK_PERMIT [0x100003e0]
tcp4 0 0 10.255.165.113.52404
10.255.165.203.179 ESTABLISHED
 sndsbcc: 0 sndsbmbcnt: 0 sndsbmbmax: 131072
 sndsblowat: 2048 sndsbhiwat: 16384
 rcvsbcc: 0 rcvsbmbcnt: 0 rcvsbmbmax: 131072
 rcvsblowat: 1 rcvsbhiwat: 16384
```



```

proc id: 0 proc name:
 iss: 1109297190 sndup: 1109332099
 snduna: 1109332118 sndnxt: 1109332118 sndwnd: 16384
 sndmax: 1109332118 sndcwnd: 1000 sndssthresh: 1073725440
 irs: 1476831634 rcvup: 1476866449
 rcvnxt: 1476866449 rcvadv: 1476882833 rcvwnd: 16384
 rtt: 0 srtt: 3235 rttv: 18
 rxtcur: 1200 rxtshift: 0 rtseq: 1109332099
 rttmin: 1000 mss: 500
 flags: REQ_SCALE RCVD_SCALE REQ_TSTMP RCVD_TSTMP SACK_PERMIT [0x3e0]

```

### show system connections lcc (TX Matrix Router)

```
user@host> show system connections lcc 2
```

```
lcc2-re0:
```

```

Active Internet connections (including servers)
```

| Proto | Recv-Q | Send-Q | Local Address       | Foreign Address   | (state)     |
|-------|--------|--------|---------------------|-------------------|-------------|
| tcp4  | 0      | 0      | 192.168.66.131.1342 | 192.168.66.130.23 | ESTABLISHED |
| tcp4  | 0      | 0      | 192.168.66.131.2059 | 192.168.66.130.23 | ESTABLISHED |
| tcp4  | 0      | 0      | 192.168.66.131.4571 | 192.168.66.130.23 | ESTABLISHED |
| tcp4  | 0      | 0      | 192.168.66.131.2496 | 192.168.66.130.23 | ESTABLISHED |
| tcp4  | 0      | 0      | *.3221              | *.*               | LISTEN      |
| tcp4  | 0      | 0      | *.23                | *.*               | LISTEN      |
| tcp4  | 0      | 0      | *.22                | *.*               | LISTEN      |
| tcp4  | 0      | 0      | *.514               | *.*               | LISTEN      |
| tcp4  | 0      | 0      | *.513               | *.*               | LISTEN      |
| tcp4  | 0      | 0      | *.21                | *.*               | LISTEN      |
| tcp4  | 0      | 0      | *.79                | *.*               | LISTEN      |
| tcp4  | 0      | 0      | *.6234              | *.*               | LISTEN      |
| udp4  | 0      | 0      | *.514               | *.*               |             |
| udp4  | 0      | 0      | *.6333              | *.*               |             |

### show system connections show-routing-instances

```
user@host> show system connections show-routing-instances
```

```
Active Internet connections (including servers) (including routing-instances)
Proto Recv-Q Send-Q Local Address Foreign Address Routing Instance
(state)
```

| Proto                | Recv-Q | Send-Q | Local Address        | Foreign Address   | Routing Instance |
|----------------------|--------|--------|----------------------|-------------------|------------------|
| tcp4                 | 0      | 0      | 192.168.69.204.23    | 172.17.28.19.4267 | default          |
|                      |        |        | ESTABLISHED          |                   |                  |
| tcp4                 | 0      | 0      | 192.168.69.204.58540 | 10.209.7.138.23   | default          |
|                      |        |        | ESTABLISHED          |                   |                  |
| tcp4                 | 0      | 0      | 192.168.69.204.23    | 172.17.28.19.1098 | default          |
|                      |        |        | ESTABLISHED          |                   |                  |
| tcp4                 | 0      | 0      | 192.168.7.1.57668    | 192.168.9.1.179   | default          |
|                      |        |        | ESTABLISHED          |                   |                  |
| tcp4                 | 0      | 0      | 192.168.7.1.179      | 192.168.8.1.49209 | default          |
|                      |        |        | ESTABLISHED          |                   |                  |
| tcp4                 | 0      | 0      | 128.0.0.1.6234       | 128.0.3.17.1024   |                  |
| __juniper_private1__ |        |        | ESTABLISHED          |                   |                  |
| tcp4                 | 0      | 0      | 128.0.0.4.9000       | 128.0.0.4.59103   |                  |
| __juniper_private1__ |        |        | ESTABLISHED          |                   |                  |
| tcp4                 | 0      | 0      | 128.0.0.4.59103      | 128.0.0.4.9000    |                  |
| __juniper_private1__ |        |        | ESTABLISHED          |                   |                  |
| tcp4                 | 0      | 0      | *.32012              | *.*               |                  |
| __juniper_private1__ |        |        | LISTEN               |                   |                  |
| tcp4                 | 0      | 0      | *.9000               | *.*               |                  |
| __juniper_private1__ |        |        | LISTEN               |                   |                  |
| tcp4                 | 0      | 0      | *.33007              | *.*               |                  |

```

__juniper_private2__ LISTEN
tcp46 0 0 *.179 *.* default
 LISTEN
tcp4 0 0 *.179 *.* default
 LISTEN
tcp4 0 0 *.6154 *.*
__juniper_private1__ LISTEN
tcp4 0 0 *.6153 *.*
__juniper_private1__ LISTEN
tcp4 0 0 *.7000 *.*
__juniper_private1__ LISTEN
tcp4 0 0 *.6152 *.*
__juniper_private1__ LISTEN
tcp4 0 0 *.6156 *.*
__juniper_private1__ LISTEN
tcp4 0 0 *.33005 *.*
__juniper_private2__ LISTEN
tcp4 0 0 *.31343 *.*
__juniper_private1__ LISTEN
tcp4 0 0 *.31341 *.*
__juniper_private1__ LISTEN
tcp4 0 0 *.32003 *.*
__juniper_private2__ LISTEN
tcp4 0 0 *.666 *.*
__juniper_private1__ LISTEN
tcp4 0 0 *.38 *.*
__juniper_private1__ LISTEN
tcp4 0 0 *.3221 *.* default
 LISTEN

```

#### show system connections (TX Matrix Plus Router)

```

user@host> show system connections
sfc0-re0:

```

```

Active Internet connections (including servers)
Proto Recv-Q Send-Q Local Address Foreign Address
 (state)
tcp4 0 3 192.168.178.11.23
172.17.28.19.3565 ESTABLISHED
tcp4 0 0 192.168.178.11.23
172.17.28.204.62719 ESTABLISHED
tcp4 0 0 192.168.178.11.23
192.168.69.199.51255 ESTABLISHED
tcp4 0 0 192.168.178.11.23
172.24.26.227.42860 ESTABLISHED
tcp4 0 0 *.6156 *.*
 LISTEN
tcp4 0 0 162.0.0.4.32012
 ESTABLISHED 162.0.0.5.58935
tcp4 0 0 *.32012 *.*
 LISTEN
tcp4 0 0 *.33007 *.*
 LISTEN
tcp4 0 0 *.666 *.*
 LISTEN
tcp4 0 0 162.0.0.4.6161
 ESTABLISHED 162.0.0.5.62026
tcp4 0 0 *.33005 *.*
 LISTEN
tcp4 0 0 162.0.0.4.9000
 162.0.0.4.51611

```

```

 ESTABLISHED
tcp4 0 0 162.0.0.4.51611 162.0.0.4.9000
 ESTABLISHED
tcp4 0 0 *.6151 *.*
 LISTEN
tcp4 0 0 *.6154 *.*
 LISTEN
tcp4 0 0 *.6153 *.*
 LISTEN
tcp4 0 0 *.31343 *.*
 LISTEN
tcp4 0 0 *.31341 *.*
 LISTEN
tcp4 0 0 *.9000 *.*
 LISTEN
tcp4 0 0 *.6152 *.*
 LISTEN
tcp4 0 0 *.32003 *.*
 LISTEN
tcp4 0 0 *.33009 *.*
 LISTEN
tcp4 0 0 *.3221 *.*
 LISTEN
tcp4 0 0 *.23 *.*
 LISTEN
tcp4 0 0 *.22 *.*
 LISTEN
tcp4 0 0 *.514 *.*
 LISTEN
tcp4 0 0 *.513 *.*
 LISTEN
tcp4 0 0 *.21 *.*
 LISTEN
tcp4 0 0 *.79 *.*
 LISTEN
tcp4 0 0 *.514 *.*
 LISTEN
tcp4 0 0 *.513 *.*
 LISTEN
tcp4 0 0 *.6234 *.*
 LISTEN
udp4 0 0 127.0.0.1.123 *.*
udp4 0 0 10.255.178.11.123 *.*
udp4 0 0 *.123 *.*
udp46 0 0 *.514 *.*
udp4 0 0 *.514 *.*
udp46 0 0 *.62027 *.*
udp4 0 0 *.59363 *.*
udp4 0 0 *.31342 *.*
udp46 0 0 *.161 *.*
udp4 0 0 *.161 *.*
udp4 0 0 *.31340 *.*
udp4 0 0 *.31340 *.*
udp46 0 0 *.49152 *.*
udp46 0 0 *.4784 *.*
udp46 0 0 *.3784 *.*
udp4 0 0 *.49152 *.*
udp4 0 0 *.4784 *.*
udp4 0 0 *.3784 *.*
udp4 0 0 *.6333 *.*
ip4 0 0 *.* *.*

```

```

ip4 0 0 *.* *.*

lcc0-re0:

Active Internet connections (including servers)
Proto Recv-Q Send-Q Local Address Foreign Address
 (state)
tcp4 0 0 192.168.178.3.23
172.24.26.227.50399 ESTABLISHED
tcp4 0 0 *.*.6234
 LISTEN
tcp4 0 0 *.*.7000
 LISTEN
tcp4 0 0 *.*.9000
 LISTEN
tcp4 0 0 *.*.33009
 LISTEN
tcp4 0 0 *.*.3221
 LISTEN
tcp4 0 0 *.*.23
 LISTEN
tcp4 0 0 *.*.22
 LISTEN
tcp4 0 0 *.*.514
 LISTEN
tcp4 0 0 *.*.513
 LISTEN
tcp4 0 0 *.*.21
 LISTEN
tcp4 0 0 *.*.79
 LISTEN
tcp4 0 0 *.*.514
 LISTEN
tcp4 0 0 *.*.513
 LISTEN
udp4 0 0 *.*.514
udp4 0 0 *.*.514
udp4 0 0 *.*.59924
udp4 0 0 *.*.59412
udp4 0 0 *.*.161
udp4 0 0 *.*.161
udp4 0 0 *.*.31342
udp4 0 0 *.*.6333

```

```

lcc1-re0:

Active Internet connections (including servers)
Proto Recv-Q Send-Q Local Address Foreign Address
 (state)
tcp4 0 0 *.*.6234
 LISTEN
tcp4 0 0 *.*.7000
 LISTEN
tcp4 0 0 *.*.9000
 LISTEN
tcp4 0 0 *.*.3221
 LISTEN
tcp4 0 0 *.*.23
 LISTEN
tcp4 0 0 *.*.22
 LISTEN

```

```

tcp4 0 0 *.514 LISTEN *.*
tcp4 0 0 *.513 LISTEN *.*
tcp4 0 0 *.21 LISTEN *.*
tcp4 0 0 *.79 LISTEN *.*
tcp4 0 0 *.514 LISTEN *.*
tcp4 0 0 *.513 LISTEN *.*
tcp4 0 0 *.33009 LISTEN *.*
udp46 0 0 *.514 *.*
udp4 0 0 *.514 *.*
udp46 0 0 *.59924 *.*
udp4 0 0 *.59412 *.*
udp4 0 0 *.31342 *.*
udp46 0 0 *.161 *.*
udp4 0 0 *.161 *.*
udp4 0 0 *.6333 *.*

```

lcc2-re0:

```

Active Internet connections (including servers)
Proto Recv-Q Send-Q Local Address Foreign Address
 (state)
tcp4 0 0 *.6234 LISTEN *.*
tcp4 0 0 *.7000 LISTEN *.*
tcp4 0 0 *.9000 LISTEN *.*
tcp4 0 0 *.33009 LISTEN *.*
tcp4 0 0 *.3221 LISTEN *.*
tcp4 0 0 *.23 LISTEN *.*
tcp4 0 0 *.22 LISTEN *.*
tcp4 0 0 *.514 LISTEN *.*
...

```

#### show system connections sfc (TX Matrix Plus Router)

```

user@host> show system connections sfc 0
sfc0-re0:

```

```

Active Internet connections (including servers)
Proto Recv-Q Send-Q Local Address Foreign Address
 (state)
tcp4 0 0 162.0.0.4.514 132.0.0.4.952
 TIME_WAIT
tcp4 0 0 162.0.0.4.514 131.0.0.4.694
 TIME_WAIT
tcp4 0 0 162.0.0.4.514 130.0.0.4.860
 TIME_WAIT
tcp4 0 0 162.0.0.4.514 129.0.0.4.716
 TIME_WAIT

```

|                      |   |      |                   |             |                 |
|----------------------|---|------|-------------------|-------------|-----------------|
| tcp4                 | 0 | 0    | 162.0.0.4.996     |             | 132.0.0.4.514   |
|                      |   |      | TIME_WAIT         |             |                 |
| tcp4                 | 0 | 0    | 162.0.0.4.798     |             | 131.0.0.4.514   |
|                      |   |      | TIME_WAIT         |             |                 |
| tcp4                 | 0 | 0    | 162.0.0.4.995     |             | 130.0.0.4.514   |
|                      |   |      | TIME_WAIT         |             |                 |
| tcp4                 | 0 | 0    | 162.0.0.4.895     |             | 129.0.0.4.514   |
|                      |   |      | TIME_WAIT         |             |                 |
| tcp4                 | 0 | 0    | 192.168.178.11.21 |             |                 |
| 172.17.28.204.64662  |   |      |                   | TIME_WAIT   |                 |
| tcp4                 | 0 | 0    | 192.168.178.11.21 |             |                 |
| 172.17.28.204.51612  |   |      |                   | TIME_WAIT   |                 |
| tcp4                 | 0 | 0    | *,6156            |             | *,*             |
|                      |   |      | LISTEN            |             |                 |
| tcp4                 | 0 | 0    | *,9000            |             | *,*             |
|                      |   |      | LISTEN            |             |                 |
| tcp4                 | 0 | 0    | *,666             |             | *,*             |
|                      |   |      | LISTEN            |             |                 |
| tcp4                 | 0 | 2    | 192.168.178.11.23 |             |                 |
| 172.17.28.19.3565    |   |      |                   | ESTABLISHED |                 |
| tcp4                 | 0 | 0    | 192.168.178.11.23 |             |                 |
| 172.17.28.204.62719  |   |      |                   | ESTABLISHED |                 |
| tcp4                 | 0 | 0    | 192.168.178.11.23 |             |                 |
| 192.168.69.199.51255 |   |      |                   | ESTABLISHED |                 |
| tcp4                 | 0 | 0    | 192.168.178.11.23 |             |                 |
| 172.24.26.227.42860  |   |      |                   | ESTABLISHED |                 |
| tcp4                 | 0 | 0    | 162.0.0.4.32012   |             | 162.0.0.5.58935 |
|                      |   |      | ESTABLISHED       |             |                 |
| tcp4                 | 0 | 0    | *,32012           |             | *,*             |
|                      |   |      | LISTEN            |             |                 |
| tcp4                 | 0 | 0    | *,33007           |             | *,*             |
|                      |   |      | LISTEN            |             |                 |
| tcp4                 | 0 | 1432 | 162.0.0.4.6161    |             | 162.0.0.5.62026 |
|                      |   |      | ESTABLISHED       |             |                 |
| tcp4                 | 0 | 0    | *,33005           |             | *,*             |
|                      |   |      | LISTEN            |             |                 |
| tcp4                 | 0 | 0    | 162.0.0.4.9000    |             | 162.0.0.4.51611 |
|                      |   |      | FIN_WAIT_2        |             |                 |
| tcp4                 | 0 | 0    | 162.0.0.4.51611   |             | 162.0.0.4.9000  |
|                      |   |      | CLOSE_WAIT        |             |                 |
| tcp4                 | 0 | 0    | *,6151            |             | *,*             |
|                      |   |      | LISTEN            |             |                 |
| tcp4                 | 0 | 0    | *,6154            |             | *,*             |
|                      |   |      | LISTEN            |             |                 |
| tcp4                 | 0 | 0    | *,6153            |             | *,*             |
|                      |   |      | LISTEN            |             |                 |
| tcp4                 | 0 | 0    | *,31343           |             | *,*             |
|                      |   |      | LISTEN            |             |                 |
| tcp4                 | 0 | 0    | *,31341           |             | *,*             |
|                      |   |      | LISTEN            |             |                 |
| tcp4                 | 0 | 0    | *,6152            |             | *,*             |
|                      |   |      | LISTEN            |             |                 |
| tcp4                 | 0 | 0    | *,32003           |             | *,*             |
|                      |   |      | LISTEN            |             |                 |
| tcp4                 | 0 | 0    | *,33009           |             | *,*             |
|                      |   |      | LISTEN            |             |                 |
| tcp4                 | 0 | 0    | *,3221            |             | *,*             |
|                      |   |      | LISTEN            |             |                 |
| tcp4                 | 0 | 0    | *,23              |             | *,*             |
|                      |   |      | LISTEN            |             |                 |
| tcp4                 | 0 | 0    | *,22              |             | *,*             |

```

tcp4 0 0 *.514 LISTEN *. *
tcp4 0 0 *.513 LISTEN *. *
tcp4 0 0 *.21 LISTEN *. *
tcp4 0 0 *.79 LISTEN *. *
tcp4 0 0 *.514 LISTEN *. *
tcp4 0 0 *.513 LISTEN *. *
tcp4 0 0 *.6234 LISTEN *. *
udp4 0 0 127.0.0.1.123 LISTEN *. *
udp4 0 0 10.255.178.11.123 LISTEN *. *
udp4 0 0 *.123 LISTEN *. *
udp46 0 0 *.514 LISTEN *. *
udp4 0 0 *.514 LISTEN *. *
udp46 0 0 *.50895 LISTEN *. *
udp4 0 0 *.50794 LISTEN *. *
udp4 0 0 *.31342 LISTEN *. *
udp46 0 0 *.161 LISTEN *. *
udp4 0 0 *.161 LISTEN *. *
udp4 0 0 *.31340 LISTEN *. *
udp4 0 0 *.31340 LISTEN *. *
udp46 0 0 *.49152 LISTEN *. *
udp46 0 0 *.4784 LISTEN *. *
udp46 0 0 *.3784 LISTEN *. *
udp4 0 0 *.49152 LISTEN *. *
udp4 0 0 *.4784 LISTEN *. *
udp4 0 0 *.3784 LISTEN *. *
udp4 0 0 *.6333 LISTEN *. *
ip4 104 0 *. * LISTEN *. *
ip4 0 0 *. * LISTEN *. *
ip4 0 0 *. * LISTEN *. *

```

#### show system connections show-routing-instances (TX Matrix Plus Router)

```

user@host> show system connections show-routing-instances
sfc0-re0:

Active Internet connections (including servers) (including routing-instances)
Proto Recv-Q Send-Q Local Address Foreign Address
 Routing Instance (state)
tcp4 0 0 *.6156 __juniper_private1__ LISTEN *. *
tcp4 0 0 *.9000 __juniper_private1__ LISTEN *. *
tcp4 0 0 *.666 __juniper_private1__ LISTEN *. *
tcp4 0 2 192.168.178.11.23 default ESTABLISHED
172.17.28.19.3565
tcp4 0 0 192.168.178.11.23 default ESTABLISHED
172.17.28.204.62719
tcp4 0 0 192.168.178.11.23 default ESTABLISHED
192.168.69.199.51255
tcp4 0 0 192.168.178.11.23 default ESTABLISHED
172.24.26.227.42860
tcp4 0 0 162.0.0.4.32012 162.0.0.5.58935

```

|       |   |   |                   |                      |             |                 |
|-------|---|---|-------------------|----------------------|-------------|-----------------|
| tcp4  | 0 | 0 | *.32012           | __juniper_private1__ | ESTABLISHED | *.*             |
| tcp4  | 0 | 0 | *.33007           | __juniper_private1__ | LISTEN      | *.*             |
| tcp4  | 0 | 0 | 162.0.0.4.6161    | __juniper_private2__ | LISTEN      | 162.0.0.5.62026 |
| tcp4  | 0 | 0 | *.33005           | __juniper_private1__ | ESTABLISHED | *.*             |
| tcp4  | 0 | 0 | 162.0.0.4.9000    | __juniper_private2__ | LISTEN      | 162.0.0.4.51611 |
| tcp4  | 0 | 0 | 162.0.0.4.51611   | __juniper_private1__ | FIN_WAIT_2  | 162.0.0.4.9000  |
| tcp4  | 0 | 0 | *.6151            | __juniper_private1__ | CLOSE_WAIT  | *.*             |
| tcp4  | 0 | 0 | *.6154            | __juniper_private1__ | LISTEN      | *.*             |
| tcp4  | 0 | 0 | *.6153            | __juniper_private1__ | LISTEN      | *.*             |
| tcp4  | 0 | 0 | *.31343           | __juniper_private1__ | LISTEN      | *.*             |
| tcp4  | 0 | 0 | *.31341           | __juniper_private1__ | LISTEN      | *.*             |
| tcp4  | 0 | 0 | *.6152            | __juniper_private1__ | LISTEN      | *.*             |
| tcp4  | 0 | 0 | *.32003           | __juniper_private1__ | LISTEN      | *.*             |
| tcp4  | 0 | 0 | *.33009           | __juniper_private2__ | LISTEN      | *.*             |
| tcp4  | 0 | 0 | *.3221            | __juniper_private2__ | LISTEN      | *.*             |
| tcp4  | 0 | 0 | *.23              | default              | LISTEN      | *.*             |
| tcp4  | 0 | 0 | *.22              | default              | LISTEN      | *.*             |
| tcp4  | 0 | 0 | *.514             | default              | LISTEN      | *.*             |
| tcp4  | 0 | 0 | *.513             | default              | LISTEN      | *.*             |
| tcp4  | 0 | 0 | *.21              | default              | LISTEN      | *.*             |
| tcp4  | 0 | 0 | *.79              | default              | LISTEN      | *.*             |
| tcp4  | 0 | 0 | *.514             | default              | LISTEN      | *.*             |
| tcp4  | 0 | 0 | *.513             | __juniper_private1__ | LISTEN      | *.*             |
| tcp4  | 0 | 0 | *.6234            | __juniper_private1__ | LISTEN      | *.*             |
| tcp4  | 0 | 0 |                   | __juniper_private1__ | LISTEN      | *.*             |
| udp4  | 0 | 0 | 127.0.0.1.123     | default              |             | *.*             |
| udp4  | 0 | 0 | 10.255.178.11.123 | default              |             | *.*             |
| udp4  | 0 | 0 | *.123             | default              |             | *.*             |
| udp46 | 0 | 0 | *.514             | default              |             | *.*             |
| udp4  | 0 | 0 | *.514             | default              |             | *.*             |
| udp46 | 0 | 0 | *.50895           | default              |             | *.*             |



```

udp4 0 0 *.50794 *.*
 default
udp4 0 0 *.31342 *.*
 __juniper_private1__
udp46 0 0 *.161 *.*
 default
udp4 0 0 *.161 *.*
 default
udp4 0 0 *.31340 *.*
 __juniper_private2__
udp4 0 0 *.31340 *.*
 __juniper_private1__
udp46 0 0 *.49152 *.*
 default
udp46 0 0 *.4784 *.*
 default
udp46 0 0 *.3784 *.*
 default
udp4 0 0 *.49152 *.*
 default
udp4 0 0 *.4784 *.*
 default
udp4 0 0 *.3784 *.*
 default
udp4 0 0 *.6333 *.*
 __juniper_private1__
ip4 0 0 *.* *.*
 default
ip4 0 0 *.* *.*
 default
ip4 0 0 *.* *.*
 default

```

lcc0-re0:

```

Active Internet connections (including servers) (including routing-instances)
Proto Recv-Q Send-Q Local Address Foreign Address
 Routing Instance (state)
tcp4 0 0 *.7000 *.*
 __juniper_private1__ LISTEN
tcp4 0 0 192.168.178.3.23 *.*
172.24.26.227.50399 default ESTABLISHED
tcp4 0 0 *.6234 *.*
 __juniper_private1__ LISTEN
tcp4 0 0 *.9000 *.*
 __juniper_private1__ LISTEN
tcp4 0 0 *.33009 *.*
 __juniper_private2__ LISTEN
tcp4 0 0 *.3221 *.*
 default LISTEN
tcp4 0 0 *.23 *.*
 default LISTEN
tcp4 0 0 *.22 *.*
 default LISTEN
tcp4 0 0 *.514 *.*
 default LISTEN
tcp4 0 0 *.513 *.*
 default LISTEN
tcp4 0 0 *.21 *.*
 default LISTEN
tcp4 0 0 *.79 *.*

```

```

tcp4 0 0 *.514 default LISTEN *.*
tcp4 0 0 *.513 __juniper_private1__ LISTEN *.*
udp46 0 0 *.514 __juniper_private1__ LISTEN *.*
udp4 0 0 *.514 default *.*
udp46 0 0 *.59924 default *.*
udp4 0 0 *.59412 default *.*
udp46 0 0 *.161 default *.*
udp4 0 0 *.161 default *.*
udp4 0 0 *.31342 default *.*
udp4 0 0 *.6333 __juniper_private1__ *.*
udp4 0 0 *.6333 __juniper_private1__

```

lcc1-re0:

-----  
Active Internet connections (including servers) (including routing-instances)  
Proto Recv-Q Send-Q Local Address

```

Routing Instance (state) Foreign Address
tcp4 0 0 *.7000 __juniper_private1__ LISTEN *.*
tcp4 0 0 *.6234 __juniper_private1__ LISTEN *.*
tcp4 0 0 *.9000 __juniper_private1__ LISTEN *.*
tcp4 0 0 *.3221 __juniper_private1__ LISTEN *.*
tcp4 0 0 *.23 default LISTEN *.*
tcp4 0 0 *.22 default LISTEN *.*
tcp4 0 0 *.514 default LISTEN *.*
tcp4 0 0 *.513 default LISTEN *.*
tcp4 0 0 *.21 default LISTEN *.*
tcp4 0 0 *.79 default LISTEN *.*
tcp4 0 0 *.514 default LISTEN *.*
tcp4 0 0 *.513 __juniper_private1__ LISTEN *.*
tcp4 0 0 *.33009 __juniper_private1__ LISTEN *.*
tcp4 0 0 *.33009 __juniper_private2__ LISTEN *.*
udp46 0 0 *.514 default *.*
udp4 0 0 *.514 default *.*
udp46 0 0 *.59924 default *.*
udp4 0 0 *.59412 default *.*
udp4 0 0 *.59412 default

```

```

udp4 0 0 *.31342 *.*
 __juniper_private1__
udp46 0 0 *.161 *.*
 default
udp4 0 0 *.161 *.*
 default
udp4 0 0 *.6333 *.*
 __juniper_private1__

lcc2-re0:

Active Internet connections (including servers) (including routing-instances)
Proto Recv-Q Send-Q Local Address Foreign Address
Routing Instance (state)
tcp4 0 0 *.7000 *.*
 __juniper_private1__ LISTEN
tcp4 0 0 *.6234 *.*
 __juniper_private1__ LISTEN
tcp4 0 0 *.9000 *.*
 __juniper_private1__ LISTEN
tcp4 0 0 *.33009 *.*
 __juniper_private2__ LISTEN
tcp4 0 0 *.3221 *.*
 default LISTEN
tcp4 0 0 *.23 *.*
 default LISTEN
tcp4 0 0 *.22 *.*
 default LISTEN
tcp4 0 0 *.514 *.*
 default LISTEN
tcp4 0 0 *.513 *.*
 default LISTEN
tcp4 0 0 *.21 *.*
 default LISTEN
tcp4 0 0 *.79 *.*
 default LISTEN
tcp4 0 0 *.514 *.*
 __juniper_private1__ LISTEN
tcp4 0 0 *.513 *.*
 __juniper_private1__ LISTEN
udp46 0 0 *.514 *.*
 default
udp4 0 0 *.514 *.*
 default
udp4 0 0 *.31342 *.*
 __juniper_private1__
udp46 0 0 *.62103 *.*
 default
udp4 0 0 *.59924 *.*
 default
udp46 0 0 *.161 *.*
 default
udp4 0 0 *.161 *.*
 default
udp4 0 0 *.6333 *.*
 __juniper_private1__

```

```

lcc3-re0:

Active Internet connections (including servers) (including routing-instances)
Proto Recv-Q Send-Q Local Address Foreign Address

```

|       |   |   |         | Routing Instance     | (state) |     |
|-------|---|---|---------|----------------------|---------|-----|
| tcp4  | 0 | 0 | *.7000  |                      |         | *.* |
| tcp4  | 0 | 0 | *.6234  | __juniper_private1__ | LISTEN  | *.* |
| tcp4  | 0 | 0 | *.9000  | __juniper_private1__ | LISTEN  | *.* |
| tcp4  | 0 | 0 | *.33009 | __juniper_private1__ | LISTEN  | *.* |
| tcp4  | 0 | 0 | *.3221  | __juniper_private2__ | LISTEN  | *.* |
| tcp4  | 0 | 0 | *.23    | default              | LISTEN  | *.* |
| tcp4  | 0 | 0 | *.22    | default              | LISTEN  | *.* |
| tcp4  | 0 | 0 | *.514   | default              | LISTEN  | *.* |
| tcp4  | 0 | 0 | *.513   | default              | LISTEN  | *.* |
| tcp4  | 0 | 0 | *.21    | default              | LISTEN  | *.* |
| tcp4  | 0 | 0 | *.79    | default              | LISTEN  | *.* |
| tcp4  | 0 | 0 | *.514   | __juniper_private1__ | LISTEN  | *.* |
| tcp4  | 0 | 0 | *.513   | __juniper_private1__ | LISTEN  | *.* |
| udp46 | 0 | 0 | *.514   |                      |         | *.* |
| udp4  | 0 | 0 | *.514   | default              |         | *.* |
| udp46 | 0 | 0 | *.62103 | default              |         | *.* |
| udp4  | 0 | 0 | *.59924 | default              |         | *.* |
| udp4  | 0 | 0 | *.31342 | __juniper_private1__ |         | *.* |
| udp46 | 0 | 0 | *.161   | default              |         | *.* |
| udp4  | 0 | 0 | *.161   | default              |         | *.* |
| udp4  | 0 | 0 | *.6333  | __juniper_private1__ |         | *.* |

#### show system connections (QFX3500 Switch)

```

user@switch> show system connections
Active Internet connections (including servers)
Proto Recv-Q Send-Q Local Address Foreign Address
 (state)
tcp4 0 0 10.94.204.110.23 172.17.28.19.1308 ESTABLISHED
tcp4 0 0 128.0.0.1.6234 128.0.0.1.65142 ESTABLISHED
tcp4 0 0 128.0.0.1.65142 128.0.0.1.6234 ESTABLISHED
tcp4 0 0 128.0.0.1.33003 128.0.0.1.61441 ESTABLISHED
tcp4 0 0 128.0.0.1.61441 128.0.0.1.33003 ESTABLISHED
tcp46 0 0 *.179 *.*
```

|      |   |                    |             |                  |
|------|---|--------------------|-------------|------------------|
|      |   |                    | LISTEN      |                  |
| tcp4 | 0 | 0 *.179            |             | *.*              |
|      |   |                    | LISTEN      |                  |
| tcp4 | 0 | 0 128.0.0.16.9000  |             | 128.0.0.16.50970 |
|      |   |                    | ESTABLISHED |                  |
| tcp4 | 0 | 0 128.0.0.16.50970 |             | 128.0.0.16.9000  |
|      |   |                    | ESTABLISHED |                  |
| tcp4 | 0 | 0 *.38             |             | *.*              |
|      |   |                    | LISTEN      |                  |
| tcp4 | 0 | 0 *.3491           |             | *.*              |
|      |   |                    | LISTEN      |                  |
| tcp4 | 0 | 0 *.6156           |             | *.*              |
|      |   |                    | LISTEN      |                  |
| tcp4 | 0 | 0 128.0.0.1.33001  |             | 128.0.0.1.59437  |
|      |   |                    | ESTABLISHED |                  |
| tcp4 | 0 | 0 128.0.0.1.59437  |             | 128.0.0.1.33001  |
|      |   |                    | ESTABLISHED |                  |
| tcp4 | 0 | 0 128.0.0.1.33023  |             | 128.0.0.1.63605  |
|      |   |                    | ESTABLISHED |                  |
| tcp4 | 0 | 0 128.0.0.1.63605  |             | 128.0.0.1.33023  |
|      |   |                    | ESTABLISHED |                  |
| tcp4 | 0 | 0 128.0.0.1.33001  |             | 128.0.0.1.63830  |
|      |   |                    | ESTABLISHED |                  |
| tcp4 | 0 | 0 128.0.0.1.63830  |             | 128.0.0.1.33001  |
|      |   |                    | ESTABLISHED |                  |
| tcp4 | 0 | 0 *.667            |             | *.*              |
|      |   |                    | LISTEN      |                  |
| tcp4 | 0 | 0 *.6156           |             | *.*              |
|      |   |                    | LISTEN      |                  |
| tcp4 | 0 | 0 128.0.0.1.7000   |             | 128.0.0.1.51580  |
|      |   |                    | ESTABLISHED |                  |
| tcp4 | 0 | 0 128.0.0.1.51580  |             | 128.0.0.1.7000   |
|      |   |                    | ESTABLISHED |                  |
| tcp4 | 0 | 0 128.0.0.1.6234   |             | 128.0.0.1.53646  |
|      |   |                    | ESTABLISHED |                  |
| tcp4 | 0 | 0 *.33001          |             | *.*              |
|      |   |                    | LISTEN      |                  |
| tcp4 | 0 | 0 *.33003          |             | *.*              |
|      |   |                    | LISTEN      |                  |
| tcp4 | 0 | 0 128.0.0.1.53646  |             | 128.0.0.1.6234   |
|      |   |                    | ESTABLISHED |                  |
| tcp4 | 0 | 0 128.0.0.16.9000  |             | 128.0.0.16.63454 |
|      |   |                    | ESTABLISHED |                  |
| tcp4 | 0 | 0 128.0.0.16.63454 |             | 128.0.0.16.9000  |
|      |   |                    | ESTABLISHED |                  |
| tcp4 | 0 | 0 *.666            |             | *.*              |
|      |   |                    | LISTEN      |                  |
| tcp4 | 0 | 0 *.7000           |             | *.*              |
|      |   |                    | LISTEN      |                  |
| tcp4 | 0 | 0 *.51627          |             | *.*              |
|      |   |                    | LISTEN      |                  |
| tcp4 | 0 | 0 *.3492           |             | *.*              |
|      |   |                    | LISTEN      |                  |
| tcp4 | 0 | 0 *.33023          |             | *.*              |
|      |   |                    | LISTEN      |                  |
| tcp4 | 0 | 0 *.33013          |             | *.*              |
|      |   |                    | LISTEN      |                  |
| tcp4 | 0 | 0 *.7202           |             | *.*              |
|      |   |                    | LISTEN      |                  |
| tcp4 | 0 | 0 *.6151           |             | *.*              |
|      |   |                    | LISTEN      |                  |

|       |   |                      |        |      |
|-------|---|----------------------|--------|------|
| tcp4  | 0 | 0 *.9000             |        | *. * |
|       |   |                      | LISTEN |      |
| tcp4  | 0 | 0 *.6161             |        | *. * |
|       |   |                      | LISTEN |      |
| tcp4  | 0 | 0 *.6011             |        | *. * |
|       |   |                      | LISTEN |      |
| tcp4  | 0 | 0 *.3221             |        | *. * |
|       |   |                      | LISTEN |      |
| tcp4  | 0 | 0 *.23               |        | *. * |
|       |   |                      | LISTEN |      |
| tcp4  | 0 | 0 *.22               |        | *. * |
|       |   |                      | LISTEN |      |
| tcp4  | 0 | 0 *.514              |        | *. * |
|       |   |                      | LISTEN |      |
| tcp4  | 0 | 0 *.513              |        | *. * |
|       |   |                      | LISTEN |      |
| tcp4  | 0 | 0 *.21               |        | *. * |
|       |   |                      | LISTEN |      |
| tcp4  | 0 | 0 *.79               |        | *. * |
|       |   |                      | LISTEN |      |
| tcp4  | 0 | 0 *.514              |        | *. * |
|       |   |                      | LISTEN |      |
| tcp4  | 0 | 0 *.513              |        | *. * |
|       |   |                      | LISTEN |      |
| tcp4  | 0 | 0 *.1127             |        | *. * |
|       |   |                      | LISTEN |      |
| tcp4  | 0 | 0 *.1129             |        | *. * |
|       |   |                      | LISTEN |      |
| tcp4  | 0 | 0 *.1128             |        | *. * |
|       |   |                      | LISTEN |      |
| tcp4  | 0 | 0 *.6234             |        | *. * |
|       |   |                      | LISTEN |      |
| udp46 | 0 | 0 *.514              |        | *. * |
| udp4  | 0 | 0 *.514              |        | *. * |
| udp4  | 0 | 0 128.0.0.1.123      |        | *. * |
| udp46 | 0 | 0 *.53344            |        | *. * |
| udp4  | 0 | 0 *.54261            |        | *. * |
| udp46 | 0 | 0 *.161              |        | *. * |
| udp4  | 0 | 0 *.161              |        | *. * |
| udp4  | 0 | 0 *.31342            |        | *. * |
| udp4  | 0 | 0 *.59137            |        | *. * |
| udp4  | 0 | 0 *. *               |        | *. * |
| udp46 | 0 | 0 *.49152            |        | *. * |
| udp46 | 0 | 0 *.4784             |        | *. * |
| udp46 | 0 | 0 *.3784             |        | *. * |
| udp4  | 0 | 0 *.49152            |        | *. * |
| udp4  | 0 | 0 *.4784             |        | *. * |
| udp4  | 0 | 0 *.3784             |        | *. * |
| udp4  | 0 | 0 10.255.204.110.123 |        | *. * |
| udp4  | 0 | 0 *.123              |        | *. * |
| udp4  | 0 | 0 *.67               |        | *. * |
| udp4  | 0 | 0 *.6333             |        | *. * |
| udp4  | 0 | 0 *.2293             |        | *. * |
| ip4   | 0 | 0 *. *               |        | *. * |
| ip4   | 0 | 0 *. *               |        | *. * |
| ip4   | 0 | 0 *. *               |        | *. * |

## show system core-dumps

|                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                     | <a href="#">Syntax on page 1103</a><br><a href="#">Syntax (EX Series Switches) on page 1103</a><br><a href="#">Syntax (TX Matrix Router) on page 1103</a><br><a href="#">Syntax (TX Matrix Plus Router) on page 1103</a><br><a href="#">Syntax (QFX Series and OCX Series) on page 1103</a>                                                                                                                                                                                                                     |
| <b>Syntax</b>                             | <pre>show system core-dumps &lt;brief   detail&gt; &lt;core-filename&gt; &lt;core-file-info&gt; &lt;re0&gt; &lt;re1&gt; &lt;routing-engine&gt;</pre>                                                                                                                                                                                                                                                                                                                                                            |
| <b>Syntax (EX Series Switches)</b>        | <pre>show system core-dumps &lt;all-members&gt; &lt;brief   detail&gt; &lt;core-filename&gt; &lt;core-file-info&gt; &lt;local&gt; &lt;member member-id&gt;</pre>                                                                                                                                                                                                                                                                                                                                                |
| <b>Syntax (TX Matrix Router)</b>          | <pre>show system core-dumps &lt;all-chassis   all-lcc   lcc number   scc&gt; &lt;brief   detail&gt; &lt;core-filename&gt; &lt;core-file-info&gt;</pre>                                                                                                                                                                                                                                                                                                                                                          |
| <b>Syntax (TX Matrix Plus Router)</b>     | <pre>show system core-dumps &lt;all-chassis   all-lcc   lcc number   sfc number&gt; &lt;brief   detail&gt; &lt;core-filename&gt; &lt;core-file-info&gt;</pre>                                                                                                                                                                                                                                                                                                                                                   |
| <b>Syntax (QFX Series and OCX Series)</b> | <pre>show system core-dumps &lt;brief   detail&gt; &lt;component (UUID   serial number   all)&gt; &lt;core-file-info component (UUID   serial number) core-file-name&gt; &lt;display-period (hours   minutes   seconds)&gt; &lt;display-order&gt; &lt;kernel-crashinfo component (UUID   serial number)&gt; &lt;repository (core   log)&gt;</pre>                                                                                                                                                               |
| <b>Release Information</b>                | <p>Command introduced before Junos OS Release 8.5.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p><b>sfc</b> option introduced for the TX Matrix Plus router in Junos OS Release 9.6.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p><b>re0</b>, <b>re1</b>, and <b>routing-engine</b> options introduced for dual Routing Engines in Junos OS Release 13.1.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> |

**Description** Show core files on all routers or switches running Junos OS. You can use the **show system core-dumps** command to show a list of system core files created when the router or switch has failed. This command can be useful for diagnostic purposes. Each list item includes the file permissions, number of links, owner, group, size, modification date, and path and filename. If dual Routing Engines are present, you can view core-dump files for either routing engine or both routing engines together. On a QFabric system, you can view core-dump files on individual QFabric system devices as well as on the entire QFabric system.

You can use the option **core-filename** and its options **core-file-info**, **brief**, and **detail** to display more information about the specified core-dump files.

**Options** **none**—Display a list of all existing core-dump files.



**NOTE:** If dual Routing Engines are present, then only the core-dump files for the active Routing Engine are listed.

**all-chassis**—(TX Matrix and TX Matrix Plus routers only) (Optional) On a routing matrix based on a TX Matrix router, display system core files for the TX Matrix router switch-card chassis [SCC] and all the T640 routers [LCCs] connected to the TX Matrix router.

On a routing matrix based on a TX Matrix Plus router, display system core files for the TX Matrix Plus router (switch-fabric chassis [SFC]) and all the T1600 routers [LCCs] connected to the TX Matrix Plus router.

**<all-lcc | lcc number>**—(TX Matrix and TX Matrix Plus routers only) (Optional) On a routing matrix based on the TX Matrix router, display core dump files for all T640 routers (line-card chassis [LCCs]) or a specific T640 router [LCC] connected to the TX Matrix router.

On a routing matrix based on the TX Matrix Plus router, display logging information for all T1600 routers (line-card chassis [LCCs]) or a specific T1600 router (LCC) connected to the TX Matrix Plus router. When using the **lcc number** option, replace **number** with a value from 0 through 3.



**NOTE:** The **all-chassis** option displays system core files for the SCC or SFC and the LCCs connected to the SCC or SFC in the routing matrix while the **all-lcc** option only displays system core files for the LCCs in the routing matrix.

**all-members**—(EX4200 switches) (Optional) Display system core files on all members of the Virtual Chassis configuration.

**brief**—(Optional) View details of a binary file.



**component** (*UUID | serial number | all*)—(QFabric systems only) (Optional) Display a list of core-dump files located on individual QFabric system device or on the entire QFabric system.

**core-file-info**—(Optional) Display the stack trace of a core file.

**core-filename**—(Optional) Name of a specific core file to display.

**detail**—(Optional) View stack trace with details of the binary file.

**display-order** (*timestamp-sort | alphanumeric-sort*)—(QFabric systems only) (Optional) Display list of debug artifacts generated within the specified period—for example, within the last hour, within the last 20 minutes, or within the last 32 seconds—or according to their filename.

**display-period** (*hours | minutes | seconds*)—(QFabric systems only) (Optional) Display core-dump files generated within the specified period—for example, within the last hour, within the last 20 minutes, or within the last 32 seconds.

**kernel-crashinfo component** (*UUID | serial number*)—(QFabric systems only) (Optional) Display kernel crash information from the EEPROM on a QFabric system device.

**local**—(EX4200 switches only) (Optional) Display system core files on the local Virtual Chassis member.

**member member-id**—(EX4200 switches only) (Optional) Display system core files on the specified member of the Virtual Chassis configuration. Replace *member-id* with a value from 0 through 9.

**re0**—(Dual Routing Engines only) Display the core-dump files on re0.

**re1**—(Dual Routing Engines only) Display the core-dump files on re1.

**repository** (*core | log*)—(QFabric systems only) (Optional) Specify either the core or log repository in which to view core-dump files.

**routing-engine** (*backup | both | local | master | other*)—(Dual routing engines only) Display a list of core-dump files for either the backup, local, master, or other routing engine or both routing engines.

**scc**—(TX Matrix routers only) (Optional) Display system core files on the TX Matrix router (or switch-card chassis).

**sfc**—(TX Matrix Plus routers only) (Optional) Display system core files on the TX Matrix Plus router (or switch-fabric chassis).

**Required Privilege Level**

view

**List of Sample Output**

[show system core-dumps on page 1107](#)

[show system core-dumps on page 1108](#)

[show system core-dumps routing-engine both on page 1108](#)

[show system core-dumps \(TX Matrix Plus Router\) on page 1108](#)

[show system core-dumps \(QFX3500 Switch\) on page 1110](#)  
[show system core-dumps \(QFabric Systems\) on page 1110](#)  
[show system core-dumps core-file-info component serial number core-file-name \(QFabric Systems\) on page 1111](#)  
[show system core-dumps component serial number display-order alphanumeric-sort repository core \(QFabric Systems\) on page 1111](#)  
[show system core-dumps display-period \(QFabric Systems\) on page 1111](#)  
[show system core-dumps kernel-crashinfo component serial number \(QFabric Systems\) on page 1113](#)  
[show system core-dumps repository core \(QFabric Systems\) on page 1115](#)  
[show system core-dumps repository log \(QFabric Systems\) on page 1115](#)

**Output Fields** [Table 71 on page 1106](#) describes the output fields for the **show system core-dumps** command. Output fields are listed in the approximate order in which they appear.

**Table 71: show system core-dumps Output Fields**

| Field Name                                | Field Description                                                                                                                                                                                                                                                                                                                           |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Permissions</i>                        | Read/write permissions for the file named.                                                                                                                                                                                                                                                                                                  |
| <i>Links</i>                              | Number of links to the file.                                                                                                                                                                                                                                                                                                                |
| <i>Owner</i>                              | Name of the file owner.                                                                                                                                                                                                                                                                                                                     |
| <i>Group</i>                              | Name of the group with file access.                                                                                                                                                                                                                                                                                                         |
| <i>File size</i>                          | File size in bytes.                                                                                                                                                                                                                                                                                                                         |
| <i>Modified</i>                           | Last file modification date and time.                                                                                                                                                                                                                                                                                                       |
| <i>Path/filename</i>                      | File path where the file resides and the filename.                                                                                                                                                                                                                                                                                          |
| <b>Repository scope:</b>                  | Repository where core-dump files and log files are stored. The core-dump files are located in the <b>core</b> repository, and the log files are located in the <b>log</b> repository. The default <b>Repository scope</b> is shared since both the <b>core</b> and <b>log</b> repositories are shared by all of the QFabric system devices. |
| <b>Repository head:</b>                   | Path to the top-level repository location.                                                                                                                                                                                                                                                                                                  |
| <b>Repository name:</b>                   | Name of the repository: <b>core</b> or <b>log</b> .                                                                                                                                                                                                                                                                                         |
| <b>List of nodes for core repository:</b> | List of core-dump files associated with a particular QFabric system device located in the core repository.                                                                                                                                                                                                                                  |
| <b>Node Group</b>                         | Name of the QFabric system device.                                                                                                                                                                                                                                                                                                          |
| <b>Node Identifier</b>                    | UUID or serial number of the QFabric system device.                                                                                                                                                                                                                                                                                         |
| <b>Num</b>                                | Number of core-dump and log files.                                                                                                                                                                                                                                                                                                          |

Table 71: show system core-dumps Output Fields (*continued*)

| Field Name                                | Field Description                                                                                                                                                      |
|-------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Model</b>                              | Model number of the QFabric system device.                                                                                                                             |
| <b>Usage</b>                              | Usage of the repository in megabytes.                                                                                                                                  |
| <b>Total usage of core repository:</b>    | Total usage of core-dump files associated with a particular QFabric system device located in the core repository. Usage is specified in megabytes and as a percentage. |
| <b>Total usage of log repository:</b>     | Total usage of log files associated with a particular QFabric system device located in the log repository. Usage is specified in megabytes and as a percentage.        |
| <b>List of nodes for core repository:</b> | List of core-dump files associated with a particular QFabric system device located in the core repository.                                                             |
| <b>List of nodes for log repository:</b>  | List of log files associated with a particular QFabric system device located in the log repository.                                                                    |
| <b>Filename</b>                           | Name of the core-dump file.                                                                                                                                            |
| <b>Date</b>                               | Last core-dump file modification date and time.                                                                                                                        |
| <b>Size</b>                               | Size of the core-dump file.                                                                                                                                            |
| <b>Core filename</b>                      | Filename of the core-dump file.                                                                                                                                        |
| <b>Process name</b>                       | Name of the process that is generating a core-dump file or log file.                                                                                                   |
| <b>Release</b>                            | Junos OS release.                                                                                                                                                      |
| <b>Build server</b>                       | Junos OS build server.                                                                                                                                                 |
| <b>Build date</b>                         | Junos OS build date.                                                                                                                                                   |
| <b>Stack trace</b>                        | Stack trace of the core-dump file.                                                                                                                                     |

## Sample Output

### show system core-dumps

This example shows the command output if core files exist.

```
user@switcht> show system core-dumps
-rw----- 1 root wheel 268369920 Jun 18 17:59 /var/crash/vmcore.0
-rw-rw---- 1 root field 3371008 Jun 18 17:53 /var/tmp/rpd.core.0
-rw-r--r-- 1 root wheel 27775914 Jun 18 17:59 /var/crash/kernel.0
```

### show system core-dumps

This example shows the command output if core files do not exist.

```
user@host> show system core-dumps
/var/crash/*core*: No such file or directory
/var/tmp/*core*: No such file or directory
/var/crash/kernel.*: No such file or directory
```

### show system core-dumps routing-engine both

This example shows the command output if dual Routing Engines are present.

```
user@host> show system core-dumps routing-engine both
re0:

/var/crash/*core*: No such file or directory
/var/tmp/pics/*core*: No such file or directory
/var/crash/kernel.*: No such file or directory

/var/tmp/cores:
total blocks: 496776
-rw-rw---- 1 root field 11910589 Nov 8 13:20 chassisd.core.0.201311081320
...

-rw-rw---- 1 root field 11737227 Oct 28 14:21
rpd.core-tarball.4.tgz.201310281421.3458162
total files: 10

re1:

/var/crash/*core*: No such file or directory
/var/tmp/pics/*core*: No such file or directory
/var/crash/kernel.*: No such file or directory

/var/tmp/cores:
total blocks: 3178420
-rw-rw---- 1 root field 19039721 Nov 8 14:29
chassisd.core.0.201311081429.3485600.gz
-rw-rw---- 1 root field 19039793 Nov 8 14:37
chassisd.core.1.201311081437.3485599.gz
..

-rw-rw---- 1 root field 11710113 Oct 17 15:26
rpd.core-tarball.1.1.tgz.201310171526.3430028
```

### show system core-dumps (TX Matrix Plus Router)

```
user@host> show system core-dumps
sfc0-re0:

/var/crash/kernel.*: No such file or directory
/tftpboot/corefiles/*core*: No such file or directory

/var/crash/cores:
total 8

/var/tmp/cores:
total 1627592
-rw-r--r-- 1 root field 535346090 May 15 07:36
rpd.core-tarball.0.090515.0736.tgz
```

```
-rw-r--r-- 1 root field 105632057 May 15 07:37
rpd.core-tarball.1.090515.0737.tgz
-rw-r--r-- 1 root field 101981681 May 15 07:38
rpd.core-tarball.2.090515.0738.tgz
-rw-r--r-- 1 root field 85854573 May 15 07:40
rpd.core-tarball.3.090515.0740.tgz
-rw-r--r-- 1 root field 4157845 May 15 08:18
rpd.core-tarball.4.090515.0818.tgz
```

lcc0-re0:

```

/var/crash/kernel.*: No such file or directory
/tftpboot/corefiles/*core*: No such file or directory
```

```
/var/crash/cores:
total 8
```

```
/var/tmp/cores:
total 12
```

lcc1-re0:

```

/var/crash/kernel.*: No such file or directory
/tftpboot/corefiles/*core*: No such file or directory
```

```
/var/crash/cores:
total 8
```

```
/var/tmp/cores:
total 10024
```

```
-rw-r--r-- 1 root field 1875794 Apr 22 15:47
chassisd.core-tarball.0.090422.1547.tgz
-rw-r--r-- 1 root field 1894183 Apr 22 19:02
chassisd.core-tarball.0.090422.1902.tgz
-rw-r--r-- 1 root field 1290240 Apr 26 16:01 ksyncd_1558.core.0.090426.1601
```

lcc2-re0:

```

/var/crash/kernel.*: No such file or directory
/tftpboot/corefiles/*core*: No such file or directory
```

```
/var/crash/cores:
total 21124008
```

```
-rw-r--r-- 1 root wheel 1022376528 May 2 06:43
core-LCC2-EGFPC7.core.0.090502.0643
-rw-r--r-- 1 root wheel 1022376528 May 2 08:13
core-LCC2-EGFPC7.core.0.090502.0813
-rw-r--r-- 1 root wheel 1022376544 May 5 06:15
core-LCC2-EGFPC7.core.0.090505.0615
-rw-r--r-- 1 root wheel 1022376544 May 6 10:59
core-LCC2-EGFPC7.core.0.090506.1059
-rw-r--r-- 1 root wheel 1022376528 May 2 06:58
core-LCC2-EGFPC7.core.1.090502.0658
-rw-r--r-- 1 root wheel 754271232 May 5 06:33
core-LCC2-EGFPC7.core.1.090505.0633
-rw-r--r-- 1 root wheel 264897536 May 6 11:12
core-LCC2-EGFPC7.core.1.090506.1112
-rw-r--r-- 1 root wheel 1022376528 May 2 07:22
core-LCC2-EGFPC7.core.2.090502.0722
-rw-r--r-- 1 root wheel 163633152 May 5 06:52
core-LCC2-EGFPC7.core.2.090505.0652
```

```

-rw-r--r-- 1 root wheel 171312128 May 6 12:13
core-LCC2-EGFPC7.core.2.090506.1213
-rw-r--r-- 1 root wheel 1022376528 May 2 07:39
core-LCC2-EGFPC7.core.3.090502.0739
-rw-r--r-- 1 root wheel 1022376528 May 2 07:55
core-LCC2-EGFPC7.core.4.090502.0755
-rw-r--r-- 1 root wheel 427277312 May 7 04:47
core-LCC2-STFPC4.core.0.090507.0447
-rw-r--r-- 1 root wheel 419609600 May 7 04:47
core-LCC2-STFPC5.core.0.090507.0447
-rw-r--r-- 1 root wheel 432356352 May 7 04:47
core-LCC2-STFPC6.core.0.090507.0447

/var/tmp/cores:
total 2568
-rw-r--r-- 1 root field 1290240 May 14 14:26 ksyncd_1540.core.0.090514.1426
...

```

### show system core-dumps (QFX3500 Switch)

```

user@switch> show system core-dumps
/var/crash/*core*: No such file or directory
-rw-rw---- 1 root field 1545143 Jun 4 2012 /var/tmp/pafxpc.core.0.gz
-rw-rw---- 1 root field 1545146 Jun 4 2012 /var/tmp/pafxpc.core.1.gz
-rw-rw---- 1 root field 1545141 Jun 4 2012 /var/tmp/pafxpc.core.2.gz
-rw-rw---- 1 root field 1545146 Jun 4 2012 /var/tmp/pafxpc.core.3.gz
-rw-rw---- 1 root field 1545142 Jun 5 2012 /var/tmp/pafxpc.core.4.gz
/var/tmp/pics/*core*: No such file or directory
/var/crash/kernel.*: No such file or directory
/tftpboot/corefiles/*core*: No such file or directory
total 5

```

### show system core-dumps (QFabric Systems)

```

user@switch> show system core-dumps
Repository scope: shared
Repository head: /pbdata/export
List of nodes for core repository: /pbdata/export/r.dumps/

```

| Node Group   | Node Identifier                      | Num | Model       | Usage |
|--------------|--------------------------------------|-----|-------------|-------|
| DG-0         | BCF7208D-E44F-E011-802F-4171BAAC781D | 0   | qfx3100     | OM    |
| FM-0         | 73747cd8-0710-11e1-b6a4-00e081c5297e | 0   | fx-jvre     | OM    |
| DRE-0        | 77116f18-0710-11e1-a2a0-00e081c5297e | 0   | fx-jvre     | OM    |
| NW-NG-0      | BBAK0394                             | 0   | qfx3500     | OM    |
| NW-NG-0      | cd78871a-0710-11e1-878e-00e081c5297e | 0   | fx-jvre     | OM    |
| NW-NG-0      | d0afda1e-0710-11e1-a1d0-00e081c5297e | 0   | fx-jvre     | OM    |
| FC-0         | d31ab7a6-0710-11e1-ad1b-00e081c5297e | 0   | fx-jvre     | OM    |
| FC-1         | d4d0f254-0710-11e1-90c3-00e081c5297e | 0   | fx-jvre     | OM    |
| IC-WS001     | WS001                                | 0   | -           | -     |
| IC-WS001     | WS001/YW3803                         | 0   | qfxc08-3008 | OM    |
| IC-WS001     | WS001/YN5999                         | 0   | qfxc08-3008 | OM    |
| node-device1 | BBAK0372                             | 0   | qfx3500     | OM    |
| node-device1 | EE3093                               | 0   | qfx3500     | OM    |

```

Total usage of core repository: 0M of 70000M (0.0%)

List of nodes for log repository: /pbdata/export/r.logs/

```

| Node Group | Node Identifier                      | Num | Model   | Usage |
|------------|--------------------------------------|-----|---------|-------|
| DG-0       | BCF7208D-E44F-E011-802F-4171BAAC781D | 0   | qfx3100 | OM    |
| FM-0       | 73747cd8-0710-11e1-b6a4-00e081c5297e | 1   | fx-jvre | OM    |
| DRE-0      | 77116f18-0710-11e1-a2a0-00e081c5297e | 1   | fx-jvre | OM    |

```

NW-NG-0 BBAK0394 1 qfx3500 OM
NW-NG-0 cd78871a-0710-11e1-878e-00e081c5297e 1 fx-jvre OM
NW-NG-0 d0afda1e-0710-11e1-a1d0-00e081c5297e 3 fx-jvre OM
FC-0 d31ab7a6-0710-11e1-ad1b-00e081c5297e 1 fx-jvre OM
FC-1 d4d0f254-0710-11e1-90c3-00e081c5297e 1 fx-jvre OM
IC-WS001 WS001 0 - -
IC-WS001 WS001/YN5999 1 qfxc08-3008 OM
IC-WS001 WS001/YW3803 1 qfxc08-3008 OM
node-device1 BBAK0372 1 qfx3500 OM
node-device1 EE3093 1 qfx3500 OM
Total usage of log repository:0M of 70000M (0.0%)

```

#### show system core-dumps core-file-info component serial number core-file-name (QFabric Systems)

```

user@switch> show system core-dumps core-file-info component
e8ff4b3e-7d92-11e0-be5d-00e081c1fe0e cosd.core.0.1519.05162011131846.gz
Repository scope: shared
Repository head: /pbstorage
Repository name: core
Core filename: /pbstorage/rdumps/e8ff4b3e-7d92-11e0-be5d-
00e081c1fe0e/5658.cosd.core.0.1519.05162011131846
Process name: cosd
Release: 11.3I0
Build server: /c/ssengupta/dfx_ha_v1/obj-i386-dcp/dcp/usr.sbin/cosd
Build date: 2011-05-14 01:11:44 UTC
Stack trace:
#0 0x8885d183 in select () from /usr/lib/libc.so.6
#0 0x8885d183 in select () from /usr/lib/libc.so.6
#1 0x887d4a45 in pselect () from /usr/lib/libc.so.6
#2 0x88774719 in pselect () from /usr/lib/libthr.so.2
#3 0x885de5db in __evGetNext () from /usr/lib/libisc.so.2
#4 0x885debf0 in __evMainLoop () from /usr/lib/libisc.so.2
#5 0x081125b2 in cosd_loop ()
#6 0x0812e19a in main ()

```

#### show system core-dumps component serial number display-order alphanumeric-sort repository core (QFabric Systems)

```

user@switch> show system core-dumps component BBAK8891 display-order alphanumeric-sort
repository core
Repository scope: shared
Repository head: /pbdata/export
Repository name: core
List of core dumps for component BBAK8891
Repository location: /pbdata/export/rdumps/BBAK8891

```

| Filename                            | Date                 | Size    |
|-------------------------------------|----------------------|---------|
| eswd.core.0.1361.11172011214257.gz  | Nov 17 21:43:10 2011 | 4779553 |
| eswd.core.1.80267.11172011214514.gz | Nov 17 21:45:19 2011 | 3541648 |
| eswd.core.2.80682.11172011214535.gz | Nov 17 21:45:43 2011 | 2156683 |
| vccpd.core.0.1195.11182011151131.gz | Nov 18 15:11:35 2011 | 375617  |

Number of core dumps in repository:4

#### show system core-dumps display-period (QFabric Systems)

```

user@switch> show system core-dumps display-period 24h
show system core-dumps display-period 24h
Repository scope: shared
Repository head: /pbdata/export
List of core dumps at repository: /pbdata/export/rdumps
Delta timespec: Last 24h

```

|                                                       |                      |        |
|-------------------------------------------------------|----------------------|--------|
| Component: BBAK8273                                   |                      |        |
| Filename                                              | Size                 | Date   |
| vccpd.core.0.1195.11182011151131.gz                   | Nov 18 15:11:35 2011 | 375794 |
| Component: cedb7b0e-0025-11e1-9a5f-00e081c52990       |                      |        |
| Filename                                              | Size                 | Date   |
| vccpd.core.0.1461.11182011151131.gz                   | Nov 18 15:11:31 2011 | 120951 |
| Component: ee19c4f8-0025-11e1-aef6-00e081c52990       |                      |        |
| Filename                                              | Size                 | Date   |
| vccpd.core.0.1462.11182011151131.gz                   | Nov 18 15:11:31 2011 | 109420 |
| Component: BBAK8281                                   |                      |        |
| Filename                                              | Size                 | Date   |
| vccpd.core.0.1196.11182011151131.gz                   | Nov 18 15:11:36 2011 | 375373 |
| Component: BBAK8891                                   |                      |        |
| Filename                                              | Size                 | Date   |
| vccpd.core.0.1195.11182011151131.gz                   | Nov 18 15:11:35 2011 | 375617 |
| Component: BBAK8276                                   |                      |        |
| Filename                                              | Size                 | Date   |
| vccpd.core.0.1196.11182011151131.gz                   | Nov 18 15:11:35 2011 | 375350 |
| Component: BBAK8868                                   |                      |        |
| Filename                                              | Size                 | Date   |
| vccpd.core.0.1196.11182011151130.gz                   | Nov 18 15:11:34 2011 | 376211 |
| Component: BBAK8835                                   |                      |        |
| Filename                                              | Size                 | Date   |
| vccpd.core.0.1195.11182011151130.gz                   | Nov 18 15:11:35 2011 | 375700 |
| Component: BBAK8283                                   |                      |        |
| Filename                                              | Size                 | Date   |
| vccpd.core.0.1195.11182011151131.gz                   | Nov 18 15:11:36 2011 | 368298 |
| Component: YW3781/YW3781                              |                      |        |
| Filename                                              | Size                 | Date   |
| vccpd.core.0.1220.11182011151131.gz                   | Nov 18 15:11:38 2011 | 380002 |
| Component: 09726be2-0026-11e1-82d9-00e081c52990       |                      |        |
| Filename                                              | Size                 | Date   |
| vccpd.core.0.1461.11182011151130.gz                   | Nov 18 15:11:31 2011 | 119965 |
| Component: BBAK8309                                   |                      |        |
| Filename                                              | Size                 | Date   |
| vccpd.core.0.1196.11182011151131.gz                   | Nov 18 15:11:36 2011 | 378930 |
| Component: 303d476a-0026-11e1-abf4-00e081c52990       |                      |        |
| Filename                                              | Size                 | Date   |
| vccpd.core.0.1460.11182011151131.gz                   | Nov 18 15:11:31 2011 | 118385 |
| Component: YW3798/YW3798                              |                      |        |
| Filename                                              | Size                 | Date   |
| vccpd.core.0.1219.11182011151131.gz                   | Nov 18 15:11:36 2011 | 380455 |
| List of log dumps at repository: /pbdata/export/rlogs |                      |        |
| Delta timespec: Last 24h                              |                      |        |
| Component: BBAK8273                                   |                      |        |
| Filename                                              | Size                 | Date   |



|                                                 |                      |       |
|-------------------------------------------------|----------------------|-------|
| vccpd.tarball.0.1195.11182011151138.tgz         | Nov 18 15:11:39 2011 | 20415 |
| Component: cedb7b0e-0025-11e1-9a5f-00e081c52990 |                      |       |
| Filename                                        | Size                 | Date  |
| vccpd.tarball.0.1461.11182011151131.tgz         | Nov 18 15:11:33 2011 | 19651 |
| Component: ee19c4f8-0025-11e1-aef6-00e081c52990 |                      |       |
| Filename                                        | Size                 | Date  |
| vccpd.tarball.0.1462.11182011151133.tgz         | Nov 18 15:11:36 2011 | 24650 |
| Component: BBAK8281                             |                      |       |
| Filename                                        | Size                 | Date  |
| vccpd.tarball.0.1196.11182011151137.tgz         | Nov 18 15:11:41 2011 | 19445 |
| Component: BBAK8891                             |                      |       |
| Filename                                        | Size                 | Date  |
| vccpd.tarball.0.1195.11182011151138.tgz         | Nov 18 15:11:41 2011 | 21916 |
| Component: BBAK8276                             |                      |       |
| Filename                                        | Size                 | Date  |
| vccpd.tarball.0.1196.11182011151137.tgz         | Nov 18 15:11:39 2011 | 20461 |
| Component: BBAK8868                             |                      |       |
| Filename                                        | Size                 | Date  |
| vccpd.tarball.0.1196.11182011151137.tgz         | Nov 18 15:11:41 2011 | 21924 |
| Component: BBAK8835                             |                      |       |
| Filename                                        | Size                 | Date  |
| vccpd.tarball.0.1195.11182011151137.tgz         | Nov 18 15:11:39 2011 | 19424 |
| Component: BBAK8283                             |                      |       |
| Filename                                        | Size                 | Date  |
| vccpd.tarball.0.1195.11182011151138.tgz         | Nov 18 15:11:42 2011 | 31186 |
| Component: YW3781/YW3781                        |                      |       |
| Filename                                        | Size                 | Date  |
| vccpd.tarball.0.1220.11182011151141.tgz         | Nov 18 15:11:45 2011 | 27565 |
| Component: 09726be2-0026-11e1-82d9-00e081c52990 |                      |       |
| Filename                                        | Size                 | Date  |
| vccpd.tarball.0.1461.11182011151130.tgz         | Nov 18 15:11:34 2011 | 19613 |
| Component: BBAK8309                             |                      |       |
| Filename                                        | Size                 | Date  |
| vccpd.tarball.0.1196.11182011151138.tgz         | Nov 18 15:11:46 2011 | 50362 |
| Component: 303d476a-0026-11e1-abf4-00e081c52990 |                      |       |
| Filename                                        | Size                 | Date  |
| vccpd.tarball.0.1460.11182011151133.tgz         | Nov 18 15:11:33 2011 | 19360 |
| Component: YW3798/YW3798                        |                      |       |
| Filename                                        | Size                 | Date  |
| vccpd.tarball.0.1219.11182011151140.tgz         | Nov 18 15:11:49 2011 | 24473 |

#### show system core-dumps kernel-crashinfo component serial number (QFabric Systems)

```
user@switch> show system core-dumps kernel-crashinfo component A0001/YA0197
Node: A0001/YA0197
```

Information about previous kernel crash:

-- Kernel panic data --

Panic string: kdb\_sysctl\_panic

System uptime: 3 day 20 hr 59 min 40 sec Kernel crash time: 2011-11-15 Wed 15:25:17

Kernel build linkstamp: JUNOS 11.3I #0: 2011-11-10 20:42:27 UTC

-- Stacktrace of panicing context --

Processor 1 (crash monarch):

savectx+0x0 (c9552800,80214efc,802a7fbc,c88ad05c) ra 801b93a8 sz 0

kdm\_kcore\_save\_crashinfo+0x254 (c9552800,0,802a7fbc,c88ad05c) ra 801b9f44 sz 784

kdm\_kcore\_kern\_panic\_event\_handler+0x4b0 (c9552800,0,802a7fbc,c88ad05c) ra 8022a9b8 sz 88

panic+0x1d0 (c9552800,0,4,77fed534) ra 802540c0 sz 56

kdb\_sysctl\_panic+0x70 (c9552800,0,4,77fed534) ra 80237e58 sz 40 sysctl\_root+0x12c (c9552800,0,4,e8bc5cf8) ra 80238e50 sz 48

userland\_sysctl+0x164 (c9552800,0,4,e8bc5cf8) ra 8023956c sz 104

\_\_sysctl+0xe4 (c9552800,0,4,e8bc5cf8) ra 806d62e8 sz 160

trap+0xe1c (c9552800,0,4,e8bc5cf8) ra 80896e68 sz 128

MipsUserGenException+0x1a4 (c9552800,0,4,405cd12c) ra 0 sz 0

pid 82340, process: sysctl

Processor 0:

restoreintr+0x14 (1,81bca820,3,0) ra 806cdc3c sz 0

spinlock\_exit+0x30 (1,81bca820,3,0) ra 8025d354 sz 24

sleepq\_release+0x64 (1,81bca820,3,0) ra 8025e670 sz 24

sleepq\_timeout+0x224 (1,81bca820,3,0) ra 80240294 sz 48

softclock+0x434 (1,81bca820,3,0) ra 802067f8 sz 80

ithread\_loop+0x244 (1,81bca820,3,0) ra 80200e28 sz 64 fork\_exit+0xc0

(1,81bca820,3,0) ra 80897c28 sz 48

MipsNMIException+0x34 (1,81bca820,3,0) ra 0 sz 0

pid 82340, process: sysctl

Processor 2:

cpu\_idle+0x20 (80960000,51bbc,2031df,81bca1b8) ra 80204948 sz 24 idle\_proc+0x130

(80960000,51bbc,2031df,81bca1b8) ra 80200e28 sz 56 fork\_exit+0xc0

(80960000,51bbc,2031df,81bca1b8) ra 80897c28 sz 48

MipsNMIException+0x34 (80960000,51bbc,2031df,81bca1b8) ra 0 sz 0

pid 82340, process: sysctl

Processor 3:

cpu\_idle+0x20 (80960000,51bbc,2038df,81bca300) ra 80204948 sz 24 idle\_proc+0x130

(80960000,51bbc,2038df,81bca300) ra 80200e28 sz 56 fork\_exit+0xc0

(80960000,51bbc,2038df,81bca300) ra 80897c28 sz 48

MipsNMIException+0x34 (80960000,51bbc,2038df,81bca300) ra 0 sz 0

pid 82340, process: sysctl

Processor 4:

cpu\_idle+0x20 (80960000,51bbc,2037df,81bca448) ra 80204948 sz 24 idle\_proc+0x130

(80960000,51bbc,2037df,81bca448) ra 80200e28 sz 56 fork\_exit+0xc0

(80960000,51bbc,2037df,81bca448) ra 80897c28 sz 48

MipsNMIException+0x34 (80960000,51bbc,2037df,81bca448) ra 0 sz 0

pid 82340, process: sysctl

Processor 5:

restoreintr+0x14 (1,51bbc,203edf,81bca590) ra 806cdc3c sz 0

spinlock\_exit+0x30 (1,51bbc,203edf,81bca590) ra 80204a34 sz 24 idle\_proc+0x21c

(1,51bbc,203edf,81bca590) ra 80200e28 sz 56 fork\_exit+0xc0

(1,51bbc,203edf,81bca590) ra 80897c28 sz 48

MipsNMIException+0x34 (1,51bbc,203edf,81bca590) ra 0 sz 0

pid 82340, process: sysctl

```

Processor 6:
cpu_idle+0x20 (80960000,51bbc,205cdf,81bca6d8) ra 80204948 sz 24 idle_proc+0x130
(80960000,51bbc,205cdf,81bca6d8) ra 80200e28 sz 56 fork_exit+0xc0
(80960000,51bbc,205cdf,81bca6d8) ra 80897c28 sz 48
MipsNMIEException+0x34 (80960000,51bbc,205cdf,81bca6d8) ra 0 sz 0
pid 82340, process: sysctl

Processor 7:
lockmgr+0x5ac (c97e8484,c8dd9800,0,c8dd9800) ra 8c11c81c sz 48
sal_sem_take+0x134 (c97e8484,c8dd9800,0,c8dd9800) ra 8c351108 sz 56
_bcm_esw_linkscan_thread+0x45c (c97e8484,c8dd9800,0,c8dd9800) ra 8c11cdb4 sz 104
sal_thread_start_wrap+0x74 (c97e8484,c8dd9800,0,c8dd9800) ra 80200e28 sz 32
fork_exit+0xc0 (c97e8484,c8dd9800,0,c8dd9800) ra 80897c28 sz 48
MipsNMIEException+0x34 (c97e8484,c8dd9800,0,c8dd9800) ra 0 sz 0
pid 82340, process: sysctl
-- End of stacktrace --

```

### show system core-dumps repository core (QFabric Systems)

```

user@switch> show system core-dumps repository core
Repository scope: shared
Repository head: /pbdata/export
Repository name: core
List of nodes for core repository: /pbdata/export/rdumps/

```

| Node Group   | Node Identifier                      | Num | Model       | Usage |
|--------------|--------------------------------------|-----|-------------|-------|
| DG-0         | BCF7208D-E44F-E011-802F-4171BAAC781D | 0   | qfx3100     | 0M    |
| FM-0         | 73747cd8-0710-11e1-b6a4-00e081c5297e | 0   | fx-jvre     | 0M    |
| DRE-0        | 77116f18-0710-11e1-a2a0-00e081c5297e | 0   | fx-jvre     | 0M    |
| NW-NG-0      | BBAK0394                             | 0   | qfx3500     | 0M    |
| NW-NG-0      | cd78871a-0710-11e1-878e-00e081c5297e | 0   | fx-jvre     | 0M    |
| NW-NG-0      | d0afda1e-0710-11e1-a1d0-00e081c5297e | 0   | fx-jvre     | 0M    |
| FC-0         | d31ab7a6-0710-11e1-ad1b-00e081c5297e | 0   | fx-jvre     | 0M    |
| FC-1         | d4d0f254-0710-11e1-90c3-00e081c5297e | 0   | fx-jvre     | 0M    |
| IC-WS001     | WS001                                | 0   | -           | -     |
| IC-WS001     | WS001/YW3803                         | 0   | qfxc08-3008 | 0M    |
| IC-WS001     | WS001/YN5999                         | 0   | qfxc08-3008 | 0M    |
| node-device1 | BBAK0372                             | 0   | qfx3500     | 0M    |
| node-device1 | EE3093                               | 0   | qfx3500     | 0M    |

Total usage of core repository: 0M of 70000M (0.0%)

### show system core-dumps repository log (QFabric Systems)

```

user@switch> show system core-dumps repository log
Repository scope: shared
Repository head: /pbdata/export
Repository name: log
List of nodes for log repository: /pbdata/export/rlogs/

```

| Node Group | Node Identifier                      | Num | Model       | Usage |
|------------|--------------------------------------|-----|-------------|-------|
| DG-0       | BCF7208D-E44F-E011-802F-4171BAAC781D | 0   | qfx3100     | 0M    |
| FM-0       | 73747cd8-0710-11e1-b6a4-00e081c5297e | 1   | fx-jvre     | 0M    |
| DRE-0      | 77116f18-0710-11e1-a2a0-00e081c5297e | 1   | fx-jvre     | 0M    |
| NW-NG-0    | BBAK0394                             | 1   | qfx3500     | 0M    |
| NW-NG-0    | cd78871a-0710-11e1-878e-00e081c5297e | 1   | fx-jvre     | 0M    |
| NW-NG-0    | d0afda1e-0710-11e1-a1d0-00e081c5297e | 3   | fx-jvre     | 0M    |
| FC-0       | d31ab7a6-0710-11e1-ad1b-00e081c5297e | 1   | fx-jvre     | 0M    |
| FC-1       | d4d0f254-0710-11e1-90c3-00e081c5297e | 1   | fx-jvre     | 0M    |
| IC-WS001   | WS001                                | 0   | -           | -     |
| IC-WS001   | WS001/YN5999                         | 1   | qfxc08-3008 | 0M    |
| IC-WS001   | WS001/YW3803                         | 1   | qfxc08-3008 | 0M    |

```

node-device1 BBAK0372 1 qfx3500 0M
node-device1 EE3093 1 qfx3500 0M
Total usage of log repository:0M of 70000M (0.0%)

```

## show system directory-usage

|                                           |                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                     | <a href="#">Syntax on page 1117</a><br><a href="#">Syntax (EX Series) on page 1117</a><br><a href="#">Syntax (TX Matrix Router) on page 1117</a><br><a href="#">Syntax (TX Matrix Plus Router) on page 1117</a><br><a href="#">Syntax (MX Series Router) on page 1117</a><br><a href="#">Syntax (QFX Series and OCX Series) on page 1117</a>                                     |
| <b>Syntax</b>                             | <pre>show system directory-usage &lt;depth <i>number</i>&gt; &lt;path&gt;</pre>                                                                                                                                                                                                                                                                                                  |
| <b>Syntax (EX Series)</b>                 | <pre>show system directory-usage &lt;all-members&gt; &lt;depth <i>number</i>&gt; &lt;local&gt; &lt;member <i>member-id</i>&gt; &lt;path&gt;</pre>                                                                                                                                                                                                                                |
| <b>Syntax (TX Matrix Router)</b>          | <pre>show system directory-usage &lt;all-chassis   all-lcc   lcc <i>number</i>   scc&gt; &lt;depth <i>number</i>&gt; &lt;path&gt;</pre>                                                                                                                                                                                                                                          |
| <b>Syntax (TX Matrix Plus Router)</b>     | <pre>show system directory-usage &lt;all-chassis   all-lcc   lcc <i>number</i>   sfc <i>number</i>&gt; &lt;depth <i>number</i>&gt; &lt;path&gt;</pre>                                                                                                                                                                                                                            |
| <b>Syntax (MX Series Router)</b>          | <pre>show system directory-usage &lt;all-members&gt; &lt;depth <i>number</i>&gt; &lt;local&gt; &lt;member <i>member-id</i>&gt; &lt;path&gt;</pre>                                                                                                                                                                                                                                |
| <b>Syntax (QFX Series and OCX Series)</b> | <pre>show system directory-usage &lt;depth <i>number</i>&gt; &lt;path&gt; &lt;infrastructure <i>name</i>&gt; &lt;interconnect-device <i>name</i>&gt; &lt;node-group <i>name</i>&gt;</pre>                                                                                                                                                                                        |
| <b>Release Information</b>                | <p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p><b>sfc</b> option introduced for the TX Matrix Plus router in Junos OS Release 9.6.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> |
| <b>Description</b>                        | Display directory usage information.                                                                                                                                                                                                                                                                                                                                             |

**Options** **none**—Display all directory usage information.

**all-chassis**—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Display directory usage information about all the T640 routers (in a routing matrix based on a TX Matrix router). Display directory usage information about all the T1600 or T4000 routers (in a routing matrix based on a TX Matrix Plus router) in the chassis.

**all-lcc**—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display directory information for all T640 routers (or line-card chassis) connected to the TX Matrix router. On a TX Matrix Plus router, display directory information for all connected T1600 or T4000 LCCs.

**all-members**—(EX4200 switches and MX Series routers only) (Optional) Display directory information for all members of the Virtual Chassis configuration.

**depth *number***—(Optional) Depth of the directory to traverse. This option is useful when you want to limit the output shown for a large file system.

**infrastructure *name***— (QFabric systems only) (Optional) Display directory information for the fabric control Routing Engines and fabric manager Routing Engines.

**interconnect-device *name***— (QFabric systems only) (Optional) Display directory information for the Interconnect device.

**node-group *name***— (QFabric systems only) (Optional) Display directory information for the Node group.

**lcc *number***—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display directory information for a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, display directory information for a specific router that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(EX4200 switches and MX Series routers only) (Optional) Display directory information for the local Virtual Chassis member.

**member *member-id***—(EX4200 switches and MX Series routers only) (Optional) Display directory information for the specified member of the Virtual Chassis configuration. For EX4200 switches, replace *member-id* with a value from 0 through 9. For an MX Series Virtual Chassis, replace *member-id* with a value of 0 or 1.

**path**—(Optional) Path or root directory to traverse.

**scc**—(TX Matrix router only) (Optional) Display directory information for the TX Matrix router (or switch-card chassis).

**sfc number**—(TX Matrix Plus routers only) (Optional) Display directory information for the TX Matrix Plus router. Replace *number* with 0.

**Required Privilege Level** view

**Related Documentation** • [Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

**List of Sample Output** [show system directory-usage scc \(TX Matrix Router\) on page 1120](#)  
[show system directory-usage sfc \(TX Matrix Plus Router\) on page 1120](#)  
[show system directory-usage \(QFX Series and OCX Series\) on page 1120](#)

**Output Fields** [Table 72 on page 1119](#) describes the output fields for the **show system directory-usage** command. Output fields are listed in the approximate order in which they appear.

**Table 72: show system directory-usage Output Fields**

| Field Name            | Field Description                             |
|-----------------------|-----------------------------------------------|
| <i>bytes</i>          | Number of bytes used by files in a directory. |
| <i>directory-name</i> | Name of the directory.                        |

## Sample Output

### show system directory-usage scc (TX Matrix Router)

```

user@host> show system directory-usage /var/tmp scc
/var/tmp
1.0K /var/tmp/vi.recover
2.0K /var/tmp/instmp.tPMk8u
1.0K /var/tmp/install
 /var/tmp/instmp.GUMpur
4.8M /var/tmp/instmp.GUMpur/packages
6.4M /var/tmp/troy1
297M /var/tmp/dsw
 /var/tmp/pkg_tmp.2073
83K /var/tmp/pkg_tmp.2073/bin
 /var/tmp/instmp.oMIDb1
89K /var/tmp/instmp.oMIDb1/bin
 /var/tmp/instmp.byhMjR
4.6M /var/tmp/instmp.byhMjR/packages
 /var/tmp/instmp.6fqHf3
1.7M /var/tmp/instmp.6fqHf3/packages
 /var/tmp/instmp.mljECe
4.6M /var/tmp/instmp.mljECe/packages

```

### show system directory-usage sfc (TX Matrix Plus Router)

```

user@switch> show system directory-usage /var/tmp sfc 0
sfc0-re0:

 /var/tmp
46K /var/tmp/gres-tp
 /var/tmp/sec-download
2.0K /var/tmp/sec-download/sub-download
2.0K /var/tmp/vi.recover
2.0K /var/tmp/install
795M /var/tmp/cores
766K /var/tmp/pr440594

```

### show system directory-usage (QFX Series and OCX Series)

```

user@switch> show system directory-usage
/var/tmp
30K /var/tmp/gres-tp
2.0K /var/tmp/rtbdb
2.0K /var/tmp/vi.recover
2.0K /var/tmp/install
2.0K /var/tmp/pics

```



## show system processes

|                                                   |                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                             | <a href="#">Syntax on page 1121</a><br><a href="#">Syntax (EX Series and QFX Series Switches) on page 1121</a><br><a href="#">Syntax (MX Series Routers) on page 1121</a><br><a href="#">Syntax (OCX Series) on page 1121</a><br><a href="#">Syntax (TX Matrix Routers) on page 1121</a><br><a href="#">Syntax (TX Matrix Plus Router) on page 1121</a> |
| <b>Syntax</b>                                     | <pre>show system processes &lt;brief   detail   extensive   summary&gt; &lt;health (pid <i>process-identifer</i>   process-name <i>process-name</i>)&gt; &lt;providers&gt; &lt;resource-limits (brief   detail) <i>process-name</i>&gt; &lt;wide&gt;</pre>                                                                                              |
| <b>Syntax (EX Series and QFX Series Switches)</b> | <pre>show system processes &lt;all-members&gt; &lt;brief   detail   extensive   summary&gt; &lt;health (pid <i>process-identifer</i>   process-name <i>process-name</i>)&gt; &lt;local&gt; &lt;member <i>member-id</i>&gt; &lt;providers&gt; &lt;resource-limits (brief   detail) <i>process-name</i>&gt; &lt;wide&gt;</pre>                            |
| <b>Syntax (MX Series Routers)</b>                 | <pre>show system processes &lt;all-members&gt; &lt;brief   detail   extensive   summary&gt; &lt;health (pid <i>process-identifer</i>   process-name <i>process-name</i>)&gt; &lt;local&gt; &lt;member <i>member-id</i>&gt; &lt;providers&gt; &lt;resource-limits (brief   detail) <i>process-name</i>&gt; &lt;wide&gt;</pre>                            |
| <b>Syntax (OCX Series)</b>                        | <pre>show system processes &lt;brief   detail   extensive   summary &gt; &lt;health (pid <i>process-identifer</i>   process-name <i>process-name</i>)&gt; host-processes (brief detail ) &lt;providers&gt; &lt;resource-limits&gt; &lt;wide&gt;</pre>                                                                                                   |
| <b>Syntax (TX Matrix Routers)</b>                 | <pre>show system processes &lt;brief   detail   extensive   summary&gt; &lt;all-chassis  all-lcc   lcc <i>number</i>   scc&gt; &lt;wide&gt;</pre>                                                                                                                                                                                                       |
| <b>Syntax (TX Matrix Plus Router)</b>             | <pre>show system processes &lt;brief   detail   extensive   summary&gt; &lt;all-chassis  all-lcc   lcc <i>number</i>   sfc <i>number</i>&gt; &lt;wide&gt;</pre>                                                                                                                                                                                         |

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Release Information</b> | <p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Option <b>sfc</b> introduced for the TX Matrix Plus router in Junos OS Release 9.6.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Description</b>         | <p>Display information about software processes that are running on the router or switch and that have controlling terminals.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Options</b>             | <p><b>none</b>—Display standard information about system processes.</p> <p><b>brief   detail   extensive   summary</b>—(Optional) Display the specified level of detail.</p> <p><b>adaptive-services</b>—(Optional) Display the configuration management process that manages the configuration for stateful firewall, Network Address Translation (NAT), intrusion detection services (IDS), and IP Security (IPsec) services on the Adaptive Services PIC.</p> <p><b>alarm-control</b>—(Optional) Display the process to configure the system alarm.</p> <p><b>all-chassis</b>—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Display standard system process information about all the T640 routers (in a routing matrix based on the TX Matrix router) or all the T1600 or T4000 routers (in a routing matrix based on the TX Matrix Plus router) in the chassis.</p> <p><b>all-lcc</b>—(TX Matrix routers and TX Matrix Plus router only) (Optional) Display standard system process information for all T640 routers (or line-card chassis) connected to the TX Matrix router. Display standard system process information for all connected T1600 or T4000 LCCs.</p> <p><b>all-members</b>—(EX4200 switches, QFX Series Virtual Chassis, and MX Series routers ) (Optional) Display standard system process information for all members of the Virtual Chassis configuration.</p> <p><b>ancpd-service</b>—Display the Access Node Control Protocol (ANCP) process, which works with a special Internet Group Management Protocol (IGMP) session to collect outgoing interface mapping events in a scalable manner.</p> <p><b>application-identification</b> —Display the process that identifies an application using intrusion detection and prevention (IDP) to allow or deny traffic based on applications running on standard or nonstandard ports.</p> <p><b>audit-process</b>—(Optional) Display the RADIUS accounting process.</p> <p><b>auto-configuration</b>—Display the Interface Auto-Configuration process.</p> <p><b>bootp</b>—Display the process that enables a router, switch, or interface to act as a Dynamic Host Configuration Protocol (DHCP) or bootstrap protocol (BOOTP) relay agent. DHCP relaying is disabled.</p> |

**captive-portal-content-delivery**—Display the HTTP redirect service by specifying the location to which a subscriber's initial Web browser session is redirected, enabling initial provisioning and service selection for the subscriber.

**ce-l2tp-service**—(Optional) (M10, M10i, M7i, and MX Series routers only) Display the Universal Edge Layer 2 Tunneling Protocol (L2TP) process, which establishes L2TP tunnels and Point-to-Point Protocol (PPP) sessions through L2TP tunnels.

**cfm**—Display Ethernet Operations, Administration, and Maintenance (OAM) connectivity fault management (CFM) process, which can be used to monitor the physical link between two switches.

**chassis-control**—(Optional) Display the chassis management process.

**class-of-service**—(Optional) Display the class-of-service (CoS) process, which controls the router's or switch's CoS configuration.

**clksyncd-service**—Display the external clock synchronization process, which uses synchronous Ethernet (SyncE).

**craft-control**—Display the process for the I/O of the craft interface.

**database-replication**—(EX Series switches and MX Series routers only) (Optional) Display the database replication process.

**datapath-trace-service**—Display the packet path tracing process.

**dhcp-service**—(EX Series switches and MX Series routers only) (Optional) Display the Dynamic Host Configuration Protocol process, which enables a DHCP server to allocate network IP addresses and deliver configuration settings to client hosts without user intervention.

**diameter-service**—(Optional) Display the diameter process.

**disk-monitoring**—(Optional) Display the disk monitoring process, which checks the health of the hard disk drive on the Routing Engine.

**dynamic-flow-capture**—(Optional) Display the dynamic flow capture (DFC) process, which controls DFC configurations on Monitoring Services III PICs.

**ecc-error-logging**—(Optional) Display the error checking and correction (ECC) process, which logs ECC parity errors in memory on the Routing Engine.

**ethernet-connectivity-fault-management**—Display the process that provides IEEE 802.1ag OAM connectivity fault management (CFM) database information for CFM maintenance association end points (MEPs) in a CFM session.

**ethernet-link-fault-management**—(EX Series switches and MX Series routers only) (Optional) Display the process that provides the OAM link fault management (LFM) information for Ethernet interfaces.

**event-processing**—(Optional) Display the event process (eventd).

**firewall**—(Optional) Display the firewall management process, which manages the firewall configuration and enables accepting or rejecting packets that are transiting an interface on a router or switch.

**general-authentication-service**—(EX Series switches and MX Series routers only)  
(Optional) Display the general authentication process.

**health (pid *process-identifier* | process-name *process-name*)**—(Optional) Display process health information, either by process id (PID) or by process name.

**host-processes**—Display process information of processes running on the host system.  
(On OCX Series only) The following options are available:

- **brief | detail**—(Optional) Display the specified level of detail.

**iccp-service**—Display the Inter-Chassis Communication Protocol (ICCP) process.

**idp-policy**—Display the intrusion detection and prevention (IDP) protocol process.

**ilmi**—Display the Integrated Local Management Interface (ILMI) protocol process, which provides bidirectional exchange of management information between two ATM interfaces across a physical connection.

**inet-process**—Display the IP multicast family process.

**init**—Display the process that initializes the USB modem.

**interface-control**—(Optional) Display the interface process, which controls the router's or switch's physical interface devices and logical interfaces.

**kernel-replication**—(Optional) Display the kernel replication process, which replicates the state of the backup Routing Engine when graceful Routing Engine switchover (GRES) is configured.

**l2-learning**—(Optional) Display the Layer 2 address flooding and learning process.

**l2cpd-service**—Display the Layer 2 Control Protocol process, which enables features such as Layer 2 protocol tunneling and nonstop bridging.

**lACP**—(Optional) Display the Link Aggregation Control Protocol (LACP) process. LACP provides a standardized means for exchanging information between partner systems on a link to allow their link aggregation control instances to reach agreement on the identity of the LAG to which the link belongs, and then to move the link to that LAG, and to enable the transmission and reception processes for the link to function in an orderly manner.

**lcc number**—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display standard system process information for a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, display standard system process information for a specific router that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—((EX4200 switches, QFX Series Virtual Chassis, and MX Series routers )) (Optional) Display standard system process information for the local Virtual Chassis member.

**local-policy-decision-function**—Display the process for the Local Policy Decision Function, which regulates collection of statistics related to applications and application groups and tracking of information about dynamic subscribers and static interfaces.

**logical-system-mux**—Display the logical router multiplexer process (lrmuxd), which manages the multiple instances of the routing protocols process (rpd) on a machine running logical routers.

**mac-validation**—Display the MAC validation process, which configures MAC address validation for subscriber interfaces created on demux interfaces in dynamic profiles on MX Series routers.

**member *member-id***—((EX4200 switches, QFX Series Virtual Chassis, and MX Series routers )) (Optional) Display standard system process information for the specified member of the Virtual Chassis configuration. For EX4200 switches, replace ***member-id*** with a value from 0 through 9. For an MX Series Virtual Chassis, replace ***member-id*** with a value of 0 or 1.

**mib-process**—(Optional) Display the MIB II process, which provides the router's MIB II agent.

**mobile-ip**—(Optional) Display the Mobile IP process, which configures Junos OS Mobile IP features.

**moundd-service**—(EX Series switches and MX Series routers only) (Optional) Display the service for NFS mounts requests.

**mpls-traceroute**—(Optional) Display the MPLS Periodic Traceroute process.

**mspd**—(Optional) Display the Multiservice process.

**multicast-snooping**—(EX Series switches and MX Series routers only) (Optional) Display the multicast snooping process, which makes Layer 2 devices such as VLAN switches aware of Layer 3 information, such as the media access control (MAC) addresses of members of a multicast group.

**named-service**—(Optional) Display the DNS Server process, which is used by a router or a switch to resolve hostnames into addresses.

**neighbor-liveness**—Display the process, which specifies the maximum length of time that the router waits for its neighbor to re-establish an LDP session.

**nfsd-service**—(Optional) Display the Remote NFS Server process, which provides remote file access for applications that need NFS-based transport.

**ntp**—Display the Network Time Protocol (NTP) process, which provides the mechanisms to synchronize time and coordinate time distribution in a large, diverse network.

**packet-triggered-subscribers**—Display the packet-triggered subscribers and policy control (PTSP) process, which allows the application of policies to dynamic subscribers that are controlled by a subscriber termination device.

**peer-selection-service**—(Optional) Display the Peer Selection Service process.

**periodic-packet-services**—Display the Periodic packet management process, which is responsible for processing a variety of time-sensitive periodic tasks so that other processes can more optimally direct their resources.

**pfe**—Display the Packet Forwarding Engine management process.

**pgcp-service**—(Optional) Display the pgcpd service process running on the Routing Engine.

**pgm**—Display the Pragmatic General Multicast (PGM) protocol process, which enables a reliable transport layer for multicast applications.

**pic-services-logging**—(Optional) Display the logging process for some PICs. With this process, also known as fsad (the file system access daemon), PICs send special logging information to the Routing Engine for archiving on the hard disk.

**ppp**—(Optional) Display the Point-to-Point Protocol (PPP) process, which is the encapsulation protocol process for transporting IP traffic across point-to-point links.

**ppp-service**—Display the Universal edge PPP process, which is the encapsulation protocol process for transporting IP traffic across universal edge routers.

**pppoe**—(Optional) Display the Point-to-Point Protocol over Ethernet (PPPoE) process, which combines PPP that typically runs over broadband connections with the Ethernet link-layer protocol that allows users to connect to a network of hosts over a bridge or access concentrator.

**process-monitor**—Display the process health monitor process (pmond).

**providers**—(Optional) Display provider processes.

**redundancy-interface-process**—(Optional) Display the ASP redundancy process.

**remote-operations**—(Optional) Display the remote operations process, which provides the ping and traceroute MIBs.

**resource-cleanup**—Display the resource cleanup process.

**resource-limits (brief | detail) process-name**—(Optional) Display process resource limits.

**routing**—(Optional) Display the routing protocol process.

**sampling**—(Optional) Display the sampling process, which performs packet sampling based on particular input interfaces and various fields in the packet header.

**sbc-configuration-process**—Display the session border controller (SBC) process of the border signaling gateway (BSG).

**scc**—(TX Matrix routers only) (Optional) Display standard system process information for the TX Matrix router (or switch-card chassis).

**sdk-service**—Display the SDK Service process, which runs on the Routing Engine and is responsible for communications between the SDK application and Junos OS. Although the SDK Service process is present on the router, it is turned off by default.

**secure-neighbor-discovery**—(EX Series switches and MX Series routers only) (Optional) Display the secure Neighbor Discovery Protocol (NDP) process, which provides support for protecting NDP messages.

**send**—(Optional) Display the Secure Neighbor Discovery Protocol (SEND) process, which provides support for protecting Neighbor Discovery Protocol (NDP) messages.

**service-deployment**—(Optional) Display the service deployment process, which enables Junos OS to work with the Session and Resource Control (SRC) software.

**sfc number**—(TX Matrix Plus routers only) (Optional) Display system process information for the TX Matrix Plus router. Replace **number** with 0.

**snmp**—Display the SNMP process, which enables the monitoring of network devices from a central location and provides the router's or switch's SNMP master agent.

**sonet-aps**—Display the SONET Automatic Protection Switching (APS) process, which monitors any SONET interface that participates in APS.

**static-subscribers**—(Optional) Display the Static subscribers process, which associates subscribers with statically configured interfaces and provides dynamic service activation and activation for these subscribers.

**tunnel-oamd**—(Optional) Display the Tunnel OAM process, which enables the Operations, Administration, and Maintenance of Layer 2 tunneled networks. Layer 2 protocol tunneling (L2PT) allows service providers to send Layer 2 protocol data units (PDUs) across the provider's cloud and deliver them to Juniper Networks EX Series Ethernet Switches that are not part of the local broadcast domain.

**vrrp**—(EX Series switches and MX Series routers only) (Optional) Display the Virtual Router Redundancy Protocol (VRRP) process, which enables hosts on a LAN to make use of redundant routing platforms on that LAN without requiring more than the static configuration of a single default route on the hosts.

**watchdog**—Display the watchdog timer process, which enables the watchdog timer when Junos OS encounters a problem.

**wide**—(Optional) Display process information that might be wider than 80 columns.

**Additional Information** By default, when you issue the **show system processes** command on the master Routing Engine of a TX Matrix router or a TX Matrix Plus router, the command is broadcast to all the master Routing Engines of the LCCs connected to it in the routing matrix. Likewise, if you issue the same command on the backup Routing Engine of a TX Matrix or a TX Matrix Plus router, the command is broadcast to all backup Routing Engines of the LCCs that are connected to it in the routing matrix.

**Required Privilege Level** view

**Related Documentation**

- [List of Junos OS Processes](#)
- [Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

**List of Sample Output**

[show system processes on page 1130](#)  
[show system processes brief on page 1131](#)  
[show system processes detail on page 1131](#)  
[show system processes extensive on page 1131](#)  
[show system processes extensive \(EX9200 Switch\) on page 1132](#)  
[show system processes host processes \(OCX1100 Switch\) on page 1132](#)  
[show system processes lcc wide \(TX Matrix Routing Matrix\) on page 1133](#)  
[show system processes summary on page 1133](#)  
[show system processes \(TX Matrix Plus Router\) on page 1134](#)  
[show system processes sfc \(TX Matrix Plus Router\) on page 1141](#)  
[show system processes lcc wide \(TX Matrix Plus Routing Matrix\) on page 1144](#)  
[show system processes \(QFX Series and OCX Series\) on page 1145](#)

**Output Fields** [Table 73 on page 1128](#) describes the output fields for the **show system processes** command. Output fields are listed in the approximate order in which they appear.

**Table 73: show system processes Output Fields**

| Field Name    | Field Description                                                                                                           | Level of Output         |
|---------------|-----------------------------------------------------------------------------------------------------------------------------|-------------------------|
| last pid      | Last process identifier assigned to the process.                                                                            | brief extensive summary |
| load averages | Three load averages followed by the current time.                                                                           | brief extensive summary |
| processes     | Number of existing processes and the number of processes in each state (sleeping, running, starting, zombies, and stopped). | brief extensive summary |
| Mem           | Information about physical and virtual memory allocation.                                                                   | brief extensive summary |



Table 73: show system processes Output Fields (*continued*)

| Field Name      | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Level of Output                 |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| <b>Swap</b>     | Information about physical and virtual memory allocation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>brief extensive summary</b>  |
| <b>PID</b>      | Process identifier.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>detail extensive summary</b> |
| <b>TT</b>       | Control terminal name.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | none <b>detail</b>              |
| <b>STAT</b>     | <p>Symbolic process state. The state is given by a sequence of letters. The first letter indicates the run state of the process:</p> <ul style="list-style-type: none"> <li>• <b>D</b>—In disk or other short-term, uninterruptible wait</li> <li>• <b>I</b>—Idle (sleeping longer than about 20 seconds)</li> <li>• <b>R</b>—Runnable</li> <li>• <b>S</b>—Sleeping for less than 20 seconds</li> <li>• <b>T</b>—Stopped</li> <li>• <b>Z</b>—Dead (zombie)</li> <li>• <b>+</b> —The process is in the foreground process group of its control terminal.</li> <li>• <b>&lt;</b>—The process has raised CPU scheduling priority.</li> <li>• <b>&gt;</b>—The process has specified a soft limit on memory requirements and is currently exceeding that limit; such a process is not swapped.</li> <li>• <b>A</b>—The process requested random page replacement.</li> <li>• <b>E</b>—The process is trying to exit.</li> <li>• <b>L</b>—The process has pages locked in core.</li> <li>• <b>N</b>—The process has reduced CPU scheduling priority.</li> <li>• <b>S</b>—The process requested first-in, first-out (FIFO) page replacement.</li> <li>• <b>s</b>—The process is a session leader.</li> <li>• <b>V</b>—The process is temporarily suspended.</li> <li>• <b>W</b>—The process is swapped out.</li> <li>• <b>X</b>—The process is being traced or debugged.</li> </ul> | none <b>detail</b>              |
| <b>UID</b>      | User identifier.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>detail</b>                   |
| <b>USERNAME</b> | Process owner.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>extensive summary</b>        |
| <b>PPID</b>     | Parent process identifier.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>detail</b>                   |
| <b>CPU</b>      | <p>(D)—Short-term CPU usage.</p> <p>(E and S)—Raw (unweighted) CPU usage. The value of this field is used to sort the processes in the output.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>detail extensive summary</b> |
| <b>RSS</b>      | Resident set size.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>detail</b>                   |
| <b>WCHAN</b>    | Symbolic name of the wait channel.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>detail</b>                   |
| <b>STARTED</b>  | Local time when the process started running.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>detail</b>                   |

Table 73: show system processes Output Fields (*continued*)

| Field Name | Field Description                                                                                                                                    | Level of Output          |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| PRI        | Current priority of the process. A lower number indicates a higher priority.                                                                         | detail extensive summary |
| NI or NICE | UNIX "niceness" value. A lower number indicates a higher priority.                                                                                   | detail extensive summary |
| SIZE       | Total size of the process (text, data, and stack), in kilobytes.                                                                                     | extensive summary        |
| RES        | Current amount of resident memory, in kilobytes.                                                                                                     | extensive summary        |
| STATE      | Current state of the process (for example, <b>sleep</b> , <b>wait</b> , <b>run</b> , <b>idle</b> , <b>zombie</b> , or <b>stop</b> ).                 | extensive summary        |
| TIME       | (S)—Number of system and user CPU seconds that the process has used.<br><br>(None, D, and E)—Total amount of time that the command has been running. | detail extensive summary |
| WCPU       | Weighted CPU usage.                                                                                                                                  | extensive summary        |
| COMMAND    | Command that is currently running.                                                                                                                   | detail extensive summary |
| THR        | Number of threads in the process                                                                                                                     | extensive                |

## Sample Output

### show system processes

```

user@host> show system processes
PID TT STAT TIME COMMAND
 0 ?? DLs 0:00.70 (swapper)
 1 ?? Is 0:00.35 /sbin/init --
 2 ?? DL 0:00.00 (pagedaemon)
 3 ?? DL 0:00.00 (vmdaemon)
 4 ?? DL 0:42.37 (update)
 5 ?? DL 0:00.00 (if_jnx)
 80 ?? Ss 0:14.66 syslogd -s
 96 ?? Is 0:00.01 portmap
 128 ?? Is 0:02.70 cron
 173 ?? Is 0:02.24 /usr/local/sbin/sshd (sshd1)
 189 ?? S 0:03.80 /sbin/watchdog -t180
 190 ?? I 0:00.03 /usr/sbin/tnetd -N
 191 ?? S 2:24.76 /sbin/ifd -N
 192 ?? S< 0:55.44 /usr/sbin/xntpd -N
 195 ?? S 0:53.11 /usr/sbin/snmpd -N
 196 ?? S 1:15.73 /usr/sbin/mib2d -N
 198 ?? I 0:00.75 /usr/sbin/inetd -N
2677 ?? I 0:00.01 /usr/sbin/mgd -N
2712 ?? Ss 0:00.24 rlogind
2735 ?? R 0:00.00 /bin/ps -ax
1985 p0- S 0:07.41 ./rpd -N
2713 p0 Is 0:00.24 -tcsh (tcsh)
2726 p0 S+ 0:00.07 cli

```

## show system processes brief

```

user@host> show system processes brief
last pid: 543; load averages: 0.00, 0.00, 0.00 18:29:47
37 processes: 1 running, 36 sleeping

Mem: 25M Active, 3976K Inact, 19M Wired, 8346K Buf, 202M Free
Swap: 528M Total, 64K Used, 528M Free

```

## show system processes detail

```

user@host> show system processes detail

```

| PID  | UID  | PPID | CPU | PRI | NI  | RSS   | WCHAN  | STARTED | TT | STAT | TIME    | COMMAND   |
|------|------|------|-----|-----|-----|-------|--------|---------|----|------|---------|-----------|
| 3151 | 1049 | 3129 | 2   | 28  | 0   | 672   | -      | 1:13PM  | p0 | R+   | 0:00.00 | ps -ax -r |
| 1    | 0    | 0    | 0   | 10  | 0   | 376   | wait   | 1:51PM  | ?? | Is   | 0:00.29 | /sbin/ini |
| 2    | 0    | 0    | 0   | -18 | 0   | 12    | psleep | 1:51PM  | ?? | DL   | 0:00.00 | (pagedae  |
| 3    | 0    | 0    | 0   | 28  | 0   | 12    | psleep | 1:51PM  | ?? | DL   | 0:00.00 | (vmdaemo  |
| 4    | 0    | 0    | 0   | 28  | 0   | 12    | update | 1:51PM  | ?? | DL   | 0:07.15 | (update)  |
| 5    | 0    | 0    | 0   | 2   | 0   | 12    | pfesel | 1:51PM  | ?? | IL   | 0:02.90 | (if_pfe)  |
| 27   | 0    | 1    | 0   | 10  | 0   | 17936 | mfsidl | 1:51PM  | ?? | Is   | 0:00.46 | mfs /dev/ |
| 81   | 0    | 1    | 0   | 2   | 0   | 496   | select | 1:52PM  | ?? | Ss   | 0:31.21 | syslogd - |
| 119  | 1    | 1    | 0   | 2   | 0   | 492   | select | 1:52PM  | ?? | Is   | 0:00.00 | portmap   |
| 134  | 0    | 1    | 0   | 2   | 0   | 580   | select | 1:52PM  | ?? | S    | 0:02.95 | amd -p -a |
| 151  | 0    | 1    | 0   | 18  | 0   | 532   | pause  | 1:52PM  | ?? | Is   | 0:00.34 | cron      |
| 183  | 0    | 1    | 0   | 2   | 0   | 420   | select | 1:52PM  | ?? | Ss   | 0:00.07 | /usr/loca |
| 206  | 0    | 1    | 0   | 18  | 0   | 72    | pause  | 1:52PM  | ?? | S    | 0:00.51 | /sbin/wat |
| 207  | 0    | 1    | 0   | 2   | 0   | 520   | select | 1:52PM  | ?? | I    | 0:00.16 | /usr/sbin |
| 208  | 0    | 1    | 0   | 2   | 0   | 536   | select | 1:52PM  | ?? | S    | 0:08.21 | /sbin/dcd |
| 210  | 0    | 1    | 255 | 2   | -12 | 740   | select | 1:52PM  | ?? | S<   | 0:05.83 | /usr/sbin |
| 211  | 0    | 1    | 0   | 2   | 0   | 376   | select | 1:52PM  | ?? | S    | 0:00.03 | /usr/sbin |
| 215  | 0    | 1    | 0   | 2   | 0   | 548   | select | 1:52PM  | ?? | I    | 0:00.50 | /usr/sbin |
| 219  | 0    | 1    | 0   | 3   | 0   | 540   | ttyin  | 1:52PM  | v0 | Is+  | 0:00.02 | /usr/libe |
| 220  | 0    | 1    | 0   | 3   | 0   | 540   | ttyin  | 1:52PM  | v1 | Is+  | 0:00.01 | /usr/libe |
| 221  | 0    | 1    | 0   | 3   | 0   | 540   | ttyin  | 1:52PM  | v2 | Is+  | 0:00.01 | /usr/libe |
| 222  | 0    | 1    | 0   | 3   | 0   | 540   | ttyin  | 1:52PM  | v3 | Is+  | 0:00.01 | /usr/libe |
| 735  | 0    | 1    | 0   | 2   | 0   | 468   | select | 2:47PM  | ?? | S    | 0:19.14 | /usr/sbin |
| 736  | 0    | 1    | 0   | 2   | 0   | 212   | select | 2:47PM  | ?? | S    | 0:14.13 | /usr/sbin |
| 1380 | 0    | 1    | 0   | 3   | 0   | 888   | ttyin  | 7:32PM  | d0 | Is+  | 0:00.46 | bash      |
| 3019 | 0    | 207  | 0   | 2   | 0   | 636   | select | 10:49AM | ?? | Ss   | 0:02.93 | tnp.chass |
| 3122 | 0    | 1380 | 0   | 2   | 0   | 1764  | select | 12:33PM | d0 | S    | 0:00.77 | ./rpd -N  |
| 3128 | 0    | 215  | 0   | 2   | 0   | 580   | select | 12:45PM | ?? | Ss   | 0:00.12 | rlogind   |
| 3129 | 1049 | 3128 | 0   | 18  | 0   | 944   | pause  | 12:45PM | p0 | Ss   | 0:00.14 | -tcsh (tc |
| 0    | 0    | 0    | 0   | -18 | 0   | 0     | sched  | 1:51PM  | ?? | DLs  | 0:00.10 | (swapper  |

## show system processes extensive

```

user@host> show system processes extensive
Mem: 241M Active, 99M Inact, 78M Wired, 325M Cache, 69M Buf, 1251M Free
Swap: 2048M Total, 2048M Free

```

| PID  | USERNAME | THR | PRI | NICE | SIZE   | RES    | STATE  | TIME   | WCPU   | COMMAND            |
|------|----------|-----|-----|------|--------|--------|--------|--------|--------|--------------------|
| 11   | root     | 1   | 171 | 52   | OK     | 12K    | RUN    | 807.5H | 98.73% | idle               |
| 13   | root     | 1   | -20 | -139 | OK     | 12K    | WAIT   | 36:17  | 0.00%  | swi7: clock sio    |
| 1499 | root     | 1   | 96  | 0    | 7212K  | 3040K  | select | 34:01  | 0.00%  | license-check      |
| 1621 | root     | 1   | 96  | 0    | 20968K | 11216K | select | 20:25  | 0.00%  | mib2d              |
| 1465 | root     | 2   | 8   | -88  | 115M   | 11748K | nanslp | 14:32  | 0.00%  | chassisd           |
| 1478 | root     | 1   | 96  | 0    | 6336K  | 3816K  | select | 11:28  | 0.00%  | ppmd               |
| 20   | root     | 1   | -68 | -187 | OK     | 12K    | WAIT   | 10:28  | 0.00%  | irq10: em0 em1+++* |
| 1490 | root     | 1   | 96  | 0    | 11792K | 4336K  | select | 9:44   | 0.00%  | shm-rtssdbd        |

```

1618 root 1 96 0 39584K 7464K select 8:47 0.00% pfed
1622 root 1 96 0 15268K 10988K select 6:16 0.00% snmpd
1466 root 1 96 0 7408K 2896K select 5:44 0.00% alarmd
 7 root 1 -16 0 0K 12K client 5:09 0.00% ifstate notify
1480 root 1 96 0 5388K 2660K select 4:29 0.00% ksyncd
 12 root 1 -40 -159 0K 12K WAIT 4:15 0.00% swi2: netisr 0
1462 root 1 96 0 1836K 1240K select 3:57 0.00% bslockd
 55 root 1 -16 0 0K 12K - 3:44 0.00% schedcpu
1392 root 1 16 0 0K 12K bcmsem 3:37 0.00% bcmLINK.0
 47 root 1 -16 0 0K 12K psleep 3:25 0.00% vmkmemdaemon
 36 root 1 20 0 0K 12K syncer 2:46 0.00% syncer
1484 root 1 96 0 7484K 3428K select 2:38 0.00% clksyncd
1616 root 1 96 0 4848K 2848K select 2:18 0.00% irsd
1487 root 1 96 0 32800K 6992K select 2:10 0.00% smid
1623 root 1 96 0 34616K 5464K select 2:01 0.00% dcd
 15 root 1 -16 0 0K 12K - 1:59 0.00% yarrow
 49 root 1 -16 0 0K 12K . 1:51 0.00% ddostasks

```

### show system processes extensive (EX9200 Switch)

```

user@switch> show system processes extensive
last pid: 3372; load averages: 0.02, 0.02, 0.00 up 0+01:42:22 16:39:57
151 processes: 4 running, 131 sleeping, 1 zombie, 15 waiting

Mem: 935M Active, 122M Inact, 108M Wired, 838M Cache, 214M Buf, 5872M Free
Swap: 8192M Total, 8192M Free

```

| PID  | USERNAME | THR | PRI | NICE | SIZE   | RES    | STATE  | TIME  | WCPU   | COMMAND         |
|------|----------|-----|-----|------|--------|--------|--------|-------|--------|-----------------|
| 10   | root     | 1   | 171 | 52   | 0K     | 16K    | RUN    | 96:34 | 92.19% | idle            |
| 3317 | root     | 1   | 97  | 0    | 40412K | 30944K | select | 0:00  | 5.13%  | mgd             |
| 3316 | root     | 1   | 96  | 0    | 26672K | 20516K | select | 0:00  | 3.08%  | cli             |
| 1626 | root     | 2   | 8   | -88  | 124M   | 20332K | nanslp | 3:19  | 2.39%  | chassisd        |
| 260  | root     | 1   | -8  | 0    | 0K     | 16K    | mdwait | 0:16  | 0.00%  | md16            |
| 19   | root     | 1   | -68 | -187 | 0K     | 16K    | WAIT   | 0:12  | 0.00%  | irq11: em0 em1  |
| em2* |          |     |     |      |        |        |        |       |        |                 |
| 1642 | root     | 1   | 96  | 0    | 8052K  | 3936K  | RUN    | 0:10  | 0.00%  | clksyncd        |
| 11   | root     | 1   | -20 | -139 | 0K     | 16K    | WAIT   | 0:07  | 0.00%  | swi7: clock sio |
| 154  | root     | 1   | -8  | 0    | 0K     | 16K    | mdwait | 0:06  | 0.00%  | md8             |
| 1784 | root     | 1   | 96  | 0    | 98M    | 33720K | select | 0:05  | 0.00%  | authd           |
| 1646 | root     | 1   | 96  | 0    | 7776K  | 2944K  | select | 0:03  | 0.00%  | license-check   |
| 1807 | root     | 1   | 96  | 0    | 41340K | 9944K  | select | 0:02  | 0.00%  | mib2d           |

[...Output truncated...]

### show system processes host processes (OCX1100 Switch)

```

user@switch>show system processes host processes
fpc0:

top - 14:14:32 up 2:05, 0 users, load average: 0.11, 0.39, 0.39
Tasks: 101 total, 1 running, 98 sleeping, 0 stopped, 2 zombie
Cpu(s): 3.1%us, 2.2%sy, 0.0%ni, 94.2%id, 0.4%wa, 0.0%hi, 0.0%si, 0.0%st
Mem: 3881300k total, 2667040k used, 1214260k free, 53232k buffers
Swap: 15620k total, 0k used, 15620k free, 808492k cached

 PID USER PR NI VIRT RES SHR S %CPU %MEM TIME+ COMMAND
 2780 root 20 0 1860m 1.5g 3780 S 14 41.7 20:56.05 kvm
 1482 bind 20 0 24676 5912 1944 S 2 0.2 0:00.07 named
 4631 root 20 0 648m 94m 13m S 2 2.5 4:19.59 dcpfe
 9230 root 20 0 15208 1092 832 R 2 0.0 0:00.01 top
 1 root 20 0 4216 660 576 S 0 0.0 2:09.61 init

```

```

 2 root 20 0 0 0 0 S 0 0.0 0:00.00 kthreadd
 3 root 20 0 0 0 0 S 0 0.0 0:00.21 ksoftirqd/0
 4 root 20 0 0 0 0 S 0 0.0 0:00.00 kworker/0:0
 5 root 0 -20 0 0 0 S 0 0.0 0:00.00 kworker/0:0H
 7 root RT 0 0 0 0 S 0 0.0 0:00.52 migration/0
 8 root 20 0 0 0 0 S 0 0.0 0:04.36 rcu_preempt
 9 root 20 0 0 0 0 S 0 0.0 0:00.00 rcu_bh
10 root 20 0 0 0 0 S 0 0.0 0:00.00 rcu_sched
11 root RT 0 0 0 0 S 0 0.0 0:00.53 migration/1

```

[...Output truncated...]

### show system processes lcc wide (TX Matrix Routing Matrix)

```
user@host> show system processes lcc 2 wide
lcc2-re0:
```

```

PID TT STAT TIME COMMAND
 0 ?? DLs 0:00.00 (swapper)
 1 ?? ILs 0:00.10 /sbin/preinit -- (init)
 2 ?? DL 0:00.00 (pagedaemon)
 3 ?? DL 0:00.00 (vmddaemon)
 4 ?? DL 0:00.00 (bufddaemon)
 5 ?? DL 0:00.04 (syncer)
 6 ?? DL 0:00.00 (netddaemon)
 7 ?? IL 0:00.00 (if_pic_listen)
 8 ?? IL 0:00.00 (scs_housekeeping)
 9 ?? IL 0:00.00 (if_pfe_listen)
10 ?? DL 0:00.00 (vmuncachedaemon)
11 ?? SL 0:00.02 (cb_poll)
172 ?? ILs 0:00.21 mfs -o noauto /dev/ad1s1b /tmp (newfs)
2909 ?? Is 0:00.00 pccardd
2932 ?? Ss 0:00.07 syslogd -r -s
3039 ?? Is 0:00.00 cron
3217 ?? I 0:00.00 /sbin/watchdog -d
3218 ?? I 0:00.02 /usr/sbin/tnetd -N
3221 ?? S 0:00.11 /usr/sbin/alarmd -N
3222 ?? S 0:00.85 /usr/sbin/craftd -N
3223 ?? S 0:00.05 /usr/sbin/mgd -N
3224 ?? I 0:00.02 /usr/sbin/inetd -N
3225 ?? I 0:00.00 /usr/sbin/tnp.sntpd -N
3226 ?? I 0:00.01 /usr/sbin/tnp.sntpc -N
3228 ?? I 0:00.01 /usr/sbin/smartd -N
3231 ?? I 0:00.01 /usr/sbin/eccd -N
3425 ?? S 0:00.09 /usr/sbin/dfwd -N
3426 ?? S 0:00.19 /sbin/dcd -N
3427 ?? I 0:00.04 /usr/sbin/pfed -N
3430 ?? S 0:00.10 /usr/sbin/ksyncd -N
3482 ?? S 1:53.63 /usr/sbin/chassisd -N
4285 ?? SL 0:00.01 (peer proxy)
4286 ?? SL 0:00.00 (peer proxy)
4303 ?? Ss 0:00.00 mgd: (mgd) (root) (mgd)
4304 ?? R 0:00.00 /bin/ps -ax -ww
3270 d0 Is+ 0:00.00 /usr/libexec/getty std.9600 ttyd0

```

### show system processes summary

```

user@host> show system processes summary
last pid: 543; load averages: 0.00, 0.00, 0.00 18:29:47
37 processes: 1 running, 36 sleeping

```

Mem: 25M Active, 3976K Inact, 19M Wired, 8346K Buf, 202M Free  
 Swap: 528M Total, 64K Used, 528M Free

| PID | USERNAME | PRI | NICE | SIZE | RES  | STATE  | TIME | WCPU  | CPU   | COMMAND |
|-----|----------|-----|------|------|------|--------|------|-------|-------|---------|
| 527 | root     | 2   | 0    | 176K | 580K | select | 0:00 | 0.04% | 0.04% | rlogind |
| 543 | root     | 30  | 0    | 604K | 768K | RUN    | 0:00 | 0.00% | 0.00% | top     |

### show system processes (TX Matrix Plus Router)

user@host> show system processes  
 sfc0-re0:

```

PID TT STAT TIME COMMAND
 0 ?? WLS 0:00.00 [swapper]
 1 ?? ILs 0:00.18 /packages/mnt/jbase/sbin/init --
 2 ?? DL 0:00.20 [g_event]
 3 ?? DL 0:00.39 [g_up]
 4 ?? DL 0:00.32 [g_down]
 5 ?? DL 0:00.00 [thread taskq]
 6 ?? DL 0:00.09 [kqueue taskq]
 7 ?? DL 0:00.01 [pagedaemon]
 8 ?? DL 0:00.00 [vmdaemon]
 9 ?? DL 0:06.63 [pagezero]
 10 ?? DL 0:00.00 [ktrace]
 11 ?? RL 310:52.98 [idle]
 12 ?? WL 0:11.03 [swi2: net]
 13 ?? WL 0:27.58 [swi7: clock sio]
 14 ?? WL 0:00.00 [swi6: vm]
 15 ?? DL 0:03.02 [yarrow]
 16 ?? WL 0:00.00 [swi9: +]
 17 ?? WL 0:00.00 [swi8: +]
 18 ?? WL 0:00.00 [swi5: cambio]
 19 ?? WL 0:00.00 [swi9: task queue]
 20 ?? WL 0:11.41 [irq16: uhci0 uhci*]
 21 ?? DL 0:00.00 [usb0]
 22 ?? DL 0:00.00 [usbtask]
 23 ?? WL 0:39.51 [irq17: uhci1 uhci*]
 24 ?? DL 0:00.00 [usb1]
 25 ?? WL 0:00.00 [irq18: uhci2 uhci*]
 26 ?? DL 0:00.83 [usb2]
 27 ?? DL 0:00.00 [usb3]
 28 ?? DL 0:00.00 [usb4]
 29 ?? DL 0:00.00 [usb5]
 30 ?? DL 0:00.73 [usb6]
 31 ?? DL 0:00.00 [usb7]
 32 ?? WL 0:00.00 [irq14: ata0]
 33 ?? WL 0:00.00 [irq15: ata1]
 34 ?? WL 0:00.00 [irq1: atkbd0]
 35 ?? WL 0:00.00 [swi0: sio]
 36 ?? WL 0:00.00 [irq11: isab0]
 37 ?? WL 0:00.00 [swi3: ip6opt ipopt]
 38 ?? WL 0:00.00 [swi4: ip6mismatch+]
 39 ?? WL 0:00.00 [swi1: ipfwd]
 40 ?? DL 0:00.02 [bufdaemon]
 41 ?? DL 0:00.02 [vnlr]
 42 ?? DL 0:00.39 [syncer]
 43 ?? DL 0:00.05 [softdepflush]
 44 ?? DL 0:00.00 [netdaemon]
 45 ?? DL 0:00.02 [vmuncachedaemon]
 46 ?? DL 0:00.00 [if_pic_listen]
 47 ?? DL 0:00.35 [vmkmemdaemon]

```

```

48 ?? DL 0:00.00 [cb_poll]
49 ?? DL 0:00.06 [if_pfe_listen]
50 ?? DL 0:00.00 [scs_housekeeping]
51 ?? IL 0:00.00 [kern_dump_proc]
52 ?? IL 0:00.00 [nfsiod 0]
53 ?? IL 0:00.00 [nfsiod 1]
54 ?? IL 0:00.00 [nfsiod 2]
55 ?? IL 0:00.00 [nfsiod 3]
56 ?? DL 0:00.37 [schedcpu]
57 ?? DL 0:00.56 [md0]
79 ?? DL 0:02.58 [md1]
100 ?? DL 0:00.03 [md2]
118 ?? DL 0:00.01 [md3]
139 ?? DL 0:00.95 [md4]
160 ?? DL 0:00.12 [md5]
181 ?? DL 0:00.00 [md6]
217 ?? DL 0:00.02 [md7]
227 ?? DL 0:00.05 [md8]
1341 ?? SL 0:01.34 [bcmTX]
1342 ?? SL 0:01.68 [bcmXGS3AsyncTX]
1343 ?? SL 0:41.40 [bcmLINK.0]
1345 ?? SL 0:33.83 [bcmLINK.1]
1350 ?? Is 0:00.01 /usr/sbin/cron
1502 ?? S 0:00.01 /sbin/watchdog -t-1
1503 ?? S 0:00.86 /usr/libexec/bslockd -mp -N
1504 ?? S 0:00.01 /usr/sbin/tnetd -N
1507 ?? S 0:01.32 /usr/sbin/alarmd -N
1508 ?? S 0:14.54 /usr/sbin/craftd -N
1509 ?? S 0:01.19 /usr/sbin/mgd -N
1512 ?? I 0:00.05 /usr/sbin/inetd -N
1513 ?? S 0:00.10 /usr/sbin/tnp.snmpd -N
1517 ?? S 0:00.11 /usr/sbin/smard -N
1525 ?? S 0:01.10 /usr/sbin/idpd -N
1526 ?? S 0:01.43 /usr/sbin/license-check -U -M -p 10 -i 10
1527 ?? I 0:00.01 /usr/libexec/getty Pc ttyv0
1616 ?? DL 0:00.30 [peer proxy]
1617 ?? DL 0:00.32 [peer proxy]
1618 ?? DL 0:00.34 [peer proxy]
1619 ?? DL 0:00.30 [peer proxy]
2391 ?? Is 0:00.01 telnetd
7331 ?? Ss 0:00.03 telnetd
9538 ?? DL 0:01.16 [jsr_kkcm]
9613 ?? DL 0:00.18 [peer proxy]
23781 ?? Ss 0:00.01 telnetd
23926 ?? Ss 0:00.01 mgd: (mgd) (user)/dev/tty2 (mgd)
36867 ?? S 0:03.14 /usr/sbin/rpd -N
36874 ?? S 0:00.08 /usr/sbin/lmpd
36876 ?? S 0:00.17 /usr/sbin/lacpd -N
36877 ?? S 0:00.15 /usr/sbin/bfdd -N
36878 ?? S 0:05.05 /usr/sbin/ppmd -N
36907 ?? S 0:25.07 /usr/sbin/chassisd -N
37775 ?? S 0:00.01 /usr/sbin/bdbrepd -N
45727 ?? S 0:00.02 /usr/sbin/xntpd -j -N -g (ntpd)
45729 ?? S 0:00.38 /usr/sbin/l2ald -N
45730 ?? S< 0:00.12 /usr/sbin/apsd -N
45731 ?? SN 0:00.10 /usr/sbin/sampled -N
45732 ?? S 0:00.03 /usr/sbin/ilmid -N
45733 ?? S 0:00.09 /usr/sbin/rmopd -N
45734 ?? S 0:00.30 /usr/sbin/cosd
45735 ?? I 0:00.00 /usr/sbin/rtspd -N
45736 ?? S 0:00.06 /usr/sbin/fsad -N

```

```

45737 ?? S 0:00.05 /usr/sbin/rdd -N
45738 ?? S 0:00.10 /usr/sbin/pppd -N
45739 ?? S 0:00.05 /usr/sbin/dfcd -N
45740 ?? S 0:00.07 /usr/sbin/lfmd -N
45741 ?? S 0:00.01 /usr/sbin/implsoamd -N
45742 ?? I 0:00.01 /usr/sbin/sendd -N
45743 ?? S 0:00.08 /usr/sbin/appidd -N
45744 ?? S 0:00.05 /usr/sbin/mspd -N
45745 ?? S 0:00.25 /usr/sbin/jdiameterd -N
45746 ?? S 0:00.10 /usr/sbin/pfed -N
45747 ?? S 0:00.19 /usr/sbin/lpdfd -N
45748 ?? S 0:00.63 /sbin/dcd -N
45750 ?? S 0:00.45 /usr/sbin/mib2d -N
45751 ?? S 0:00.15 /usr/sbin/dfwd -N
45752 ?? S 0:00.15 /usr/sbin/irsd -N
45764 ?? S 0:20.59 /usr/sbin/snmpd -N
56479 ?? Ss 0:00.00 mgd: (mgd) (root) (mgd)
56480 ?? R 0:00.00 /bin/ps -ax
1142 d0- I 0:00.01 /usr/sbin/usbd -N
1160 d0- S 0:29.17 /usr/sbin/eventd -N -r -s -A
6527 d0 Is+ 0:00.00 /usr/libexec/getty std.9600 ttyd0
2392 p1 Is 0:00.00 login [pam] (login)
2393 p1 I 0:00.00 -csh (csh)
2394 p1 I 0:00.00 su -
2395 p1 I+ 0:00.01 -su (csh)
23782 p2 Is 0:00.00 login [pam] (login)
23881 p2 I 0:00.00 -csh (csh)
23925 p2 S+ 0:00.03 cli
7332 p3 Is 0:00.00 login [pam] (login)
7333 p3 I 0:00.00 -csh (csh)
23780 p3 S+ 0:00.02 telnet aj

```

```
lcc0-re0:
```

```

PID TT STAT TIME COMMAND
 0 ?? Ws 0:00.00 [swapper]
 1 ?? ILs 0:00.16 /packages/mnt/jbase/sbin/init --
 2 ?? DL 0:00.01 [g_event]
 3 ?? DL 0:00.16 [g_up]
 4 ?? DL 0:00.11 [g_down]
 5 ?? DL 0:00.00 [thread taskq]
 6 ?? DL 0:00.00 [kqueue taskq]
 7 ?? DL 0:00.00 [pagedaemon]
 8 ?? DL 0:00.00 [vmdaemon]
 9 ?? DL 0:01.77 [pagezero]
 10 ?? DL 0:00.00 [ktrace]
 11 ?? RL 17:22.31 [idle]
 12 ?? WL 0:00.32 [swi2: net]
 13 ?? WL 0:01.21 [swi7: clock sio]
 14 ?? WL 0:00.00 [swi6: vm]
 15 ?? DL 0:00.10 [yarrow]
 16 ?? WL 0:00.00 [swi9: +]
 17 ?? WL 0:00.00 [swi8: +]
 18 ?? WL 0:00.00 [swi5: cambio]
 19 ?? WL 0:00.00 [swi9: task queue]
 20 ?? WL 0:02.73 [irq10: bcm0 uhci1*]
 21 ?? WL 0:00.02 [irq11: cb0 uhci0+*]
 22 ?? DL 0:00.00 [usb0]
 23 ?? DL 0:00.00 [usbtask]
 24 ?? DL 0:00.00 [usb1]
 25 ?? DL 0:00.05 [usb2]

```



```

26 ?? DL 0:00.00 [usb3]
27 ?? DL 0:00.00 [usb4]
28 ?? DL 0:00.00 [usb5]
29 ?? DL 0:00.04 [usb6]
30 ?? DL 0:00.00 [usb7]
31 ?? WL 0:00.00 [irq14: ata0]
32 ?? WL 0:00.00 [irq15: ata1]
33 ?? WL 0:00.00 [irq1: atkbd0]
34 ?? WL 0:00.00 [swi0: sio]
35 ?? WL 0:00.00 [swi3: ip6opt ipopt]
36 ?? WL 0:00.00 [swi4: ip6mismatch+]
37 ?? WL 0:00.00 [swi1: ipfwd]
38 ?? DL 0:00.00 [bufdaemon]
39 ?? DL 0:00.00 [vn1ru]
40 ?? DL 0:00.01 [syncer]
41 ?? DL 0:00.00 [softdepflush]
42 ?? DL 0:00.00 [netdaemon]
43 ?? DL 0:00.00 [vmuncachedaemon]
44 ?? DL 0:00.00 [if_pic_listen]
45 ?? DL 0:00.02 [vmkmemdaemon]
46 ?? DL 0:00.01 [cb_poll]
47 ?? DL 0:00.00 [if_pfe_listen]
48 ?? DL 0:00.00 [scs_housekeeping]
49 ?? IL 0:00.00 [kern_dump_proc]
50 ?? IL 0:00.00 [nfsiod 0]
51 ?? IL 0:00.00 [nfsiod 1]
52 ?? IL 0:00.00 [nfsiod 2]
53 ?? IL 0:00.00 [nfsiod 3]
54 ?? DL 0:00.01 [schedcpu]
55 ?? DL 0:00.73 [md0]
77 ?? DL 0:03.54 [md1]
98 ?? DL 0:00.37 [md2]
116 ?? DL 0:00.02 [md3]
137 ?? DL 0:00.56 [md4]
158 ?? DL 0:00.15 [md5]
179 ?? DL 0:00.00 [md6]
215 ?? DL 0:00.03 [md7]
225 ?? DL 0:00.03 [md8]
1078 ?? DL 0:00.00 [jsr_kkcm]
1363 ?? SL 0:00.09 [bcmTX]
1364 ?? SL 0:00.10 [bcmXGS3AsyncTX]
1365 ?? SL 0:03.08 [bcmLINK.0]
1370 ?? Is 0:00.00 /usr/sbin/cron
1522 ?? S 0:00.00 /sbin/watchdog -t-1
1523 ?? S 0:00.05 /usr/libexec/bslockd -mp -N
1524 ?? I 0:00.01 /usr/sbin/tnetd -N
1526 ?? S 0:04.98 /usr/sbin/chassisd -N
1527 ?? S 0:00.04 /usr/sbin/alarmd -N
1528 ?? I 0:00.40 /usr/sbin/craftd -N
1529 ?? S 0:00.08 /usr/sbin/mgd -N
1532 ?? I 0:00.04 /usr/sbin/inetd -N
1533 ?? I 0:00.00 /usr/sbin/tnp.sntpd -N
1534 ?? I 0:00.00 /usr/sbin/tnp.sntpc -N
1536 ?? S 0:00.01 /usr/sbin/smartd -N
1540 ?? I 0:00.07 /usr/sbin/jcsd -N
1541 ?? S 0:00.11 /usr/sbin/idpd -N
1542 ?? I 0:00.00 /usr/libexec/getty Pc ttyv0
2089 ?? DL 0:00.01 [peer proxy]
2090 ?? DL 0:00.01 [peer proxy]
2091 ?? DL 0:00.01 [peer proxy]
2657 ?? S 0:00.02 /usr/sbin/dfwd -N

```

```

2658 ?? S 0:00.02 /sbin/dcd -N
2659 ?? S 0:00.05 /usr/sbin/snmpd -N
2660 ?? S 0:00.01 /usr/sbin/mib2d -N
2661 ?? S 0:00.01 /usr/sbin/pfed -N
2662 ?? S 0:00.01 /usr/sbin/irsd -N
2667 ?? S 0:00.13 /usr/sbin/ksyncd -N
2690 ?? Ss 0:00.00 mgd: (mgd) (root) (mgd)
2691 ?? R 0:00.00 /bin/ps -ax
1164 d0- S 0:00.00 /usr/sbin/usbd -N
1182 d0- S 0:00.34 /usr/sbin/eventd -N -r -s -A
1543 d0 Is+ 0:00.00 /usr/libexec/getty std.9600 ttyd0

```

```
lcc1-re0:
```

```

PID TT STAT TIME COMMAND
 0 ?? Wls 0:00.00 [swapper]
 1 ?? ILs 0:00.17 /packages/mnt/jbase/sbin/init --
 2 ?? DL 0:00.01 [g_event]
 3 ?? DL 0:00.16 [g_up]
 4 ?? DL 0:00.11 [g_down]
 5 ?? DL 0:00.00 [thread taskq]
 6 ?? DL 0:00.00 [kqueue taskq]
 7 ?? DL 0:00.00 [pagedaemon]
 8 ?? DL 0:00.00 [vmdaemon]
 9 ?? DL 0:01.77 [pagezero]
 10 ?? DL 0:00.00 [ktrace]
 11 ?? RL 17:22.83 [idle]
 12 ?? WL 0:00.35 [swi2: net]
 13 ?? WL 0:01.20 [swi7: clock sio]
 14 ?? WL 0:00.00 [swi6: vm]
 15 ?? DL 0:00.10 [yarrow]
 16 ?? WL 0:00.00 [swi9: +]
 17 ?? WL 0:00.00 [swi8: +]
 18 ?? WL 0:00.00 [swi5: cambio]
 19 ?? WL 0:00.00 [swi9: task queue]
 20 ?? WL 0:02.87 [irq10: bcm0 uhci1*]
 21 ?? WL 0:00.02 [irq11: cb0 uhci0+*]
 22 ?? DL 0:00.00 [usb0]
 23 ?? DL 0:00.00 [usbtask]
 24 ?? DL 0:00.00 [usb1]
 25 ?? DL 0:00.05 [usb2]
 26 ?? DL 0:00.00 [usb3]
 27 ?? DL 0:00.00 [usb4]
 28 ?? DL 0:00.00 [usb5]
 29 ?? DL 0:00.04 [usb6]
 30 ?? DL 0:00.00 [usb7]
 31 ?? WL 0:00.00 [irq14: ata0]
 32 ?? WL 0:00.00 [irq15: ata1]
 33 ?? WL 0:00.00 [irq1: atkbd0]
 34 ?? WL 0:00.00 [swi0: sio]
 35 ?? WL 0:00.00 [swi3: ip6opt ipopt]
 36 ?? WL 0:00.00 [swi4: ip6mismatch+]
 37 ?? WL 0:00.00 [swi1: ipfwd]
 38 ?? DL 0:00.00 [bufdaemon]
 39 ?? DL 0:00.00 [vn1ru]
 40 ?? DL 0:00.01 [syncer]
 41 ?? DL 0:00.00 [softdepflush]
 42 ?? DL 0:00.00 [netdaemon]
 43 ?? DL 0:00.00 [vmuncachedaemon]
 44 ?? DL 0:00.00 [if_pic_listen]
 45 ?? DL 0:00.02 [vmknemdaemon]

```

```

46 ?? DL 0:00.01 [cb_poll]
47 ?? DL 0:00.00 [if_pfe_listen]
48 ?? DL 0:00.00 [scs_housekeeping]
49 ?? IL 0:00.00 [kern_dump_proc]
50 ?? IL 0:00.00 [nfsiod 0]
51 ?? IL 0:00.00 [nfsiod 1]
52 ?? IL 0:00.00 [nfsiod 2]
53 ?? IL 0:00.00 [nfsiod 3]
54 ?? DL 0:00.02 [schedcpu]
55 ?? DL 0:00.75 [md0]
77 ?? DL 0:03.40 [md1]
98 ?? DL 0:00.37 [md2]
116 ?? DL 0:00.02 [md3]
137 ?? DL 0:00.56 [md4]
158 ?? DL 0:00.15 [md5]
179 ?? DL 0:00.00 [md6]
215 ?? DL 0:00.03 [md7]
225 ?? DL 0:00.03 [md8]
1052 ?? DL 0:00.00 [jsr_kkcm]
1337 ?? SL 0:00.09 [bcmTX]
1338 ?? SL 0:00.10 [bcmXGS3AsyncTX]
1339 ?? SL 0:03.10 [bcmLINK.0]
1344 ?? Is 0:00.00 /usr/sbin/cron
1496 ?? S 0:00.00 /sbin/watchdog -t-1
1497 ?? S 0:00.05 /usr/libexec/bslockd -mp -N
1498 ?? I 0:00.01 /usr/sbin/tnetd -N
1500 ?? S 0:04.97 /usr/sbin/chassisd -N
1501 ?? S 0:00.04 /usr/sbin/alarmd -N
1502 ?? I 0:00.40 /usr/sbin/craftd -N
1503 ?? S 0:00.08 /usr/sbin/mgd -N
1506 ?? I 0:00.04 /usr/sbin/inetd -N
1507 ?? I 0:00.00 /usr/sbin/tnp.sntpd -N
1508 ?? I 0:00.00 /usr/sbin/tnp.sntpc -N
1510 ?? S 0:00.01 /usr/sbin/smartd -N
1514 ?? I 0:00.07 /usr/sbin/jcsd -N
1515 ?? S 0:00.18 /usr/sbin/idpd -N
1516 ?? I 0:00.00 /usr/libexec/getty Pc ttyv0
2068 ?? DL 0:00.01 [peer proxy]
2069 ?? DL 0:00.01 [peer proxy]
2070 ?? DL 0:00.01 [peer proxy]
2666 ?? S 0:00.02 /sbin/dcd -N
2667 ?? S 0:00.01 /usr/sbin/irsd -N
2668 ?? S 0:00.01 /usr/sbin/pfed -N
2669 ?? S 0:00.05 /usr/sbin/snmpd -N
2670 ?? S 0:00.01 /usr/sbin/mib2d -N
2671 ?? S 0:00.02 /usr/sbin/dfwd -N
2675 ?? S 0:00.13 /usr/sbin/ksyncd -N
2699 ?? Ss 0:00.00 mgd: (mgd) (root) (mgd)
2700 ?? R 0:00.00 /bin/ps -ax
1138 d0- S 0:00.00 /usr/sbin/usbd -N
1156 d0- S 0:00.37 /usr/sbin/eventd -N -r -s -A
1517 d0 Is+ 0:00.00 /usr/libexec/getty std.9600 ttyd0

```

```
lcc2-re0:
```

```

PID TT STAT TIME COMMAND
0 ?? Wls 0:00.00 [swapper]
1 ?? ILs 0:00.18 /packages/mnt/jbase/sbin/init --
2 ?? DL 0:00.01 [g_event]
3 ?? DL 0:00.17 [g_up]
4 ?? DL 0:00.12 [g_down]

```

```

5 ?? DL 0:00.00 [thread taskq]
6 ?? DL 0:00.00 [kqueue taskq]
7 ?? DL 0:00.00 [pagedaemon]
8 ?? DL 0:00.00 [vmdaemon]
9 ?? DL 0:01.77 [pagezero]
10 ?? DL 0:00.00 [ktrace]
11 ?? RL 17:19.13 [idle]
12 ?? WL 0:00.36 [swi2: net]
13 ?? WL 0:01.20 [swi7: clock sio]
14 ?? WL 0:00.00 [swi6: vm]
15 ?? DL 0:00.13 [yarrow]
16 ?? WL 0:00.00 [swi9: +]
17 ?? WL 0:00.00 [swi8: +]
18 ?? WL 0:00.00 [swi5: cambio]
19 ?? WL 0:00.00 [swi9: task queue]
20 ?? WL 0:03.03 [irq10: bcm0 uhci1*]
21 ?? WL 0:00.02 [irq11: cb0 uhci0+*]
22 ?? DL 0:00.00 [usb0]
23 ?? DL 0:00.00 [usbtask]
24 ?? DL 0:00.00 [usb1]
25 ?? DL 0:00.05 [usb2]
26 ?? DL 0:00.00 [usb3]
27 ?? DL 0:00.00 [usb4]
28 ?? DL 0:00.00 [usb5]
29 ?? DL 0:00.04 [usb6]
30 ?? DL 0:00.00 [usb7]
31 ?? WL 0:00.00 [irq14: ata0]
32 ?? WL 0:00.00 [irq15: ata1]
33 ?? WL 0:00.00 [irq1: atkbd0]
34 ?? WL 0:00.00 [swi0: sio]
35 ?? WL 0:00.00 [swi3: ip6opt ipopt]
36 ?? WL 0:00.00 [swi4: ip6mismatch+]
37 ?? WL 0:00.00 [swi1: ipfwd]
38 ?? DL 0:00.00 [bufdaemon]
39 ?? DL 0:00.00 [vn1ru]
40 ?? DL 0:00.01 [syncer]
41 ?? DL 0:00.00 [softdepflush]
42 ?? DL 0:00.00 [netdaemon]
43 ?? DL 0:00.00 [vmuncachedaemon]
44 ?? DL 0:00.00 [if_pic_listen]
45 ?? DL 0:00.02 [vmkmemdaemon]
46 ?? DL 0:00.01 [cb_poll]
47 ?? DL 0:00.00 [if_pfe_listen]
48 ?? DL 0:00.00 [scs_housekeeping]
49 ?? IL 0:00.00 [kern_dump_proc]
50 ?? IL 0:00.00 [nfsiod 0]
51 ?? IL 0:00.00 [nfsiod 1]
52 ?? IL 0:00.00 [nfsiod 2]
53 ?? IL 0:00.00 [nfsiod 3]
54 ?? DL 0:00.02 [schedcpu]
55 ?? DL 0:00.75 [md0]
77 ?? DL 0:03.48 [md1]
98 ?? DL 0:00.59 [md2]
116 ?? DL 0:00.02 [md3]
137 ?? DL 0:00.56 [md4]
158 ?? DL 0:00.15 [md5]
179 ?? DL 0:00.00 [md6]
215 ?? DL 0:00.03 [md7]
225 ?? DL 0:00.03 [md8]
1052 ?? DL 0:00.00 [jsr_kkcm]
1337 ?? SL 0:00.09 [bcmTX]

```

```

1338 ?? SL 0:00.10 [bcmXGS3AsyncTX]
1339 ?? SL 0:03.22 [bcmLINK.0]
1344 ?? Is 0:00.00 /usr/sbin/cron
1496 ?? S 0:00.00 /sbin/watchdog -t-1
1497 ?? S 0:00.05 /usr/libexec/bslockd -mp -N
1498 ?? S 0:00.01 /usr/sbin/tnetd -N
1500 ?? R 0:05.17 /usr/sbin/chassisd -N
1501 ?? S 0:00.04 /usr/sbin/alarmd -N
1502 ?? I 0:00.39 /usr/sbin/craftd -N
1503 ?? S 0:00.08 /usr/sbin/mgd -N
1506 ?? I 0:00.05 /usr/sbin/inetd -N
1507 ?? I 0:00.00 /usr/sbin/tnp.sntpd -N
1508 ?? I 0:00.00 /usr/sbin/tnp.sntpc -N
1510 ?? S 0:00.01 /usr/sbin/smartd -N
1514 ?? I 0:00.07 /usr/sbin/jcsd -N
1515 ?? S 0:00.17 /usr/sbin/idpd -N
1516 ?? I 0:00.00 /usr/libexec/getty Pc ttyv0
2591 ?? DL 0:00.01 [peer proxy]
2592 ?? DL 0:00.01 [peer proxy]
2593 ?? DL 0:00.01 [peer proxy]
2597 ?? DL 0:00.00 [peer proxy]
3192 ?? S 0:00.01 /usr/sbin/irsd -N
3193 ?? S 0:00.05 /usr/sbin/snmpd -N
3194 ?? S 0:00.02 /sbin/dcd -N
3195 ?? S 0:00.01 /usr/sbin/pfed -N
3196 ?? S 0:00.01 /usr/sbin/mib2d -N
3197 ?? S 0:00.02 /usr/sbin/dfwd -N
3198 ?? S 0:00.13 /usr/sbin/ksyncd -N
3228 ?? Ss 0:00.00 mgd: (mgd) (root) (mgd)
3229 ?? R 0:00.00 /bin/ps -ax
1138 d0- S 0:00.00 /usr/sbin/usbd -N
1156 d0- S 0:00.42 /usr/sbin/eventd -N -r -s -A
1517 d0 Is+ 0:00.00 /usr/libexec/getty std.9600 ttyd0
...

```

### show system processes sfc (TX Matrix Plus Router)

```

user@host> show system processes sfc 0
sfc0-re0:

```

```

PID TT STAT TIME COMMAND
 0 ?? WLS 0:00.00 [swapper]
 1 ?? SLs 0:00.18 /packages/mnt/jbase/sbin/init --
 2 ?? DL 0:00.20 [g_event]
 3 ?? DL 0:00.39 [g_up]
 4 ?? DL 0:00.32 [g_down]
 5 ?? DL 0:00.00 [thread taskq]
 6 ?? DL 0:00.09 [kqueue taskq]
 7 ?? DL 0:00.01 [pagedaemon]
 8 ?? DL 0:00.00 [vmdaemon]
 9 ?? DL 0:06.63 [pagezero]
 10 ?? DL 0:00.00 [ktrace]
 11 ?? RL 312:09.00 [idle]
 12 ?? WL 0:11.07 [swi2: net]
 13 ?? WL 0:27.70 [swi7: clock sio]
 14 ?? WL 0:00.00 [swi6: vm]
 15 ?? DL 0:03.03 [yarrow]
 16 ?? WL 0:00.00 [swi9: +]
 17 ?? WL 0:00.00 [swi8: +]
 18 ?? WL 0:00.00 [swi5: cambio]
 19 ?? WL 0:00.00 [swi9: task queue]

```

```

20 ?? WL 0:11.46 [irq16: uhci0 uhci*]
21 ?? DL 0:00.00 [usb0]
22 ?? DL 0:00.00 [usbtask]
23 ?? WL 0:39.63 [irq17: uhci1 uhci*]
24 ?? DL 0:00.00 [usb1]
25 ?? WL 0:00.00 [irq18: uhci2 uhci*]
26 ?? DL 0:00.84 [usb2]
27 ?? DL 0:00.00 [usb3]
28 ?? DL 0:00.00 [usb4]
29 ?? DL 0:00.00 [usb5]
30 ?? DL 0:00.73 [usb6]
31 ?? DL 0:00.00 [usb7]
32 ?? WL 0:00.00 [irq14: ata0]
33 ?? WL 0:00.00 [irq15: ata1]
34 ?? WL 0:00.00 [irq1: atkbd0]
35 ?? WL 0:00.00 [swi0: sio]
36 ?? WL 0:00.00 [irq11: isab0]
37 ?? WL 0:00.00 [swi3: ip6opt ipopt]
38 ?? WL 0:00.00 [swi4: ip6mismatch+]
39 ?? WL 0:00.00 [swi1: ipfwd]
40 ?? DL 0:00.02 [bufdaemon]
41 ?? DL 0:00.02 [vn1ru]
42 ?? DL 0:00.39 [syncer]
43 ?? DL 0:00.05 [softdepflush]
44 ?? DL 0:00.00 [netdaemon]
45 ?? DL 0:00.02 [vmuncachedaemon]
46 ?? DL 0:00.00 [if_pic_listen]
47 ?? DL 0:00.35 [vmkmemdaemon]
48 ?? DL 0:00.00 [cb_poll]
49 ?? DL 0:00.06 [if_pfe_listen]
50 ?? DL 0:00.00 [scs_housekeeping]
51 ?? IL 0:00.00 [kern_dump_proc]
52 ?? IL 0:00.00 [nfsiod 0]
53 ?? IL 0:00.00 [nfsiod 1]
54 ?? IL 0:00.00 [nfsiod 2]
55 ?? IL 0:00.00 [nfsiod 3]
56 ?? DL 0:00.37 [schedcpu]
57 ?? DL 0:00.56 [md0]
79 ?? DL 0:02.58 [md1]
100 ?? DL 0:00.03 [md2]
118 ?? DL 0:00.01 [md3]
139 ?? DL 0:00.95 [md4]
160 ?? DL 0:00.12 [md5]
181 ?? DL 0:00.00 [md6]
217 ?? DL 0:00.02 [md7]
227 ?? DL 0:00.05 [md8]
1341 ?? SL 0:01.35 [bcmTX]
1342 ?? SL 0:01.69 [bcmXGS3AsyncTX]
1343 ?? SL 0:41.57 [bcmLINK.0]
1345 ?? SL 0:33.97 [bcmLINK.1]
1350 ?? Is 0:00.01 /usr/sbin/cron
1502 ?? S 0:00.01 /sbin/watchdog -t-1
1503 ?? S 0:00.86 /usr/libexec/bslockd -mp -N
1504 ?? I 0:00.01 /usr/sbin/tnetd -N
1507 ?? S 0:01.32 /usr/sbin/alarmd -N
1508 ?? S 0:14.54 /usr/sbin/craftd -N
1509 ?? S 0:01.20 /usr/sbin/mgd -N
1512 ?? S 0:00.05 /usr/sbin/inetd -N
1513 ?? S 0:00.10 /usr/sbin/tnp.snptd -N
1517 ?? S 0:00.11 /usr/sbin/smartd -N
1525 ?? S 0:01.11 /usr/sbin/idpd -N

```

```

1526 ?? S 0:01.43 /usr/sbin/license-check -U -M -p 10 -i 10
1527 ?? I 0:00.01 /usr/libexec/getty Pc ttyv0
1616 ?? DL 0:00.30 [peer proxy]
1617 ?? DL 0:00.32 [peer proxy]
1618 ?? DL 0:00.34 [peer proxy]
1619 ?? DL 0:00.30 [peer proxy]
2391 ?? Is 0:00.01 telnetd
7331 ?? Ss 0:00.03 telnetd
9538 ?? DL 0:01.16 [jsr_kkcm]
9613 ?? DL 0:00.18 [peer proxy]
23781 ?? Ss 0:00.01 telnetd
23926 ?? Ss 0:00.03 mgd: (mgd) (user)/dev/tty2 (mgd)
36867 ?? S 0:03.14 /usr/sbin/rpd -N
36874 ?? S 0:00.08 /usr/sbin/lmpd
36876 ?? S 0:00.17 /usr/sbin/lacpd -N
36877 ?? S 0:00.15 /usr/sbin/bfd -N
36878 ?? S 0:05.05 /usr/sbin/ppmd -N
36907 ?? S 0:26.63 /usr/sbin/chassisd -N
37775 ?? S 0:00.01 /usr/sbin/bdbrepd -N
45727 ?? S 0:00.02 /usr/sbin/xntpd -j -N -g (ntpd)
45729 ?? S 0:00.40 /usr/sbin/l2ald -N
45730 ?? S< 0:00.13 /usr/sbin/apd -N
45731 ?? SN 0:00.10 /usr/sbin/sampled -N
45732 ?? S 0:00.03 /usr/sbin/ilmid -N
45733 ?? S 0:00.09 /usr/sbin/rmopd -N
45734 ?? S 0:00.31 /usr/sbin/cosd
45735 ?? I 0:00.00 /usr/sbin/rtsdpd -N
45736 ?? S 0:00.06 /usr/sbin/fsad -N
45737 ?? S 0:00.05 /usr/sbin/rdd -N
45738 ?? S 0:00.10 /usr/sbin/pppd -N
45739 ?? S 0:00.05 /usr/sbin/dfcd -N
45740 ?? S 0:00.08 /usr/sbin/lfmd -N
45741 ?? S 0:00.01 /usr/sbin/mpi1soamd -N
45742 ?? I 0:00.01 /usr/sbin/sendd -N
45743 ?? S 0:00.08 /usr/sbin/appidd -N
45744 ?? S 0:00.05 /usr/sbin/mspd -N
45745 ?? S 0:00.27 /usr/sbin/jdiameterd -N
45746 ?? S 0:00.10 /usr/sbin/pfed -N
45747 ?? S 0:00.19 /usr/sbin/lpdfd -N
45748 ?? S 0:00.64 /sbin/dcd -N
45750 ?? S 0:00.46 /usr/sbin/mib2d -N
45751 ?? S 0:00.16 /usr/sbin/dfwd -N
45752 ?? S 0:00.15 /usr/sbin/irsd -N
45764 ?? S 0:20.60 /usr/sbin/snmpd -N
56481 ?? Ss 0:00.02 telnetd
56548 ?? Rs 0:00.19 mgd: (mgd) (user)/dev/tty0 (mgd)
56577 ?? Ss 0:00.00 mgd: (mgd) (root) (mgd)
56578 ?? R 0:00.00 /bin/ps -ax
1142 d0- S 0:00.01 /usr/sbin/usbd -N
1160 d0- S 0:29.71 /usr/sbin/eventd -N -r -s -A
6527 d0 Is+ 0:00.00 /usr/libexec/getty std.9600 ttyd0
56482 p0 Is 0:00.00 login [pam] (login)
56483 p0 S 0:00.01 -csh (csh)
56547 p0 S+ 0:00.02 cli
2392 p1 Is 0:00.00 login [pam] (login)
2393 p1 I 0:00.00 -csh (csh)
2394 p1 I 0:00.00 su -
2395 p1 I+ 0:00.01 -su (csh)
23782 p2 Is 0:00.00 login [pam] (login)
23881 p2 I 0:00.00 -csh (csh)
23925 p2 S+ 0:00.03 cli

```

```

7332 p3 Is 0:00.00 login [pam] (login)
7333 p3 I 0:00.00 -csh (csh)
23780 p3 S+ 0:00.02 telnet aj

```

### show system processes lcc wide (TX Matrix Plus Routing Matrix)

```

user@host> show system processes lcc 2 wide
lcc2-re0:

```

```

PID TT STAT TIME PROVIDER COMMAND
0 ?? WLS 0:00.00 (null) [swapper]
1 ?? ILs 0:00.19 /packages/mnt/jbase/sbin/init --
2 ?? DL 0:00.02 [g_event]
3 ?? DL 0:00.19 [g_up]
4 ?? DL 0:00.13 [g_down]
5 ?? DL 0:00.00 [thread taskq]
6 ?? DL 0:00.00 [kqueue taskq]
7 ?? DL 0:00.00 [pagedaemon]
8 ?? DL 0:00.00 [vmdaemon]
9 ?? DL 0:01.77 [pagezero]
10 ?? DL 0:00.00 [ktrace]
11 ?? RL 20:33.81 [idle]
12 ?? WL 0:00.38 [swi2: net]
13 ?? WL 0:01.43 [swi7: clock sio]
14 ?? WL 0:00.00 [swi6: vm]
15 ?? DL 0:00.14 [yarrow]
16 ?? WL 0:00.00 [swi9: +]
17 ?? WL 0:00.00 [swi8: +]
18 ?? WL 0:00.00 [swi5: cambio]
19 ?? WL 0:00.00 [swi9: task queue]
20 ?? WL 0:03.18 [irq10: bcm0 uhci1*]
21 ?? WL 0:00.03 [irq11: cb0 uhci0+*]
22 ?? DL 0:00.00 [usb0]
23 ?? DL 0:00.00 [usbtask]
24 ?? DL 0:00.00 [usb1]
25 ?? DL 0:00.06 [usb2]
26 ?? DL 0:00.00 [usb3]
27 ?? DL 0:00.00 [usb4]
28 ?? DL 0:00.00 [usb5]
29 ?? DL 0:00.05 [usb6]
30 ?? DL 0:00.00 [usb7]
31 ?? WL 0:00.00 [irq14: ata0]
32 ?? WL 0:00.00 [irq15: ata1]
33 ?? WL 0:00.00 [irq1: atkbd0]
34 ?? WL 0:00.00 [swi0: sio]
35 ?? WL 0:00.00 [swi3: ip6opt ipopt]
36 ?? WL 0:00.00 [swi4: ip6mismatch+]
37 ?? WL 0:00.00 [swi1: ipfwd]
38 ?? DL 0:00.00 [bufdaemon]
39 ?? DL 0:00.00 [vnlr]
40 ?? DL 0:00.02 [syncer]
41 ?? DL 0:00.01 [softdepflush]
42 ?? DL 0:00.00 [netdaemon]
43 ?? DL 0:00.00 [vmuncachedaemon]
44 ?? DL 0:00.00 [if_pic_listen]
45 ?? DL 0:00.03 [vmkmemdaemon]
46 ?? DL 0:00.01 [cb_poll]
47 ?? DL 0:00.00 [if_pfe_listen]
48 ?? DL 0:00.00 [scs_housekeeping]
49 ?? IL 0:00.00 [kern_dump_proc]
50 ?? IL 0:00.00 [nfsiod 0]

```



```

51 ?? IL 0:00.00 [nfsiod 1]
52 ?? IL 0:00.00 [nfsiod 2]
53 ?? IL 0:00.00 [nfsiod 3]
54 ?? DL 0:00.02 [schedcpu]
55 ?? DL 0:00.75 [md0]
77 ?? DL 0:03.84 [md1]
98 ?? DL 0:00.59 [md2]
116 ?? DL 0:00.02 [md3]
137 ?? DL 0:00.72 [md4]
158 ?? DL 0:00.15 [md5]
179 ?? DL 0:00.00 [md6]
215 ?? DL 0:00.03 [md7]
225 ?? DL 0:00.03 [md8]
1052 ?? DL 0:00.00 [jsr_kkcm]
1337 ?? SL 0:00.11 [bcmTX]
1338 ?? SL 0:00.12 [bcmXGS3AsyncTX]
1339 ?? SL 0:03.82 [bcmLINK.0]
1344 ?? Is 0:00.00 /usr/sbin/cron
1496 ?? I 0:00.00 /sbin/watchdog -t-1
1497 ?? S 0:00.06 /usr/libexec/bslockd -mp -N
1498 ?? I 0:00.01 /usr/sbin/tnetd -N
1500 ?? S 0:09.93 /usr/sbin/chassisd -N
1501 ?? S 0:00.05 /usr/sbin/alarmd -N
1502 ?? I 0:00.39 /usr/sbin/craftd -N
1503 ?? S 0:00.09 /usr/sbin/mgd -N
1506 ?? I 0:00.05 /usr/sbin/inetd -N
1507 ?? I 0:00.00 /usr/sbin/tnp.sntpd -N
1508 ?? I 0:00.00 /usr/sbin/tnp.sntpc -N
1510 ?? S 0:00.01 /usr/sbin/smartd -N
1514 ?? I 0:00.07 /usr/sbin/jcsd -N
1515 ?? S 0:00.17 /usr/sbin/idpd -N
1516 ?? I 0:00.00 /usr/libexec/getty Pc ttyv0
2591 ?? DL 0:00.01 [peer proxy]
2592 ?? DL 0:00.01 [peer proxy]
2593 ?? DL 0:00.01 [peer proxy]
2597 ?? DL 0:00.01 [peer proxy]
3192 ?? S 0:00.02 /usr/sbin/irsd -N
3193 ?? S 0:00.05 /usr/sbin/snmpd -N
3194 ?? S 0:00.04 /sbin/dcd -N
3195 ?? I 0:00.01 /usr/sbin/pfed -N
3196 ?? S 0:00.02 /usr/sbin/mib2d -N
3197 ?? I 0:00.03 /usr/sbin/dfwd -N
3198 ?? S 0:00.15 /usr/sbin/ksyncd -N
3559 ?? Ss 0:00.00 mgd: (mgd) (root) (mgd)
3560 ?? R 0:00.00 /bin/ps -ax -jppw
1138 d0- S 0:00.00 /usr/sbin/usbd -N
1156 d0- S 0:00.50 /usr/sbin/eventd -N -r -s -A
1517 d0 Is+ 0:00.00 /usr/libexec/getty std.9600 ttyd0

```

### show system processes (QFX Series and OCX Series)

```

user@switch> show system processes
PID TT STAT TIME COMMAND
0 ?? Wls -2341043:-31.01 [swapper]
1 ?? SLs 0:01.34 /packages/mnt/jbase/sbin/init --
2 ?? DL 2:48.31 [g_event]
3 ?? DL 1:47.44 [g_up]
4 ?? DL 1:37.82 [g_down]
5 ?? DL 0:00.00 [kdm_tcp_poller]
6 ?? DL 0:00.00 [thread taskq]
7 ?? DL 0:04.86 [kqueue taskq]

```

```

 9 ?? DL 0:03.94 [pagedaemon]
10 ?? DL 0:00.00 [ktrace]
11 ?? RL 0:00.00 [idle: cpu31]
12 ?? RL 0:00.00 [idle: cpu30]
13 ?? RL 0:00.00 [idle: cpu29]
14 ?? RL 0:00.00 [idle: cpu28]
15 ?? RL 0:00.00 [idle: cpu27]
16 ?? RL 0:00.00 [idle: cpu26]
17 ?? RL 0:00.00 [idle: cpu25]
18 ?? RL 0:00.00 [idle: cpu24]
19 ?? RL 0:00.00 [idle: cpu23]
20 ?? RL 0:00.00 [idle: cpu22]
21 ?? RL 0:00.00 [idle: cpu21]
22 ?? RL 0:00.00 [idle: cpu20]
23 ?? RL 0:00.00 [idle: cpu19]
24 ?? RL 0:00.00 [idle: cpu18]
25 ?? RL 0:00.00 [idle: cpu17]
26 ?? RL 0:00.00 [idle: cpu16]
27 ?? RL 0:00.00 [idle: cpu15]
28 ?? RL 0:00.00 [idle: cpu14]
29 ?? RL 0:00.00 [idle: cpu13]
30 ?? RL 0:00.00 [idle: cpu12]
31 ?? RL 0:00.00 [idle: cpu11]
32 ?? RL 0:00.00 [idle: cpu10]
33 ?? RL 0:00.00 [idle: cpu9]
34 ?? RL 18184:07.25 [idle: cpu8]
35 ?? RL 0:00.00 [idle: cpu7]
36 ?? RL 17862:11.31 [idle: cpu6]
37 ?? RL 19343:45.16 [idle: cpu5]
38 ?? RL 5192:38.30 [idle: cpu4]
39 ?? RL 0:00.00 [idle: cpu3]
40 ?? RL 19278:02.24 [idle: cpu2]
41 ?? RL 19291:00.72 [idle: cpu1]
42 ?? RL 18910:31.21 [idle: cpu0]
43 ?? WL 19:03.74 [swi2: net]
44 ?? WL 261:43.82 [swi7: clock sio]
45 ?? WL 0:00.00 [swi6: vm]
46 ?? DL 2:18.57 [yarrow]
47 ?? WL 0:00.00 [swi9: +]
48 ?? WL 0:00.00 [swi8: +]
49 ?? WL 0:12.36 [swi5: cambio]
50 ?? WL 0:00.00 [swi9: task queue]
51 ?? WL 0:00.00 [swi0: sio]
52 ?? WL 0:32.40 [irq39: ehci0]
53 ?? DL 0:00.21 [usb0]
54 ?? DL 0:00.00 [usbtask]
55 ?? WL 0:00.00 [irq22: xlr_lbus0]
56 ?? WL 0:00.00 [irq38: xlr_lbus0]
57 ?? WL 0:00.00 [swi3: ip6opt ipopt]
58 ?? WL 0:00.00 [swi4: ip6mismatch+]
59 ?? WL 0:00.00 [swi1: ipfwd]
60 ?? DL 0:18.65 [pagezero]
61 ?? DL 0:18.59 [bufdaemon]
62 ?? DL 1:10.44 [vnlr_u_mem]
63 ?? DL 1:51.66 [syncer]
64 ?? DL 0:20.22 [vnlr_u]
65 ?? DL 0:40.48 [softdepflush]
66 ?? DL 0:00.00 [netdaemon]
67 ?? DL 20:47.67 [vmkmemdaemon]
68 ?? DL 0:00.00 [if_pfe_listen]
69 ?? SL 0:02.80 [kdm_checkkcore]

```

```

70 ?? SL 0:03.34 [kdm_savekcore]
71 ?? SL 0:04.31 [kdm_livekcore]
72 ?? SL 0:06.14 [kdm_logger]
73 ?? SL 0:04.31 [kdm_kdb]
74 ?? SL 0:00.02 [devrt_kernel_thread]
75 ?? DL 0:21.54 [vmuncachedaemon]
76 ?? DL 0:00.00 [if_pic_listen0]
77 ?? SL 0:00.00 [nfsiod 0]
78 ?? SL 0:00.00 [nfsiod 1]
79 ?? SL 0:00.00 [nfsiod 2]
80 ?? SL 0:00.00 [nfsiod 3]
81 ?? WL 5:59.98 [irq13: +]
82 ?? RL 105:06.81 [pkt_sender: cpu0]
83 ?? DL 0:03.62 [md0]
95 ?? DL 0:37.04 [md1]
115 ?? DL 0:06.01 [md2]
135 ?? DL 0:00.75 [md3]
155 ?? DL 0:21.17 [md4]
175 ?? DL 0:01.90 [md5]
195 ?? DL 0:06.26 [md6]
231 ?? DL 0:00.01 [md7]
755 ?? Ss 0:04.17 /usr/sbin/cron
847 ?? S 0:00.10 /usr/sbin/tnetd -N
849 ?? S 0:06.82 /usr/sbin/mgd -N
850 ?? S 0:00.32 /usr/sbin/inetd -N
852 ?? S 1:05.34 /usr/sbin/dhcpd -N
853 ?? S 0:00.18 /usr/sbin/inetd -p /var/run/inetd_4.pid -N -JU __juni
855 ?? L 1181:02.21 /usr/sbin/dc-pfe -N (pafxpc)
857 ?? S 17:55.86 /usr/sbin/vccpd -N
896 ?? S 93:43.45 /usr/sbin/chassism -N
953 ?? S 0:02.89 /sbin/watchdog -t-1
954 ?? S 3:34.00 /sbin/dcd -N
955 ?? S 10:30.13 /usr/sbin/chassisd -N
956 ?? DL 0:00.21 [peer proxy]
957 ?? S 4:07.43 /usr/sbin/alarmd -N
958 ?? S 0:31.69 /usr/sbin/craftd -N
959 ?? S 0:55.16 /usr/sbin/mib2d -N
960 ?? S 3:40.64 /usr/sbin/rpd -N
961 ?? S 0:00.03 /usr/sbin/tnp.snmpd -N
962 ?? S 0:51.94 /usr/sbin/pfed -N
963 ?? S 0:47.31 /usr/sbin/rmopd -N
964 ?? S 0:33.65 /usr/sbin/cosd
965 ?? S 1:48.41 /usr/sbin/ppmd -N
966 ?? S 0:07.18 /usr/sbin/dfwd -N
967 ?? S 1:02.56 /usr/sbin/bfdd -N
968 ?? S 0:00.63 /usr/sbin/rdd -N
969 ?? S 0:40.61 /usr/sbin/dfcd -N
971 ?? S 0:07.81 /usr/sbin/bdbrepd -N
972 ?? S 0:00.28 /usr/sbin/sendd -N
973 ?? S 1:37.69 /usr/sbin/xntpd -j -N -g -JU __example_process4__ (nt
974 ?? S 5:56.28 /usr/sbin/snmpd -N -JU __example_process4__
975 ?? S 16:46.82 /usr/sbin/jdiameterd -N
976 ?? S 2:34.13 /usr/sbin/eswd -N
977 ?? S 1:03.05 /usr/sbin/sflowd -N
978 ?? S 0:22.30 /usr/sbin/fcd -N
979 ?? S 1:07.01 /usr/sbin/vccpdf -N
982 ?? S 0:25.25 /usr/sbin/mcsnoopd -N
983 ?? S 3:45.68 /usr/sbin/rpdf -N
1043 ?? S 0:37.87 /usr/sbin/lacpd -N
1048 ?? DL 0:01.29 [peer proxy]
1111 ?? WL 0:00.00 [swi2: FMNITHRD+]

```

```

1112 ?? DL 0:00.03 [peer proxy]
12816 ?? S 15:35.32 /usr/sbin/sfid -N
30893 ?? Ss 0:00.65 sshd: tlewis@tty0 (sshd)
30897 ?? Ss 0:00.15 mgd: (mgd) (tlewis)/dev/tty0 (mgd)
30905 ?? Ss 0:00.64 sshd: tlewis@tty1 (sshd)
30909 ?? Ss 0:00.15 mgd: (mgd) (tlewis)/dev/tty1 (mgd)
30910 ?? Ss 0:01.26 sshd: tcheng@tty2 (sshd)
30914 ?? Ss 0:00.80 mgd: (mgd) (tcheng)/dev/tty2 (mgd)
30937 ?? R 0:00.03 /bin/ps -ax
 661 d0- S 0:21.24 /usr/sbin/eventd -N -r -s -A
 860 d0 Ss+ 0:00.07 /usr/libexec/getty std.9600 ttyd0
30896 p0 Ss+ 0:00.55 -cli (cli)
30908 p1 Ss+ 0:00.50 -cli (cli)
30913 p2 Ss+ 0:00.85 -cli (cli)

```

## show system reboot

|                                           |                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                     | <a href="#">Syntax on page 1149</a><br><a href="#">Syntax (EX Series Switches) on page 1149</a><br><a href="#">Syntax (TX Matrix Router) on page 1149</a><br><a href="#">Syntax (TX Matrix Plus Router) on page 1149</a><br><a href="#">Syntax (MX Series Router) on page 1149</a><br><a href="#">Syntax (QFX Series and OCX Series) on page 1149</a>                            |
| <b>Syntax</b>                             | show system reboot<br><both-routing-engines>                                                                                                                                                                                                                                                                                                                                     |
| <b>Syntax (EX Series Switches)</b>        | show system reboot<br><all-members><br><both-routing-engines><br><local><br><member <i>member-id</i> >                                                                                                                                                                                                                                                                           |
| <b>Syntax (TX Matrix Router)</b>          | show system reboot<br><all-chassis   all-lcc   lcc <i>number</i>   scc><br><both-routing-engines>                                                                                                                                                                                                                                                                                |
| <b>Syntax (TX Matrix Plus Router)</b>     | show system reboot<br><all-chassis   all-lcc   lcc <i>number</i>   sfc <i>number</i> ><br><both-routing-engines>                                                                                                                                                                                                                                                                 |
| <b>Syntax (MX Series Router)</b>          | show system reboot<br><all-members><br><both-routing-engines><br><local><br><member <i>member-id</i> >                                                                                                                                                                                                                                                                           |
| <b>Syntax (QFX Series and OCX Series)</b> | show system reboot<br><both-routing-engines><br><infrastructure <i>name</i> ><br><interconnect-device <i>name</i> ><br><node-device <i>name</i> >                                                                                                                                                                                                                                |
| <b>Release Information</b>                | <p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p><b>sfc</b> option introduced for the TX Matrix Plus router in Junos OS Release 9.6.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> |
| <b>Description</b>                        | Display pending system reboots or halts.                                                                                                                                                                                                                                                                                                                                         |
| <b>Options</b>                            | <p><b>none</b>—Display pending reboots or halts on the active Routing Engine.</p> <p><b>all-chassis</b>—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display halt or reboot request information for all the T640 routers in the chassis that are connected to the TX Matrix router. On a TX Matrix router, display</p>                  |

halt or reboot request information for all the T1600 or T4000 routers in the chassis that are connected to the TX Matrix Plus router.

**all-members**—(EX4200 switches and MX Series routers only) (Optional) Display halt or reboot request information for all members of the Virtual Chassis configuration.

**all-lcc**—(TX Matrix routers and TX Matrix Plus router only) (Optional) On a TX Matrix router, display system halt or reboot request information for all T640 routers connected to the TX Matrix router. On a TX Matrix Plus router, display halt or reboot request information for all connected T1600 or T4000 LCCs.

**both-routing-engines**—(Systems with multiple Routing Engines) (Optional) Display halt or reboot request information on both Routing Engines.

**infrastructure *name***—(QFabric systems only) (Optional) Display reboot request information on the fabric manager Routing Engines and fabric control Routing Engines.

**interconnect-device *name***—(QFabric systems only) (Optional) Display reboot request information on the Interconnect device.

**lcc *number***—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display halt or reboot request information for a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, display halt or reboot request information for a specific router that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(EX4200 switches and MX Series routers only) (Optional) Display halt or reboot request information for the local Virtual Chassis member.

**member *member-id***—(EX4200 switches and MX Series routers only) (Optional) Display halt or reboot request information for the specified member of the Virtual Chassis configuration. For EX4200 switches, replace *member-id* with a value from 0 through 9. For an MX Series Virtual Chassis, replace *member-id* with a value of 0 or 1.

**node-group *name***—(QFabric systems only) (Optional) Display reboot request information on the Node group.

**scc**—(TX Matrix router only) (Optional) Display halt or reboot request information for the TX Matrix router (or switch-card chassis).

**sfc**—(TX Matrix Plus router only) (Optional) Display halt or reboot request information for the TX Matrix Plus router.

**Additional Information** By default, when you issue the **show system reboot** command on a TX Matrix or TX Matrix Plus master Routing Engine, the command is broadcast to all the T640 (in a routing matrix based on the TX Matrix router) or T1600 (in a routing matrix based on the TX Matrix Plus router) master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix or TX Matrix Plus backup Routing Engine, the command is broadcast to all the T640 (in a routing matrix based on the TX Matrix router) or T1600 (in a routing matrix based on the TX Matrix Plus router) backup Routing Engines that are connected to it.

**Required Privilege Level** maintenance

**Related Documentation**

- [Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

**List of Sample Output**

- [show system reboot on page 1151](#)
- [show system reboot all-lcc \(TX Matrix Router\) on page 1151](#)
- [show system reboot sfc \(TX Matrix Plus Router\) on page 1151](#)
- [show system reboot \(QFX3500 Switch\) on page 1151](#)

## Sample Output

### show system reboot

```
user@host> show system reboot
reboot requested by root at Wed Feb 10 17:40:46 1999
[process id 17885]
```

### show system reboot all-lcc (TX Matrix Router)

```
user@host> show system reboot all-lcc
lcc0-re0:
```

```

No shutdown/reboot scheduled.
```

```
lcc2-re0:
```

```

No shutdown/reboot scheduled.
```

### show system reboot sfc (TX Matrix Plus Router)

```
user@host> show system sfc 0
No shutdown/reboot scheduled.
```

### show system reboot (QFX3500 Switch)

```
user@switch> show system reboot
No shutdown/reboot scheduled.
```

## show system resource-cleanup processes

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | show system resource-cleanup processes<br><detail><br><pid <i>number</i> ><br><process-name <i>name</i> >                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Release Information</b>      | Command introduced in Junos OS Release 9.3.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                                                                  |
| <b>Description</b>              | Display the list of processes that have been registered for resource cleanup services.                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Options</b>                  | <p><b>detail</b>—(Optional) Display the list of processes that have been registered for resource cleanup services, along with the resources that have been requested for cleanup.</p> <p><b>pid <i>number</i></b>—(Optional) Display a process that has been registered for resource cleanup services by specifying the Process Identifier number.</p> <p><b>process-name <i>name</i></b>—(Optional) Display a process that has been registered for resource cleanup services by name of the process.</p> |
| <b>Required Privilege Level</b> | view                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li><i>resource-cleanup</i></li> <li><i>traceoptions (Resource Cleanup)</i></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>List of Sample Output</b>    | <a href="#">show system resource-cleanup processes on page 1152</a><br><a href="#">show system resource-cleanup processes detail on page 1153</a>                                                                                                                                                                                                                                                                                                                                                         |
| <b>Output Fields</b>            | For a description of the output fields, see <a href="#">Table 74 on page 1152</a> . Output fields are listed in the approximate order in which they appear.                                                                                                                                                                                                                                                                                                                                               |

**Table 74: show system resource-cleanup processes Output Fields**

| Field Name                | Field Description                                     |
|---------------------------|-------------------------------------------------------|
| <b>PID</b>                | Process ID, a number that identifies a process.       |
| <b>Process name</b>       | String that identifies the process.                   |
| <b>Resources to clean</b> | Resources that have been registered to be cleaned up. |

## Sample Output

### show system resource-cleanup processes

```

user@host> show system resource-cleanup processes
PID Process name Resources to clean
420 jnx-exampld GENCFG, SYSV shared memory

```



**show system resource-cleanup processes detail**

```
user@host> show system resource-cleanup processes detail
PID Process name Resources to clean
420 jnx-exampld GENCFG blob major ID 0x8000, minor ID 0x0000
 SYSV shared memory ID 65536, key 1108955839
 SYSV shared memory ID 65537, key 1108955837
```

## show system services service-deployment

|                                 |                                                                                                                                                                                                                                                                    |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | show system services service-deployment                                                                                                                                                                                                                            |
| <b>Release Information</b>      | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>              | Display information about a Session and Resource Control (SRC) client.                                                                                                                                                                                             |
| <b>Options</b>                  | This command has no options.                                                                                                                                                                                                                                       |
| <b>Required Privilege Level</b> | system<br>view                                                                                                                                                                                                                                                     |
| <b>List of Sample Output</b>    | <a href="#">show system services service-deployment on page 1154</a>                                                                                                                                                                                               |
| <b>Output Fields</b>            | <a href="#">Table 75 on page 1154</a> lists the output fields for the <b>show system services service-deployment</b> command. Output fields are listed in the approximate order in which they appear.                                                              |

**Table 75: show system services service-deployment Output Fields**

| Field Name             | Field Description                                       |
|------------------------|---------------------------------------------------------|
| PDT Keepalive settings | Configured PDT keepalive interval, in seconds.          |
| Keepalives sent        | Number of keepalives sent.                              |
| Notifications sent     | Number of notifications sent.                           |
| Last update from peer  | Time at which the last update from a peer was received. |

## Sample Output

### show system services service-deployment

```

user@host> show system services service-deployment
Connected to 192.4.4.4 port 10288 since 2004-05-03 11:04:34 PDT Keepalive settings:
Interval 15 seconds Keepalives sent: 750 Notifications sent: 0 Last update from
peer: 00:00:06 ago

```

## show system software

|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                 | <a href="#">Syntax on page 1155</a><br><a href="#">Syntax (EX Series Switches) on page 1155</a><br><a href="#">Syntax (TX Matrix Router) on page 1155</a><br><a href="#">Syntax (TX Matrix Plus Router) on page 1155</a><br><a href="#">Syntax (J Series Routers) on page 1155</a><br><a href="#">Syntax (QFX Series) on page 1155</a>                                                                                                                                                                          |
| <b>Syntax</b>                         | show system software<br><detail>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Syntax (EX Series Switches)</b>    | show system software<br><all-members><br><detail><br><local><br><member <i>member-id</i> >                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Syntax (TX Matrix Router)</b>      | show system software<br><all-chassis   all-lcc   lcc <i>number</i>   scc><br><detail>                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Syntax (TX Matrix Plus Router)</b> | show system software<br><all-chassis   all-lcc   lcc <i>number</i>   sfc <i>number</i> ><br><detail>                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Syntax (J Series Routers)</b>      | show system software<br><backup><br><detail>                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Syntax (QFX Series)</b>            | show system software<br><detail><br><infrastructure <i>name</i> ><br><interconnect-device <i>name</i> ><br><node-group <i>name</i> >                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Release Information</b>            | <p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p><b>sfc</b> option introduced for the TX Matrix Plus router in Junos OS Release 9.6.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>                                                                                                                                |
| <b>Description</b>                    | Display the Junos OS extensions loaded on your router or switch.                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Options</b>                        | <p><b>none</b>—Display standard information about all loaded Junos OS extensions.</p> <p><b>all-chassis</b>—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Display system software information for all the T640 routers (TX Matrix Router) or all the routers (TX Matrix Plus Router) in the chassis.</p> <p><b>all-lcc</b>—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display system software information for all T640 routers connected to the</p> |

TX Matrix router. On a TX Matrix Plus router, display system software information for all connected T1600 or T4000 LCCs.

**all-members**—(EX4200 switches only) (Optional) Display the system software running on all members of the Virtual Chassis configuration.

**backup**—(J Series routers only) (Optional) Display the status of old system software packages only.

**detail**—(Optional) Display detailed information about available Junos OS extensions.

**infrastructure name**—(QFabric systems only) (Optional) Display the system software running on the fabric control Routing Engine and the fabric manager Routing Engine.

**interconnect-device name**—(QFabric systems only) (Optional) Display the system software running on the Interconnect device.

**lcc number**—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display system software information for a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, display system software information for a specific router that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(EX4200 switches only) (Optional) Display the system software running on the local Virtual Chassis member.

**member member-id**—(EX4200 switches only) (Optional) Display the system software running on the specified member of the Virtual Chassis configuration. Replace *member-id* with a value from 0 through 9.

**node-group name**—(QFabric systems only) (Optional) Display the system software running on the Node group.

**scc**—(Routing matrix only) (Optional) Display the system software running on a TX Matrix router (or switch-card chassis).

**sfc**—(TX Matrix Plus routers only) (Optional) Display system software information for the TX Matrix Plus router.

**Required Privilege Level** maintenance

|                       |                                                                                                                                                                                                  |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Related Documentation | <ul style="list-style-type: none"> <li>• <a href="#">Routing Matrix with a TX Matrix Plus Router Solutions Page</a></li> </ul>                                                                   |
| List of Sample Output | <a href="#">show system software on page 1157</a><br><a href="#">show system software (TX Matrix Plus Router) on page 1157</a><br><a href="#">show system software (QFX Series) on page 1161</a> |
| Output Fields         | When you enter this command, you are provided a list of Junos OS packages installed on the router and their corresponding Junos OS release number.                                               |

## Sample Output

### show system software

```

user@host> show system software
Information for jbase:

Comment:
JUNOS Base OS Software Suite [7.2R1.7]

Information for jcrypto:

Comment:
JUNOS Crypto Software Suite [7.2R1.7]
Information for jdocs:

Comment:
JUNOS Online Documentation [7.2R1.7]

Information for jkernel:

Comment:
JUNOS Kernel Software Suite [7.2R1.7]

Information for jpfe:

Comment:
JUNOS Packet Forwarding Engine Support (M20/M40) [7.2R1.7]

Information for jroute:

Comment:
JUNOS Routing Software Suite [7.2R1.7]

Information for junos:

Comment:
JUNOS Base OS boot [7.2R1.7]
```

### show system software (TX Matrix Plus Router)

```

user@host> show system software
sfc0-re0:

Information for jbase:
```

Comment:  
JUNOS Base OS Software Suite [9.6-20090515.0]

Information for jcrypto:

Comment:  
JUNOS Crypto Software Suite [9.6-20090515.0]

Information for jdocs:

Comment:  
JUNOS Online Documentation [9.6-20090515.0]  
Information for jkernel:

Comment:  
JUNOS Kernel Software Suite [9.6-20090515.0]

Information for jpfe:

Comment:  
JUNOS Packet Forwarding Engine Support (T-Series) [9.6-20090515.0]

Information for jpfe-common:

Comment:  
JUNOS Packet Forwarding Engine Support (M/T Common) [9.6-20090515.0]

Information for jroute:Comment:  
JUNOS Routing Software Suite [9.6-20090515.0]

Information for jservices-aac1:

Comment:  
JUNOS Services ACL Container package [9.6-20090515.0]

Information for jservices-appid:

Comment:  
JUNOS AppId Services [9.6-20090515.0]

Information for jservices-bgf:

Comment:  
JUNOS Border Gateway Function package [9.6-20090515.0]

Information for jservices-idp:

Comment:  
JUNOS IDP Services [9.6-20090515.0]

Information for jservices-llpdf:

Comment:  
JUNOS Services LL-PDF Container package [9.6-20090515.0]

Information for jservices-sfw:

Comment:  
JUNOS Services Stateful Firewall [9.6-20090515.0]  
Information for jservices-voice:

Comment:  
JUNOS Voice Services Container package [9.6-20090515.0]

Information for junos:

Comment:  
JUNOS Base OS boot [9.6-20090515.0]  
...  
lcc0-re0:  
-----

Information for jbase:

Comment:  
JUNOS Base OS Software Suite [9.6-20090515.0]

Information for jcrypto:

Comment:  
JUNOS Crypto Software Suite [9.6-20090515.0]

Information for jdocs:

Comment:  
JUNOS Online Documentation [9.6-20090515.0]

Information for jkernel:

Comment:  
JUNOS Kernel Software Suite [9.6-20090515.0]

Information for jpfe:

Comment:  
JUNOS Packet Forwarding Engine Support (T-Series) [9.6-20090515.0]

Information for jpfe-common:

Comment:  
JUNOS Packet Forwarding Engine Support (M/T Common) [9.6-20090515.0]

Information for jroute:

Comment:  
JUNOS Routing Software Suite [9.6-20090515.0]

Information for jservices-aacl:

Comment:  
JUNOS Services ACL Container package [9.6-20090515.0]

Information for jservices-appid:

Comment:  
JUNOS AppId Services [9.6-20090515.0]

Information for jservices-bgf:

Comment:  
JUNOS Border Gateway Function package [9.6-20090515.0]

Information for jservices-idp:

Comment:  
JUNOS IDP Services [9.6-20090515.0]

Information for jservices-llpdf:

Comment:  
JUNOS Services LL-PDF Container package [9.6-20090515.0]

Information for jservices-sfw:

Comment:  
JUNOS Services Stateful Firewall [9.6-20090515.0]



Information for jservices-voice:

Comment:

JUNOS Voice Services Container package [9.6-20090515.0]

Information for junos:

Comment:

JUNOS Base OS boot [9.6-20090515.0]

lcc1-re0:

-----  
Information for jbase:

Comment:

JUNOS Base OS Software Suite [9.6-20090515.0]

Information for jcrypto:

Comment:

JUNOS Crypto Software Suite [9.6-20090515.0]

...

### show system software (QFX Series)

user@switch> **show system software**

Information for jbase:

Comment:

JUNOS Base OS Software Suite [11.3-20110730.0]

Information for jcrypto:

Comment:

JUNOS Crypto Software Suite [11.3-20110730.0]

Information for jdocs:

Comment:

JUNOS Online Documentation [11.3-20110730.0]

Information for jkernel:

Comment:

JUNOS Kernel Software Suite [11.3-20110730.0]

Information for jpfe:

Comment:

JUNOS Packet Forwarding Engine Support (QFX) [11.3-20110730.0]

Information for jroute:

Comment:

JUNOS Routing Software Suite [11.3-20110730.0]

Information for jswitch:

Comment:

JUNOS Enterprise Software Suite [11.3-20110730.0]

Information for junos:

Comment:

JUNOS Base OS boot [11.3-20110730.0]

Information for jweb:

Comment:

JUNOS Web Management [11.3-20110730.0]

## show system statistics

|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                 | <a href="#">Syntax on page 1163</a><br><a href="#">Syntax (EX Series Switches) on page 1163</a><br><a href="#">Syntax (TX Matrix Router) on page 1163</a><br><a href="#">Syntax (TX Matrix Plus Router) on page 1163</a><br><a href="#">Syntax (MX Series Router) on page 1163</a><br><a href="#">Syntax (QFX Series) on page 1163</a>                                                                                                                                                                                                                                                                                      |
| <b>Syntax</b>                         | show system statistics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Syntax (EX Series Switches)</b>    | show system statistics<br><all-members><br><local><br><member <i>member-id</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Syntax (TX Matrix Router)</b>      | show system statistics<br><all-chassis   all-lcc   lcc <i>number</i>   scc>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Syntax (TX Matrix Plus Router)</b> | show system statistics<br><all-chassis   all-lcc   lcc <i>number</i>   sfc <i>number</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Syntax (MX Series Router)</b>      | show system statistics<br><all-members><br><local><br><member <i>member-id</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Syntax (QFX Series)</b>            | show system statistics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Release Information</b>            | Command introduced before JUNOS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br><b>sfc</b> option introduced for the TX Matrix Plus router in JUNOS Release 9.6.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                         |
| <b>Description</b>                    | Display system-wide protocol-related statistics.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Options</b>                        | <b>none</b> —Display system statistics for all the following protocols: <ul style="list-style-type: none"> <li>• <b>arp</b>—Address Resolution Protocol</li> <li>• <b>bridge</b>—IEEE 802.1 Bridging</li> <li>• <b>clns</b>—Connectionless Network Service</li> <li>• <b>esis</b>—End System-to-Intermediate System</li> <li>• <b>ethoamcfm</b>—Ethernet OAM protocol for connectivity fault management</li> <li>• <b>ethoamlfm</b>—Ethernet OAM protocol for link fault management</li> <li>• <b>icmp</b>—Internet Control Message Protocol</li> <li>• <b>icmp6</b>—Internet Control Message Protocol version 6</li> </ul> |

- **igmp**—Internet Group Management Protocol
- **ip**—Internet Protocol version 4
- **ip6**—Internet Protocol version 6
- **mpls**—Multiprotocol Label Switching
- **rdp**—Reliable Datagram Protocol
- **tcp**—Transmission Control Protocol
- **tnp**—Trivial Network Protocol
- **ttp**—TNP Tunneling Protocol
- **tudp**—Trivial User Datagram Protocol
- **udp**—User Datagram Protocol
- **vpls**—Virtual Private LAN Service

**all-chassis**—(TX Matrix and TX Matrix Plus routers only) (Optional) Display system statistics for a protocol for all the routers in the chassis.

**all-lcc**—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display system statistics for a protocol for all T640 routers (or line-card chassis) connected to the TX Matrix router. On a TX Matrix Plus router, display system statistics for a protocol for all routers (line-card chassis) connected to the TX Matrix Plus router

**all-members**—(EX4200 switches and MX Series routers only) (Optional) Display system statistics for a protocol for all members of the Virtual Chassis configuration.

**lcc number**—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display system statistics for a protocol for a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, display system statistics for a protocol for a specific router that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(EX4200 switches and MX Series routers only) (Optional) Display system statistics for a protocol for the local Virtual Chassis member.

**member *member-id***—(EX4200 switches and MX Series routers only) (Optional) Display system statistics for a protocol for the specified member of the Virtual Chassis configuration. For EX4200 switches, replace ***member-id*** with a value from 0 through 9. For an MX Series Virtual Chassis, replace ***member-id*** with a value of 0 or 1.

**scc**—(TX Matrix routers only) (Optional) Display system statistics for a protocol for the TX Matrix router (or switch-card chassis).

**sfc *number***—(TX Matrix Plus routers only) (Optional) Display system statistics for a protocol for the TX Matrix Plus router (or switch-fabric chassis). Replace ***number*** with 0.

**Additional Information** By default, when you issue the **show system statistics** command on a TX Matrix or TX Matrix Plus master Routing Engine, the command is broadcast to all the T640 (in a routing matrix based on the TX Matrix router) or T1600 (in a routing matrix based on the TX Matrix Plus router) master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix or TX Matrix Plus backup Routing Engine, the command is broadcast to all the T640 (in a routing matrix based on the TX Matrix router) or T1600 (in a routing matrix based on the TX Matrix Plus router) backup Routing Engines that are connected to it.

**Required Privilege Level** view

**List of Sample Output** [show system statistics on page 1165](#)  
[show system statistics \(EX Series Switches\) on page 1172](#)  
[show system statistics \(TX Matrix Router\) on page 1182](#)  
[show system statistics \(QFX Series\) on page 1188](#)

## Sample Output

**show system statistics**

```
user@host> show system statistics
ip:
 3682087 total packets received
 0 bad header checksums
 0 with size smaller than minimum
 0 with data size < data length
 0 with header length < data size
 0 with data length < header length
 0 with incorrect version number
 0 packets destined to dead next hop
 0 fragments received
 0 fragments dropped (dup or out of space)
 0 fragments dropped (queue overflow)
 0 fragments dropped after timeout
 0 fragments dropped due to over limit
 0 packets reassembled ok
 3664774 packets for this host
 17316 packets for unknown/unsupported protocol
 0 packets forwarded
 0 packets not forwardable
 0 redirects sent
 6528 packets sent from this host
```

```

0 packets sent with fabricated ip header
0 output packets dropped due to no bufs
0 output packets discarded due to no route
0 output datagrams fragmented
0 fragments created
0 datagrams that can't be fragmented
0 packets with bad options
1123 packets with options handled without error
0 strict source and record route options
0 loose source and record route options
0 record route options
0 timestamp options
0 timestamp and address options
0 timestamp and prespecified address options
0 option packets dropped due to rate limit
1123 router alert options
0 multicast packets dropped (no iflist)
0 packets dropped (src and int don't match)
icmp:
0 drops due to rate limit
0 calls to icmp_error
0 errors not generated because old message was icmp
Output histogram:
 echo reply: 75
0 messages with bad code fields
0 messages less than the minimum length
0 messages with bad checksum
0 messages with bad source address
0 messages with bad length
0 echo drops with broadcast or multicast destination address
0 timestamp drops with broadcast or multicast destination address
Input histogram:
 echo: 75
 router advertisement: 130
75 message responses generated
tcp:
3844 packets sent
 3618 data packets (1055596 bytes)
 0 data packets (0 bytes) retransmitted
 0 resends initiated by MTU discovery
 205 ack-only packets (148 packets delayed)
 0 URG only packets
 0 window probe packets
 0 window update packets
 1079 control packets
5815 packets received
 3377 acks (for 1055657 bytes)
 24 duplicate acks
 0 acks for unsent data
 2655 packets (15004 bytes) received in-sequence
 1 completely duplicate packet (0 bytes)
 0 old duplicate packets
 0 packets with some dup. data (0 bytes duped)
 0 out-of-order packets (0 bytes)
 0 packets (0 bytes) of data after window
 0 window probes
 7 window update packets
 0 packets received after close
 0 discarded for bad checksums
 0 discarded for bad header offset fields
 0 discarded because packet too short

```

```

1 connection request
32 connection accepts
0 bad connection attempts
0 listen queue overflows
33 connections established (including accepts)
30 connections closed (including 0 drops)
 27 connections updated cached RTT on close
 27 connections updated cached RTT variance on close
 0 connections updated cached ssthresh on close
0 embryonic connections dropped
3374 segments updated rtt (of 3220 attempts)
0 retransmit timeouts
 0 connections dropped by rexmit timeout
0 persist timeouts
 0 connections dropped by persist timeout
344 keepalive timeouts
 0 keepalive probes sent
 0 connections dropped by keepalive
1096 correct ACK header predictions
1314 correct data packet header predictions
32 syncache entries added
 0 retransmitted
 0 dupsyn
 0 dropped
 32 completed
 0 bucket overflow
 0 cache overflow
 0 reset
 0 stale
 0 aborted
 0 badack
 0 unreach
 0 zone failures
0 cookies sent
0 cookies received
0 ACKs sent in response to in-window but not exact RSTs
0 ACKs sent in response to in-window SYNs on established connections
0 rcv packets dropped by TCP due to bad address
0 out-of-sequence segment drops due to insufficient memory
1058 RST packets
0 ICMP packets ignored by TCP
0 send packets dropped by TCP due to auth errors
0 rcv packets dropped by TCP due to auth errors

udp:
3658884 datagrams received
0 with incomplete header
0 with bad data length field
0 with bad checksum
3657342 dropped due to no socket
3657342 broadcast/multicast datagrams dropped due to no socket
0 dropped due to full socket buffers
0 not for hashed pcb
4291311496 delivered
1551 datagrams output

ipsec:
0 inbound packets processed successfully
0 inbound packets violated process security policy
0 inbound packets with no SA available
0 invalid inbound packets
0 inbound packets failed due to insufficient memory
0 inbound packets failed getting SPI

```

```

0 inbound packets failed on AH replay check
0 inbound packets failed on ESP replay check
0 inbound AH packets considered authentic
0 inbound AH packets failed on authentication
0 inbound ESP packets considered authentic
0 inbound ESP packets failed on authentication
0 outbound packets processed successfully
0 outbound packets violated process security policy
0 outbound packets with no SA available
0 invalid outbound packets
0 outbound packets failed due to insufficient memory
0 outbound packets with no route

igmp:
17186 messages received
0 messages received with too few bytes
0 messages received with bad checksum
0 membership queries received
0 membership queries received with invalid field(s)
0 membership reports received
0 membership reports received with invalid field(s)
0 membership reports received for groups to which we belong
0 membership reports sent

arp:
44181302 datagrams received
2 ARP requests received
2028 ARP replies received
3156 resolution requests received
0 unrestricted proxy requests
0 received proxy requests
0 proxy requests not proxied
0 with bogus interface
787 with incorrect length
712 for non-IP protocol
0 with unsupported op code
0 with bad protocol address length
0 with bad hardware address length
0 with multicast source address
7611 with multicast target address
0 with my own hardware address
14241699 for an address not on the interface
0 with a broadcast source address
0 with source address duplicate to mine
29929250 which were not for me
0 packets discarded waiting for resolution
6 packets sent after waiting for resolution
17812 ARP requests sent
2 ARP replies sent
0 requests for memory denied
0 requests dropped on entry
0 requests dropped during retry

ip6:
0 total packets received
0 with size smaller than minimum
0 with data size < data length
0 with bad options
0 with incorrect version number
0 fragments received
0 fragments dropped (dup or out of space)
0 fragments dropped after timeout
0 fragments that exceeded limit
0 packets reassembled ok

```



```

0 packets for this host
0 packets forwarded
0 packets not forwardable
0 redirects sent
0 packets sent from this host
0 packets sent with fabricated ip header
0 output packets dropped due to no bufs, etc.
0 output packets discarded due to no route
0 output datagrams fragmented
0 fragments created
0 datagrams that can't be fragmented
0 packets that violated scope rules
0 multicast packets which we don't join
Mbuf statistics:
0 packets whose headers are not continuous
0 tunneling packets that can't find gif
0 packets discarded due to too many headers
0 failures of source address selection
0 forward cache hit
0 forward cache miss
0 packets destined to dead next hop
0 option packets dropped due to rate limit
0 packets dropped (src and int don't match)
0 packets dropped due to bad protocol

icmp6:
0 calls to icmp_error
0 errors not generated because old message was icmp error or so
0 errors not generated because rate limitation
0 messages with bad code fields
0 messages < minimum length
0 bad checksums
0 messages with bad length
Histogram of error messages to be generated:
 0 no route
 0 administratively prohibited
 0 beyond scope
 0 address unreachable
 0 port unreachable
 0 packet too big
 0 time exceed transit
 0 time exceed reassembly
 0 erroneous header field
 0 unrecognized next header
 0 unrecognized option
 0 redirect
 0 unknown
0 message responses generated
0 messages with too many ND options

ipsec6:
0 inbound packets processed successfully
0 inbound packets violated process security policy
0 inbound packets with no SA available
0 invalid inbound packets
0 inbound packets failed due to insufficient memory
0 inbound packets failed getting SPI
0 inbound packets failed on AH replay check
0 inbound packets failed on ESP replay check
0 inbound AH packets considered authentic
0 inbound AH packets failed on authentication
0 inbound ESP packets considered authentic
0 inbound ESP packets failed on authentication

```

```
0 outbound packets processed successfully
0 outbound packets violated process security policy
0 outbound packets with no SA available
0 invalid outbound packets
0 outbound packets failed due to insufficient memory
0 outbound packets with no route

c1nl:
0 total packets received
0 packets delivered
0 too small
0 bad header length
0 bad checksum
0 bad version
0 unknown or unsupported protocol
0 bogus sdl size
0 no free memory in socket buffer
0 send packets discarded
0 sbappend failure
0 mcopy failure
0 address fields were not reasonable
0 segment information forgotten
0 forwarded packets
0 total packets sent
0 output packets discarded
0 non-forwarded packets
0 packets fragmented
0 fragments sent
0 fragments discarded
0 fragments timed out
0 fragmentation prohibited
0 packets reconstructed
0 packets destined to dead nexthop
0 packets discarded due to no route
0 Error pdu rate drops
0 ER pdu generation failure

esis:
0 total pkts received
0 total packets consumed by protocol
0 pdus received with bad checksum
0 pdus received with bad version number
0 pdus received with bad type field
0 short pdus received
0 bogus sdl size
0 bad header length
0 unknown or unsupported protocol
0 no free memory in socket buffer
0 send packets discarded
0 sbappend failure
0 mcopy failure
0 ISO family not configured

tnp:
146776365 unicast packets received
0 broadcast packets received
0 fragmented packets received
0 hello packets dropped
0 fragments dropped
0 fragment reassembly queue flushes
0 hello packets received
0 control packets received
49681642 rdp packets received
337175 udp packets received
```

```

96757548 tunnel packets received
0 input packets discarded with no protocol
98397591 unicast packets sent
0 broadcast packets sent
0 fragmented packets sent
0 hello packets dropped
0 fragments dropped
0 hello packets sent
0 control packets sent
49681642 rdp packets sent
337175 udp packets sent
48378774 tunnel packets sent
0 packets sent with unknown protocol

rdp:
49681642 input packets
0 discards for bad checksum
0 discards bad sequence number
0 refused connections
2031964 acks received
0 dropped due to full socket buffers
49692 retransmits
49681642 output packets
24815968 acks sent
28 connects
0 closes
22783990 keepalives received
22783990 keepalives sent

tudp:
337175 datagrams received
0 with incomplete header
0 with bad data length field
0 with bad checksum
0 dropped due to no socket
0 broadcast/multicast datagrams dropped due to no socket
0 dropped due to full socket buffers
337175 delivered
337175 datagrams output

ttp:
398749 packets sent
0 packets sent while unconnected
0 packets sent while interface down
0 packets sent couldn't get buffer
0 packets sent couldn't find neighbor
44696687 L2 packets received
0 unknown L3 packets received
3682087 IPv4 L3 packets received
0 MPLS L3 packets received
0 MPLS->IPv4 L3 packets received
0 IPv4->MPLS L3 packets received
0 IPv6 L3 packets received
0 ARP L3 packets received
0 CLNP L3 packets received
0 TNP L3 packets received
0 NULL L3 packets received
0 cyclotron cycle L3 packets received
0 cyclotron send L3 packets received
0 packets received while unconnected
0 packets received from unknown ifl
0 input packets couldn't get buffer
0 input packets with bad type
0 input packets with discard type

```

```

0 Input packets with too many tlvs
0 Input packets with bad tlv header
70633 Input packets with bad tlv type
68877 Input packets dropped based on tlv result
0 input packets for which rt lookup is bypassed

mpls:
0 total mpls packets received
0 packets forwarded
0 packets dropped
0 with header too small
0 after tagging, can't fit link MTU
0 with IPv4 explicit NULL tag
0 with IPv4 explicit NULL cksum errors
0 with router alert tag
0 lsp ping packets (ttl-expired/router alert)
0 with ttl expired
0 with tag encoding error
0 packets discarded, no route

vpls:
0 total packets received
0 with size smaller than minimum
0 with incorrect version number
0 packets for this host
0 packets with no logical interface
0 packets with no family
0 packets with no route table
0 packets with no auxiliary table
0 packets with no corefacing entry
0 packets with no CE-facing entry
0 mac route learning requests
0 mac routes learnt
0 requests to learn an existing route
0 learning requests while learning disabled on interface
0 learning requests over capacity
0 mac routes moved
0 requests to move static route
0 mac route aging requests
0 mac routes aged
0 bogus address in aging requests
0 requests to age static route
0 requests to re-ageout aged route
0 requests involving multiple peer FEs
0 aging acks from PFE
0 aging non-acks from PFE
0 aging requests timed out waiting on FEs
0 aging requests over max-rate
0 errors finding peer FEs

```

### show system statistics (EX Series Switches)

```

user@host> show system statistics
Tcp:
571779 packets sent
21517 data packets (1797102 bytes)
2 data packets retransmitted (20 bytes)
0 resends initiated by MTU discovery
3708 ack only packets (531 packets delayed)
0 URG only packets
1 window probe packets
1 window update packets
1093063 control packets

```

```

1132541 packets received
 20961 acks(for 1796102 bytes)
 5861 duplicate acks
 0 acks for unsent data
 19556 packets received in-sequence(232079 bytes)
 3018 completely duplicate packets(0 bytes)
 0 old duplicate packets
 4 packets with some duplicate data(4 bytes duped)
 2 out-of-order packets(2 bytes)
 0 packets of data after window(0 bytes)
 0 window probes
 39 window update packets
 0 packets received after close
 0 discarded for bad checksums
 0 discarded for bad header offset fields
 0 discarded because packet too short
546519 connection requests
78 connection accepts
0 bad connection attempts
0 listen queue overflows
100 connections established (including accepts)
546596 connections closed (including 6 drops)
 47 connections updated cached RTT on close
 47 connections updated cached RTT variance on close
 0 connections updated cached ssthresh on close
546497 embryonic connections dropped
20453 segments updated rtt(of 566914 attempts)
2 retransmit timeouts
 0 connections dropped by retransmit timeout
0 persist timeouts
 0 connections dropped by persist timeout
3028 keepalive timeouts
 3027 keepalive probes sent
 1 connections dropped by keepalive
7515 correct ACK header predictions
12258 correct data packet header predictions
78 syncache entries added
 0 retransmitted
 0 dupsyn
 4 dropped
 78 completed
 0 bucket overflow
 0 cache overflow
 0 reset
 0 stale
 0 aborted
 0 badack
 0 unreach
 0 zone failures
0 cookies sent
0 cookies received
1 SACK recovery episodes
1 segment retransmits in SACK recovery episodes
1 byte retransmits in SACK recovery episodes
71 SACK options (SACK blocks) received
1 SACK options (SACK blocks) sent
0 SACK scoreboard overflow
0 ACKs sent in response to in-window but not exact RSTs
0 ACKs sent in response to in-window SYNs on established connections
0 rcv packets dropped by TCP due to bad address
0 out-of-sequence segment drops due to insufficient memory

```

```
546544 RST packets
0 ICMP packets ignored by TCP
0 send packets dropped by TCP due to auth errors
0 rcv packets dropped by TCP due to auth errors
0 outgoing segments dropped due to policing

udp:
147 datagrams received
0 with incomplete header
0 with bad data length field
0 with bad checksum
9 dropped due to no socket
0 broadcast/multicast datagrams dropped due to no socket
0 dropped due to full socket buffers
0 not for hashed pcb
138 delivered
0 datagrams output

ip:
73704 total packets received
0 bad header checksums
0 with size smaller than minimum
0 with data size < data length
0 with header length < data size
0 with data length < header length
0 with incorrect version number
0 packets destined to dead next hop
0 fragments received
0 fragments dropped (dup or out of space)
0 fragments dropped (queue overflow)
0 fragments dropped after timeout
0 fragments dropped due to over limit
0 packets reassembled ok
1133057 packets for this host
0 packets for unknown/unsupported protocol
40146 packets forwarded
0 packets not forwardable
40146 redirects sent
1121700 packets sent from this host
0 packets sent with fabricated ip header
0 output packets dropped due to no bufs
0 output packets discarded due to no route
0 output datagrams fragmented
0 fragments created
0 datagrams that can't be fragmented
0 packets with bad options
0 packets with options handled without error
0 strict source and record route options
0 loose source and record route options
0 record route options
0 timestamp options
0 timestamp and address options
0 timestamp and prespecified address options
0 option packets dropped due to rate limit
0 router alert options
0 multicast packets dropped (no iflist)
0 packets dropped (src and int don't match)
0 transit re packets dropped on mgmt i/f
0 packets used first nexthop in ecmp unilist
0 incoming ttpoip packets received
0 incoming ttpoip packets dropped
0 outgoing TTPoIP packets sent
0 outgoing TTPoIP packets dropped
```

```

icmp:
 0 drops due to rate limit
 9 calls to icmp_error
 0 errors not generated because old message was icmp
 Output histogram:
 295 echo reply
 9 destination unreachable
 0 messages with bad code fields
 0 messages less than the minimum length
 0 messages with bad checksum
 0 messages with bad source address
 0 messages with bad length
 0 echo drops with broadcast or multicast destination address
 0 timestamp drops with broadcast or multicast destination address
 Input histogram:
 295 echo
 295 message responses generated

igmp:
 0 messages received
 0 messages received with too few bytes
 0 messages received with bad checksum
 0 membership queries received
 0 membership queries received with invalid fields
 0 membership reports received
 0 membership reports received with invalid fields
 0 membership reports received for groups to which we belong
 0 Membership reports sent

raw_if:
 0 RAW packets transmitted
 0 PPPOE packets transmitted
 0 ISDN packets transmitted
 0 DIALER packets transmitted
 0 PPP packets transmitted to pppd
 0 PPP packets transmitted to jppd
 0 IGMPv2 packets transmitted
 13 output drops due to tx error
 0 MPU packets transmitted
 0 PPPOE packets received
 0 ISDN packets received
 0 DIALER packets received
 0 PPP packets received from pppd
 0 MPU packets received
 0 PPP packets received from jppd
 0 IGMPv2 packets received
 0 Input drops due to bogus protocol
 0 input drops due to no mbufs available
 0 input drops due to no space in socket
 0 input drops due to no socket

arp:
 186413 datagrams received
 88 ARP requests received
 88 ARP replies received
 0 resolution request received
 0 unrestricted proxy requests
 0 restricted proxy requests
 0 received proxy requests
 0 proxy requests not proxied
 0 restricted proxy requests not proxied
 0 datagrams with bogus interface
 0 datagrams with incorrect length
 0 datagrams for non-IP protocol

```

```

0 datagrams with unsupported op code
0 datagrams with bad protocol address length
 0 datagrams with bad hardware address length
0 datagrams with multicast source address
0 datagrams with multicast source address
0 datagrams with my own hardware address
164 datagrams for an address not on the interface
0 datagrams with a broadcast source address
0 datagrams with source address duplicate to mine
186065 datagrams which were not for me
0 packets discarded waiting for resolution
0 packets sent after waiting for resolution
50 ARP requests sent
88 ARP replies sent
0 requests for memory denied
0 requests dropped on entry
0 requests dropped during retry
0 requests dropped due to interface deletion
0 requests on unnumbered interfaces
0 new requests on unnumbered interfaces
0 replies for from unnumbered interfaces
0 requests on unnumbered interface with non-subnetted donor
0 replies from unnumbered interface with non-subnetted donor
ip6:
0 total packets received
0 packets with size smaller than minimum
0 packets with data size < data length
0 packets with bad options
0 packets with incorrect version number
0 fragments received
0 fragments dropped (dup or out of space)
0 fragments dropped after timeout
0 fragments that exceeded limit
0 packets reassembled ok
0 packets for this host
0 packets forwarded
0 packets not forwardable
0 redirects sent
0 packets sent from this host
0 packets sent with fabricated ip header
0 output packets dropped due to no bufs, etc.
0 output datagrams fragmented
0 fragments created
0 datagrams that can't be fragmented
0 packets that violated scope rules
0 multicast packets which we don't join
0 packets whose headers are not continuous
0 tunneling packets that can't find gif
0 packets discarded due to too many headers
0 failures of source address selection
0 forward cache hit
0 forward cache miss
0 Packets destined to dead next hop
0 option packets dropped due to rate limit
0 Packets dropped (src and int don't match)
0 packets dropped due to bad protocol
0 transit re packet(null) dropped on mgmt i/f
icmp6:
0 Calls to icmp_error
0 Errors not generated because old message was icmp error
0 Errors not generated because rate limitation

```



```

0 Messages with bad code fields
0 Messages < minimum length
0 Bad checksums
0 Messages with bad length
 0 No route
 0 Administratively prohibited
 0 Beyond scope
 0 Address unreachable
 0 Port unreachable
 0 packet too big
 0 Time exceed transit
 0 Time exceed reassembly
 0 Erroneous header field
 0 Unrecognized next header
 0 Unrecognized option
 0 redirect
 0 Unknown
0 Message responses generated
0 Messages with too many ND options
pfkey:
0 Requests sent from userland
0 Bytes sent from userland
histogram by message type:
 0 reserved
 0 dump
0 Messages with invalid length field
0 Messages with invalid version field
0 Messages with invalid message type field
0 Messages too short
0 Messages with memory allocation failure
0 Messages with duplicate extension
0 Messages with invalid extension type
0 Messages with invalid sa type
0 Messages with invalid address extension
0 Requests sent to userland
0 Bytes sent to userland
histogram by message type:
 0 reserved
 0 dump
0 Messages toward single socket
0 Messages toward all sockets
0 Messages toward registered sockets
0 Messages with memory allocation failure
c1n1:
0 Total packets received
0 Packets delivered
0 Too small packets
0 Packets with bad header length
0 Packets with bad checksum
0 Bad version packets
0 Unknown or unsupported protocol packets
0 Packets with bogus sdl size
0 No free memory in socket buffer
0 Send packets discarded
0 Sbappend failure
0 Mcopy failure
0 Address fields were not reasonable
0 Segment information forgotten
0 Forwarded packets
0 Total packets sent
0 Output packets discarded

```

```
0 Non-forwarded packets
0 Packets fragmented
0 Fragments sent
0 Fragments discarded
0 Fragments timed out
0 Fragmentation prohibited
0 Packets reconstructed
0 Packets destined to dead nexthop
0 Packets discarded due to no route
0 Error pdu rate drops
0 ER pdu generation failure

esis:
0 Total pkts received
0 Total packets consumed by protocol
0 Pdus received with bad checksum
0 Pdus received with bad version number
0 Pdus received with bad type field
0 Short pdus received
0 Pdus with bogus sdl size
0 Pdus with bad header length
0 Pdus with unknown or unsupported protocol
0 No free memory in socket buffer
0 Send packets discarded
0 Sbappend failure
0 Mcopy failure
0 ISO family not configured

tnp:
0 Unicast packets received
0 Broadcast packets received
0 Fragmented packets received
0 Hello packets dropped
0 Fragments dropped
0 Fragment reassembly queue flushes
0 Packets with tnp src address collision received
0 Hello packets received
0 Control packets received
0 Rdp packets received
0 Udp packets received
0 Tunnel packets received
0 Input packets discarded with no protocol
0 Packets of version unspecified received
0 Packets of version 1 received
0 Packets of version 2 received
0 Packets of version 3 received
0 Unicast packets sent
0 Broadcast packets sent
0 Fragmented packets sent
0 Hello packets dropped
0 Fragments dropped
0 Hello packets sent
0 Control packets sent
0 Rdp packets sent
0 Udp packets sent
0 Tunnel packets sent
0 Packets sent with unknown protocol
0 Packets of version unspecified sent
0 Packets of version 1 sent
0 Packets of version 2 sent
0 Packets of version 3 sent

rdp:
0 Input packets
```

```

0 Packets discarded for bad checksum
0 Packets discarded due to bad sequence number
0 Refused connections
0 Acks received
0 Packets dropped due to full socket buffers
0 Retransmits
0 Output packets
0 Acks sent
0 Connects
0 Closes
0 Keepalives received
0 Keepalives sent
tudp:
67 Datagrams received
0 Datagrams with incomplete header
0 Datagrams with bad data length field
0 Datagrams with bad checksum
0 Datagrams dropped due to no socket
0 Broadcast/multicast datagrams dropped due to no socket
0 Datagrams dropped due to full socket buffers
67 Delivered
68 Datagrams output
ttp:
0 Packets sent
0 Packets sent while unconnected
0 Packets sent while interface down
0 Packets sent couldn't get buffer
0 Packets sent couldn't find neighbor
0 L2 packets received
0 Unknown L3 packets received
0 IPv4 L3 packets received
0 MPLS L3 packets received
0 MPLS->IPv4 L3 packets received
0 IPv4->MPLS L3 packets received
0 IPv6 L3 packets received
0 ARP L3 packets received
0 CLNP L3 packets received
0 TNP L3 packets received
0 NULL L3 packets received
0 Cyclotron cycle L3 packets received
0 Cyclotron send L3 packets received
0 Packets received while unconnected
0 Packets received from unknown ifl
0 Input packets couldn't get buffer
0 Input packets with bad type
0 Input packets with discard type
0 Input packets with too many tlvs
0 Input packets with bad tlv header
70633 Input packets with bad tlv type
68877 Input packets dropped based on tlv result
0 Input packets for which rt lookup is bypassed
mpls:
0 Total MPLS packets received
0 Packets forwarded
0 Packets dropped
0 Packets with header too small
0 After tagging, packets can't fit link MTU
0 Packets with IPv4 explicit NULL tag
0 Packets with IPv4 explicit NULL cksum errors
0 Packets with router alert tag
0 LSP ping packets (ttl-expired/router alert)

```

```
0 Packets with ttl expired
0 Packets with tag encoding error
0 Packets discarded due to no route
0 Packets used first nexthop in ecmp unilist

vpls:
0 Total packets received
0 Packets with size smaller than minimum
0 Packets with incorrect version number
0 Packets for this host
0 Packets with no logical interface
0 Packets with no family
0 Packets with no route table
0 Packets with no auxiliary table
0 Packets with no corefacing entry
0 packets with no CE-facing entry
0 MAC route learning requests
0 MAC routes learnt
0 Requests to learn an existing route
0 Learning requests while learning disabled on interface
0 Learning requests over capacity
0 MAC routes moved
0 Requests to move static route
0 MAC route aging requests
0 MAC routes aged
0 Bogus address in aging requests
0 Requests to age static route
0 Requests to re-ageout aged route
0 Requests involving multiple peer FEs
0 Aging acks from PFE
0 Aging non-acks from PFE
0 Aging requests timed out waiting on FEs
0 Aging requests over max-rate
0 Errors finding peer FEs
0 Unsupported platform
0 Packets dropped due to no l3 route table
0 Packets dropped due to no local ifl
0 Packets punted
0 Packets dropped due to no socket

bridge:
Input:
0 packets received
0 packets forwarded
0 packets failed to forward
0 packets dropped
0 packets with vmember lookup failures
0 packets with vlan lookup failures
0 packets with stp state lookup failures
0 packets dropped due to stp blocked/listening
0 packets dropped due to stp learning
0 packets with src MAC learning failures
0 packets with input control processing failures
Forward:
0 packets sent successfully
0 packets with send failures
0 packets forwarded to l3 interface
0 packets with l3 send failures
0 packets discarded
0 packets with l2ifl store failures
0 packets with ifl mismatch failures
0 packets with packet duplication failures
0 packets with tag lookup failures
```

```
0 packets with no route for DMAC
0 packets with no route table
0 packets with no nexthop
0 packets with dead nexthop
0 packets with eof reached error
Learning:
0 MACs learned
0 packets sent to l3 interface
0 packets with l3 send failures
0 packets hit holdq while learning
0 MAC moves
0 packets discarded
0 packets with no route for SMAC
0 packets with no nexthop
0 packets with dead nexthop
0 packets dropped due to no resolve route
0 packets with l3 ifd lookup failures
0 packets with l3 ifl lookup failures
0 packets with l3 invalid rnh
0 packets with no route for SMAC in clone learning
0 packets with no nexthop in clone learning
0 packets with dead nexthop in clone learning
0 packets dropped due to no resolve nh in clone learning
Output:
0 packets forwarded
0 packets failed to forward
0 packets with vmember lookup failures
0 packets with vlan lookup failures
0 packets with input control processing failures
Send:
0 packets sent successfully
0 packets with send failures
0 packets dropped due to interface down
0 packets with dev output failures
0 blocked ifl discards
0 packets with tag lookup failures
0 packets with stp state lookup failures
0 packets with tag insertion failures
0 packets with tag removal failures
Flood:
0 packets flooded
0 flood failures
IGMP:
0 packets sent successfully
0 packets with send failures
0 packets forwarded
0 packets failed to forward
0 packets with mpull failures
0 packets with vmember lookup failures
0 packets with vlan lookup failures
0 packets with ifl lookup failures
0 packets with tag lookup failures
Misc:
0 packets with size smaller than minimum
0 packets with double tags
0 packets with no ifl
0 packets with no family
0 packets with no route table
```

## show system statistics (TX Matrix Router)

```
user@host> show system statistics
sfc0-re0:
```

```

Tcp:
```

```

361694 packets sent
 326507 data packets (103237236 bytes)
 2343 data packets retransmitted (2673324 bytes)
 0 resends initiated by MTU discovery
 33857 ack only packets (31613 packets delayed)
 0 URG only packets
 14 window probe packets
 387 window update packets
 1108 control packets
345879 packets received
 298207 acks(for 103141728 bytes)
 438 duplicate acks
 0 acks for unsent data
 204578 packets received in-sequence(13820995 bytes)
 6 completely duplicate packets(18 bytes)
 0 old duplicate packets
 0 packets with some duplicate data(0 bytes duped)
 0 out-of-order packets(0 bytes)
 0 packets of data after window(0 bytes)
 0 window probes
 899 window update packets
 166 packets received after close
 0 discarded for bad checksums
 0 discarded for bad header offset fields
 0 discarded because packet too short
406 connection requests
233 connection accepts
0 bad connection attempts
0 listen queue overflows
616 connections established (including accepts)
911 connections closed (including 41 drops)
 346 connections updated cached RTT on close
 346 connections updated cached RTT variance on close
 200 connections updated cached ssthresh on close
23 embryonic connections dropped
298155 segments updated rtt(of 287216 attempts)
1163 retransmit timeouts
 27 connections dropped by retransmit timeout
0 persist timeouts
 0 connections dropped by persist timeout
5 keepalive timeouts
 5 keepalive probes sent
 0 connections dropped by keepalive
69922 correct ACK header predictions
34993 correct data packet header predictions
233 syncache entries added
 0 retransmitted
 0 dupsyn
 0 dropped
 233 completed
 0 bucket overflow
 0 cache overflow
 0 reset
 0 stale
 0 aborted
```

```

0 badack
0 unreach
0 zone failures
0 cookies sent
0 cookies received
23 SACK recovery episodes
68 segment retransmits in SACK recovery episodes
71542 byte retransmits in SACK recovery episodes
158 SACK options (SACK blocks) received
0 SACK options (SACK blocks) sent
0 SACK scoreboard overflow
0 ACKs sent in response to in-window but not exact RSTs
0 ACKs sent in response to in-window SYNs on established connections
0 rcv packets dropped by TCP due to bad address
0 out-of-sequence segment drops due to insufficient memory
259 RST packets
0 ICMP packets ignored by TCP
0 send packets dropped by TCP due to auth errors
0 rcv packets dropped by TCP due to auth errors
0 outgoing segments dropped due to policing

```

lcc0-re0:

-----  
 Tcp:

```

346 packets sent
 222 data packets (22894 bytes)
 0 data packets retransmitted (0 bytes)
 0 resends initiated by MTU discovery
 80 ack only packets (12 packets delayed)
 0 URG only packets
 0 window probe packets
 5 window update packets
 42 control packets
358 packets received
 268 acks(for 22939 bytes)
 9 duplicate acks
 0 acks for unsent data
 203 packets received in-sequence(33820 bytes)
 0 completely duplicate packets(0 bytes)
 0 old duplicate packets
 0 packets with some duplicate data(0 bytes duped)
 0 out-of-order packets(0 bytes)
 0 packets of data after window(0 bytes)
 0 window probes
 6 window update packets
 0 packets received after close
 0 discarded for bad checksums
 0 discarded for bad header offset fields
 0 discarded because packet too short
13 connection requests
18 connection accepts
0 bad connection attempts
0 listen queue overflows
31 connections established (including accepts)
35 connections closed (including 2 drops)
 3 connections updated cached RTT on close
 3 connections updated cached RTT variance on close
 0 connections updated cached ssthresh on close
0 embryonic connections dropped
268 segments updated rtt(of 247 attempts)
0 retransmit timeouts

```

```

 0 connections dropped by retransmit timeout
0 persist timeouts
 0 connections dropped by persist timeout
0 keepalive timeouts
 0 keepalive probes sent
 0 connections dropped by keepalive
0 correct ACK header predictions
42 correct data packet header predictions
18 syncache entries added
 0 retransmitted
 0 dupsyn
 0 dropped
 18 completed
 0 bucket overflow
 0 cache overflow
 0 reset
 0 stale
 0 aborted
 0 badack
 0 unreach
 0 zone failures
0 cookies sent
0 cookies received
0 SACK recovery episodes
0 segment retransmits in SACK recovery episodes
0 byte retransmits in SACK recovery episodes
0 SACK options (SACK blocks) received
0 SACK options (SACK blocks) sent
0 SACK scoreboard overflow
0 ACKs sent in response to in-window but not exact RSTs
0 ACKs sent in response to in-window SYNs on established connections
0 rcv packets dropped by TCP due to bad address
0 out-of-sequence segment drops due to insufficient memory
5 RST packets
0 ICMP packets ignored by TCP
0 send packets dropped by TCP due to auth errors
0 rcv packets dropped by TCP due to auth errors
0 outgoing segments dropped due to policing

```

lcc1-re0:

Tcp:

```

348 packets sent
 223 data packets (22895 bytes)
 0 data packets retransmitted (0 bytes)
 0 resends initiated by MTU discovery
 81 ack only packets (13 packets delayed)
 0 URG only packets
 0 window probe packets
 5 window update packets
 42 control packets
360 packets received
 269 acks(for 22940 bytes)
 9 duplicate acks
 0 acks for unsent data
 203 packets received in-sequence(33820 bytes)
 0 completely duplicate packets(0 bytes)
 0 old duplicate packets
 0 packets with some duplicate data(0 bytes duped)
 0 out-of-order packets(0 bytes)
 0 packets of data after window(0 bytes)

```



```

 0 window probes
 6 window update packets
 0 packets received after close
 0 discarded for bad checksums
 0 discarded for bad header offset fields
 0 discarded because packet too short
13 connection requests
18 connection accepts
0 bad connection attempts
0 listen queue overflows
31 connections established (including accepts)
36 connections closed (including 2 drops)
 3 connections updated cached RTT on close
 3 connections updated cached RTT variance on close
 0 connections updated cached ssthresh on close
0 embryonic connections dropped
269 segments updated rtt(of 248 attempts)
0 retransmit timeouts
 0 connections dropped by retransmit timeout
0 persist timeouts
 0 connections dropped by persist timeout
0 keepalive timeouts
 0 keepalive probes sent
 0 connections dropped by keepalive
0 correct ACK header predictions
43 correct data packet header predictions
18 syncache entries added
 0 retransmitted
 0 dupsyn
 0 dropped
 18 completed
 0 bucket overflow
 0 cache overflow
 0 reset
 0 stale
 0 aborted
 0 badack
 0 unreach
 0 zone failures
0 cookies sent
0 cookies received
0 SACK recovery episodes
0 segment retransmits in SACK recovery episodes
0 byte retransmits in SACK recovery episodes
0 SACK options (SACK blocks) received
0 SACK options (SACK blocks) sent
0 SACK scoreboard overflow
0 ACKs sent in response to in-window but not exact RSTs
0 ACKs sent in response to in-window SYNs on established connections
0 rcv packets dropped by TCP due to bad address
0 out-of-sequence segment drops due to insufficient memory
5 RST packets
0 ICMP packets ignored by TCP
0 send packets dropped by TCP due to auth errors
0 rcv packets dropped by TCP due to auth errors
0 outgoing segments dropped due to policing

```

1cc2-re0:

-----  
 Tcp:

405 packets sent

```
271 data packets (23926 bytes)
0 data packets retransmitted (0 bytes)
0 resends initiated by MTU discovery
86 ack only packets (13 packets delayed)
0 URG only packets
0 window probe packets
5 window update packets
46 control packets
418 packets received
321 acks(for 23975 bytes)
9 duplicate acks
0 acks for unsent data
234 packets received in-sequence(34403 bytes)
0 completely duplicate packets(0 bytes)
0 old duplicate packets
0 packets with some duplicate data(0 bytes duped)
0 out-of-order packets(0 bytes)
0 packets of data after window(0 bytes)
0 window probes
7 window update packets
0 packets received after close
0 discarded for bad checksums
0 discarded for bad header offset fields
0 discarded because packet too short
15 connection requests
19 connection accepts
0 bad connection attempts
0 listen queue overflows
34 connections established (including accepts)
39 connections closed (including 2 drops)
4 connections updated cached RTT on close
4 connections updated cached RTT variance on close
0 connections updated cached ssthresh on close
0 embryonic connections dropped
321 segments updated rtt(of 299 attempts)
0 retransmit timeouts
0 connections dropped by retransmit timeout
0 persist timeouts
0 connections dropped by persist timeout
0 keepalive timeouts
0 keepalive probes sent
0 connections dropped by keepalive
0 correct ACK header predictions
48 correct data packet header predictions
19 syncache entries added
0 retransmitted
0 dupsyn
0 dropped
19 completed
0 bucket overflow
0 cache overflow
0 reset
0 stale
0 aborted
0 badack
0 unreach
0 zone failures
0 cookies sent
0 cookies received
0 SACK recovery episodes
0 segment retransmits in SACK recovery episodes
```

```

0 byte retransmits in SACK recovery episodes
0 SACK options (SACK blocks) received
0 SACK options (SACK blocks) sent
0 SACK scoreboard overflow
0 ACKs sent in response to in-window but not exact RSTs
0 ACKs sent in response to in-window SYNs on established connections
0 rcv packets dropped by TCP due to bad address
0 out-of-sequence segment drops due to insufficient memory
5 RST packets
0 ICMP packets ignored by TCP
0 send packets dropped by TCP due to auth errors
0 rcv packets dropped by TCP due to auth errors
0 outgoing segments dropped due to policing

```

lcc3-re0:

-----  
 Tcp:

```

346 packets sent
 221 data packets (22895 bytes)
 0 data packets retransmitted (0 bytes)
 0 resends initiated by MTU discovery
 81 ack only packets (13 packets delayed)
 0 URG only packets
 0 window probe packets
 5 window update packets
 42 control packets
360 packets received
 267 acks(for 22940 bytes)
 9 duplicate acks
 0 acks for unsent data
 203 packets received in-sequence(33820 bytes)
 0 completely duplicate packets(0 bytes)
 0 old duplicate packets
 0 packets with some duplicate data(0 bytes duped)
 0 out-of-order packets(0 bytes)
 0 packets of data after window(0 bytes)
 0 window probes
 6 window update packets
 0 packets received after close
 0 discarded for bad checksums
 0 discarded for bad header offset fields
 0 discarded because packet too short
13 connection requests
18 connection accepts
0 bad connection attempts
0 listen queue overflows
31 connections established (including accepts)
35 connections closed (including 2 drops)
 3 connections updated cached RTT on close
 3 connections updated cached RTT variance on close
 0 connections updated cached ssthresh on close
0 embryonic connections dropped
267 segments updated rtt(of 246 attempts)
0 retransmit timeouts
 0 connections dropped by retransmit timeout
0 persist timeouts
 0 connections dropped by persist timeout
0 keepalive timeouts
 0 keepalive probes sent
 0 connections dropped by keepalive
0 correct ACK header predictions

```

```

43 correct data packet header predictions
18 syncache entries added
 0 retransmitted
 0 dupsyn
 0 dropped
 18 completed
 0 bucket overflow
 0 cache overflow
 0 reset
 0 stale
 0 aborted
 0 badack
 0 unreach
 0 zone failures
0 cookies sent
0 cookies received
0 SACK recovery episodes
0 segment retransmits in SACK recovery episodes
0 byte retransmits in SACK recovery episodes
0 SACK options (SACK blocks) received
0 SACK options (SACK blocks) sent
0 SACK scoreboard overflow
0 ACKs sent in response to in-window but not exact RSTs
0 ACKs sent in response to in-window SYNs on established connections
0 rcv packets dropped by TCP due to bad address
0 out-of-sequence segment drops due to insufficient memory
5 RST packets
0 ICMP packets ignored by TCP
0 send packets dropped by TCP due to auth errors
0 rcv packets dropped by TCP due to auth errors
0 outgoing segments dropped due to policing

```

#### show system statistics (QFX Series)

```

user@switch> show system statistics
Tcp:
571779 packets sent
21517 data packets (1797102 bytes)
2 data packets retransmitted (20 bytes)
0 resends initiated by MTU discovery
3708 ack only packets (531 packets delayed)
0 URG only packets
1 window probe packets
1 window update packets
1093063 control packets
1132541 packets received
20961 acks(for 1796102 bytes)
5861 duplicate acks
0 acks for unsent data
19556 packets received in-sequence(232079 bytes)
3018 completely duplicate packets(0 bytes)
0 old duplicate packets
4 packets with some duplicate data(4 bytes duped)
2 out-of-order packets(2 bytes)
0 packets of data after window(0 bytes)
0 window probes
39 window update packets
0 packets received after close
0 discarded for bad checksums
0 discarded for bad header offset fields
0 discarded because packet too short

```

```

546519 connection requests
78 connection accepts
0 bad connection attempts
0 listen queue overflows
100 connections established (including accepts)
546596 connections closed (including 6 drops)
47 connections updated cached RTT on close
47 connections updated cached RTT variance on close
0 connections updated cached ssthresh on close
546497 embryonic connections dropped
20453 segments updated rtt(of 566914 attempts)
2 retransmit timeouts
0 connections dropped by retransmit timeout
0 persist timeouts
0 connections dropped by persist timeout
3028 keepalive timeouts
3027 keepalive probes sent
1 connections dropped by keepalive
7515 correct ACK header predictions
12258 correct data packet header predictions
78 syncache entries added
0 retransmitted
0 dupsyn
4 dropped
78 completed
0 bucket overflow
0 cache overflow
0 reset
0 stale
0 aborted
0 badack
0 unreach
0 zone failures
0 cookies sent
0 cookies received
1 SACK recovery episodes
1 segment retransmits in SACK recovery episodes
1 byte retransmits in SACK recovery episodes
71 SACK options (SACK blocks) received
1 SACK options (SACK blocks) sent
0 SACK scoreboard overflow
0 ACKs sent in response to in-window but not exact RSTs
0 ACKs sent in response to in-window SYNs on established connections
0 rcv packets dropped by TCP due to bad address
0 out-of-sequence segment drops due to insufficient memory
546544 RST packets
0 ICMP packets ignored by TCP
0 send packets dropped by TCP due to auth errors
0 rcv packets dropped by TCP due to auth errors
0 outgoing segments dropped due to policing
udp:
147 datagrams received
0 with incomplete header
0 with bad data length field
0 with bad checksum
9 dropped due to no socket
0 broadcast/multicast datagrams dropped due to no socket
0 dropped due to full socket buffers
0 not for hashed pcb
138 delivered
0 datagrams output

```

```
ip:
73704 total packets received
0 bad header checksums
0 with size smaller than minimum
0 with data size < data length
0 with header length < data size
0 with data length < header length
0 with incorrect version number
0 packets destined to dead next hop
0 fragments received
0 fragments dropped (dup or out of space)
0 fragments dropped (queue overflow)
0 fragments dropped after timeout
0 fragments dropped due to over limit
0 packets reassembled ok
1133057 packets for this host
0 packets for unknown/unsupported protocol
40146 packets forwarded
0 packets not forwardable
40146 redirects sent
1121700 packets sent from this host
0 packets sent with fabricated ip header
0 output packets dropped due to no bufs
0 output packets discarded due to no route
0 output datagrams fragmented
0 fragments created
0 datagrams that can't be fragmented
0 packets with bad options
0 packets with options handled without error
0 strict source and record route options
0 loose source and record route options
0 record route options
0 timestamp options
0 timestamp and address options
0 timestamp and prespecified address options
0 option packets dropped due to rate limit
0 router alert options
0 multicast packets dropped (no iflist)
0 packets dropped (src and int don't match)
0 transit re packets dropped on mgmt i/f
0 packets used first nexthop in ecmp unilist
0 incoming ttpoip packets received
0 incoming ttpoip packets dropped
0 outgoing TTPoIP packets sent
0 outgoing TTPoIP packets dropped
icmp:
0 drops due to rate limit
9 calls to icmp_error
0 errors not generated because old message was icmp
Output histogram:
295 echo reply
9 destination unreachable
0 messages with bad code fields
0 messages less than the minimum length
0 messages with bad checksum
0 messages with bad source address
0 messages with bad length
0 echo drops with broadcast or multicast destination address
0 timestamp drops with broadcast or multicast destination address
Input histogram:
295 echo
```

```
295 message responses generated
igmp:
0 messages received
0 messages received with too few bytes
0 messages received with bad checksum
0 membership queries received
0 membership queries received with invalid fields
0 membership reports received
0 membership reports received with invalid fields
0 membership reports received for groups to which we belong
0 Membership reports sent
raw_if:
0 RAW packets transmitted
0 PPPOE packets transmitted
0 ISDN packets transmitted
0 DIALER packets transmitted
0 PPP packets transmitted to pppd
0 PPP packets transmitted to jppd
0 IGMP2 packets transmitted
13 output drops due to tx error
0 MPU packets transmitted
0 PPPOE packets received
0 ISDN packets received
0 DIALER packets received
0 PPP packets received from pppd
0 MPU packets received
0 PPP packets received from jppd
0 IGMP2 packets received
0 Input drops due to bogus protocol
0 input drops due to no mbufs available
0 input drops due to no space in socket
0 input drops due to no socket
arp:
186413 datagrams received
88 ARP requests received
88 ARP replies received
0 resolution request received
0 unrestricted proxy requests
0 restricted proxy requests
0 received proxy requests
0 proxy requests not proxied
0 restricted proxy requests not proxied
0 datagrams with bogus interface
0 datagrams with incorrect length
0 datagrams for non-IP protocol
0 datagrams with unsupported op code
0 datagrams with bad protocol address length
0 datagrams with bad hardware address length
0 datagrams with multicast source address
0 datagrams with multicast source address
0 datagrams with my own hardware address
164 datagrams for an address not on the interface
0 datagrams with a broadcast source address
0 datagrams with source address duplicate to mine
186065 datagrams which were not for me
0 packets discarded waiting for resolution
0 packets sent after waiting for resolution
50 ARP requests sent
88 ARP replies sent
0 requests for memory denied
0 requests dropped on entry
```

```
0 requests dropped during retry
0 requests dropped due to interface deletion
0 requests on unnumbered interfaces
0 new requests on unnumbered interfaces
0 replies for from unnumbered interfaces
0 requests on unnumbered interface with non-subnetted donor
0 replies from unnumbered interface with non-subnetted donor
ip6:
0 total packets received
0 packets with size smaller than minimum
0 packets with data size < data length
0 packets with bad options
0 packets with incorrect version number
0 fragments received
0 fragments dropped (dup or out of space)
0 fragments dropped after timeout
0 fragments that exceeded limit
0 packets reassembled ok
0 packets for this host
0 packets forwarded
0 packets not forwardable
0 redirects sent
0 packets sent from this host
0 packets sent with fabricated ip header
0 output packets dropped due to no bufs, etc.
0 output datagrams fragmented
0 fragments created
0 datagrams that can't be fragmented
0 packets that violated scope rules
0 multicast packets which we don't join
0 packets whose headers are not continuous
0 tunneling packets that can't find gif
0 packets discarded due to too may headers
0 failures of source address selection
0 forward cache hit
0 forward cache miss
0 Packets destined to dead next hop
0 option packets dropped due to rate limit
0 Packets dropped (src and int don't match)
0 packets dropped due to bad protocol
0 transit re packet(null) dropped on mgmt i/f
icmp6:
0 Calls to icmp_error
0 Errors not generated because old message was icmp error
0 Errors not generated because rate limitation
0 Messages with bad code fields
0 Messages < minimum length
0 Bad checksums
0 Messages with bad length
0 No route
0 Administratively prohibited
0 Beyond scope
0 Address unreachable
0 Port unreachable
0 packet too big
0 Time exceed transit
0 Time exceed reassembly
0 Erroneous header field
0 Unrecognized next header
0 Unrecognized option
0 redirect
```



```

0 Unknown
0 Message responses generated
0 Messages with too many ND options
pfkey:
0 Requests sent from userland
0 Bytes sent from userland
histogram by message type:
0 reserved
0 dump
0 Messages with invalid length field
0 Messages with invalid version field
0 Messages with invalid message type field
0 Messages too short
0 Messages with memory allocation failure
0 Messages with duplicate extension
0 Messages with invalid extension type
0 Messages with invalid sa type
0 Messages with invalid address extension
0 Requests sent to userland
0 Bytes sent to userland
histogram by message type:
0 reserved
0 dump
0 Messages toward single socket
0 Messages toward all sockets
0 Messages toward registered sockets
0 Messages with memory allocation failure
c1n1:
0 Total packets received
0 Packets delivered
0 Too small packets
0 Packets with bad header length
0 Packets with bad checksum
0 Bad version packets
0 Unknown or unsupported protocol packets
0 Packets with bogus sdl size
0 No free memory in socket buffer
0 Send packets discarded
0 Sbappend failure
0 Mcopy failure
0 Address fields were not reasonable
0 Segment information forgotten
0 Forwarded packets
0 Total packets sent
0 Output packets discarded
0 Non-forwarded packets
0 Packets fragmented
0 Fragments sent
0 Fragments discarded
0 Fragments timed out
0 Fragmentation prohibited
0 Packets reconstructed
0 Packets destined to dead nexthop
0 Packets discarded due to no route
0 Error pdu rate drops
0 ER pdu generation failure
esis:
0 Total pkts received
0 Total packets consumed by protocol
0 Pdus received with bad checksum
0 Pdus received with bad version number

```

```
0 Pdus received with bad type field
0 Short pdus received
0 Pdus with bogus sdl size
0 Pdus with bad header length
0 Pdus with unknown or unsupported protocol
0 No free memory in socket buffer
0 Send packets discarded
0 Sbappend failure
0 Mcopy failure
0 ISO family not configured
tnp:
0 Unicast packets received
0 Broadcast packets received
0 Fragmented packets received
0 Hello packets dropped
0 Fragments dropped
0 Fragment reassembly queue flushes
0 Packets with tnp src address collision received
0 Hello packets received
0 Control packets received
0 Rdp packets received
0 Udp packets received
0 Tunnel packets received
0 Input packets discarded with no protocol
0 Packets of version unspecified received
0 Packets of version 1 received
0 Packets of version 2 received
0 Packets of version 3 received
0 Unicast packets sent
0 Broadcast packets sent
0 Fragmented packets sent
0 Hello packets dropped
0 Fragments dropped
0 Hello packets sent
0 Control packets sent
0 Rdp packets sent
0 Udp packets sent
0 Tunnel packets sent
0 Packets sent with unknown protocol
0 Packets of version unspecified sent
0 Packets of version 1 sent
0 Packets of version 2 sent
0 Packets of version 3 sent
rdp:
0 Input packets
0 Packets discarded for bad checksum
0 Packets discarded due to bad sequence number
0 Refused connections
0 Acks received
0 Packets dropped due to full socket buffers
0 Retransmits
0 Output packets
0 Acks sent
0 Connects
0 Closes
0 Keepalives received
0 Keepalives sent
tudp:
67 Datagrams received
0 Datagrams with incomplete header
0 Datagrams with bad data length field
```

```

0 Datagrams with bad checksum
0 Datagrams dropped due to no socket
0 Broadcast/multicast datagrams dropped due to no socket
0 Datagrams dropped due to full socket buffers
67 Delivered
68 Datagrams output
ttp:
0 Packets sent
0 Packets sent while unconnected
0 Packets sent while interface down
0 Packets sent couldn't get buffer
0 Packets sent couldn't find neighbor
0 L2 packets received
0 Unknown L3 packets received
0 IPv4 L3 packets received
0 MPLS L3 packets received
0 MPLS->IPv4 L3 packets received
0 IPv4->MPLS L3 packets received
0 IPv6 L3 packets received
0 ARP L3 packets received
0 CLNP L3 packets received
0 TNP L3 packets received
0 NULL L3 packets received
0 Cyclotron cycle L3 packets received
0 Cyclotron send L3 packets received
0 Packets received while unconnected
0 Packets received from unknown ifl
0 Input packets couldn't get buffer
0 Input packets with bad type
0 Input packets with discard type
0 Input packets with too many tlvs
0 Input packets with bad tlv header
70633 Input packets with bad tlv type
68877 Input packets dropped based on tlv result0 Input packets for which rt lookup
 is bypassed
mpls:
0 Total MPLS packets received
0 Packets forwarded
0 Packets dropped
0 Packets with header too small
0 After tagging, packets can't fit link MTU
0 Packets with IPv4 explicit NULL tag
0 Packets with IPv4 explicit NULL cksum errors
0 Packets with router alert tag
0 LSP ping packets (ttl-expired/router alert)
0 Packets with ttl expired
0 Packets with tag encoding error
0 Packets discarded due to no route
0 Packets used first nexthop in ecmp unilist
vpls:
0 Total packets received
0 Packets with size smaller than minimum
0 Packets with incorrect version number
0 Packets for this host
0 Packets with no logical interface
0 Packets with no family
0 Packets with no route table
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0 Packets with no auxiliary table
0 Packets with no corefacing entry
0 packets with no CE-facing entry

```

```
0 MAC route learning requests
0 MAC routes learnt
0 Requests to learn an existing route
0 Learning requests while learning disabled on interface
0 Learning requests over capacity
0 MAC routes moved
0 Requests to move static route
0 MAC route aging requests
0 MAC routes aged
0 Bogus address in aging requests
0 Requests to age static route
0 Requests to re-ageout aged route
0 Requests involving multiple peer FEs
0 Aging acks from PFE
0 Aging non-acks from PFE
0 Aging requests timed out waiting on FEs
0 Aging requests over max-rate
0 Errors finding peer FEs
0 Unsupported platform
0 Packets dropped due to no l3 route table
0 Packets dropped due to no local ifl
0 Packets punted
0 Packets dropped due to no socket
bridge:
Input:
0 packets received
0 packets forwarded
0 packets failed to forward
0 packets dropped
0 packets with vmember lookup failures
0 packets with vlan lookup failures
0 packets with stp state lookup failures
0 packets dropped due to stp blocked/listening
0 packets dropped due to stp learning
0 packets with src MAC learning failures
0 packets with input control processing failures
Forward:
0 packets sent successfully
0 packets with send failures
0 packets forwarded to l3 interface
0 packets with l3 send failures
0 packets discarded
0 packets with l2ifl store failures
0 packets with ifl mismatch failures
0 packets with packet duplication failures
0 packets with tag lookup failures
0 packets with no route for DMAC
0 packets with no route table
0 packets with no nexthop
0 packets with dead nexthop
0 packets with eof reached error
Learning:
0 MACs learned
0 packets sent to l3 interface
0 packets with l3 send failures
0 packets hit holdq while learning
0 MAC moves
0 packets discarded
0 packets with no route for SMAC
0 packets with no nexthop
0 packets with dead nexthop
```

```
0 packets dropped due to no resolve route
0 packets with l3 ifd lookup failures
0 packets with l3 ifl lookup failures
0 packets with l3 invalid rnh
0 packets with no route for SMAC in clone learning
0 packets with no nexthop in clone learning
0 packets with dead nexthop in clone learning
0 packets dropped due to no resolve nh in clone learning
Output:
0 packets forwarded
0 packets failed to forward
0 packets with vmember lookup failures
0 packets with vlan lookup failures
0 packets with input control processing failures
Send:
0 packets sent successfully
0 packets with send failures
0 packets dropped due to interface down
0 packets with dev output failures
0 blocked ifl discards
0 packets with tag lookup failures
0 packets with stp state lookup failures
0 packets with tag insertion failures
0 packets with tag removal failures
Flood:
0 packets flooded
0 flood failures
IGMP:
0 packets sent successfully
0 packets with send failures
0 packets forwarded
0 packets failed to forward
0 packets with mpull failures
0 packets with vmember lookup failures
0 packets with vlan lookup failures
0 packets with ifl lookup failures
0 packets with tag lookup failures
Misc:
0 packets with size smaller than minimum
0 packets with double tags
0 packets with no ifl
0 packets with no family
0 packets with no route table
```

## show system storage

---

|                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                                                        | <a href="#">Syntax on page 1198</a><br><a href="#">Syntax (EX Series Switches) on page 1198</a><br><a href="#">Syntax (MX Series Router) on page 1198</a><br><a href="#">Syntax (QFX Series) on page 1198</a><br><a href="#">Syntax (SRX Series) on page 1198</a><br><a href="#">Syntax (TX Matrix Router) on page 1198</a><br><a href="#">Syntax (TX Matrix Plus Router and TX Matrix Plus Router with 3D SIBs) on page 1198</a> |
| <b>Syntax</b>                                                                | <pre>show system storage &lt;detail&gt; &lt;invoke-on (all-routing-engines   other-routing-engine)&gt;</pre>                                                                                                                                                                                                                                                                                                                      |
| <b>Syntax (EX Series Switches)</b>                                           | <pre>show system storage &lt;detail&gt; &lt;all-members&gt; &lt;local&gt; &lt;member member-id&gt; &lt;invoke-on (all-routing-engines   other-routing-engine)&gt;</pre>                                                                                                                                                                                                                                                           |
| <b>Syntax (MX Series Router)</b>                                             | <pre>show system storage &lt;detail&gt; &lt;all-members&gt; &lt;local&gt; &lt;member member-id&gt; &lt;invoke-on (all-routing-engines   other-routing-engine)&gt;</pre>                                                                                                                                                                                                                                                           |
| <b>Syntax (QFX Series)</b>                                                   | <pre>show system storage &lt;detail&gt; &lt;infrastructure name&gt; &lt;interconnect-device name&gt; &lt;node-group name&gt; &lt;invoke-on (all-routing-engines   other-routing-engine)&gt;</pre>                                                                                                                                                                                                                                 |
| <b>Syntax (SRX Series)</b>                                                   | <pre>show system storage &lt;detail&gt; &lt;partitions&gt; &lt;invoke-on (all-routing-engines   other-routing-engine)&gt;</pre>                                                                                                                                                                                                                                                                                                   |
| <b>Syntax (TX Matrix Router)</b>                                             | <pre>show system storage &lt;detail&gt; &lt;all-chassis   all-lcc   lcc number   scc&gt; &lt;invoke-on (all-routing-engines   other-routing-engine)&gt;</pre>                                                                                                                                                                                                                                                                     |
| <b>Syntax (TX Matrix Plus Router and TX Matrix Plus Router with 3D SIBs)</b> | <pre>show system storage &lt;detail&gt; &lt;all-chassis   all-lcc   lcc number   sfc number&gt; &lt;invoke-on (all-routing-engines   other-routing-engine)&gt;</pre>                                                                                                                                                                                                                                                              |
| <b>Release Information</b>                                                   | <p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p>                                                                                                                                                                                                                                                                                                  |

**sfc** option introduced for the TX Matrix Plus router in JUNOS Release 9.6.  
 Command introduced in Junos OS Release 11.1 for the QFX Series.  
 Option **invoke-on (all-routing-engines | other-routing-engine)** introduced in Junos OS Release 14.1  
 Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

- Description** Display statistics about the amount of free disk space in the router's or switch's file systems.
- Options**
- none**—Display standard information about the amount of free disk space in the router's or switch's file systems.
  - detail**—(Optional) Display detailed output.
  - invoke-on all-routing-engines**—(Optional) Display the system storage information on all master and backup Routing Engines on a routing matrix based on the TX Matrix or TX Matrix Plus router or on a router that has dual Routing Engines.
  - invoke-on other-routing-engines**—(Optional) Display the system storage information on the other Routing Engine. For example, if you issue this command on the master Routing Engine on an M320 router, the JUNOS Software displays the system storage information on the backup Routing Engine. On a routing matrix based on the TX Matrix or TX Matrix Plus router, if you issue this command on the TX Matrix or TX Matrix Plus router's master Routing Engine, the JUNOS Software displays all the system storage information on all the backup Routing Engines.
  - all-chassis**—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Display system storage statistics for all the routers in the chassis.
  - all-lcc**—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display system storage statistics for all T640 routers connected to the TX Matrix router. On a TX Matrix Plus router, display system storage statistics for all routers connected to the TX Matrix Plus router.
  - all-members**—(EX4200 switches and MX Series routers only) (Optional) Display system storage statistics for all members of the Virtual Chassis configuration.
  - infrastructure name**—(QFabric systems only) (Optional) Display system storage statistics for the fabric control Routing Engines or fabric manager Routing Engines.
  - interconnect-device name**—(QFabric systems only) (Optional) Display system storage statistics for the Interconnect device.
  - lcc number**—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display system storage statistics for a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, display system storage statistics for a specific router that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(EX4200 switches and MX Series routers only) (Optional) Display system storage statistics for the local Virtual Chassis member.

**member *member-id***—(EX4200 switches and MX Series routers only) (Optional) Display system storage statistics for the specified member of the Virtual Chassis configuration. For EX4200 switches, replace *member-id* with a value from 0 through 9. For an MX Series Virtual Chassis, replace *member-id* with a value of 0 or 1.

**node-group *name***—(QFabric systems only) (Optional) Display system storage statistics for the Node group.

**scc**—(TX Matrix routers only) (Optional) Display system storage statistics for the TX Matrix router (or switch-card chassis).

**sfc *number***—(TX Matrix Plus routers only) (Optional) Display system storage statistics for the TX Matrix Plus router. Replace *number* with 0.

**Additional Information** By default, when you issue the **show system storage** command on the master Routing Engine of a TX Matrix router or a TX Matrix Plus router, the command is broadcast to all the master Routing Engines of the LCCs connected to it in the routing matrix. Likewise, if you issue the same command on the backup Routing Engine of a TX Matrix or a TX Matrix Plus router, the command is broadcast to all backup Routing Engines of the LCCs that are connected to it in the routing matrix.

**Required Privilege Level** view

**Related Documentation**

- [Routing Matrix with a TX Matrix Plus Router Solutions Page](#)
- [show system storage partitions \(View SRX Series\)](#)

**List of Sample Output**

- [show system storage on page 1201](#)
- [show system storage \(TX Matrix Plus Router\) on page 1201](#)
- [show system storage \(QFX3500 Switch\) on page 1203](#)
- [show system storage invoke-on all-routing-engines on page 1204](#)
- [show system storage invoke-on other-routing-engine on page 1205](#)



**Output Fields** Table 76 on page 1201 describes the output fields for the **show system storage** command. Output fields are listed in the approximate order in which they appear.

**Table 76: show system storage Output Fields**

| Field Name        | Field Description                                      |
|-------------------|--------------------------------------------------------|
| <b>Filesystem</b> | Name of the filesystem.                                |
| <b>Size</b>       | Size of the filesystem.                                |
| <b>Used</b>       | Amount of space used in the filesystem.                |
| <b>Avail</b>      | Amount of space available in the filesystem.           |
| <b>Capacity</b>   | Percentage of the filesystem space that is being used. |
| <b>Mounted on</b> | Directory in which the filesystem is mounted.          |

## Sample Output

### show system storage

```

user@host> show system storage
Filesystem Size Used Avail Capacity Mounted on
/dev/ad0s1a 77M 37M 34M 52% /
devfs 16K 16K 0B 100% /dev/
/dev/vn0 12M 12M 0B 100% /packages/mnt/jbase
/dev/vn1 39M 39M 0B 100%
/packages/mnt/jkernel-7.2R1.7
/dev/vn2 12M 12M 0B 100%
/packages/mnt/jpfe-M40-7.2R1.7
/dev/vn3 2.3M 2.3M 0B 100%
/packages/mnt/jdocs-7.2R1.7
/dev/vn4 14M 14M 0B 100%
/packages/mnt/jroute-7.2R1.7
/dev/vn5 4.5M 4.5M 0B 100%
/packages/mnt/jcrypto-7.2R1.7
mfs:172 1.5G 4.0K 1.3G 0% /tmp
/dev/ad0s1e 12M 20K 11M 0% /config
procfs 4.0K 4.0K 0B 100% /proc
/dev/ad1s1f 9.4G 4.9G 3.7G 57% /var

```

### show system storage (TX Matrix Plus Router)

```

user@host> show system storage
sfc0-re0:

Filesystem Size Used Avail Capacity Mounted on
/dev/ad0s1a 3.4G 178M 2.9G 6% /
devfs 1.0K 1.0K 0B 100% /dev
devfs 1.0K 1.0K 0B 100% /dev/
/dev/md0 33M 33M 0B 100% /packages/mnt/jbase
/dev/md1 216M 216M 0B 100%
/packages/mnt/jkernel-9.6-20090519.0
/dev/md2 66M 66M 0B 100%
/packages/mnt/jpfe-T-9.6-20090519.0

```

```

/dev/md3 4.1M 4.1M 0B 100%
/packages/mnt/jdocs-9.6-20090519.0
/dev/md4 57M 57M 0B 100%
/packages/mnt/jroute-9.6-20090519.0
/dev/md5 15M 15M 0B 100%
/packages/mnt/jcrypto-9.6-20090519.0
/dev/md6 34M 34M 0B 100%
/packages/mnt/jpfe-common-9.6-20090519.0
/dev/md7 2.0G 10.0K 1.8G 0% /tmp
/dev/md8 2.0G 1.0M 1.8G 0% /mfs
/dev/ad0s1e 383M 82K 352M 0% /config
procfs 4.0K 4.0K 0B 100% /proc
/dev/ad1s1f 52G 7.5G 40G 16% /var

```

```
lcc0-re0:
```

```

Filesystem Size Used Avail Capacity Mounted on
/dev/ad0s1a 3.4G 178M 2.9G 6% /
devfs 1.0K 1.0K 0B 100% /dev
devfs 1.0K 1.0K 0B 100% /dev/
/dev/md0 33M 33M 0B 100% /packages/mnt/jbase
/dev/md1 216M 216M 0B 100%
/packages/mnt/jkernel-9.6-20090519.0
/dev/md2 66M 66M 0B 100%
/packages/mnt/jpfe-T-9.6-20090519.0
/dev/md3 4.1M 4.1M 0B 100%
/packages/mnt/jdocs-9.6-20090519.0
/dev/md4 57M 57M 0B 100%
/packages/mnt/jroute-9.6-20090519.0
/dev/md5 15M 15M 0B 100%
/packages/mnt/jcrypto-9.6-20090519.0
/dev/md6 34M 34M 0B 100%
/packages/mnt/jpfe-common-9.6-20090519.0
/dev/md7 2.0G 10.0K 1.8G 0% /tmp
/dev/md8 2.0G 540K 1.8G 0% /mfs
/dev/ad0s1e 383M 88K 352M 0% /config
procfs 4.0K 4.0K 0B 100% /proc
/dev/ad1s1f 52G 6.3G 41G 13% /var

```

```
lcc1-re0:
```

```

Filesystem Size Used Avail Capacity Mounted on
/dev/ad0s1a 3.4G 178M 2.9G 6% /
devfs 1.0K 1.0K 0B 100% /dev
devfs 1.0K 1.0K 0B 100% /dev/
/dev/md0 33M 33M 0B 100% /packages/mnt/jbase
/dev/md1 216M 216M 0B 100%
/packages/mnt/jkernel-9.6-20090519.0
/dev/md2 66M 66M 0B 100%
/packages/mnt/jpfe-T-9.6-20090519.0
/dev/md3 4.1M 4.1M 0B 100%
/packages/mnt/jdocs-9.6-20090519.0
/dev/md4 57M 57M 0B 100%
/packages/mnt/jroute-9.6-20090519.0
/dev/md5 15M 15M 0B 100%
/packages/mnt/jcrypto-9.6-20090519.0
/dev/md6 34M 34M 0B 100%
/packages/mnt/jpfe-common-9.6-20090519.0
/dev/md7 2.0G 10.0K 1.8G 0% /tmp
/dev/md8 2.0G 540K 1.8G 0% /mfs
/dev/ad0s1e 383M 88K 352M 0% /config

```

```

procfs 4.0K 4.0K 0B 100% /proc
/dev/ad1s1f 23G 13G 7.7G 64% /var

lcc2-re0:

Filesystem Size Used Avail Capacity Mounted on
/dev/ad0s1a 3.4G 178M 2.9G 6% /
devfs 1.0K 1.0K 0B 100% /dev
devfs 1.0K 1.0K 0B 100% /dev/
/dev/md0 33M 33M 0B 100% /packages/mnt/jbase
/dev/md1 216M 216M 0B 100%
/packages/mnt/jkernel-9.6-20090519.0
/dev/md2 66M 66M 0B 100%
/packages/mnt/jpfe-T-9.6-20090519.0
/dev/md3 4.1M 4.1M 0B 100%
/packages/mnt/jdocs-9.6-20090519.0
/dev/md4 57M 57M 0B 100%
/packages/mnt/jroute-9.6-20090519.0
/dev/md5 15M 15M 0B 100%
/packages/mnt/jcrypto-9.6-20090519.0
/dev/md6 34M 34M 0B 100%
/packages/mnt/jpfe-common-9.6-20090519.0
/dev/md7 2.0G 10.0K 1.8G 0% /tmp
/dev/md8 2.0G 540K 1.8G 0% /mfs
/dev/ad0s1e 383M 64K 352M 0% /config
procfs 4.0K 4.0K 0B 100% /proc
/dev/ad1s1f 23G 3.7G 17G 18% /var

lcc3-re0:

Filesystem Size Used Avail Capacity Mounted on
/dev/ad0s1a 3.4G 178M 2.9G 6% /
devfs 1.0K 1.0K 0B 100% /dev
devfs 1.0K 1.0K 0B 100% /dev/
/dev/md0 33M 33M 0B 100% /packages/mnt/jbase
/dev/md1 216M 216M 0B 100%
/packages/mnt/jkernel-9.6-20090519.0
/dev/md2 66M 66M 0B 100%
/packages/mnt/jpfe-T-9.6-20090519.0
/dev/md3 4.1M 4.1M 0B 100%
/packages/mnt/jdocs-9.6-20090519.0
/dev/md4 57M 57M 0B 100%
/packages/mnt/jroute-9.6-20090519.0
/dev/md5 15M 15M 0B 100%
/packages/mnt/jcrypto-9.6-20090519.0
/dev/md6 34M 34M 0B 100%
/packages/mnt/jpfe-common-9.6-20090519.0
/dev/md7 2.0G 10.0K 1.8G 0% /tmp
/dev/md8 2.0G 540K 1.8G 0% /mfs
/dev/ad0s1e 383M 34K 352M 0% /config
procfs 4.0K 4.0K 0B 100% /proc
/dev/ad1s1f 23G 18G 3.5G 84% /var

```

#### show system storage (QFX3500 Switch)

```

user@switch> show system storage
Filesystem Size Used Avail Capacity Mounted on
/dev/da0s2a 343M 192M 123M 61% /
devfs 1.0K 1.0K 0B 100% /dev
/dev/md0 119M 119M 0B 100% /packages/mnt/jbase
/dev/md1 513M 513M 0B 100%

```

```

/packages/mnt/jkernel-qfx-11.1R1.5
/dev/md2 37M 37M 0B 100%
/packages/mnt/jpfe-qfx-e9xxx-11.1R1.5
/dev/md3 6.0M 6.0M 0B 100%
/packages/mnt/jdocs-qfx-11.1R1.5
/dev/md4 216M 216M 0B 100%
/packages/mnt/jroute-qfx-11.1R1.5
/dev/md5 59M 59M 0B 100%
/packages/mnt/jcrypto-qfx-11.1R1.5
/dev/md6 85M 85M 0B 100%
/packages/mnt/jswitch-qfx-11.1R1.5
/dev/md7 63M 8.0K 58M 0% /tmp
/dev/da0s2f 228M 14M 196M 7% /var
/dev/da0s3d 590M 3.0M 540M 1% /var/tmp
/dev/da0s3e 104M 162K 95M 0% /config
procfs 4.0K 4.0K 0B 100% /proc

```

### show system storage invoke-on all-routing-engines

```
user@host> show system storage invoke-on all-routing-engines
```

```
re0:
```

```

Filesystem Size Used Avail Capacity Mounted on
/dev/ad0s1a 3.3G 440M 2.6G 14% /
devfs 1.0K 1.0K 0B 100% /dev
/dev/md0 76M 76M 0B 100% /packages/mnt/jbase
/dev/md1 40M 40M 0B 100%
/packages/mnt/jkernel64-14.1-20140407.1
/dev/md2 219M 219M 0B 100%
/packages/mnt/jpfe-T-14.1-20140407.1
/dev/md3 5.4M 5.4M 0B 100%
/packages/mnt/jdocs-14.1-20140407.1
/dev/md4 116M 116M 0B 100%
/packages/mnt/jroute-14.1-20140407.1
/dev/md5 44M 44M 0B 100%
/packages/mnt/jcrypto64-14.1-20140407.1
/dev/md6 70M 70M 0B 100%
/packages/mnt/jpfe-common-14.1-20140407.1
/dev/md7 182K 182K 0B 100%
/packages/mnt/jplatform-14.1-20140407.1
/dev/md8 499M 499M 0B 100%
/packages/mnt/jruntime-14.1-20140407.1
/dev/md9 41M 41M 0B 100%
/packages/mnt/jruntime64-14.1-20140407.1
/dev/md10 12M 12M 0B 100%
/packages/mnt/py-base-i386-14.1-20140407.1
/dev/md11 3.2G 8.0K 2.9G 0% /tmp
/dev/md12 3.2G 1.1M 2.9G 0% /mfs
/dev/ad0s1e 376M 220K 346M 0% /config
procfs 4.0K 4.0K 0B 100% /proc
/dev/ad1s1f 50G 43G 3.2G 93% /var

```

```
re1:
```

```

Filesystem Size Used Avail Capacity Mounted on
/dev/ad0s1a 3.3G 440M 2.6G 14% /
devfs 1.0K 1.0K 0B 100% /dev
/dev/md0 76M 76M 0B 100% /packages/mnt/jbase
/dev/md1 40M 40M 0B 100%
/packages/mnt/jkernel64-14.1-20140407.1
/dev/md2 219M 219M 0B 100%

```

```

/packages/mnt/jpfe-T-14.1-20140407.1
/dev/md3 5.4M 5.4M 0B 100%
/packages/mnt/jdocs-14.1-20140407.1
/dev/md4 116M 116M 0B 100%
/packages/mnt/jroute-14.1-20140407.1
/dev/md5 44M 44M 0B 100%
/packages/mnt/jcrypto64-14.1-20140407.1
/dev/md6 70M 70M 0B 100%
/packages/mnt/jpfe-common-14.1-20140407.1
/dev/md7 182K 182K 0B 100%
/packages/mnt/jplatform-14.1-20140407.1
/dev/md8 499M 499M 0B 100%
/packages/mnt/jruntime-14.1-20140407.1
/dev/md9 41M 41M 0B 100%
/packages/mnt/jruntime64-14.1-20140407.1
/dev/md10 12M 12M 0B 100%
/packages/mnt/py-base-i386-14.1-20140407.1
/dev/md11 3.2G 8.0K 2.9G 0% /tmp
/dev/md12 3.2G 662K 2.9G 0% /mfs
/dev/ad0s1e 375M 230K 344M 0% /config
procfs 4.0K 4.0K 0B 100% /proc
/dev/ad1s1f 52G 46G 2.2G 95% /var

```

#### show system storage invoke-on other-routing-engine

```

user@host> show system storage invoke-on other-routing-engine
rel:

```

```

Filesystem Size Used Avail Capacity Mounted on
/dev/ad0s1a 3.3G 440M 2.6G 14% /
devfs 1.0K 1.0K 0B 100% /dev
/dev/md0 76M 76M 0B 100% /packages/mnt/jbase
/dev/md1 40M 40M 0B 100%
/packages/mnt/jkernel64-14.1-20140407.1
/dev/md2 219M 219M 0B 100%
/packages/mnt/jpfe-T-14.1-20140407.1
/dev/md3 5.4M 5.4M 0B 100%
/packages/mnt/jdocs-14.1-20140407.1
/dev/md4 116M 116M 0B 100%
/packages/mnt/jroute-14.1-20140407.1
/dev/md5 44M 44M 0B 100%
/packages/mnt/jcrypto64-14.1-20140407.1
/dev/md6 70M 70M 0B 100%
/packages/mnt/jpfe-common-14.1-20140407.1
/dev/md7 182K 182K 0B 100%
/packages/mnt/jplatform-14.1-20140407.1
/dev/md8 499M 499M 0B 100%
/packages/mnt/jruntime-14.1-20140407.1
/dev/md9 41M 41M 0B 100%
/packages/mnt/jruntime64-14.1-20140407.1
/dev/md10 12M 12M 0B 100%
/packages/mnt/py-base-i386-14.1-20140407.1
/dev/md11 3.2G 8.0K 2.9G 0% /tmp
/dev/md12 3.2G 662K 2.9G 0% /mfs
/dev/ad0s1e 375M 230K 344M 0% /config
procfs 4.0K 4.0K 0B 100% /proc
/dev/ad1s1f 52G 46G 2.2G 95% /var

```

## show system uptime

|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                 | <a href="#">Syntax on page 1206</a><br><a href="#">Syntax (EX Series Switches) on page 1206</a><br><a href="#">Syntax (QFX Series) on page 1206</a><br><a href="#">Syntax (TX Matrix Router) on page 1206</a><br><a href="#">Syntax (TX Matrix Plus Router) on page 1206</a><br><a href="#">Syntax (MX Series Router) on page 1206</a>                                                                                                                                                                                                   |
| <b>Syntax</b>                         | show system uptime                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Syntax (EX Series Switches)</b>    | show system uptime<br><all-members><br><local><br><member <i>member-id</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Syntax (QFX Series)</b>            | show system uptime<br><director-group <i>name</i> ><br><infrastructure <i>name</i> ><br><interconnect-device <i>name</i> ><br><node-group <i>name</i> >                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Syntax (TX Matrix Router)</b>      | show system uptime<br><all-chassis   all-lcc   lcc <i>number</i>   scc>                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Syntax (TX Matrix Plus Router)</b> | show system uptime<br><detail><br><all-chassis   all-lcc   lcc <i>number</i>   sfc <i>number</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Syntax (MX Series Router)</b>      | show system uptime<br><all-members><br><invoke-on><br><local><br><member <i>member-id</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Release Information</b>            | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br><b>sfc</b> option introduced for the TX Matrix Plus router in JUNOS Release 9.6.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                   |
| <b>Description</b>                    | Display the current time and information about how long the router or switch, router or switch software, and routing protocols have been running.                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Options</b>                        | <b>none</b> —Show time since the system rebooted and processes started.<br><br><b>all-chassis</b> —(TX Matrix routers and TX Matrix Plus routers only) (Optional) Show time since the system rebooted and processes started on all the routers in the chassis.<br><br><b>all-lcc</b> —(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, show time since the system rebooted and processes started for all T640 routers (or line-card chassis) connected to the TX Matrix router. On a TX Matrix Plus |

router, show time since the system rebooted and processes started for all connected T1600 or T4000 LCCs.

**all-members**—(EX4200 switches and MX Series routers only) (Optional) Show time since the system rebooted and processes started on all members of the Virtual Chassis configuration.

**director-group *name***—(QFabric systems only) (Optional) Show time since the system rebooted and processes started on the Director group.

**infrastructure *name***—(QFabric systems only) (Optional) Show time since the system rebooted and processes started on the fabric control Routing Engine and fabric manager Routing Engine.

**interconnect-device *name***—(QFabric systems only) (Optional) Show time since the system rebooted and processes started on the Interconnect device.

**invoke-on**—(MX Series routers only) (Optional) Display the time since the system rebooted and processes started on the master Routing Engine, backup Routing Engine, or both, on a router with two Routing Engines.

**lcc *number***—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, show time since the system rebooted and processes started for a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, show time since the system rebooted and processes started for a specific router that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(EX4200 switches and MX Series routers only) (Optional) Show time since the system rebooted and processes started on the local Virtual Chassis member.

**member *member-id***—(EX4200 switches and MX Series routers only) (Optional) Show time since the system rebooted and processes started on the specified member of the Virtual Chassis configuration. For EX4200 switches, replace *member-id* with a value from 0 through 9. For an MX Series Virtual Chassis, replace *member-id* with a value of 0 or 1.

**node-group *name***—(QFabric systems only) (Optional) Show time since the system rebooted and processes started on the Node group.

**scc**—(TX Matrix routers only) (Optional) Show time since the system rebooted and processes started for the TX Matrix router (or switch-card chassis).

**sfc number**—(TX Matrix Plus routers only) (Optional) Show time since the system rebooted and processes started for the TX Matrix Plus router. Replace *number* with 0.

**Additional Information** By default, when you issue the **show system uptime** command on the master Routing Engine of a TX Matrix router or a TX Matrix Plus router, the command is broadcast to all the master Routing Engines of the LCCs connected to it in the routing matrix. Likewise, if you issue the same command on the backup Routing Engine of a TX Matrix or a TX Matrix Plus router, the command is broadcast to all backup Routing Engines of the LCCs that are connected to it in the routing matrix.

**Required Privilege Level** view

**Related Documentation**

- [Monitoring System Process Information on page 253](#)
- [Monitoring System Properties on page 254](#)
- [10-Gigabit Ethernet LAN/WAN PIC with XFP \(T640 Router\)](#)
- [Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

**List of Sample Output**

- [show system uptime on page 1209](#)
- [show system uptime all-lcc \(TX Matrix Router\) on page 1209](#)
- [show system uptime all-lcc \(TX Matrix Plus Router\) on page 1209](#)
- [show system uptime \(EX Series\) on page 1210](#)
- [show system uptime \(QFX Series\) on page 1210](#)

**Output Fields** Table 77 on page 1208 describes the output fields for the **show system uptime** command. Output fields are listed in the approximate order in which they appear.

**Table 77: show system uptime Output Fields**

| Field Name               | Field Description                                                                                                                 |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| <b>Current time</b>      | Current system time in UTC.                                                                                                       |
| <b>System booted</b>     | Date and time when the Routing Engine on the router or switch was last booted and how long it has been running.                   |
| <b>Protocols started</b> | Date and time when the routing protocols were last started and how long they have been running.                                   |
| <b>Last configured</b>   | Date and time when a configuration was last committed. Also shows the name of the user who issued the last <b>commit</b> command. |
| <b>time and up</b>       | Current time, in the local time zone, and how long the router or switch has been operational.                                     |
| <b>users</b>             | Number of users logged in to the router or switch.                                                                                |
| <b>load averages</b>     | Load averages for the last 1 minute, 5 minutes, and 15 minutes.                                                                   |



## Sample Output

### show system uptime

```
user@host> show system uptime
Current time: 1998-10-13 19:45:47 UTC
System booted: 1998-10-12 20:51:41 UTC (22:54:06 ago)
Protocols started: 1998-10-13 19:33:45 UTC (00:12:02 ago)
Last configured: 1998-10-13 19:33:45 UTC (00:12:02 ago) by abc
12:45PM up 22:54, 2 users, load averages: 0.07, 0.02, 0.01
```

### show system uptime all-lcc (TX Matrix Router)

```
user@host> show system uptime all-lcc
lcc0-re0:

Current time: 2004-09-13 09:55:35 PDT
System booted: 2004-09-13 03:13:55 PDT (06:41:40 ago)
Last configured: 2004-09-13 03:17:48 PDT (06:37:47 ago) by root
9:55AM PDT up 6:42, 1 user, load averages: 0.02, 0.03, 0.00
lcc2-re0:

Current time: 2004-09-13 09:55:35 PDT
System booted: 2004-09-12 03:23:43 PDT (1d 06:31 ago)
Last configured: 2004-09-13 03:05:36 PDT (06:49:59 ago) by root
9:55AM PDT up 1 day, 6:32, 1 user, load averages: 0.02, 0.01, 0.00
```

### show system uptime all-lcc (TX Matrix Plus Router)

```
user@host> show system uptime all-lcc
sfc0-re0:

Current time: 2009-05-25 00:24:30 PDT
System booted: 2009-05-24 06:39:33 PDT (17:44:57 ago)
Protocols started: 2009-05-24 06:40:30 PDT (17:44:00 ago)
Last configured: 2009-05-24 06:33:27 PDT (17:51:03 ago) by gregdo
12:24AM up 17:45, 2 users, load averages: 0.07, 0.05, 0.01

lcc0-re0:

Current time: 2009-05-25 00:24:30 PDT
System booted: 2009-05-24 06:39:46 PDT (17:44:44 ago)
error: the routing subsystem is not running
Last configured: 2009-05-24 06:40:47 PDT (17:43:43 ago) by root
12:24AM up 17:45, 0 users, load averages: 0.00, 0.00, 0.00

lcc1-re0:

Current time: 2009-05-25 00:24:30 PDT
System booted: 2009-05-24 06:39:38 PDT (17:44:52 ago)
error: the routing subsystem is not running
Last configured: 2009-05-24 06:40:18 PDT (17:44:12 ago) by root
12:24AM up 17:45, 0 users, load averages: 0.00, 0.00, 0.00

lcc2-re0:

Current time: 2009-05-25 00:24:30 PDT
System booted: 2009-05-24 06:39:48 PDT (17:44:42 ago)
error: the routing subsystem is not running
Last configured: 2009-05-24 06:40:44 PDT (17:43:46 ago) by root
12:24AM up 17:45, 0 users, load averages: 0.00, 0.00, 0.00
```

lcc3-re0:

```

Current time: 2009-05-25 00:24:30 PDT
System booted: 2009-05-24 06:39:44 PDT (17:44:46 ago)
error: the routing subsystem is not running
Last configured: 2009-05-24 06:40:08 PDT (17:44:22 ago) by root
12:24AM up 17:45, 0 users, load averages: 0.00, 0.00, 0.00
```

#### show system uptime (EX Series)

```
user@switch> show system uptime
Current time: 2014-03-12 16:39:56 UTC
System booted: 2014-03-12 14:58:05 UTC (01:41:51 ago)
Protocols started: 2014-03-12 14:59:48 UTC (01:40:08 ago)
Last configured: 2014-03-12 14:58:58 UTC (01:40:58 ago) by root
4:39PM up 1:42, 4 users, load averages: 0.02, 0.02, 0.00
```

#### show system uptime (QFX Series)

```
user@switch> show system uptime
Current time: 2010-08-27 03:12:30 PDT
System booted: 2010-08-13 17:11:54 PDT (1w6d 10:00 ago)
Protocols started: 2010-08-13 17:13:56 PDT (1w6d 09:58 ago)
Last configured: 2010-08-26 05:54:00 PDT (21:18:30 ago) by user
3:12AM up 13 days, 10:01, 3 users, load averages: 0.00, 0.00, 0.00
```

## show system users

|                                       |                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                 | <a href="#">Syntax on page 1211</a><br><a href="#">Syntax (TX Matrix Router) on page 1211</a><br><a href="#">Syntax (TX Matrix Plus Router) on page 1211</a><br><a href="#">Syntax (MX Series Router) on page 1211</a>                                                                                                                                                           |
| <b>Syntax</b>                         | show system users<br><no-resolve>                                                                                                                                                                                                                                                                                                                                                |
| <b>Syntax (TX Matrix Router)</b>      | show system users<br><all-chassis   all-lcc   lccnumber   scc><br><no-resolve>                                                                                                                                                                                                                                                                                                   |
| <b>Syntax (TX Matrix Plus Router)</b> | show system users<br><detail><br><all-chassis   all-lcc   lcc number   sfc number> <no-resolve>                                                                                                                                                                                                                                                                                  |
| <b>Syntax (MX Series Router)</b>      | show system users<br><all-members><br><local><br><member member-id><br><no-resolve>                                                                                                                                                                                                                                                                                              |
| <b>Release Information</b>            | <p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p><b>sfc</b> option introduced for the TX Matrix Plus router in JUNOS OS Release 9.6.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> |
| <b>Description</b>                    | List information about the users who are currently logged in to the router or switch.                                                                                                                                                                                                                                                                                            |



**NOTE:** The **show system users** command lists the information about administrative users that are logged in to a router or switch using the CLI, J-Web, or an SSH client. The output does not list information about web users or automated users that are logged in from a remote client application using Junos XML APIs, such as NETCONF.

- Options** **none**—List information about the users who are currently logged in to the router or switch.
- all-chassis**—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Show users currently logged in to all the routers in the chassis.
- all-lcc**—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, show users currently logged in to all T640 routers (or line-card chassis) connected to the TX Matrix router. On a TX Matrix Plus router, show users currently logged in to all connected T1600 or T4000 LCCs.

**all-members**—(MX Series routers only) (Optional) Display users currently logged in to all members of the Virtual Chassis configuration.

**lcc *number***—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, show users currently logged in to a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, show users currently logged in to a specific router that is connected to the TX Matrix Plus router. Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(MX Series routers only) (Optional) Display users currently logged in to the local Virtual Chassis member.

**member *member-id***—(MX Series routers only) (Optional) Display users currently logged in to the specified member of the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

**no-resolve**—(Optional) Do not attempt to resolve IP addresses to hostnames.

**scc**—(TX Matrix routers only) (Optional) Show users currently logged in to the TX Matrix router (or switch-card chassis).

**sfc *number***—(TX Matrix Plus routers only) (Optional) Show users currently logged in to the TX Matrix Plus router. Replace *number* with 0.

**Additional Information** By default, when you issue the **show system users** command on the master Routing Engine of a TX Matrix router or a TX Matrix Plus router, the command is broadcast to all the master Routing Engines of the LCCs connected to it in the routing matrix. Likewise, if you issue the same command on the backup Routing Engine of a TX Matrix or a TX Matrix Plus router, the command is broadcast to all backup Routing Engines of the LCCs that are connected to it in the routing matrix.

**Required Privilege Level** view

**Related Documentation**

- [Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

**List of Sample Output** [show system users on page 1213](#)  
[show system users lcc no-resolve \(TX Matrix, TX Matrix Plus Router\) on page 1213](#)  
[show system users \(TX Matrix Plus Router\) on page 1213](#)

[show system users \(QFX Series\) on page 1214](#)

[show system users no-resolve \(QFX Series\) on page 1214](#)

**Output Fields** [Table 78 on page 1213](#) describes the output fields for the **show system users** command. Output fields are listed in the approximate order in which they appear.

**Table 78: show system users Output Fields**

| Field Name           | Field Description                                                                                            |
|----------------------|--------------------------------------------------------------------------------------------------------------|
| <i>time and up</i>   | Current time, in the local time zone, and how long the router or switch has been operational.                |
| <i>users</i>         | Number of users logged in to the router or switch.                                                           |
| <i>load averages</i> | Load averages for the last 1 minute, 5 minutes, and 15 minutes.                                              |
| <i>USER</i>          | Username.                                                                                                    |
| <i>TTY</i>           | Terminal through which the user is logged in.                                                                |
| <i>FROM</i>          | System from which the user has logged in. A hyphen indicates that the user is logged in through the console. |
| <i>LOGIN@</i>        | Time when the user logged in.                                                                                |
| <i>IDLE</i>          | How long the user has been idle.                                                                             |
| <i>WHAT</i>          | Processes that the user is running.                                                                          |

## Sample Output

### show system users

```
user@host> show system users
7:30PM up 4 days, 2:26, 2 users, load averages: 0.07, 0.02, 0.01
USER TTY FROM LOGIN@ IDLE WHAT
root d0 - Fri05PM 4days -csh (csh)
blue p0 leve15.company.net 7:30PM - cli
```

### show system users lcc no-resolve (TX Matrix, TX Matrix Plus Router)

```
user@host> show system users lcc 2 no-resolve
```

```
lcc2-re0:
```

```

10:34AM PDT up 1 day, 7:11, 5 users, load averages: 0.03, 0.01, 0.00
USER TTY FROM LOGIN@ IDLE WHAT
root d0 - 3:21AM 7:12 /bin/csh
user1 p0 scc-re0 10:15AM - telnet hostA
user1 p1 scc-re0 10:16AM - telnet hostA
user1 p2 scc-re0 10:19AM - telnet hostA
user1 p3 scc-re0 10:24AM - telnet hostA
```

### show system users (TX Matrix Plus Router)

```
user@host> show system users
```

sfc0-re0:

```

1:41AM up 26 mins, 3 users, load averages: 0.08, 0.04, 0.03
USER TTY FROM LOGIN@ IDLE WHAT
user2 p0 10.209.208.123 1:18AM 21 cli
user2 p1 172.17.29.207 1:37AM 2 cli
user2 p2 172.17.28.19 1:40AM - cli

```

lcc0-re0:

```

1:41AM up 26 mins, 0 users, load averages: 0.00, 0.00, 0.03

```

lcc1-re0:

```

1:41AM up 26 mins, 0 users, load averages: 0.00, 0.02, 0.03

```

lcc2-re0:

```

1:41AM up 26 mins, 0 users, load averages: 0.16, 0.06, 0.02

```

lcc3-re0:

```

1:41AM up 26 mins, 0 users, load averages: 0.12, 0.04, 0.04

```

user3@aj> show system users

sfc0-re0:

```

1:42AM up 28 mins, 4 users, load averages: 0.02, 0.03, 0.02
USER TTY FROM LOGIN@ IDLE WHAT
user p0 device1.example.com 1:18AM 22 cli
user p1 device2.example.com 1:37AM - cli
user p2 device3.example.com 1:40AM - cli
user p3 device4.example.com 1:42AM - -csh (csh)

```

lcc0-re0:

```

1:42AM up 28 mins, 0 users, load averages: 0.02, 0.01, 0.03

```

lcc1-re0:

```

1:42AM up 28 mins, 0 users, load averages: 0.07, 0.04, 0.03

```

lcc2-re0:

```

1:42AM up 27 mins, 0 users, load averages: 0.07, 0.06, 0.02

```

lcc3-re0:

```

1:42AM up 28 mins, 0 users, load averages: 0.05, 0.04, 0.04

```

### show system users (QFX Series)

user@switch> show system users

```

USER TTY FROM LOGIN@ IDLE WHAT
tlewis p0 172.22.18.117 2:54AM 39 -cli (cli)
tlewis p1 172.22.18.117 3:01AM - -cli (cli)
tcheng p2 172.22.17.197 3:08AM 11 -cli (cli)

```

### show system users no-resolve (QFX Series)

user@switch> show system users no-resolve

| USER   | TTY | FROM          | LOGIN@ | IDLE | WHAT       |
|--------|-----|---------------|--------|------|------------|
| tlewis | p0  | 172.22.18.117 | 2:54AM | 39   | -cli (cli) |
| tlewis | p1  | 172.22.18.117 | 3:01AM | -    | -cli (cli) |
| tcheng | p2  | 172.22.17.197 | 3:08AM | 11   | -cli (cli) |

## show system virtual-memory

|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                 | <a href="#">Syntax on page 1216</a><br><a href="#">Syntax (EX Series) on page 1216</a><br><a href="#">Syntax (TX Matrix Router) on page 1216</a><br><a href="#">Syntax (TX Matrix Plus Router) on page 1216</a><br><a href="#">Syntax (MX Series Router) on page 1216</a><br><a href="#">Syntax (QFX Series) on page 1216</a>                                                                                                                                                                                                                                    |
| <b>Syntax</b>                         | show system virtual-memory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Syntax (EX Series)</b>             | show system virtual-memory<br><all-members><br><local><br><member <i>member-id</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Syntax (TX Matrix Router)</b>      | show system virtual-memory<br><all-chassis   all-lcc   lcc <i>number</i>   scc>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Syntax (TX Matrix Plus Router)</b> | show system virtual-memory<br><all-chassis   all-lcc   lcc <i>number</i>   sfc <i>number</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Syntax (MX Series Router)</b>      | show system virtual-memory<br><all-members><br><local><br><member <i>member-id</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Syntax (QFX Series)</b>            | show system virtual-memory<br><infrastructure <i>name</i> ><br><interconnect-device <i>name</i> ><br><node-group <i>name</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Release Information</b>            | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br><b>sfc</b> option introduced for the TX Matrix Plus router in Junos OS Release 9.6.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                        |
| <b>Description</b>                    | Display the usage of Junos OS kernel memory listed first by size of allocation and then by type of usage. Use the <b>show system virtual-memory</b> command for troubleshooting with Juniper Networks Customer Support.                                                                                                                                                                                                                                                                                                                                          |
| <b>Options</b>                        | <b>none</b> —Display kernel dynamic memory usage information.<br><br><b>all-chassis</b> —(TX Matrix routers and TX Matrix Plus routers only) (Optional) Display kernel dynamic memory usage information for all chassis.<br><br><b>all-lcc</b> —(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display kernel dynamic memory usage information for all T640 routers connected to the TX Matrix router. On a TX Matrix Plus router, display kernel dynamic memory usage information for all connected T1600 or T4000 LCCs. |



**all-members**—(EX4200 switches and MX Series routers only) (Optional) Display kernel dynamic memory usage information for all members of the Virtual Chassis configuration.

**infrastructure *name***—(QFabric systems only) (Optional) Display kernel dynamic memory usage information for the fabric control Routing Engine and fabric manager Routing Engine.

**interconnect-device *name***—(QFabric systems only) (Optional) Display kernel dynamic memory usage information for the Interconnect device.

**lcc *number***—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display kernel dynamic memory usage information for a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, display kernel dynamic memory usage information for a specific router that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(EX4200 switches and MX Series routers only) (Optional) Display kernel dynamic memory usage information for the local Virtual Chassis member.

**member *member-id***—(EX4200 switches and MX Series routers only) (Optional) Display kernel dynamic memory usage information for the specified member of the Virtual Chassis configuration. For EX4200 switches, replace *member-id* with a value from 0 through 9. For an MX Series Virtual Chassis, replace *member-id* with a value of 0 or 1.

**node-group *name***—(QFabric systems only) (Optional) Display kernel dynamic memory usage information for the Node group.

**scc**—(TX Matrix routers only) (Optional) Display kernel dynamic memory usage information for the TX Matrix router (or switch-card chassis).

**sfc *number***—(TX Matrix Plus routers only) (Optional) Display kernel dynamic memory usage information for the TX Matrix Plus router. Replace *number* with 0.

**Additional Information** By default, when you issue the **show system virtual-memory** command on the master Routing Engine of a TX Matrix router or a TX Matrix Plus router, the command is broadcast to all the master Routing Engines of the LCCs connected to it in the routing matrix. Likewise, if you issue the same command on the backup Routing Engine of a TX Matrix

or a TX Matrix Plus router, the command is broadcast to all backup Routing Engines of the LCCs that are connected to it in the routing matrix.



**NOTE:** The `show system virtual-memory` command with the `| display XML` pipe option now displays XML output for the command in the parent tags: `<vmstat-memstat-malloc>`, `<vmstat-memstat-zone>`, `<vmstat-sumstat>`, `<vmstat-intr>`, and `<vmstat-kernel-state>` with each child element as a separate XML tag. In Junos OS Releases 10.1 and earlier, the `| display XML` option for this command does not have an XML API element and the entire output is displayed in a single `<output>` tag element.

|                          |                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Required Privilege Level | view                                                                                                                                                                                                                                                                                                                                                                              |
| Related Documentation    | <ul style="list-style-type: none"> <li>• <a href="#">Routing Matrix with a TX Matrix Plus Router Solutions Page</a></li> </ul>                                                                                                                                                                                                                                                    |
| List of Sample Output    | <a href="#">show system virtual-memory on page 1220</a><br><a href="#">show system virtual-memory scc (TX Matrix Router) on page 1224</a><br><a href="#">show system virtual-memory sfc (TX Matrix Plus Router) on page 1225</a><br><a href="#">show system virtual-memory   display xml on page 1228</a><br><a href="#">show system virtual-memory (QFX Series) on page 1251</a> |
| Output Fields            | <p><a href="#">Table 79 on page 1219</a> lists the output fields for the <code>show system virtual-memory</code> command. Output fields are listed in the approximate order in which they appear.</p>                                                                                                                                                                             |

Table 79: show system virtual-memory Output Fields

| Field Name                              | Field Description                                                                                                                                     |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Memory statistics by bucket size</b> |                                                                                                                                                       |
| <b>Size</b>                             | Memory block size (bytes). The kernel memory allocator appropriates blocks of memory whose size is exactly a power of 2.                              |
| <b>In Use</b>                           | Number of memory blocks of this size that are in use (bytes).                                                                                         |
| <b>Free</b>                             | Number of memory blocks of this size that are free (bytes).                                                                                           |
| <b>Requests</b>                         | Number of memory allocation requests made.                                                                                                            |
| <b>HighWater</b>                        | Maximum value the free list can have. Once the system starts reclaiming physical memory, it continues until the free list is increased to this value. |
| <b>Couldfree</b>                        | Total number of times that the free elements for a bucket size exceed the high-water mark for that bucket size.                                       |
| <b>Memory usage type by bucket size</b> |                                                                                                                                                       |
| <b>Size</b>                             | Memory block size (bytes).                                                                                                                            |
| <b>Type(s)</b>                          | Kernel modules that are using these memory blocks. For a definition of each type, refer to a FreeBSD book.                                            |
| <b>Memory statistics by type</b>        |                                                                                                                                                       |
| <b>Type</b>                             | Kernel module that is using dynamic memory.                                                                                                           |
| <b>InUse</b>                            | Number of memory blocks used by this type. The number is rounded up.                                                                                  |
| <b>MemUse</b>                           | Amount of memory in use, in kilobytes (KB).                                                                                                           |
| <b>HighUse</b>                          | Maximum memory ever used by this type.                                                                                                                |
| <b>Limit</b>                            | Maximum memory that can be allocated to this type.                                                                                                    |
| <b>Requests</b>                         | Total number of dynamic memory allocation requests this type has made.                                                                                |
| <b>Type Limit</b>                       | Number of times requests were blocked for reaching the maximum limit.                                                                                 |
| <b>Kern Limit</b>                       | Number of times requests were blocked for the kernel map.                                                                                             |
| <b>Size(s)</b>                          | Memory block sizes this type is using.                                                                                                                |
| <b>Memory Totals</b>                    |                                                                                                                                                       |
| <b>In Use</b>                           | Total kernel dynamic memory in use (bytes, rounded up).                                                                                               |
| <b>Free</b>                             | Total kernel dynamic memory free (bytes, rounded up).                                                                                                 |

Table 79: show system virtual-memory Output Fields (*continued*)

| Field Name       | Field Description                                                    |
|------------------|----------------------------------------------------------------------|
| <b>Requests</b>  | Total number of memory allocation requests.                          |
| <b>ITEM</b>      | Kernel module that is using memory.                                  |
| <b>Size</b>      | Memory block size (bytes).                                           |
| <b>Limit</b>     | Maximum memory that can be allocated to this type.                   |
| <b>Used</b>      | Number of memory blocks used by this type. The number is rounded up. |
| <b>Free</b>      | Number of memory blocks available to this type.                      |
| <b>Requests</b>  | Total number of memory allocation requests this type has made.       |
| <b>interrupt</b> | Timer events and scheduling interruptions.                           |
| <b>total</b>     | Total number of interruptions for each type.                         |
| <b>rate</b>      | Interruption rate.                                                   |
| <b>Total</b>     | Total for all interruptions.                                         |

## Sample Output

### show system virtual-memory

```

user@host> show system virtual-memory
Memory statistics by bucket size
Size In Use Free Requests HighWater Couldfree
16 906 118 154876 1280 0
32 455 313 209956 640 0
64 4412 260 75380 320 20
128 3200 32 19361 160 81
256 1510 10 8844 80 4
512 446 2 5085 40 0
1K 18 2 5901 20 0
2K 1128 2 4445 10 1368
4K 185 1 456 5 0
8K 5 1 2653 5 0
16K 181 0 233 5 0
32K 2 0 1848 5 0
64K 20 0 22 5 0
128K 5 0 5 5 0
256K 2 0 2 5 0
512K 1 0 1 5 0

Memory usage type by bucket size
Size Type(s)
16 uc_devlist, nexusdev, iftable, temp, devbuf, atexit, COS, BPF,
 DEVFS mount, DEVFS node, vnodes, mount, pcb, soname, proc-args, kld,
 MD disk, rman, ATA generic, bus, sysctl, ippool, pfestat, ifstate,

```

```

pfe_ipc, mkey, rtable, ifmaddr, ipfw, rnode
32 atkbddev, dirrem, mkdir, diradd, freefile, freefrag, indirdep,
bmsafemap, newblk, temp, devbuf, COS, vnodes, cluster_save buffer,
pcb, soname, proc-args, sigio, kld, Gzip trees, taskqueue, SWAP,
eventhandler, bus, sysctl, uidinfo, subproc, pgrp, pfestat, itable32,
ifstate, pfe_ipc, mkey, rtable, ifmaddr, ipfw, rnode, rtnexthop
64 isadev, iftable, MFS node, allocindir, allocdirect, pagedep, temp,
devbuf, lockf, COS, NULLFS hash, DEVFS name, vnodes,
cluster_save buffer, vfscache, pcb, soname, proc-args, file,
AR driver, AD driver, Gzip trees, rman, eventhandler, bus, sysctl,
subproc, pfestat, pic, ifstate, pfe_ipc, mkey, ifaddr, rtable, ipfw
128 ZONE, freeblks, inodedep, temp, devbuf, zombie, COS, DEVFS node,
vnodes, mount, vfscache, pcb, soname, proc-args, ttys, dev_t,
timecounter, kld, Gzip trees, ISOFS node, bus, uidinfo, cred,
session, pic, itable16, ifstate, pfe_ipc, rtable, ifstat, metrics,
rtnexthop, iffamily
256 iflogical, iftable, MFS node, FFS node, newblk, temp, devbuf,
NFS daemon, vnodes, proc-args, kqueue, file desc, Gzip trees, bus,
subproc, itable16, ifstate, pfe_ipc, sysctl, rtnexthop
512 UFS mount, temp, devbuf, mount, BIO buffer, ptys, ttys, AR driver,
Gzip trees, ISOFS mount, msg, iocltops, ATA generic, bus, proc,
pfestat, lr, ifstate, pfe_ipc, rtable, ipfw, ifstat, rtnexthop
1K iftable, temp, devbuf, NQ NFS Lease, kqueue, kld, AD driver,
Gzip trees, sem, MD disk, bus, ifstate, pfe_ipc, ipfw
2K uc_devlist, UFS mount, temp, devbuf, BIO buffer, pcb, AR driver,
Gzip trees, iocltops, bus, ipfw, ifstat, rcache
4K memdesc, iftable, UFS mount, temp, devbuf, kld, Gzip trees, sem, msg
8K temp, devbuf, syncache, Gzip trees
16K indirdep, temp, devbuf, shm, msg
32K pagedep, kld, Gzip trees
64K VM pgdata, devbuf, MSDOSFS mount
128K UFS ihash, inodedep, NFS hash, kld, ISOFS mount
256K mbuf, vfscache
512K SWAP

```

| Memory statistics by type |       |        |             |       | Type     | Kern  |       |                 |
|---------------------------|-------|--------|-------------|-------|----------|-------|-------|-----------------|
| Type                      | InUse | MemUse | HighUse     | Limit | Requests | Limit | Limit | Size(s)         |
| isadev                    | 13    | 1K     | 1K127753K   | 13    | 0        | 0     | 0     | 64              |
| atkbddev                  | 2     | 1K     | 1K127753K   | 2     | 0        | 0     | 0     | 32              |
| uc_devlist                | 24    | 3K     | 3K127753K   | 24    | 0        | 0     | 0     | 16,2K           |
| nexusdev                  | 3     | 1K     | 1K127753K   | 3     | 0        | 0     | 0     | 16              |
| memdesc                   | 1     | 4K     | 4K127753K   | 1     | 0        | 0     | 0     | 4K              |
| mbuf                      | 1     | 152K   | 152K127753K | 1     | 0        | 0     | 0     | 256K            |
| iflogical                 | 6     | 2K     | 2K127753K   | 6     | 0        | 0     | 0     | 256             |
| iftable                   | 17    | 9K     | 9K127753K   | 18    | 0        | 0     | 0     | 16,64,256,1K,4K |
| ZONE                      | 15    | 2K     | 2K127753K   | 15    | 0        | 0     | 0     | 128             |
| VM pgdata                 | 1     | 64K    | 64K127753K  | 1     | 0        | 0     | 0     | 64K             |
| UFS mount                 | 12    | 26K    | 26K127753K  | 12    | 0        | 0     | 0     | 512,2K,4K       |
| UFS ihash                 | 1     | 128K   | 128K127753K | 1     | 0        | 0     | 0     | 128K            |
| MFS node                  | 6     | 2K     | 3K127753K   | 35    | 0        | 0     | 0     | 64,256          |
| FFS node                  | 906   | 227K   | 227K127753K | 1352  | 0        | 0     | 0     | 256             |
| dirrem                    | 0     | 0K     | 4K127753K   | 500   | 0        | 0     | 0     | 32              |
| mkdir                     | 0     | 0K     | 1K127753K   | 38    | 0        | 0     | 0     | 32              |
| diradd                    | 0     | 0K     | 6K127753K   | 521   | 0        | 0     | 0     | 32              |
| freefile                  | 0     | 0K     | 4K127753K   | 374   | 0        | 0     | 0     | 32              |
| freeblks                  | 0     | 0K     | 8K127753K   | 219   | 0        | 0     | 0     | 128             |
| freefrag                  | 0     | 0K     | 1K127753K   | 193   | 0        | 0     | 0     | 32              |
| allocindir                | 0     | 0K     | 25K127753K  | 1518  | 0        | 0     | 0     | 64              |
| indirdep                  | 0     | 0K     | 17K127753K  | 76    | 0        | 0     | 0     | 32,16K          |
| allocdirect               | 0     | 0K     | 10K127753K  | 760   | 0        | 0     | 0     | 64              |
| bmsafemap                 | 0     | 0K     | 1K127753K   | 72    | 0        | 0     | 0     | 32              |

|                     |      |       |              |        |   |   |                  |
|---------------------|------|-------|--------------|--------|---|---|------------------|
| newblk              | 1    | 1K    | 1K127753K    | 2279   | 0 | 0 | 32,256           |
| inodedep            | 1    | 128K  | 175K127753K  | 2367   | 0 | 0 | 128,128K         |
| pagedep             | 1    | 32K   | 33K127753K   | 47     | 0 | 0 | 64,32K           |
| temp                | 1239 | 92K   | 96K127753K   | 8364   | 0 | 0 | 16,32,64K        |
| devbuf              | 1413 | 5527K | 5527K127753K | 1535   | 0 | 0 | 16,32,64,128,256 |
| lockf               | 38   | 3K    | 3K127753K    | 2906   | 0 | 0 | 64               |
| atexit              | 1    | 1K    | 1K127753K    | 1      | 0 | 0 | 16               |
| zombie              | 0    | 0K    | 2K127753K    | 3850   | 0 | 0 | 128              |
| NFS hash            | 1    | 128K  | 128K127753K  | 1      | 0 | 0 | 128K             |
| NQNFS Lease         | 1    | 1K    | 1K127753K    | 1      | 0 | 0 | 1K               |
| NFS daemon          | 1    | 1K    | 1K127753K    | 1      | 0 | 0 | 256              |
| syncache            | 1    | 8K    | 8K127753K    | 1      | 0 | 0 | 8K               |
| COS                 | 353  | 44K   | 44K127753K   | 353    | 0 | 0 | 16,32,64,128     |
| BPF                 | 189  | 3K    | 3K127753K    | 189    | 0 | 0 | 16               |
| MSDOSFS mount       | 1    | 64K   | 64K127753K   | 1      | 0 | 0 | 64K              |
| NULLFS hash         | 1    | 1K    | 1K127753K    | 1      | 0 | 0 | 64               |
| DEVFS mount         | 2    | 1K    | 1K127753K    | 2      | 0 | 0 | 16               |
| DEVFS name          | 487  | 31K   | 31K127753K   | 487    | 0 | 0 | 64               |
| DEVFS node          | 471  | 58K   | 58K127753K   | 479    | 0 | 0 | 16,128           |
| vnodes              | 28   | 7K    | 7K127753K    | 429    | 0 | 0 | 16,32,64,128,256 |
| mount               | 15   | 8K    | 8K127753K    | 18     | 0 | 0 | 16,128,512       |
| cluster_save buffer | 0    | 0K    | 1K127753K    | 55     | 0 | 0 | 32,64            |
| vfscache            | 1898 | 376K  | 376K127753K  | 3228   | 0 | 0 | 64,128,256K      |
| BIO buffer          | 49   | 98K   | 398K127753K  | 495    | 0 | 0 | 512,2K           |
| pcb                 | 159  | 16K   | 17K127753K   | 399    | 0 | 0 | 16,32,64,128,2K  |
| soname              | 82   | 10K   | 10K127753K   | 42847  | 0 | 0 | 16,32,64,128     |
| proc-args           | 57   | 2K    | 3K127753K    | 2105   | 0 | 0 | 16,32,64,128,256 |
| ptys                | 32   | 16K   | 16K127753K   | 32     | 0 | 0 | 512              |
| ttys                | 254  | 33K   | 33K127753K   | 522    | 0 | 0 | 128,512          |
| kqueue              | 5    | 3K    | 4K127753K    | 23     | 0 | 0 | 256,1K           |
| sigio               | 1    | 1K    | 1K127753K    | 27     | 0 | 0 | 32               |
| file                | 383  | 24K   | 24K127753K   | 16060  | 0 | 0 | 64               |
| file desc           | 76   | 19K   | 20K127753K   | 3968   | 0 | 0 | 256              |
| shm                 | 1    | 12K   | 12K127753K   | 1      | 0 | 0 | 16K              |
| dev_t               | 286  | 36K   | 36K127753K   | 286    | 0 | 0 | 128              |
| timecounter         | 10   | 2K    | 2K127753K    | 10     | 0 | 0 | 128              |
| kld                 | 11   | 117K  | 122K127753K  | 34     | 0 | 0 | 16,32,128,1K,4K  |
| AR driver           | 1    | 1K    | 3K127753K    | 5      | 0 | 0 | 64,512,2K        |
| AD driver           | 2    | 2K    | 3K127753K    | 2755   | 0 | 0 | 64,1K            |
| Gzip trees          | 0    | 0K    | 46K127753K   | 133848 | 0 | 0 | 32,64,128,256    |
| ISOFS node          | 1136 | 142K  | 142K127753K  | 1189   | 0 | 0 | 128              |
| ISOFS mount         | 9    | 132K  | 132K127753K  | 10     | 0 | 0 | 512,128K         |
| sem                 | 3    | 6K    | 6K127753K    | 3      | 0 | 0 | 1K,4K            |
| MD disk             | 2    | 2K    | 2K127753K    | 2      | 0 | 0 | 16,1K            |
| msg                 | 4    | 25K   | 25K127753K   | 4      | 0 | 0 | 512,4K,16K       |
| rman                | 59   | 4K    | 4K127753K    | 461    | 0 | 0 | 16,64            |
| ioctlops            | 0    | 0K    | 2K127753K    | 992    | 0 | 0 | 512,2K           |
| taskqueue           | 2    | 1K    | 1K127753K    | 2      | 0 | 0 | 32               |
| SWAP                | 2    | 413K  | 413K127753K  | 2      | 0 | 0 | 32,512K          |
| ATA generic         | 6    | 3K    | 3K127753K    | 6      | 0 | 0 | 16,512           |
| eventhandler        | 17   | 1K    | 1K127753K    | 17     | 0 | 0 | 32,64            |
| bus                 | 340  | 30K   | 31K127753K   | 794    | 0 | 0 | 16,32,64,128,256 |
| sysctl              | 0    | 0K    | 1K127753K    | 130262 | 0 | 0 | 16,32,64         |
| uidinfo             | 4    | 1K    | 1K127753K    | 10     | 0 | 0 | 32,128           |
| cred                | 22   | 3K    | 3K127753K    | 3450   | 0 | 0 | 128              |
| subproc             | 156  | 10K   | 10K127753K   | 7882   | 0 | 0 | 32,64,256        |
| proc                | 2    | 1K    | 1K127753K    | 2      | 0 | 0 | 512              |
| session             | 12   | 2K    | 2K127753K    | 34     | 0 | 0 | 128              |
| pgrp                | 16   | 1K    | 1K127753K    | 45     | 0 | 0 | 32               |
| ippool              | 1    | 1K    | 1K127753K    | 1      | 0 | 0 | 16               |
| pfestat             | 0    | 0K    | 1K127753K    | 47349  | 0 | 0 | 16,32,64,512     |

|           |     |      |             |       |   |   |                  |
|-----------|-----|------|-------------|-------|---|---|------------------|
| pic       | 5   | 1K   | 1K127753K   | 5     | 0 | 0 | 64,128           |
| lr        | 1   | 1K   | 1K127753K   | 1     | 0 | 0 | 512              |
| itable32  | 110 | 4K   | 4K127753K   | 110   | 0 | 0 | 32               |
| itable16  | 161 | 26K  | 26K127753K  | 161   | 0 | 0 | 128,256          |
| ifstate   | 694 | 159K | 160K127753K | 1735  | 0 | 0 | 16,32,64,128,1K  |
| pfe_ipc   | 0   | 0K   | 1K127753K   | 56218 | 0 | 0 | 16,32,64,128,1K  |
| mkey      | 250 | 4K   | 4K127753K   | 824   | 0 | 0 | 16,32,64         |
| ifaddr    | 9   | 1K   | 1K127753K   | 9     | 0 | 0 | 64               |
| sysctl    | 0   | 0K   | 1K127753K   | 30    | 0 | 0 | 256              |
| rtable    | 49  | 6K   | 6K127753K   | 307   | 0 | 0 | 16,32,64,128,512 |
| ifmaddr   | 22  | 1K   | 1K127753K   | 22    | 0 | 0 | 16,32            |
| ipfw      | 23  | 10K  | 10K127753K  | 48    | 0 | 0 | 16,32,64,512,2K  |
| ifstat    | 698 | 805K | 805K127753K | 698   | 0 | 0 | 128,512,2K       |
| rcache    | 4   | 8K   | 8K127753K   | 4     | 0 | 0 | 2K               |
| rnode     | 27  | 1K   | 1K127753K   | 285   | 0 | 0 | 16,32            |
| metrics   | 1   | 1K   | 1K127753K   | 3     | 0 | 0 | 128              |
| rtnexthop | 57  | 9K   | 9K127753K   | 312   | 0 | 0 | 32,128,256,512   |
| iffamily  | 12  | 2K   | 2K127753K   | 12    | 0 | 0 | 128              |

|                |        |      |          |
|----------------|--------|------|----------|
| Memory Totals: | In Use | Free | Requests |
|                | 9311K  | 54K  | 489068   |

| ITEM        | SIZE  | LIMIT   | USED   | FREE    | REQUESTS |
|-------------|-------|---------|--------|---------|----------|
| PIPE:       | 192,  | 0,      | 4,     | 81,     | 4422     |
| SWAPMETA:   | 160,  | 95814,  | 0,     | 0,      | 0        |
| unpcb:      | 160,  | 0,      | 114,   | 36,     | 279      |
| ripcb:      | 192,  | 25330,  | 5,     | 37,     | 5        |
| syncache:   | 128,  | 15359,  | 0,     | 64,     | 5        |
| tcpcb:      | 576,  | 25330,  | 23,    | 12,     | 32       |
| udpcb:      | 192,  | 25330,  | 14,    | 28,     | 255      |
| socket:     | 256,  | 25330,  | 246,   | 26,     | 819      |
| KNOTE:      | 96,   | 0,      | 27,    | 57,     | 71       |
| NFSNODE:    | 352,  | 0,      | 0,     | 0,      | 0        |
| NFSMOUNT:   | 544,  | 0,      | 0,     | 0,      | 0        |
| VNODE:      | 224,  | 0,      | 2778,  | 43,     | 2778     |
| NAMEI:      | 1024, | 0,      | 0,     | 8,      | 40725    |
| VMSPACE:    | 192,  | 0,      | 57,    | 71,     | 3906     |
| PROC:       | 448,  | 0,      | 73,    | 17,     | 3923     |
| DP fakepg:  | 64,   | 0,      | 0,     | 0,      | 0        |
| PV ENTRY:   | 28,   | 499566, | 44530, | 152053, | 1525141  |
| MAP ENTRY:  | 48,   | 0,      | 1439,  | 134,    | 351075   |
| KMAP ENTRY: | 48,   | 35645,  | 179,   | 119,    | 10904    |
| MAP:        | 108,  | 0,      | 7,     | 3,      | 7        |
| VM OBJECT:  | 92,   | 0,      | 2575,  | 109,    | 66912    |

```

792644 cpu context switches
9863474 device interrupts
286510 software interrupts
390851 traps
3596829 system calls
 16 kernel threads created
 3880 fork() calls
 27 vfork() calls
 0 rfork() calls
 0 swap pager pageins
 0 swap pager pages paged in
 0 swap pager pageouts
 0 swap pager pages paged out
 380 vnode pager pageins
 395 vnode pager pages paged in
 122 vnode pager pageouts

```

```

1476 vnode pager pages paged out
 0 page daemon wakeups
 0 pages examined by the page daemon
101 pages reactivated
161722 copy-on-write faults
 0 copy-on-write optimized faults
84623 zero fill pages zeroed
83063 zero fill pages prezeroed
 7 intransit blocking page faults
535606 total VM faults taken
 0 pages affected by kernel thread creation
238254 pages affected by fork()
 2535 pages affected by vfork()
 0 pages affected by rfork()
283379 pages freed
 0 pages freed by daemon
190091 pages freed by exiting processes
17458 pages active
29166 pages inactive
 0 pages in VM cache
10395 pages wired down
134610 pages free
 4096 bytes per page
183419 total name lookups
 cache hits (90% pos + 7% neg) system 0% per-directory
 deletions 0%, falsehits 0%, toolong 0%

```

| interrupt  | total   | rate |
|------------|---------|------|
| ata0 irq14 | 113338  | 3    |
| mux irq7   | 727643  | 21   |
| fxp1 irq10 | 1178671 | 34   |
| sio0 irq4  | 833     | 0    |
| clk irq0   | 3439769 | 99   |
| rtc irq8   | 4403221 | 127  |
| Total      | 9863475 | 286  |

```

Kernel direct memory map:
 4423 pages used
 4057340 pages maximum

```

*Note:* Kernel direct memory map only displays for 64 bit platform.

### show system virtual-memory scc (TX Matrix Router)

```
user@host> show system virtual-memory scc
```

```

Memory statistics by bucket size
Size In Use Free Requests HighWater Couldfree
16 898 126 749493 1280 0
32 2018 1310 980643 640 632
64 3490 13342 935420 320 5365
...

```

```
Memory usage type by bucket size
```

```

Size Type(s)
16 uc_devlist, COS, BPF, DEVFS mount, DEVFS node, vnodes, mount, pcb,
 soname, rman, bus, sysctl, ifstate, pfe_ipc, mkey, socket, rtable,
 ifmaddr, ipfw, rnode, iftable, temp, devbuf, atexit, proc-args, kld,
 MD disk
32 atkbddev, Gzip trees, dirrem, mkdir, diradd, freefile, freefrag,
 indirdep, bmsafemap, newblk, tseg_qent, COS, vnodes,

```



...

```

Memory statistics by type
 Type InUse MemUse HighUse Limit Requests Limit Limit Size(s)
 isadev 12 1K 1K166400K 12 0 0 64
 atkbddev 2 1K 1K166400K 2 0 0 32
 uc_devlist 24 3K 3K166400K 24 0 0 16,2K
....

Memory Totals: In Use Free Requests
 6091K 1554K 2897122

```

### show system virtual-memory sfc (TX Matrix Plus Router)

```

user@host> show system virtual-memory sfc 0
sfc0-re0:

```

```

 Type InUse MemUse HighUse Requests Size(s)
CAM dev queue 1 1K - 1 64
 entropy 1024 64K - 1024 64
 linker 487 6272K - 1163 16,32,64,4096,32768,131072
 USB 127 10K - 127 16,32,64,128,256,1024,2048
 lockf 46 3K - 98418 64
 USBdev 10 2K - 34 16,128,2048,16384
ifstateSLLNode 0 0K - 1096 16
 devbuf 21243 15683K - 21810
16,32,64,128,256,512,1024,2048,4096,8192,16384,32768,65536,131072
 temp 1283 151K - 2483472
16,32,64,128,256,512,2048,4096,8192,16384,32768,65536,131072
 ip6ndp 0 0K - 4 64
 in6ifmulti 1 1K - 1 64
 in6grentry 1 1K - 1 64
 iflogical 20 5K - 29 2048
 iffamily 45 6K - 69 32,1024,2048
 rtnexthop 266 46K - 608013 32,256,512,1024,2048,4096
 metrics 31 4K - 54 256
 rnode 212 4K - 607848 16,32
 rcache 4 8K - 4 65536
 iflist 0 0K - 6 16,64
 ifdevice 11 8K - 17 16,32768
 ifstat 424 472K - 427 512,16384,65536
 ipfw 42 23K - 145
16,32,64,128,256,512,1024,16384,32768,65536,131072
 ifmaddr 415 11K - 415 16,32
 rtable 329 28K - 608066 16,32,64,128,1024,16384
 sysctl 0 0K - 887976 16,32,64,4096,16384,32768
 ifaddr 64 5K - 70 32,64,128
 mkey 331 6K - 12528 16,128
 pfe_ipc 0 0K - 7299115
16,32,64,128,256,512,1024,2048,4096,8192,16384,32768,65536,131072
 ifstate 1245054 70088K - 3040437
16,32,64,128,256,512,1024,2048,4096,8192,16384,32768
 idxbucket 1 1K - 1 16
 itable16 5069 1250K - 5103 1024,4096
 itable32 157 10K - 157 64
 itable64 2 1K - 2 128
 lr 1 1K - 4 16384
 pic 37 6K - 37 64,16384
 pfestat 0 0K - 6220 32,64,128,256,131072
 gencfg 1486 424K - 2614 16,32,64,256,512,16384,32768,65536

```

```

 jsr 2 1K - 22 16
 idl 1 4K - 165
32, 64, 128, 256, 512, 1024, 2048, 8192, 16384, 32768, 65536, 131072
 rtmsg 0 0K - 16 131072
 module 250 16K - 250 64, 128
 mtx_pool 1 8K - 1 64, 128
 DEVFS3 113 13K - 114 256
 DEVFS1 106 24K - 106 2048
 pgrp 15 1K - 8600 64
 session 11 2K - 2829 512
 proc 2 1K - 2 16384
 subproc 296 572K - 24689 2048, 131072
 cred 38 5K - 619244 256
 plimit 18 4K - 21311 2048
 uidinfo 3 1K - 10 32, 512
 sysctluid 2701 82K - 2701 16, 32, 64
 sysctltmp 0 0K - 15572 16, 32, 64, 1024
 umtx 171 11K - 171 64
 SWAP 2 277K - 2 64
 bus 779 125K - 3072 16, 32, 64, 128, 32768
 bus-sc 67 62K - 1477
16, 32, 64, 512, 1024, 2048, 8192, 16384, 65536, 131072
 devstat 8 17K - 8 16, 131072
 eventhandler 46 2K - 47 32, 128
 kobj 93 186K - 111 65536
 DEVFS 8 1K - 9 16, 64
 rman 106 7K - 490 16, 32, 64
 sbuf 0 0K - 28234 16, 32, 32768, 131072

```

...

lcc0-re0:

```

 Type InUse MemUse HighUse Requests Size(s)
CAM dev queue 1 1K - 1 64
 entropy 1024 64K - 1024 64
 linker 487 6272K - 1163 16, 32, 64, 4096, 32768, 131072
 USB 127 10K - 127 16, 32, 64, 128, 256, 1024, 2048
 lockf 23 2K - 169585 64
 USBdev 10 2K - 34 16, 128, 2048, 16384
 devbuf 5128 10760K - 5310
16, 32, 64, 128, 256, 512, 1024, 2048, 4096, 8192, 16384, 32768, 65536, 131072
 temp 1285 151K - 10770
16, 32, 64, 128, 256, 512, 2048, 4096, 8192, 16384, 32768, 65536, 131072
 ip6ndp 0 0K - 4 64
 iflogical 20 5K - 29 2048
 iffamilly 45 6K - 69 32, 1024, 2048
 rtnexthop 189 29K - 1211988 32, 256, 512, 1024, 2048, 4096
 metrics 11 2K - 16 256
 rnode 135 3K - 606391 16, 32
 rcache 4 8K - 4 65536
 iflist 0 0K - 6 16, 64
 ifdevice 11 8K - 17 16, 32768
 ifstat 412 471K - 415 512, 16384, 65536
 ipfw 42 23K - 91
16, 32, 64, 128, 256, 512, 1024, 16384, 32768, 65536, 131072
 ifmaddr 415 11K - 415 16, 32
 rtable 225 20K - 606584 16, 32, 64, 128, 1024, 16384
 sysctl 0 0K - 2302479 16, 32, 64
 ifaddr 53 4K - 69 32, 64, 128
 mkey 133 3K - 8974 16, 128
 pfe_ipc 0 0K - 19035108
16, 32, 64, 128, 512, 1024, 2048, 8192, 16384, 32768, 65536, 131072

```

```

ifstate 710270 42176K - 9583703
16,32,64,128,256,512,1024,2048,8192,16384,32768
idxbucket 1 1K - 1 16
itable16 5045 1245K - 1825178 1024,4096
itable32 157 10K - 157 64
itable64 2 1K - 2 128
lr 1 1K - 4 16384
pic 37 6K - 37 64,16384
pfestat 0 0K - 1682 32,64,128,256,131072
gencfg 1486 424K - 2812 16,32,64,256,512,16384,32768,65536
jsr 0 0K - 22 16
idl 0 0K - 4 32768,131072
rtsmsg 0 0K - 3 131072
module 250 16K - 250 64,128
mtx_pool 1 8K - 1 64,128
DEVFS3 108 12K - 109 256
DEVFS1 101 23K - 101 2048
pgrp 5 1K - 917 64
session 5 1K - 917 512
proc 2 1K - 2 16384
subproc 217 441K - 4867 2048,131072
cred 21 3K - 48719 256
plimit 9 2K - 5255 2048
uidinfo 2 1K - 2 32,512
sysctluid 2786 85K - 2786 16,32,64
sysctltmp 0 0K - 1833 16,32,64,1024
umtx 126 8K - 126 64
SWAP 2 277K - 2 64
bus 780 125K - 2734 16,32,64,128,32768
bus-sc 69 69K - 1194
16,32,64,512,1024,2048,8192,16384,65536,131072
devstat 8 17K - 8 16,131072
eventhandler 45 2K - 46 32,128
kobj 93 186K - 111 65536
DEVFS 8 1K - 9 16,64
rman 94 6K - 477 16,32,64
sbuf 0 0K - 532 16,32,32768,131072
NULLFS hash 1 1K - 1 64
taskqueue 5 1K - 5 64
turnstiles 127 8K - 127 64
Unitno 6 1K - 44 16,64
ioctlops 0 0K - 1771718 16,32,64,128,8192,16384,65536,131072

iov 0 0K - 79425 16,64,128,256,512,1024,2048,131072
msg 4 25K - 4 32768,131072
sem 4 7K - 4 16384,32768,131072
shm 2 13K - 4 32768
ttys 93 16K - 195 512,32768
soname 31 3K - 389284 16,32,64,256
pcb 101 16K - 4374
16,32,64,128,1024,2048,4096,16384,65536
BIO buffer 40 80K - 750 65536
vfscache 1 512K - 1 65536
cluster_save buffer 0 OK - 55 32,64
VFS hash 1 256K - 1 32,64
vnodes 1 1K - 1 512
mount 266 21K - 481 16,32,64,128,256,4096,32768
vnodemarker 0 0K - 2497 16384
pfs_nodes 25 3K - 25 128
pfs_vncache 144 5K - 386 32
STP 1 1K - 1 64

```

```

 GEOM 173 15K - 1068
16,32,64,128,256,512,2048,16384,32768,131072
 syncache 1 8K - 1
16,32,64,128,256,512,2048,16384,32768,131072
 tlv_stat 0 0K - 223
16,32,64,128,256,512,2048,16384,32768,131072
 NFS daemon 1 8K - 1
16,32,64,128,256,512,2048,16384,32768,131072
 p1003.1b 1 1K - 1 16
 MD disk 9 18K - 9 65536
 ata_generic 2 2K - 25 16,16384,32768
 ISOFS mount 7 1K - 13 512
 ISOFS node 1439 135K - 1453 128
 CAM SIM 1 1K - 1 64
 CAM XPT 6 1K - 9 16,64,16384
 CAM periph 1 1K - 1 128
 ad_driver 2 1K - 2 256
 pagedep 1 64K - 105 64
 inodedep 1 256K - 552 256
 newblk 1 1K - 327 64,4096
 bmsafemap 0 0K - 19 64
 allocdirect 0 0K - 326 128
 freefrag 0 0K - 31 32
 freeblks 0 0K - 103 2048
 freefile 0 0K - 175 32
 diradd 0 0K - 590 64
 mkdir 0 0K - 166 32
 dirrem 0 0K - 382 32
 savedino 0 0K - 283 512
 UFS mount 15 36K - 15 2048,65536,131072
 ata_dma 6 1K - 6 256
 UMAHash 1 4K - 5 4096,16384,32768,65536,131072
 cdev 26 3K - 26 256
 file desc 111 25K - 5199 16,1024,2048,16384
 VM pgdata 2 65K - 2 64
 sigio 1 1K - 27 32
 kenv 30 5K - 33 16,32,64,131072
 atkbddev 2 1K - 2 32
 kqueue 0 0K - 88 1024,4096,32768
 proc-args 28 2K - 3970 32,64,128,256,512,1024
 isadev 23 2K - 23 64
 zombie 1 1K - 4651 128
 ithread 92 7K - 92 16,64,256
 legacydrv 3 1K - 3 16
 memdesc 1 4K - 1 131072
 nexusdev 2 1K - 2 16
 CAM queue 3 1K - 3 16
 KTRACE 100 10K - 100 128
 kbdmux 5 9K - 5 128,2048,65536,131072
ITEM SIZE LIMIT USED FREE REQUESTS
UMA Kegs: 136, 0, 71, 1, 71
...

```

## show system virtual-memory | display xml

```

user@host> show system virtual-memory | display xml
<rpc-reply xmlns:junos="http://xml.juniper.net/junos/10.2R1/junos">
 <system-virtual-memory-information>
 <vmstat-memstat-malloc>
 <memstat-name>CAM dev queue</memstat-name>
 <inuse>1</inuse>
 </vmstat-memstat-malloc>
 </system-virtual-memory-information>
</rpc-reply>

```

```

<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>entropy</memstat-name>
<inuse>1024</inuse>
<memuse>64</memuse>
<high-use>--</high-use>
<memstat-req>1024</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>linker</memstat-name>
<inuse>481</inuse>
<memuse>1871</memuse>
<high-use>--</high-use>
<memstat-req>1145</memstat-req>
<memstat-size>16,32,64,4096,32768,131072</memstat-size>
<memstat-name>lockf</memstat-name>
<inuse>56</inuse>
<memuse>4</memuse>
<high-use>--</high-use>
<memstat-req>5998</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>devbuf</memstat-name>
<inuse>2094</inuse>
<memuse>3877</memuse>
<high-use>--</high-use>
<memstat-req>2099</memstat-req>

<memstat-size>16,32,64,128,512,1024,4096,8192,16384,32768,65536,131072</memstat-size>

<memstat-name>temp</memstat-name>
<inuse>21</inuse>
<memuse>66</memuse>
<high-use>--</high-use>
<memstat-req>3127</memstat-req>

<memstat-size>16,32,64,128,256,512,2048,4096,8192,16384,32768,65536,131072</memstat-size>

<memstat-name>ip6ndp</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>4</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>in6ifmulti</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>in6grentry</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>iflogical</memstat-name>
<inuse>13</inuse>
<memuse>3</memuse>
<high-use>--</high-use>
<memstat-req>13</memstat-req>

```

```
<memstat-size>64,2048</memstat-size>
<memstat-name>iffamily</memstat-name>
<inuse>28</inuse>
<memuse>4</memuse>
<high-use>--</high-use>
<memstat-req>28</memstat-req>
<memstat-size>32,1024,2048</memstat-size>
<memstat-name>rtnexthop</memstat-name>
<inuse>127</inuse>
<memuse>18</memuse>
<high-use>--</high-use>
<memstat-req>129</memstat-req>
<memstat-size>32,256,512,1024,2048,4096</memstat-size>
<memstat-name>metrics</memstat-name>
<inuse>3</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>5</memstat-req>
<memstat-size>256</memstat-size>
<memstat-name>inifmulti</memstat-name>
<inuse>3</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>3</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>ingrentry</memstat-name>
<inuse>6</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>6</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>rnode</memstat-name>
<inuse>68</inuse>
<memuse>2</memuse>
<high-use>--</high-use>
<memstat-req>76</memstat-req>
<memstat-size>16,32</memstat-size>
<memstat-name>rcache</memstat-name>
<inuse>4</inuse>
<memuse>8</memuse>
<high-use>--</high-use>
<memstat-req>4</memstat-req>
<memstat-size>65536</memstat-size>
<memstat-name>ifdevice</memstat-name>
<inuse>4</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>4</memstat-req>
<memstat-size>16</memstat-size>
<memstat-name>ifstat</memstat-name>
<inuse>40</inuse>
<memuse>22</memuse>
<high-use>--</high-use>
<memstat-req>40</memstat-req>
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<memstat-name>dirrem</memstat-name>
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 <intr-cnt>1140</intr-cnt>
 <intr-rate>0</intr-rate>
 <intr-name>irq8: rtc </intr-name>
 <intr-cnt>159164</intr-cnt>
 <intr-rate>127</intr-rate>
 <intr-name>irq9: cbb1 fxp0 </intr-name>
 <intr-cnt>28490</intr-cnt>
 <intr-rate>22</intr-rate>
 <intr-name>irq10: fxp1 </intr-name>
 <intr-cnt>20593</intr-cnt>
 <intr-rate>16</intr-rate>
 <intr-name>irq14: ata0 </intr-name>
 <intr-cnt>5031</intr-cnt>
 <intr-rate>4</intr-rate>
 <intr-name>Total</intr-name>
 <intr-cnt>1457873</intr-cnt>
 <intr-rate>1171</intr-rate>
 </vmstat-intr>
 <vm-kernel-state>
 <vm-kmem-map-free>248524800</vm-kmem-map-free>
 </vm-kernel-state>
 <kernel-direct-mm-size-information>
 <vm-directmm-size-used>4644</vm-directmm-size-used>
 <vm-directmm-size-max>4057334</vm-directmm-size-max>
 </kernel-direct-mm-size-information>
</system-virtual-memory-information>
<cli>
 <banner></banner>
</cli>
</rpc-reply>

```

Note: <kernel-direct-mm-size-information> only displays for 64 bit platform.

## show system virtual-memory (QFX Series)

```

user@switch> show system virtual-memory | display xml
<rpc-reply xmlns:junos="http://xml.juniper.net/junos/11.1R1/junos">
 <system-virtual-memory-information>
 <vmstat-memstat-malloc>
 <memstat-name>CAM dev queue</memstat-name>
 <inuse>1</inuse>
 <memuse>1</memuse>
 <high-use>-</high-use>
 <memstat-req>1</memstat-req>
 <memstat-size>64</memstat-size>
 <memstat-name>entropy</memstat-name>
 <inuse>1024</inuse>
 <memuse>64</memuse>
 <high-use>-</high-use>
 <memstat-req>1024</memstat-req>
 <memstat-size>64</memstat-size>
 <memstat-name>linker</memstat-name>
 <inuse>481</inuse>
 <memuse>1871</memuse>
 <high-use>-</high-use>
 <memstat-req>1145</memstat-req>
 <memstat-size>16,32,64,4096,32768,131072</memstat-size>
 <memstat-name>lockf</memstat-name>
 <inuse>56</inuse>
 <memuse>4</memuse>
 <high-use>-</high-use>
 <memstat-req>5998</memstat-req>
 <memstat-size>64</memstat-size>
 <memstat-name>devbuf</memstat-name>
 <inuse>2094</inuse>
 <memuse>3877</memuse>
 <high-use>-</high-use>
 <memstat-req>2099</memstat-req>

 <memstat-size>16,32,64,128,512,1024,4096,8192,16384,32768,65536,131072</memstat-size>

 <memstat-name>temp</memstat-name>
 <inuse>21</inuse>
 <memuse>66</memuse>
 <high-use>-</high-use>
 <memstat-req>3127</memstat-req>

 <memstat-size>16,32,64,128,256,512,2048,4096,8192,16384,32768,65536,131072</memstat-size>

 <memstat-name>ip6ndp</memstat-name>
 <inuse>0</inuse>
 <memuse>0</memuse>
 <high-use>-</high-use>
 <memstat-req>4</memstat-req>
 <memstat-size>64</memstat-size>
 <memstat-name>in6ifmulti</memstat-name>
 <inuse>1</inuse>
 <memuse>1</memuse>
 <high-use>-</high-use>
 <memstat-req>1</memstat-req>
 <memstat-size>64</memstat-size>
 <memstat-name>in6grenty</memstat-name>
 <inuse>1</inuse>
 <memuse>1</memuse>

```

```
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>iflogical</memstat-name>
<inuse>13</inuse>
<memuse>3</memuse>
<high-use>--</high-use>
<memstat-req>13</memstat-req>
<memstat-size>64,2048</memstat-size>
<memstat-name>iffamily</memstat-name>
<inuse>28</inuse>
<memuse>4</memuse>
<high-use>--</high-use>
<memstat-req>28</memstat-req>
<memstat-size>32,1024,2048</memstat-size>
<memstat-name>rtnextthop</memstat-name>
<inuse>127</inuse>
<memuse>18</memuse>
<high-use>--</high-use>
<memstat-req>129</memstat-req>
<memstat-size>32,256,512,1024,2048,4096</memstat-size>
<memstat-name>metrics</memstat-name>
<inuse>3</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>5</memstat-req>
<memstat-size>256</memstat-size>
<memstat-name>inifmulti</memstat-name>
<inuse>3</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>3</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>ingrentry</memstat-name>
<inuse>6</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>6</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>rnode</memstat-name>
<inuse>68</inuse>
<memuse>2</memuse>
<high-use>--</high-use>
<memstat-req>76</memstat-req>
<memstat-size>16,32</memstat-size>
<memstat-name>rcache</memstat-name>
<inuse>4</inuse>
<memuse>8</memuse>
<high-use>--</high-use>
<memstat-req>4</memstat-req>
<memstat-size>65536</memstat-size>
<memstat-name>ifdevice</memstat-name>
<inuse>4</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>4</memstat-req>
<memstat-size>16</memstat-size>
<memstat-name>ifstat</memstat-name>
<inuse>40</inuse>
<memuse>22</memuse>
<high-use>--</high-use>
```

```

<memstat-req>40</memstat-req>
<memstat-size>512,16384,32768</memstat-size>
<memstat-name>ipfw</memstat-name>
<inuse>42</inuse>
<memuse>23</memuse>
<high-use>--</high-use>
<memstat-req>91</memstat-req>

<memstat-size>16,32,64,128,256,512,1024,16384,32768,65536,131072</memstat-size>
<memstat-name>ifmaddr</memstat-name>
<inuse>103</inuse>
<memuse>3</memuse>
<high-use>--</high-use>
<memstat-req>103</memstat-req>
<memstat-size>16,32</memstat-size>
<memstat-name>rtable</memstat-name>
<inuse>129</inuse>
<memuse>14</memuse>
<high-use>--</high-use>
<memstat-req>139</memstat-req>
<memstat-size>16,32,64,128,1024,16384</memstat-size>
<memstat-name>sysctl</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>14847</memstat-req>
<memstat-size>16,32,64,4096,16384,32768</memstat-size>
<memstat-name>ifaddr</memstat-name>
<inuse>29</inuse>
<memuse>3</memuse>
<high-use>--</high-use>
<memstat-req>29</memstat-req>
<memstat-size>64,128</memstat-size>
<memstat-name>mkey</memstat-name>
<inuse>345</inuse>
<memuse>6</memuse>
<high-use>--</high-use>
<memstat-req>2527</memstat-req>
<memstat-size>16,128</memstat-size>
<memstat-name>pfe_ipc</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>1422</memstat-req>

<memstat-size>16,32,64,128,512,1024,2048,8192,16384,32768,65536,131072</memstat-size>

<memstat-name>ifstate</memstat-name>
<inuse>594</inuse>
<memuse>51</memuse>
<high-use>--</high-use>
<memstat-req>655</memstat-req>

<memstat-size>16,32,64,128,256,1024,2048,4096,16384,32768</memstat-size>
<memstat-name>itable16</memstat-name>
<inuse>276</inuse>
<memuse>52</memuse>
<high-use>--</high-use>
<memstat-req>294</memstat-req>
<memstat-size>1024,4096</memstat-size>
<memstat-name>itable32</memstat-name>

```

```

<inuse>160</inuse>
<memuse>10</memuse>
<high-use>--</high-use>
<memstat-req>160</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>itable64</memstat-name>
<inuse>2</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>2</memstat-req>
<memstat-size>128</memstat-size>
<memstat-name>lr</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>16384</memstat-size>
<memstat-name>pic</memstat-name>
<inuse>5</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>5</memstat-req>
<memstat-size>64,512</memstat-size>
<memstat-name>pfestat</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>162</memstat-req>
<memstat-size>16,32,128,256,16384</memstat-size>
<memstat-name>gencfg</memstat-name>
<inuse>224</inuse>
<memuse>56</memuse>
<high-use>--</high-use>
<memstat-req>540</memstat-req>
<memstat-size>16,32,64,256,512,32768,65536</memstat-size>
<memstat-name>jsr</memstat-name>
<inuse>2</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>4</memstat-req>
<memstat-size>16</memstat-size>
<memstat-name>idl</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>13</memstat-req>
<memstat-size>16,32,64,128,256,4096,16384,32768,131072</memstat-size>

<memstat-name>rtsmsg</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>2</memstat-req>
<memstat-size>131072</memstat-size>
<memstat-name>module</memstat-name>
<inuse>249</inuse>
<memuse>16</memuse>
<high-use>--</high-use>
<memstat-req>249</memstat-req>
<memstat-size>64,128</memstat-size>
<memstat-name>mtx_pool</memstat-name>

```

```

<inuse>1</inuse>
<memuse>8</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>64,128</memstat-size>
<memstat-name>DEVFS3</memstat-name>
<inuse>109</inuse>
<memuse>12</memuse>
<high-use>--</high-use>
<memstat-req>117</memstat-req>
<memstat-size>256</memstat-size>
<memstat-name>DEVFS1</memstat-name>
<inuse>102</inuse>
<memuse>23</memuse>
<high-use>--</high-use>
<memstat-req>109</memstat-req>
<memstat-size>2048</memstat-size>
<memstat-name>pgrp</memstat-name>
<inuse>12</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>21</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>session</memstat-name>
<inuse>8</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>15</memstat-req>
<memstat-size>512</memstat-size>
<memstat-name>proc</memstat-name>
<inuse>2</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>2</memstat-req>
<memstat-size>16384</memstat-size>
<memstat-name>subproc</memstat-name>
<inuse>244</inuse>
<memuse>496</memuse>
<high-use>--</high-use>
<memstat-req>1522</memstat-req>
<memstat-size>2048,131072</memstat-size>
<memstat-name>cred</memstat-name>
<inuse>30</inuse>
<memuse>4</memuse>
<high-use>--</high-use>
<memstat-req>11409</memstat-req>
<memstat-size>256</memstat-size>
<memstat-name>plimit</memstat-name>
<inuse>17</inuse>
<memuse>4</memuse>
<high-use>--</high-use>
<memstat-req>133</memstat-req>
<memstat-size>2048</memstat-size>
<memstat-name>uidinfo</memstat-name>
<inuse>3</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>6</memstat-req>
<memstat-size>32,512</memstat-size>
<memstat-name>sysctluid</memstat-name>
<inuse>1117</inuse>

```

```

<memuse>34</memuse>
<high-use>--</high-use>
<memstat-req>1117</memstat-req>
<memstat-size>16,32,64</memstat-size>
<memstat-name>sysctltmp</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>743</memstat-req>
<memstat-size>16,32,64,1024</memstat-size>
<memstat-name>umtx</memstat-name>
<inuse>144</inuse>
<memuse>9</memuse>
<high-use>--</high-use>
<memstat-req>144</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>SWAP</memstat-name>
<inuse>2</inuse>
<memuse>209</memuse>
<high-use>--</high-use>
<memstat-req>2</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>bus</memstat-name>
<inuse>496</inuse>
<memuse>55</memuse>
<high-use>--</high-use>
<memstat-req>1196</memstat-req>
<memstat-size>16,32,64,128,32768</memstat-size>
<memstat-name>bus-sc</memstat-name>
<inuse>23</inuse>
<memuse>33</memuse>
<high-use>--</high-use>
<memstat-req>335</memstat-req>

<memstat-size>16,32,64,512,1024,2048,8192,16384,65536,131072</memstat-size>
<memstat-name>devstat</memstat-name>
<inuse>10</inuse>
<memuse>21</memuse>
<high-use>--</high-use>
<memstat-req>10</memstat-req>
<memstat-size>16,131072</memstat-size>
<memstat-name>eventhandler</memstat-name>
<inuse>35</inuse>
<memuse>2</memuse>
<high-use>--</high-use>
<memstat-req>36</memstat-req>
<memstat-size>32,128</memstat-size>
<memstat-name>kobj</memstat-name>
<inuse>93</inuse>
<memuse>186</memuse>
<high-use>--</high-use>
<memstat-req>111</memstat-req>
<memstat-size>65536</memstat-size>
<memstat-name>DEVFS</memstat-name>
<inuse>8</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>9</memstat-req>
<memstat-size>16,64</memstat-size>
<memstat-name>rman</memstat-name>
<inuse>71</inuse>

```



```

<memuse>5</memuse>
<high-use>--</high-use>
<memstat-req>433</memstat-req>
<memstat-size>16,32,64</memstat-size>
<memstat-name>sbuf</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>522</memstat-req>
<memstat-size>16,32,32768,131072</memstat-size>
<memstat-name>NULLFS hash</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>taskqueue</memstat-name>
<inuse>5</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>5</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>turnstiles</memstat-name>
<inuse>145</inuse>
<memuse>10</memuse>
<high-use>--</high-use>
<memstat-req>145</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>Unitno</memstat-name>
<inuse>8</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>44</memstat-req>
<memstat-size>16,64</memstat-size>
<memstat-name>iocltops</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>27622</memstat-req>
<memstat-size>16,64,8192,16384,131072</memstat-size>
<memstat-name>iov</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>18578</memstat-req>
<memstat-size>16,64,128,256,512,1024,2048,131072</memstat-size>
<memstat-name>msg</memstat-name>
<inuse>4</inuse>
<memuse>25</memuse>
<high-use>--</high-use>
<memstat-req>4</memstat-req>
<memstat-size>32768,131072</memstat-size>
<memstat-name>sem</memstat-name>
<inuse>4</inuse>
<memuse>7</memuse>
<high-use>--</high-use>
<memstat-req>4</memstat-req>
<memstat-size>16384,32768,131072</memstat-size>
<memstat-name>shm</memstat-name>
<inuse>9</inuse>
<memuse>20</memuse>

```

```

<high-use>--</high-use>
<memstat-req>14</memstat-req>
<memstat-size>32768</memstat-size>
<memstat-name>ttys</memstat-name>
<inuse>321</inuse>
<memuse>61</memuse>
<high-use>--</high-use>
<memstat-req>528</memstat-req>
<memstat-size>512,32768</memstat-size>
<memstat-name>ptys</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>128</memstat-size>
<memstat-name>mbuf_tag</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>23383</memstat-req>
<memstat-size>16</memstat-size>
<memstat-name>soname</memstat-name>
<inuse>115</inuse>
<memuse>12</memuse>
<high-use>--</high-use>
<memstat-req>24712</memstat-req>
<memstat-size>16,32,64,256</memstat-size>
<memstat-name>pcb</memstat-name>
<inuse>216</inuse>
<memuse>33</memuse>
<high-use>--</high-use>
<memstat-req>484</memstat-req>

<memstat-size>16,32,64,128,1024,2048,4096,16384,32768,65536</memstat-size>
<memstat-name>BIO buffer</memstat-name>
<inuse>43</inuse>
<memuse>86</memuse>
<high-use>--</high-use>
<memstat-req>405</memstat-req>
<memstat-size>65536</memstat-size>
<memstat-name>vfscache</memstat-name>
<inuse>1</inuse>
<memuse>256</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>65536</memstat-size>
<memstat-name>cluster_save buffer</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>2</memstat-req>
<memstat-size>32,64</memstat-size>
<memstat-name>VFS hash</memstat-name>
<inuse>1</inuse>
<memuse>128</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>32,64</memstat-size>
<memstat-name>vnodes</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>

```

```

<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>512</memstat-size>
<memstat-name>mount</memstat-name>
<inuse>290</inuse>
<memuse>23</memuse>
<high-use>--</high-use>
<memstat-req>535</memstat-req>
<memstat-size>16,32,64,128,256,4096,32768</memstat-size>
<memstat-name>vnodemarker</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>--</high-use>
<memstat-req>498</memstat-req>
<memstat-size>16384</memstat-size>
<memstat-name>pfs_nodes</memstat-name>
<inuse>25</inuse>
<memuse>3</memuse>
<high-use>--</high-use>
<memstat-req>25</memstat-req>
<memstat-size>128</memstat-size>
<memstat-name>pfs_vncache</memstat-name>
<inuse>27</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>53</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>STP</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>GEOM</memstat-name>
<inuse>146</inuse>
<memuse>11</memuse>
<high-use>--</high-use>
<memstat-req>1042</memstat-req>

<memstat-size>16,32,64,128,256,512,2048,16384,32768,131072</memstat-size>
<memstat-name>syncache</memstat-name>
<inuse>1</inuse>
<memuse>8</memuse>
<high-use>--</high-use>
<memstat-req>1</memstat-req>

<memstat-size>16,32,64,128,256,512,2048,16384,32768,131072</memstat-size>
<memstat-name>tlv_stat</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
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<zone-size>72</zone-size>
<count-limit>0</count-limit>
<used>42</used>
<free>64</free>
<zone-req>3311</zone-req>
<zone-name>socket:</zone-name>
<zone-size>412</zone-size>
<count-limit>25191</count-limit>
<used>343</used>
<free>8</free>
<zone-req>2524</zone-req>
<zone-name>unpcb:</zone-name>
<zone-size>140</zone-size>
<count-limit>25200</count-limit>
<used>170</used>
<free>26</free>
<zone-req>2157</zone-req>
<zone-name>ipq:</zone-name>
<zone-size>52</zone-size>
<count-limit>216</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>udpcb:</zone-name>
<zone-size>232</zone-size>
<count-limit>25194</count-limit>
<used>19</used>
<free>32</free>
<zone-req>31</zone-req>
<zone-name>inpcb:</zone-name>
<zone-size>232</zone-size>
<count-limit>25194</count-limit>
<used>40</used>
<free>28</free>
<zone-req>105</zone-req>
<zone-name>tcpcb:</zone-name>
<zone-size>520</zone-size>
<count-limit>25193</count-limit>
<used>40</used>
<free>16</free>
<zone-req>105</zone-req>
<zone-name>tcptw:</zone-name>
<zone-size>56</zone-size>
<count-limit>5092</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>syncache:</zone-name>
<zone-size>128</zone-size>
<count-limit>15360</count-limit>
<used>0</used>
<free>60</free>
<zone-req>55</zone-req>
<zone-name>tcpreass:</zone-name>
<zone-size>20</zone-size>
<count-limit>1690</count-limit>
```

```

<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>sackhole:</zone-name>
<zone-size>20</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>ripcb:</zone-name>
<zone-size>232</zone-size>
<count-limit>25194</count-limit>
<used>5</used>
<free>29</free>
<zone-req>5</zone-req>
<zone-name>SWAPMETA:</zone-name>
<zone-size>276</zone-size>
<count-limit>94948</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>FFS inode:</zone-name>
<zone-size>132</zone-size>
<count-limit>0</count-limit>
<used>1146</used>
<free>72</free>
<zone-req>1306</zone-req>
<zone-name>FFS1 dinode:</zone-name>
<zone-size>128</zone-size>
<count-limit>0</count-limit>
<used>1146</used>
<free>24</free>
<zone-req>1306</zone-req>
<zone-name>FFS2 dinode:</zone-name>
<zone-size>256</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
</vmstat-memstat-zone>
<vmstat-sumstat>
 <cpu-context-switch>934906</cpu-context-switch>
 <dev-intr>1707986</dev-intr>
 <soft-intr>33819</soft-intr>
 <traps>203604</traps>
 <sys-calls>1200636</sys-calls>
 <kernel-thrds>60</kernel-thrds>
 <fork-calls>1313</fork-calls>
 <vfork-calls>21</vfork-calls>
 <rfork-calls>0</rfork-calls>
 <swap-pageins>0</swap-pageins>
 <swap-pagedin>0</swap-pagedin>
 <swap-pageouts>0</swap-pageouts>
 <swap-pagedout>0</swap-pagedout>
 <vnode-pageins>23094</vnode-pageins>
 <vnode-pagedin>23119</vnode-pagedin>
 <vnode-pageouts>226</vnode-pageouts>
 <vnode-pagedout>3143</vnode-pagedout>
 <page-daemon-wakeup>0</page-daemon-wakeup>
 <page-daemon-examined-pages>0</page-daemon-examined-pages>
 <pages-reactivated>8821</pages-reactivated>

```

```

<copy-on-write-faults>48364</copy-on-write-faults>
<copy-on-write-optimized-faults>31</copy-on-write-optimized-faults>
<zero-fill-pages-zeroed>74665</zero-fill-pages-zeroed>
<zero-fill-pages-prezeroed>70061</zero-fill-pages-prezeroed>
<transit-blocking-page-faults>85</transit-blocking-page-faults>
<total-vm-faults>191824</total-vm-faults>

<pages-affected-by-kernel-thrd-creat>0</pages-affected-by-kernel-thrd-creat>
<pages-affected-by-fork>95343</pages-affected-by-fork>
<pages-affected-by-vfork>3526</pages-affected-by-vfork>
<pages-affected-by-rfork>0</pages-affected-by-rfork>
<pages-freed>221502</pages-freed>
<pages-freed-by-daemon>0</pages-freed-by-daemon>
<pages-freed-by-exiting-proc>75630</pages-freed-by-exiting-proc>
<pages-active>45826</pages-active>
<pages-inactive>13227</pages-inactive>
<pages-in-vm-cache>49278</pages-in-vm-cache>
<pages-wired-down>10640</pages-wired-down>
<pages-free>70706</pages-free>
<bytes-per-page>4096</bytes-per-page>
<swap-pages-used>0</swap-pages-used>
<peak-swap-pages-used>0</peak-swap-pages-used>
<total-name-lookups>214496</total-name-lookups>
<positive-cache-hits>92</positive-cache-hits>
<negative-cache-hits>5</negative-cache-hits>
<pass2>0</pass2>
<cache-deletions>0</cache-deletions>
<cache-falsehits>0</cache-falsehits>
<toolong>0</toolong>
</vmstat-sumstat>
<vmstat-intr>
 <intr-name>irq0: clk </intr-name>
 <intr-cnt>1243455</intr-cnt>
 <intr-rate>999</intr-rate>
 <intr-name>irq4: sio0 </intr-name>
 <intr-cnt>1140</intr-cnt>
 <intr-rate>0</intr-rate>
 <intr-name>irq8: rtc </intr-name>
 <intr-cnt>159164</intr-cnt>
 <intr-rate>127</intr-rate>
 <intr-name>irq9: cbb1 fxp0 </intr-name>
 <intr-cnt>28490</intr-cnt>
 <intr-rate>22</intr-rate>
 <intr-name>irq10: fxp1 </intr-name>
 <intr-cnt>20593</intr-cnt>
 <intr-rate>16</intr-rate>
 <intr-name>irq14: ata0 </intr-name>
 <intr-cnt>5031</intr-cnt>
 <intr-rate>4</intr-rate>
 <intr-name>Total</intr-name>
 <intr-cnt>1457873</intr-cnt>
 <intr-rate>1171</intr-rate>
</vmstat-intr>
<vm-kernel-state>
 <vm-kmem-map-free>248524800</vm-kmem-map-free>
</vm-kernel-state>
</system-virtual-memory-information>
<cli>
 <banner></banner>
</cli>
</rpc-reply>

```





## show version

---

|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                 | <a href="#">Syntax on page 1274</a><br><a href="#">Syntax (EX Series Switches) on page 1274</a><br><a href="#">Syntax (TX Matrix Router) on page 1274</a><br><a href="#">Syntax (TX Matrix Plus Router) on page 1274</a><br><a href="#">Syntax (MX Series Router) on page 1274</a><br><a href="#">Syntax (QFX Series) on page 1274</a>                                                                                                    |
| <b>Syntax</b>                         | show version<br><brief   detail>                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Syntax (EX Series Switches)</b>    | show version<br><all-members><br><brief   detail><br><local><br><member <i>member-id</i> >                                                                                                                                                                                                                                                                                                                                                |
| <b>Syntax (TX Matrix Router)</b>      | show version<br><brief   detail><br><all-chassis   all-lcc   lcc <i>number</i>   scc>                                                                                                                                                                                                                                                                                                                                                     |
| <b>Syntax (TX Matrix Plus Router)</b> | show version<br><all-chassis   all-lcc   lcc <i>number</i>   sfc <i>number</i> ><br><brief   detail>                                                                                                                                                                                                                                                                                                                                      |
| <b>Syntax (MX Series Router)</b>      | show version<br><brief   detail><br><all-members><br><local><br><member <i>member-id</i> >                                                                                                                                                                                                                                                                                                                                                |
| <b>Syntax (QFX Series)</b>            | show version<br><brief   detail><br><component <i>component-name</i>   all>                                                                                                                                                                                                                                                                                                                                                               |
| <b>Release Information</b>            | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br><b>sfc</b> option introduced for the TX Matrix Plus router in Junos OS Release 9.6.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                 |
| <b>Description</b>                    | Display the hostname and version information about the software running on the router or switch.<br><br>Beginning in Junos OS Release 13.3, the <b>show version</b> command output includes the <b>Junos</b> field that displays the Junos OS version running on the device. This field provides a consistent means of identifying the Junos OS version, rather than extracting that information from the list of installed sub-packages. |

**Options** **none**—Display standard information about the hostname and version of the software running on the router or switch.

**brief | detail**—(Optional) Display the specified level of output.

**all-members**—(EX4200 switches and MX Series routers only) (Optional) Display standard information about the hostname and version of the software running on all members of the Virtual Chassis configuration.

**component all**—(QFabric systems only) (Optional) Display the host name and version information about the software running on all the components on the QFabric system.

**component *component-name***—(QFabric systems only) (Optional) Display the host name and version information about the software running on a specific QFabric system component. Replace *component-name* with the name of the QFabric system component. The *component-name* can be the name of a diagnostics Routing Engine, Director group, fabric control Routing Engine, fabric manager Routing Engine, Interconnect device, or Node group.

**local**—(EX4200 switches and MX Series routers only) (Optional) Display standard information about the hostname and version of the software running on the local Virtual Chassis member.

**member *member-id***—(EX4200 switches and MX Series routers only) (Optional) Display standard information about the hostname and version of the software running on the specified member of the Virtual Chassis configuration. For EX4200 switches, replace *member-id* with a value from 0 through 9. For an MX Series Virtual Chassis, replace *member-id* with a value of 0 or 1.

**scc**—(TX Matrix routers only) (Optional) Display the hostname and version information about the software running on the TX Matrix router (or switch-card chassis).

**lcc *number***—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display the host name and version information about the software running on for a specified T640 router (line-card chassis or LCC) that is connected to the TX Matrix router. On a TX Matrix Plus router, display the host name and version information about the software running for a specified T1600 or T4000 router (LCC) that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**sfc *number***—(TX Matrix Plus routers only) (Optional) Display the hostname and version information about the software running on the TX Matrix Plus router (or switch-fabric chassis). Replace *number* with 0.

**Additional Information** By default, when you issue the **show version** command on a TX Matrix or TX Matrix Plus master Routing Engine, the command is broadcast to all the T640 (in a routing matrix based on a TX Matrix router) or T1600 or T4000 (in a routing matrix based on a TX Matrix Plus router) master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix or TX Matrix Plus backup Routing Engine, the command is broadcast to all the T640 (in a routing matrix based on a TX Matrix router) or T1600 or T4000 (in a routing matrix based on a TX Matrix Plus router) backup Routing Engines that are connected to it.

**Required Privilege Level** view

**List of Sample Output** [show version \(Devices Running Junos OS Release 13.3 and Later\) on page 1277](#)  
[show version on page 1277](#)  
[show version \(TX Matrix Plus Router\) on page 1278](#)  
[show version \(TX Matrix Plus Router with 3D SIBs\) on page 1280](#)  
[show version \(MX Series Router\) on page 1284](#)  
[show version \(QFX3500 Switch\) on page 1284](#)  
[show version \(QFabric System\) on page 1284](#)  
[show version component all \(QFabric System\) on page 1285](#)

## Sample Output

### show version (Devices Running Junos OS Release 13.3 and Later)

The following output is from the MX240 Router and shows the **Junos** field introduced in Junos OS 13.3. Depending on the platform running Junos OS 13.3, you might see different installed sub-packages, but the **Junos** field is common across all platforms that run Junos OS 13.3 and later.

```
user@host > show version
Hostname: lab
Model: mx240
Junos: 13.3R1.4
JUNOS Base OS boot [13.3R1.4]
JUNOS Base OS Software Suite [13.3R1.4]
JUNOS Kernel Software Suite [13.3R1.4]
JUNOS Crypto Software Suite [13.3R1.4]
JUNOS Packet Forwarding Engine Support (M/T/EX Common) [13.3R1.4]
JUNOS Packet Forwarding Engine Support (MX Common) [13.3R1.4]
JUNOS Online Documentation [13.3R1.4]
JUNOS Services ACL Container package [13.3R1.4]
JUNOS Services Application Level Gateways [13.3R1.4]
JUNOS AppId Services [13.3R1.4]
JUNOS Border Gateway Function package [13.3R1.4]
JUNOS Services Captive Portal and Content Delivery Container package [13.3R1.4]
JUNOS Services HTTP Content Management package [13.3R1.4]
JUNOS IDP Services [13.3R1.4]
JUNOS Services Jflow Container package [13.3R1.4]
JUNOS Services LL-PDF Container package [13.3R1.4]
JUNOS Services MobileNext Software package [13.3R1.4]
JUNOS Services Mobile Subscriber Service Container package [13.3R1.4]
JUNOS Services NAT [13.3R1.4]
JUNOS Services PTSP Container package [13.3R1.4]
JUNOS Services RPM [13.3R1.4]
JUNOS Services Stateful Firewall [13.3R1.4]
JUNOS Voice Services Container package [13.3R1.4]
JUNOS Services Crypto [13.3R1.4]
JUNOS Services SSL [13.3R1.4]
JUNOS Services IPSec [13.3R1.4]
JUNOS platform Software Suite [13.3R1.4]
JUNOS Runtime Software Suite [13.3R1.4]
JUNOS Routing Software Suite [13.3R1.4]
JUNOS py-base-i386 [13.3R1.4]
```

### show version

```
user@host> show version
Hostname: router1
Model: m20
JUNOS Base OS boot [7.2-20050312.0]
JUNOS Base OS Software Suite [7.2-20050312.0]
JUNOS Kernel Software Suite [7.2R1.7]
JUNOS Packet Forwarding Engine Support (M20/M40) [7.2R1.7]
JUNOS Routing Software Suite [7.2R1.7]
JUNOS Online Documentation [7.2R1.7]
JUNOS Crypto Software Suite [7.2R1.7]

{master}

user@host> show version psd 1
```

psd1-re0:

```

Hostname: china
Model: t640
JUNOS Base OS boot [9.1I20080311_1959_builder]
JUNOS Base OS Software Suite [9.1-20080321.0]
JUNOS Kernel Software Suite [9.1-20080321.0]
JUNOS Crypto Software Suite [9.1-20080321.0]
JUNOS Packet Forwarding Engine Support (M/T Common) [9.1-20080321.0]
JUNOS Packet Forwarding Engine Support (T-series) [9.1-20080321.0]
JUNOS Online Documentation [9.1-20080321.0]
JUNOS Routing Software Suite [9.1-20080321.0]
labpkg [7.0]
```

#### show version (TX Matrix Plus Router)

user@host> show version

sfc0-re0:

```

Hostname: host
Model: txp
JUNOS Base OS boot [12.3-20121019.0]
JUNOS Base OS Software Suite [12.3-20121019.0]
JUNOS Kernel Software Suite [12.3-20121019.0]
JUNOS Crypto Software Suite [12.3-20121019.0]
JUNOS Packet Forwarding Engine Support (M/T Common) [12.3-20121019.0]
JUNOS Packet Forwarding Engine Support (T-Series) [12.3-20121019.0]
JUNOS Online Documentation [12.3-20121019.0]
JUNOS Services AACL Container package [12.3-20121019.0]
JUNOS Services Application Level Gateways [12.3-20121019.0]
JUNOS AppId Services [12.3-20121019.0]
JUNOS Border Gateway Function package [12.3-20121019.0]
JUNOS Services Captive Portal and Content Delivery Container package
[12.3-20121019.0]
JUNOS Services HTTP Content Management package [12.3-20121019.0]
JUNOS IDP Services [12.3-20121019.0]
JUNOS Services LL-PDF Container package [12.3-20121019.0]
JUNOS Services NAT [12.3-20121019.0]
JUNOS Services PTSP Container package [12.3-20121019.0]
JUNOS Services RPM [12.3-20121019.0]
JUNOS Services Stateful Firewall [12.3-20121019.0]
JUNOS Voice Services Container package [12.3-20121019.0]
JUNOS Services Example Container package [12.3-20121019.0]
JUNOS Services Crypto [12.3-20121019.0]
JUNOS Services SSL [12.3-20121019.0]
JUNOS Services IPSec [12.3-20121019.0]
JUNOS Runtime Software Suite [12.3-20121019.0]
JUNOS Routing Software Suite [12.3-20121019.0]
```

lcc0-re0:

```

Hostname: host1
Model: t1600
JUNOS Base OS boot [12.3-20121019.0]
JUNOS Base OS Software Suite [12.3-20121019.0]
JUNOS Kernel Software Suite [12.3-20121019.0]
JUNOS Crypto Software Suite [12.3-20121019.0]
JUNOS Packet Forwarding Engine Support (M/T Common) [12.3-20121019.0]
JUNOS Packet Forwarding Engine Support (T-Series) [12.3-20121019.0]
JUNOS Online Documentation [12.3-20121019.0]
JUNOS Services AACL Container package [12.3-20121019.0]
```

```

JUNOS Services Application Level Gateways [12.3-20121019.0]
JUNOS AppId Services [12.3-20121019.0]
JUNOS Border Gateway Function package [12.3-20121019.0]
JUNOS Services Captive Portal and Content Delivery Container package
[12.3-20121019.0]
JUNOS Services HTTP Content Management package [12.3-20121019.0]
JUNOS IDP Services [12.3-20121019.0]
JUNOS Services LL-PDF Container package [12.3-20121019.0]
JUNOS Services NAT [12.3-20121019.0]
JUNOS Services PTSP Container package [12.3-20121019.0]
JUNOS Services RPM [12.3-20121019.0]
JUNOS Services Stateful Firewall [12.3-20121019.0]
JUNOS Voice Services Container package [12.3-20121019.0]
JUNOS Services Example Container package [12.3-20121019.0]
JUNOS Services Crypto [12.3-20121019.0]
JUNOS Services SSL [12.3-20121019.0]
JUNOS Services IPSec [12.3-20121019.0]
JUNOS Runtime Software Suite [12.3-20121019.0]
JUNOS Routing Software Suite [12.3-20121019.0]

```

```
lcc1-re0:
```

```

Hostname: host2
Model: t1600
JUNOS Base OS boot [12.3-20121019.0]
JUNOS Base OS Software Suite [12.3-20121019.0]
JUNOS Kernel Software Suite [12.3-20121019.0]
JUNOS Crypto Software Suite [12.3-20121019.0]
JUNOS Packet Forwarding Engine Support (M/T Common) [12.3-20121019.0]
JUNOS Packet Forwarding Engine Support (T-Series) [12.3-20121019.0]
JUNOS Online Documentation [12.3-20121019.0]
JUNOS Services ACL Container package [12.3-20121019.0]
JUNOS Services Application Level Gateways [12.3-20121019.0]
JUNOS AppId Services [12.3-20121019.0]
JUNOS Border Gateway Function package [12.3-20121019.0]
JUNOS Services Captive Portal and Content Delivery Container package
[12.3-20121019.0]
JUNOS Services HTTP Content Management package [12.3-20121019.0]
JUNOS IDP Services [12.3-20121019.0]
JUNOS Services LL-PDF Container package [12.3-20121019.0]
JUNOS Services NAT [12.3-20121019.0]
JUNOS Services PTSP Container package [12.3-20121019.0]
JUNOS Services RPM [12.3-20121019.0]
JUNOS Services Stateful Firewall [12.3-20121019.0]
JUNOS Voice Services Container package [12.3-20121019.0]
JUNOS Services Example Container package [12.3-20121019.0]
JUNOS Services Crypto [12.3-20121019.0]
JUNOS Services SSL [12.3-20121019.0]
JUNOS Services IPSec [12.3-20121019.0]
JUNOS Runtime Software Suite [12.3-20121019.0]
JUNOS Routing Software Suite [12.3-20121019.0]

```

```
lcc2-re0:
```

```

Hostname: host3
Model: t1600
JUNOS Base OS boot [12.3-20121019.0]
JUNOS Base OS Software Suite [12.3-20121019.0]
JUNOS Kernel Software Suite [12.3-20121019.0]
JUNOS Crypto Software Suite [12.3-20121019.0]
JUNOS Packet Forwarding Engine Support (M/T Common) [12.3-20121019.0]

```

```

JUNOS Packet Forwarding Engine Support (T-Series) [12.3-20121019.0]
JUNOS Online Documentation [12.3-20121019.0]
JUNOS Services AACL Container package [12.3-20121019.0]
JUNOS Services Application Level Gateways [12.3-20121019.0]
JUNOS AppId Services [12.3-20121019.0]
JUNOS Border Gateway Function package [12.3-20121019.0]
JUNOS Services Captive Portal and Content Delivery Container package
[12.3-20121019.0]
JUNOS Services HTTP Content Management package [12.3-20121019.0]
JUNOS IDP Services [12.3-20121019.0]
JUNOS Services LL-PDF Container package [12.3-20121019.0]
JUNOS Services NAT [12.3-20121019.0]
JUNOS Services PTSP Container package [12.3-20121019.0]
JUNOS Services RPM [12.3-20121019.0]
JUNOS Services Stateful Firewall [12.3-20121019.0]
JUNOS Voice Services Container package [12.3-20121019.0]
JUNOS Services Example Container package [12.3-20121019.0]
JUNOS Services Crypto [12.3-20121019.0]
JUNOS Services SSL [12.3-20121019.0]
JUNOS Services IPSec [12.3-20121019.0]
JUNOS Runtime Software Suite [12.3-20121019.0]
JUNOS Routing Software Suite [12.3-20121019.0]

```

```
lcc3-re0:
```

```

Hostname: host4
Model: t1600
JUNOS Base OS boot [12.3-20121019.0]
JUNOS Base OS Software Suite [12.3-20121019.0]
JUNOS Kernel Software Suite [12.3-20121019.0]
JUNOS Crypto Software Suite [12.3-20121019.0]
JUNOS Packet Forwarding Engine Support (M/T Common) [12.3-20121019.0]
JUNOS Packet Forwarding Engine Support (T-Series) [12.3-20121019.0]
JUNOS Online Documentation [12.3-20121019.0]
JUNOS Services AACL Container package [12.3-20121019.0]
JUNOS Services Application Level Gateways [12.3-20121019.0]
JUNOS AppId Services [12.3-20121019.0]
JUNOS Border Gateway Function package [12.3-20121019.0]
JUNOS Services Captive Portal and Content Delivery Container package
[12.3-20121019.0]
JUNOS Services HTTP Content Management package [12.3-20121019.0]
JUNOS IDP Services [12.3-20121019.0]
JUNOS Services LL-PDF Container package [12.3-20121019.0]
JUNOS Services NAT [12.3-20121019.0]
JUNOS Services PTSP Container package [12.3-20121019.0]
JUNOS Services RPM [12.3-20121019.0]
JUNOS Services Stateful Firewall [12.3-20121019.0]
JUNOS Voice Services Container package [12.3-20121019.0]
JUNOS Services Example Container package [12.3-20121019.0]
JUNOS Services Crypto [12.3-20121019.0]
JUNOS Services SSL [12.3-20121019.0]
JUNOS Services IPSec [12.3-20121019.0]
JUNOS Runtime Software Suite [12.3-20121019.0]
JUNOS Routing Software Suite [12.3-20121019.0]

```

#### show version (TX Matrix Plus Router with 3D SIBs)

```

user@host>show version
sfc0-re0:

```

```

Hostname: sfc0

```



```

Model: txp
JUNOS Base OS boot [13.1-20130306.0]
JUNOS Base OS Software Suite [13.1-20130306.0]
JUNOS Kernel Software Suite [13.1-20130306.0]
JUNOS Crypto Software Suite [13.1-20130306.0]
JUNOS Packet Forwarding Engine Support (M/T Common) [13.1-20130306.0]
JUNOS Packet Forwarding Engine Support (T-Series) [13.1-20130306.0]
JUNOS Online Documentation [13.1-20130306.0]
JUNOS Services ACL Container package [13.1-20130306.0]
JUNOS Services Application Level Gateways [13.1-20130306.0]
JUNOS AppId Services [13.1-20130306.0]
JUNOS Border Gateway Function package [13.1-20130306.0]
JUNOS Services Captive Portal and Content Delivery Container package
[13.1-20130306.0]
JUNOS Services HTTP Content Management package [13.1-20130306.0]
JUNOS IDP Services [13.1-20130306.0]
JUNOS Services Jflow Container package [13.1-20130306.0]
JUNOS Services LL-PDF Container package [13.1-20130306.0]
JUNOS Services MobileNext Software package [13.1-20130306.0]
JUNOS Services Mobile Subscriber Service Container package [13.1-20130306.0]
JUNOS Services NAT [13.1-20130306.0]
JUNOS Services PTSP Container package [13.1-20130306.0]
JUNOS Services RPM [13.1-20130306.0]
JUNOS Services Stateful Firewall [13.1-20130306.0]
JUNOS Voice Services Container package [13.1-20130306.0]
JUNOS Services Example Container package [13.1-20130306.0]
JUNOS Services Crypto [13.1-20130306.0]
JUNOS Services SSL [13.1-20130306.0]
JUNOS Services IPSec [13.1-20130306.0]
JUNOS Runtime Software Suite [13.1-20130306.0]
JUNOS Routing Software Suite [13.1-20130306.0]

```

```
lcc0-re0:
```

```

Hostname: lcc0
Model: t4000
JUNOS Base OS boot [13.1-20130306.0]
JUNOS Base OS Software Suite [13.1-20130306.0]
JUNOS Kernel Software Suite [13.1-20130306.0]
JUNOS Crypto Software Suite [13.1-20130306.0]
JUNOS Packet Forwarding Engine Support (M/T Common) [13.1-20130306.0]
JUNOS Packet Forwarding Engine Support (T-Series) [13.1-20130306.0]
JUNOS Online Documentation [13.1-20130306.0]
JUNOS Services ACL Container package [13.1-20130306.0]
JUNOS Services Application Level Gateways [13.1-20130306.0]
JUNOS AppId Services [13.1-20130306.0]
JUNOS Border Gateway Function package [13.1-20130306.0]
JUNOS Services Captive Portal and Content Delivery Container package
[13.1-20130306.0]
JUNOS Services HTTP Content Management package [13.1-20130306.0]
JUNOS IDP Services [13.1-20130306.0]
JUNOS Services Jflow Container package [13.1-20130306.0]
JUNOS Services LL-PDF Container package [13.1-20130306.0]
JUNOS Services MobileNext Software package [13.1-20130306.0]
JUNOS Services Mobile Subscriber Service Container package [13.1-20130306.0]
JUNOS Services NAT [13.1-20130306.0]
JUNOS Services PTSP Container package [13.1-20130306.0]
JUNOS Services RPM [13.1-20130306.0]
JUNOS Services Stateful Firewall [13.1-20130306.0]
JUNOS Voice Services Container package [13.1-20130306.0]
JUNOS Services Example Container package [13.1-20130306.0]

```

JUNOS Services Crypto [13.1-20130306.0]  
JUNOS Services SSL [13.1-20130306.0]  
JUNOS Services IPSec [13.1-20130306.0]  
JUNOS Runtime Software Suite [13.1-20130306.0]  
JUNOS Routing Software Suite [13.1-20130306.0]

lcc2-re0:

-----  
Hostname: lcc2  
Model: t4000  
JUNOS Base OS boot [13.1-20130306.0]  
JUNOS Base OS Software Suite [13.1-20130306.0]  
JUNOS Kernel Software Suite [13.1-20130306.0]  
JUNOS Crypto Software Suite [13.1-20130306.0]  
JUNOS Packet Forwarding Engine Support (M/T Common) [13.1-20130306.0]  
JUNOS Packet Forwarding Engine Support (T-Series) [13.1-20130306.0]  
JUNOS Online Documentation [13.1-20130306.0]  
JUNOS Services AACL Container package [13.1-20130306.0]  
JUNOS Services Application Level Gateways [13.1-20130306.0]  
JUNOS AppId Services [13.1-20130306.0]  
JUNOS Border Gateway Function package [13.1-20130306.0]  
JUNOS Services Captive Portal and Content Delivery Container package [13.1-20130306.0]  
JUNOS Services HTTP Content Management package [13.1-20130306.0]  
JUNOS IDP Services [13.1-20130306.0]  
JUNOS Services Jflow Container package [13.1-20130306.0]  
JUNOS Services LL-PDF Container package [13.1-20130306.0]  
JUNOS Services MobileNext Software package [13.1-20130306.0]  
JUNOS Services Mobile Subscriber Service Container package [13.1-20130306.0]  
JUNOS Services NAT [13.1-20130306.0]  
JUNOS Services PTSP Container package [13.1-20130306.0]  
JUNOS Services RPM [13.1-20130306.0]  
JUNOS Services Stateful Firewall [13.1-20130306.0]  
JUNOS Voice Services Container package [13.1-20130306.0]  
JUNOS Services Example Container package [13.1-20130306.0]  
JUNOS Services Crypto [13.1-20130306.0]  
JUNOS Services SSL [13.1-20130306.0]  
JUNOS Services IPSec [13.1-20130306.0]  
JUNOS Runtime Software Suite [13.1-20130306.0]  
JUNOS Routing Software Suite [13.1-20130306.0]

lcc4-re0:

-----  
Hostname: lcc4  
Model: t4000  
JUNOS Base OS boot [13.1-20130306.0]  
JUNOS Base OS Software Suite [13.1-20130306.0]  
JUNOS Kernel Software Suite [13.1-20130306.0]  
JUNOS Crypto Software Suite [13.1-20130306.0]  
JUNOS Packet Forwarding Engine Support (M/T Common) [13.1-20130306.0]  
JUNOS Packet Forwarding Engine Support (T-Series) [13.1-20130306.0]  
JUNOS Online Documentation [13.1-20130306.0]  
JUNOS Services AACL Container package [13.1-20130306.0]  
JUNOS Services Application Level Gateways [13.1-20130306.0]  
JUNOS AppId Services [13.1-20130306.0]  
JUNOS Border Gateway Function package [13.1-20130306.0]  
JUNOS Services Captive Portal and Content Delivery Container package [13.1-20130306.0]  
JUNOS Services HTTP Content Management package [13.1-20130306.0]  
JUNOS IDP Services [13.1-20130306.0]

```

JUNOS Services Jflow Container package [13.1-20130306.0]
JUNOS Services LL-PDF Container package [13.1-20130306.0]
JUNOS Services MobileNext Software package [13.1-20130306.0]
JUNOS Services Mobile Subscriber Service Container package [13.1-20130306.0]
JUNOS Services NAT [13.1-20130306.0]
JUNOS Services PTSP Container package [13.1-20130306.0]
JUNOS Services RPM [13.1-20130306.0]
JUNOS Services Stateful Firewall [13.1-20130306.0]
JUNOS Voice Services Container package [13.1-20130306.0]
JUNOS Services Example Container package [13.1-20130306.0]
JUNOS Services Crypto [13.1-20130306.0]
JUNOS Services SSL [13.1-20130306.0]
JUNOS Services IPSec [13.1-20130306.0]
JUNOS Runtime Software Suite [13.1-20130306.0]
JUNOS Routing Software Suite [13.1-20130306.0]

```

lcc6-re0:

```

Hostname: lcc6
Model: t1600
JUNOS Base OS boot [13.1-20130306.0]
JUNOS Base OS Software Suite [13.1-20130306.0]
JUNOS Kernel Software Suite [13.1-20130306.0]
JUNOS Crypto Software Suite [13.1-20130306.0]
JUNOS Packet Forwarding Engine Support (M/T Common) [13.1-20130306.0]
JUNOS Packet Forwarding Engine Support (T-Series) [13.1-20130306.0]
JUNOS Online Documentation [13.1-20130306.0]
JUNOS Services AACL Container package [13.1-20130306.0]
JUNOS Services Application Level Gateways [13.1-20130306.0]
JUNOS AppId Services [13.1-20130306.0]
JUNOS Border Gateway Function package [13.1-20130306.0]
JUNOS Services Captive Portal and Content Delivery Container package
[13.1-20130306.0]
JUNOS Services HTTP Content Management package [13.1-20130306.0]
JUNOS IDP Services [13.1-20130306.0]
JUNOS Services Jflow Container package [13.1-20130306.0]
JUNOS Services LL-PDF Container package [13.1-20130306.0]
JUNOS Services MobileNext Software package [13.1-20130306.0]
JUNOS Services Mobile Subscriber Service Container package [13.1-20130306.0]
JUNOS Services NAT [13.1-20130306.0]
JUNOS Services PTSP Container package [13.1-20130306.0]
JUNOS Services RPM [13.1-20130306.0]
JUNOS Services Stateful Firewall [13.1-20130306.0]
JUNOS Voice Services Container package [13.1-20130306.0]
JUNOS Services Example Container package [13.1-20130306.0]
JUNOS Services Crypto [13.1-20130306.0]
JUNOS Services SSL [13.1-20130306.0]
JUNOS Services IPSec [13.1-20130306.0]
JUNOS Runtime Software Suite [13.1-20130306.0]
JUNOS Routing Software Suite [13.1-20130306.0]

```

lcc7-re0:

```

Hostname: lcc7
Model: t1600
JUNOS Base OS boot [13.1-20130306.0]
JUNOS Base OS Software Suite [13.1-20130306.0]
JUNOS Kernel Software Suite [13.1-20130306.0]
JUNOS Crypto Software Suite [13.1-20130306.0]
JUNOS Packet Forwarding Engine Support (M/T Common) [13.1-20130306.0]

```

```
JUNOS Packet Forwarding Engine Support (T-Series) [13.1-20130306.0]
JUNOS Online Documentation [13.1-20130306.0]
JUNOS Services AACL Container package [13.1-20130306.0]
JUNOS Services Application Level Gateways [13.1-20130306.0]
JUNOS AppId Services [13.1-20130306.0]
JUNOS Border Gateway Function package [13.1-20130306.0]
JUNOS Services Captive Portal and Content Delivery Container package
[13.1-20130306.0]
JUNOS Services HTTP Content Management package [13.1-20130306.0]
JUNOS IDP Services [13.1-20130306.0]
JUNOS Services Jflow Container package [13.1-20130306.0]
JUNOS Services LL-PDF Container package [13.1-20130306.0]
JUNOS Services MobileNext Software package [13.1-20130306.0]
JUNOS Services Mobile Subscriber Service Container package [13.1-20130306.0]
JUNOS Services NAT [13.1-20130306.0]
JUNOS Services PTSP Container package [13.1-20130306.0]
JUNOS Services RPM [13.1-20130306.0]
JUNOS Services Stateful Firewall [13.1-20130306.0]
JUNOS Voice Services Container package [13.1-20130306.0]
JUNOS Services Example Container package [13.1-20130306.0]
JUNOS Services Crypto [13.1-20130306.0]
JUNOS Services SSL [13.1-20130306.0]
JUNOS Services IPSec [13.1-20130306.0]
JUNOS Runtime Software Suite [13.1-20130306.0]
JUNOS Routing Software Suite [13.1-20130306.0]
```

#### show version (MX Series Router)

```
user@host5> show version
Hostname: host5
Model: mx80
JUNOS Base OS boot [11.3-20110717.0]
JUNOS Base OS Software Suite [11.3-20110717.0]
JUNOS Kernel Software Suite [11.3-20110717.0]
JUNOS Crypto Software Suite [11.3-20110717.0]
JUNOS Packet Forwarding Engine Support (MX80) [11.3-20110717.0]
JUNOS Online Documentation [11.3-20110717.0]
JUNOS Routing Software Suite [11.3-20110717.0]
```

#### show version (QFX3500 Switch)

```
user@switch> show version
Hostname: switch
Model: qfx_s3500
JUNOS Base OS boot [11.1R1]
JUNOS Base OS Software Suite [11.1R1]
JUNOS Kernel Software Suite [11.1R1]
JUNOS Crypto Software Suite [11.1R1]
JUNOS Online Documentation [11.1R1]
JUNOS Enterprise Software Suite [11.1R1]
JUNOS Packet Forwarding Engine Support (QFX) [11.1R1]
JUNOS Routing Software Suite [11.1R1]
```

#### show version (QFabric System)

```
user@qfabric> show version
Hostname: qfabric
Model: qfx3000-g
Serial Number: qfsn-0123456789
QFabric System ID: f158527a-f99e-11e0-9fbd-00e081c57cda
JUNOS Base Version [12.2I20111018_0215_dc-builder]
```

**show version component all (QFabric System)**

```

user@switch> show version component all
dg1:
-
Hostname: qfabric
Model: qfx3100
JUNOS Base Version [11.3R1.6]

dg0:
-
Hostname: qfabric
Model: qfx3100
JUNOS Base Version [11.3R1.6]

NW-NG-0:
-
Hostname: qfabric
Model: qfx-jvre
JUNOS Base OS boot [11.3R1.6]
JUNOS Base OS Software Suite [11.3R1.6]
JUNOS Kernel Software Suite [11.3R1.6]
JUNOS Crypto Software Suite [11.3R1.6]
JUNOS Online Documentation [11.3R1.6]
JUNOS Enterprise Software Suite [11.3R1.6]
JUNOS Packet Forwarding Engine Support (QFX RE) [11.3R1.6]
JUNOS Routing Software Suite [11.3R1.6]

FC-0:
-
Hostname: qfabric
Model: qfx-jvre
JUNOS Base OS boot [11.3R1.6]
JUNOS Base OS Software Suite [11.3R1.6]
JUNOS Kernel Software Suite [11.3R1.6]
JUNOS Crypto Software Suite [11.3R1.6]
JUNOS Online Documentation [11.3R1.6]
JUNOS Enterprise Software Suite [11.3R1.6]
JUNOS Packet Forwarding Engine Support (QFX RE) [11.3R1.6]
JUNOS Routing Software Suite [11.3R1.6]

FC-1:
Hostname: qfabric
Model: qfx-jvre
JUNOS Base OS boot [11.3R1.6]
JUNOS Base OS Software Suite [11.3R1.6]
JUNOS Kernel Software Suite [11.3R1.6]
JUNOS Crypto Software Suite [11.3R1.6]
JUNOS Online Documentation [11.3R1.6]
JUNOS Enterprise Software Suite [11.3R1.6]
JUNOS Packet Forwarding Engine Support (QFX RE) [11.3R1.6]
JUNOS Routing Software Suite [11.3R1.6]

DRE-0:
-
Hostname: dre-0
Model: qfx-jvre
JUNOS Base OS boot [11.3R1.6]
JUNOS Base OS Software Suite [11.3R1.6]
JUNOS Kernel Software Suite [11.3R1.6]
JUNOS Crypto Software Suite [11.3R1.6]

```

```
JUNOS Online Documentation [11.3R1.6]
JUNOS Enterprise Software Suite [11.3R1.6]
JUNOS Packet Forwarding Engine Support (QFX RE) [11.3R1.6]
JUNOS Routing Software Suite [11.3R1.6]
```

```
FM-0:
```

```
-
```

```
Hostname: qfabric
Model: qfx-jvre
JUNOS Base OS boot [11.3R1.6]
JUNOS Base OS Software Suite [11.3R1.6]
JUNOS Kernel Software Suite [11.3R1.6]
JUNOS Crypto Software Suite [11.3R1.6]
JUNOS Online Documentation [11.3R1.6]
JUNOS Enterprise Software Suite [11.3R1.6]
JUNOS Packet Forwarding Engine Support (QFX RE) [11.3R1.6]
JUNOS Routing Software Suite [11.3R1.6]
```

```
nodedevice1:
```

```
-
```


```
Hostname: qfabric
Model: QFX3500
JUNOS Base OS boot [11.3R1.6]
JUNOS Base OS Software Suite [11.3R1.6]
JUNOS Kernel Software Suite [11.3R1.6]
JUNOS Crypto Software Suite [11.3R1.6]
JUNOS Online Documentation [11.3R1.6]
JUNOS Enterprise Software Suite [11.3R1.6]
JUNOS Packet Forwarding Engine Support (QFX RE) [11.3R1.6]
JUNOS Routing Software Suite [11.3R1.6]
```

```
interconnectdevice1:
```

```
-
```

```
Hostname: qfabric
Model: QFX3108
JUNOS Base OS boot [11.3R1.6]
JUNOS Base OS Software Suite [11.3R1.6]
JUNOS Kernel Software Suite [11.3R1.6]
JUNOS Crypto Software Suite [11.3R1.6]
JUNOS Online Documentation [11.3R1.6]
JUNOS Enterprise Software Suite [11.3R1.6]
JUNOS Packet Forwarding Engine Support (QFX RE) [11.3R1.6]
JUNOS Routing Software Suite [11.3R1.6]
warning: from interconnectdevice0: Disconnected
```

## start shell

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                               | start shell (csh   sh)<br><user <i>username</i> >                                                                                                                                                                                                                  |
| <b>Release Information</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Exit from the CLI environment and create a UNIX-level shell. To return to the CLI, type <b>exit</b> from the shell.                                                                                                                                                |
| <div>  <b>NOTE:</b> <ul style="list-style-type: none"> <li>To issue this command, the user must have the required login access privileges configured by including the <b>permissions</b> statement at the [edit system login class <i>class-name</i>] hierarchy level.</li> <li>UNIX wheel group membership or permissions are no longer required to issue this command.</li> </ul> </div> |                                                                                                                                                                                                                                                                    |
| <b>Options</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>csh</b> —Create a UNIX C shell.<br><br><b>sh</b> —Create a UNIX Bourne shell.<br><br><b>user <i>username</i></b> —(Optional) Start the shell as another user.                                                                                                   |
| <b>Additional Information</b>                                                                                                                                                                                                                                                                                                                                                                                                                                               | When you are in the shell, the shell prompt has the following format:<br><i>username@hostname%</i><br>An example of the prompt is:<br>root@host%                                                                                                                   |
| <b>Required Privilege Level</b>                                                                                                                                                                                                                                                                                                                                                                                                                                             | shell and maintenance                                                                                                                                                                                                                                              |
| <b>List of Sample Output</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                | <a href="#">start shell csh on page 1287</a>                                                                                                                                                                                                                       |
| <b>Output Fields</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                        | When you enter this command, you are provided feedback on the status of your request.                                                                                                                                                                              |

## Sample Output

### start shell csh

```
user@host> start shell csh
%
exit
%
```

```
username@hostname% start shell sh
%

exit
user@host>
```



## test configuration

|                                 |                                                                                                                                                                                                                                                                                       |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>test configuration <i>filename</i></code>                                                                                                                                                                                                                                       |
| <b>Release Information</b>      | <p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> |
| <b>Description</b>              | Verify that the syntax of a configuration file is correct. If the configuration contains any syntax or commit check errors, a message is displayed to indicate the line number and column number in which the error was found. This command only accepts text files.                  |
| <b>Options</b>                  | <p><b><i>filename</i></b>—Name of the configuration file.</p> <p><b>syntax-only</b>—Check the syntax of a partial configuration file, without checking for commit errors. This option introduced in Junos OS Release 12.1.</p>                                                        |
| <b>Required Privilege Level</b> | view                                                                                                                                                                                                                                                                                  |
| <b>List of Sample Output</b>    | <a href="#">test configuration on page 1289</a>                                                                                                                                                                                                                                       |
| <b>Output Fields</b>            | When you enter this command, you are provided feedback on the status of your request.                                                                                                                                                                                                 |

## Sample Output

### test configuration

```

user@host> test configuration terminal
[Type ^D to end input]
system {
host-name bluesky;
paris-23;
login;
}
terminal:3:(8) syntax error: paris
[edit system]
 'paris-23;'
 syntax error
terminal:4:(11) statement must contain additional statements: ;
[edit system login]
 'login ;'
 statement must contain additional statements
configuration syntax failed

```

## traceroute

**List of Syntax**   [Syntax on page 1290](#)  
[Syntax \(QFX Series and OCX Series\) on page 1290](#)

**Syntax**   `traceroute host`  
                   `<as-number-lookup>`  
                   `<bypass-routing>`  
                   `<clns>`  
                   `<gateway address>`  
                   `<inet | inet6>`  
                   `<interface interface-name>`  
                   `<logical system logical-system-name>`  
                   `<monitor host>`  
                   `<mpls (ldp FEC address | rsvp label-switched-path-name)>`  
                   `<no-resolve>`  
                   `<propagate-ttl>`  
                   `<routing-instance routing-instance-name>`  
                   `<source source-address>`  
                   `<tos value>`  
                   `<ttl value>`  
                   `<wait seconds>`

**Syntax (QFX Series and OCX Series)**   `traceroute host`  
                   `<as-number-lookup>`  
                   `<bypass-routing>`  
                   `<gateway address>`  
                   `<inet>`  
                   `<inet6>`  
                   `<interface interface-name>`  
                   `<monitor host>`  
                   `<no-resolve>`  
                   `<routing-instance routing-instance-name>`  
                   `<source source-address>`  
                   `<tos value>`  
                   `<ttl value>`  
                   `<wait seconds>`

**Release Information**   Command introduced before Junos OS Release 7.4.  
                               Command introduced in Junos OS Release 9.0 for EX Series switches.  
                               **mpls** option introduced in Junos OS Release 9.2.  
                               Command introduced in Junos OS Release 11.1 for the QFX Series.  
                               **propagate-ttl** option introduced in Junos OS Release 12.1.  
                               Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

**Description**   Display the route that packets take to a specified network host. Use **traceroute** as a debugging tool to locate points of failure in a network.

**Options**   **host**—IP address or name of remote host.

**as-number-lookup**—(Optional) Display the autonomous system (AS) number of each intermediate hop on the path from the host to the destination.

**bypass-routing**—(Optional) Bypass the normal routing tables and send requests directly to a system on an attached network. If the system is not on a directly attached network, an error is returned. Use this option to display a route to a local system through an interface that has no route through it.

**clns**—(Optional) Trace the route belonging to the Connectionless Network Service (CLNS).

**gateway address**—(Optional) Address of a router or switch through which the route transits.

**inet | inet6**—(Optional) Trace the route belonging to IPv4 or IPv6, respectively.

**interface *interface-name***—(Optional) Name of the interface over which to send packets.

**logical-system *logical-system-name***—(Optional) Perform this operation on all logical systems or on a particular logical system.

**monitor *host***—(Optional) Display real-time monitoring information for the specified host.

**mpls (*ldp FEC address* | *rsvp label-switched-path name*)**—(Optional) See *traceroute mpls ldp* and *traceroute mpls rsvp*.

**no-resolve**—(Optional) Do not attempt to determine the hostname that corresponds to the IP address.

**propagate-ttl**—(Optional) On the PE routing device, use this option to view locally generated Routing Engine transit traffic. This is applicable for MPLS L3VPN traffic only.

Use for troubleshooting, when you want to view hop-by-hop information from the local provider router to the remote provider router, when TTL decrementing is disabled on the core network using the **no-propagate-ttl** configuration statement.



**NOTE:** Using **propagate-ttl** with **traceroute** on the CE router does not show hop-by-hop information.

**routing-instance *routing-instance-name***—(Optional) Name of the routing instance for the traceroute attempt.

**source *source-address***—(Optional) Source address of the outgoing traceroute packets.

**tos *value***—(Optional) Value to include in the IP type-of-service (ToS) field. The range of values is 0 through 255.

**ttl *value***—(Optional) Maximum time-to-live value to include in the traceroute request. The range of values is 0 through 128.

**wait *seconds***—(Optional) Maximum time to wait for a response to the traceroute request.

**Required Privilege Level** network

## Related Documentation

- [traceroute monitor on page 1294](#)

## List of Sample Output

[traceroute on page 1292](#)  
[traceroute as-number-lookup host on page 1292](#)  
[traceroute no-resolve on page 1292](#)  
[traceroute propagate-ttl on page 1293](#)  
[traceroute \(Between CE Routers, Layer 3 VPN\) on page 1293](#)  
[traceroute \(Through an MPLS LSP\) on page 1293](#)

## Output Fields

Table 80 on page 1292 describes the output fields for the **traceroute** command. Output fields are listed in the approximate order in which they appear.

**Table 80: traceroute Output Fields**

| Field Name             | Field Description                                             |
|------------------------|---------------------------------------------------------------|
| <b>traceroute to</b>   | IP address of the receiver.                                   |
| <b>hops max</b>        | Maximum number of hops allowed.                               |
| <b>byte packets</b>    | Size of packets being sent.                                   |
| <i>number-of-hops</i>  | Number of hops from the source to the named router or switch. |
| <i>router-name</i>     | Name of the router or switch for this hop.                    |
| <i>address</i>         | Address of the router or switch for this hop.                 |
| <b>Round trip time</b> | Average round-trip time, in milliseconds (ms).                |

## Sample Output

### traceroute

```

user@host> traceroute santacruz
traceroute to green.company.net (10.156.169.254), 30 hops max, 40 byte packets
 1 blue23 (10.168.1.254) 2.370 ms 2.853 ms 0.367 ms
 2 red14 (10.168.255.250) 0.778 ms 2.937 ms 0.446 ms
 3 yellow (10.156.169.254) 7.737 ms 89.905 ms 0.834 ms

```

### traceroute as-number-lookup host

```

user@host> traceroute as-number-lookup 10.100.1.1
traceroute to 10.100.1.1 (10.100.1.1), 30 hops max, 40 byte packets
 1 10.39.1.1 (10.39.1.1) 0.779 ms 0.728 ms 0.562 ms
 2 10.39.1.6 (10.39.1.6) [AS 32] 0.657 ms 0.611 ms 0.617 ms
 3 10.100.1.1 (10.100.1.1) [AS 10, 40, 50] 0.880 ms 0.808 ms 0.774 ms

```

### traceroute no-resolve

```

user@host> traceroute santacruz no-resolve

```

```

traceroute to green.company.net (10.156.169.254), 30 hops max, 40 byte packets
 1 10.168.1.254 0.458 ms 0.370 ms 0.365 ms
 2 10.168.255.250 0.474 ms 0.450 ms 0.444 ms
 3 10.156.169.254 0.931 ms 0.876 ms 0.862 ms

```

### traceroute propagate-ttl

```

user@host> traceroute propagate-ttl 100.200.2.2 routing-instance VPN-A
traceroute to 100.200.2.2 (100.200.2.2) from 1.1.0.2, 30 hops max, 40 byte packets

 1 1.2.0.2 (1.2.0.2) 2.456 ms 1.753 ms 1.672 ms
 MPLS Label=299776 CoS=0 TTL=1 S=0
 MPLS Label=299792 CoS=0 TTL=1 S=1
 2 1.3.0.2 (1.3.0.2) 1.213 ms 1.225 ms 1.166 ms
 MPLS Label=299792 CoS=0 TTL=1 S=1
 3 100.200.2.2 (100.200.2.2) 1.422 ms 1.521 ms 1.443 ms

```

### traceroute (Between CE Routers, Layer 3 VPN)

```

user@host> traceroute vpn09
traceroute to vpn09.skybank.net (10.255.14.179), 30 hops max, 40
byte packets
 1 10.39.10.21 (10.39.10.21) 0.598 ms 0.500 ms 0.461 ms
 2 10.39.1.13 (10.39.1.13) 0.796 ms 0.775 ms 0.806 ms
 MPLS Label=100006 CoS=0 TTL=1 S=1
 3 vpn09.skybank.net (10.255.14.179) 0.783 ms 0.716 ms 0.686

```

### traceroute (Through an MPLS LSP)

```

user@host> traceroute mpls1
traceroute to 10.168.1.224 (10.168.1.224), 30 hops max, 40 byte packets
 1 mpls1-sr0.company.net (10.168.200.101) 0.555 ms 0.393 ms 0.367 ms
 MPLS Label=1024 CoS=0 TTL=1
 2 mpls5-lo0.company.net (10.168.1.224) 0.420 ms 0.394 ms 0.401 ms

```

## traceroute monitor

---

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>      | <a href="#">Syntax on page 1294</a><br><a href="#">Syntax (QFX Series) on page 1294</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Syntax</b>              | <code>traceroute monitor <i>host</i></code><br><code>&lt;count <i>value</i>&gt;</code><br><code>&lt;inet   inet6&gt;</code><br><code>&lt;interval <i>seconds</i>&gt;</code><br><code>&lt;no resolve&gt;</code><br><code>&lt;size <i>value</i>&gt;</code><br><code>&lt;source <i>source-address</i>&gt;</code><br><code>&lt;summary&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Syntax (QFX Series)</b> | <code>traceroute monitor <i>host</i></code><br><code>&lt;count <i>value</i>&gt;</code><br><code>&lt;inet&gt;</code><br><code>&lt;inet6&gt;</code><br><code>&lt;interval <i>seconds</i>&gt;</code><br><code>&lt;no resolve&gt;</code><br><code>&lt;size <i>value</i>&gt;</code><br><code>&lt;source <i>source-address</i>&gt;</code><br><code>&lt;summary&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Release Information</b> | Command introduced in Junos OS Release 8.0<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Description</b>         | Display live monitoring of each hop in the route that packets take to a specified network host. Use as a debugging tool to locate points of failure in a network.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Options</b>             | <p><b><i>host</i></b>—IP address or name of remote host.</p> <p><b><i>count value</i></b>—Number of ping requests, in packets, to send in summary mode. The default value is <b>10</b>.</p> <p><b><i>inet   inet6</i></b>—(Optional) Trace the route belonging to IPv4 or IPv6, respectively.</p> <p><b><i>interval seconds</i></b>—(Optional) Number of seconds to wait before sending ping requests. The default value is <b>1</b>.</p> <p><b><i>no resolve</i></b>—(Optional) Do not attempt to display addresses symbolically.</p> <p><b><i>size value</i></b>—(Optional) Receive the specified number of bytes for each packet. The range is <b>0</b> through <b>65468</b> bytes. The default value is <b>64</b>.</p> <p><b><i>source source-address</i></b>—(Optional) Source address of the outgoing ping packets.</p> <p><b><i>summary</i></b>—(Optional) Generate and display a summary of live monitoring of each hop on the route that packets take to a specified network host.</p> |

**Required Privilege Level** network

**List of Sample Output** [traceroute monitor on page 1295](#)

**Output Fields** [Table 81 on page 1295](#) describes the output fields for the **traceroute monitor** command. Output fields are listed in the approximate order in which they appear.

**Table 81: traceroute monitor Output Fields**

| Field Name   | Field Description                                                                                                       |
|--------------|-------------------------------------------------------------------------------------------------------------------------|
| <b>Host</b>  | Hostname or IP address of the router at each hop.                                                                       |
| <b>Loss%</b> | Percent of packet loss. The number of ping responses divided by the number of ping requests, specified as a percentage. |
| <b>Snt</b>   | Number of ping requests sent to the router at this hop.                                                                 |
| <b>Last</b>  | Most recent round-trip time, in milliseconds, to the router at this hop.                                                |
| <b>Avg</b>   | Average round-trip time, in milliseconds, to the router at this hop.                                                    |
| <b>Best</b>  | Shortest round-trip time, in milliseconds, to the router at this hop.                                                   |
| <b>Wrst</b>  | Longest round-trip time, in milliseconds, to the router at this hop.                                                    |
| <b>StDev</b> | Standard deviation of round-trip times, in milliseconds, to the router at this hop.                                     |

## Sample Output

### traceroute monitor

```
user@host> traceroute monitor 10.16.0.1
```

|                   | Loss% | Snt | Last | Avg | Best | Wrst | StDev |
|-------------------|-------|-----|------|-----|------|------|-------|
| Host              |       |     |      |     |      |      |       |
| 1. 10.17.41.254   | 0.0%  | 17  | 0.7  | 1.0 | 0.6  | 5.4  | 1.2   |
| 2. secret.net     | 0.0%  | 17  | 0.6  | 1.0 | 0.6  | 6.6  | 1.4   |
| 3. top-secret.net | 0.0%  | 17  | 0.6  | 0.6 | 0.6  | 0.6  | 0.0   |





## CHAPTER 36

# Standard Software Installation and Upgrade Operational Commands

- request system software add
- request system software delete
- request system software download
- request system software rollback
- request system software validate
- rollback
- show system rollback

## request system software add

---

**List of Syntax**    [Syntax on page 1298](#)  
                         [Syntax \(EX Series Switches\) on page 1298](#)  
                         [Syntax \(TX Matrix Router\) on page 1298](#)  
                         [Syntax \(TX Matrix Plus Router\) on page 1299](#)  
                         [Syntax \(MX Series Router\) on page 1299](#)  
                         [Syntax \(QFX Series\) on page 1299](#)  
                         [Syntax \(OCX Series\) on page 1299](#)

**Syntax**    request system software add *package-name*  
                 <best-effort-load>  
                 <delay-restart>  
                 <force>  
                 <no-copy>  
                 <no-validate>  
                 <re0 | re1>  
                 <reboot>  
                 <set [*package-name package-name*]>  
                 <unlink>  
                 <upgrade-with-config>  
                 <upgrade-with-config-format *format*>  
                 <validate>

**Syntax (EX Series Switches)**    request system software add *package-name*  
                 <best-effort-load>  
                 <delay-restart>  
                 <force>  
                 <no-copy>  
                 <no-validate>  
                 <re0 | re1>  
                 <reboot>  
                 <set [*package-name package-name*]>  
                 <upgrade-with-config>  
                 <upgrade-with-config-format *format*>  
                 <validate>

**Syntax (TX Matrix Router)**    request system software add *package-name*  
                 <best-effort-load>  
                 <delay-restart>  
                 <force>  
                 <lcc *number* | scc>  
                 <no-copy>  
                 <no-validate>  
                 <re0 | re1>  
                 <reboot>  
                 <set [*package-name package-name*]>  
                 <unlink>  
                 <upgrade-with-config>  
                 <upgrade-with-config-format *format*>  
                 <validate>

**Syntax (TX Matrix Plus Router)** request system software add *package-name*  
 <best-effort-load>  
 <delay-restart>  
 <force>  
 <lcc *number* | sfc *number*>  
 <no-copy>  
 <no-validate>  
 <re0 | re1>  
 <reboot>  
 <set [*package-name package-name*]>  
 <unlink>  
 <upgrade-with-config>  
 <upgrade-with-config-format *format*>  
 <validate>

**Syntax (MX Series Router)** request system software add *package-name*  
 <best-effort-load>  
 <delay-restart>  
 <force>  
 <member *member-id*>  
 <no-copy>  
 <no-validate>  
 <re0 | re1>  
 <reboot>  
 <set [*package-name package-name*]>  
 <unlink>  
 <upgrade-with-config>  
 <upgrade-with-config-format *format*>  
 <validate>

**Syntax (QFX Series)** request system software add *package-name*  
 <best-effort-load>  
 <component all>  
 <delay-restart>  
 <force>  
 <force-host>  
 <no-copy>  
 <no-validate>  
 <partition>  
 <reboot>  
 <unlink>  
 <upgrade-with-config>  
 <upgrade-with-config-format *format*>  
 <validate>

**Syntax (OCX Series)** request system software add *package-name*  
 <best-effort-load>  
 <delay-restart>  
 <force>  
 <force-host>  
 <no-copy>  
 <no-validate>  
 <reboot>  
 <unlink>  
 <upgrade-with-config>

<upgrade-with-config-format *format*>  
<validate>

#### Release Information

Command introduced before Junos OS Release 7.4.

**best-effort-load** and **unlink** options added in Junos OS Release 7.4.

Command introduced in Junos OS Release 9.0 for EX Series switches.

**sfc** option introduced for the TX Matrix Plus router in Junos OS Release 9.6.

Command introduced in Junos OS Release 11.1 for the QFX Series.

**set [package-name package-name]** option added in Junos OS Release 11.1 for EX Series switches.

**set [package-name package-name]** option added in Junos OS Release 12.2 for M Series, MX Series, T Series routers, and Branch SRX Series Services Gateways.



**NOTE:** On EX Series switches, the **set [package-name package-name]** option allows you to install only two software packages on a mixed EX4200 and EX4500 Virtual Chassis, whereas, on M Series, MX Series, T Series routers, and Branch SRX Series Services Gateways, the **set [package-name package-name]** option allows you to install multiple software packages and software add-on packages at the same time.

**upgrade-with-config** and **upgrade-with-config-format *format*** options added in Junos OS Release 12.3 for M Series routers, MX Series routers, T Series routers, EX Series Ethernet switches, and QFX Series devices.

Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

#### Description



**NOTE:** We recommend that you always download the software image to **/var/tmp** only. On EX Series and QFX Series switches, you must use the **/var/tmp** directory. Other directories are not supported.

Install a software package or bundle on the router or switch.



**WARNING:** Any configuration changes performed after inputting the **request system software add** command will be lost when the system reboots with an upgraded version of JUNOS.

#### Options

**package-name**—Location from which the software package or bundle is to be installed.  
For example:

- **/var/tmp/package-name**—For a software package or bundle that is being installed from a local directory on the router or switch.
- **protocol://hostname/pathname/package-name**—For a software package or bundle that is to be downloaded and installed from a remote location. Replace **protocol** with one of the following:

- **ftp**—File Transfer Protocol.  
Use **ftp://hostname/pathname/package-name**. To specify authentication credentials, use **ftp://<username>:<password>@hostname/pathname/package-name**. To have the system prompt you for the password, specify **prompt** in place of the password. If a password is required, and you do not specify the password or **prompt**, an error message is displayed.
- **http**—Hypertext Transfer Protocol.  
Use **http://hostname/pathname/package-name**. To specify authentication credentials, use **http://<username>:<password>@hostname/pathname/package-name**. If a password is required and you omit it, you are prompted for it.
- **scp**—Secure copy (available only for Canada and U.S. version).  
Use **scp://hostname/pathname/package-name**. To specify authentication credentials, use **scp://<username>:<password>@hostname/pathname/package-name**.

**NOTE:**

- The **pathname** in the protocol is the relative path to the user's home directory on the remote system and not the root directory.
- Do not use the **scp** protocol in the request system software add command to download and install a software package or bundle from a remote location. The previous statement does not apply to the QFabric switch. The software upgrade is handled by the MGD process which does not support **scp**.  
Use the file copy command to copy the software package or bundle from the remote location to the **/var/tmp** directory on the hard disk:  
**file copy scp://source/package-name /var/tmp**  
Then install the software package or bundle using the request system software add command:  
**request system software add /var/tmp/package-name**
- On a J Series Services Router, when you install the software from a remote location, the package is removed at the earliest opportunity in order to make room for the installation to be completed. If you copy the software to a local directory on the router and then install the new package, use the **unlink** option to achieve the same effect and allow the installation to be completed.

**best-effort-load**—(Optional) Activate a partial load and treat parsing errors as warnings instead of errors.

**component all**—(QFabric systems only) (Optional) Install software package on all of the QFabric components.

**delay-restart**—(Optional) Install a software package or bundle, but do not restart software processes.

**force**—(Optional) Force the addition of the software package or bundle (ignore warnings).

**force-host**—(Optional) Force the addition of host software package or bundle (ignore warnings) on the QFX5100 device.

**lcc number** —(TX Matrix routers and TX Matrix Plus routers only) (Optional) In a routing matrix based on the TX Matrix router, install a software package or bundle on a T640 router that is connected to the TX Matrix router. In a routing matrix based on the TX Matrix Plus router, install a software package or bundle on a router that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**member member-id**—(MX Series routers only) (Optional) Install a software package on the specified Virtual Chassis member. Replace *member-id* with a value of 0 or 1.

**partition** —(QFX3500 switches only) (Optional) Format and repartition the media before installation.

**scc**—(TX Matrix routers only) (Optional) Install a software package or bundle on a Routing Engine on a TX Matrix router (or switch-card chassis).

**sfc number**—(TX Matrix Plus routers only) (Optional) Install a software package or bundle on a Routing Engine on a TX Matrix Plus router. Replace *number* with 0.

**no-copy**—(Optional) Install a software package or bundle, but do not save copies of the package or bundle files.

**no-validate**—(Optional) When loading a software package or bundle with a different release, suppress the default behavior of the **validate** option.

**re0 | re1**—(Optional) On routers or switches that support dual or redundant Routing Engines, load a software package or bundle on the Routing Engine in slot 0 (re0) or the Routing Engine in slot 1 (re1).

**reboot**—(Optional) After adding the software package or bundle, reboot the system. On a QFabric switch, the software installation is not complete until you reboot the component for which you have installed the software.

**set** [*package-name package-name*]**—**(Mixed EX4200 and EX4500 Virtual Chassis only) (Optional) Install two software packages—a package for an EX4200 switch and the same release of the package for an EX4500 switch—to upgrade all member switches in a mixed EX4200 and EX4500 Virtual Chassis.

**set** [*package-name package-name*]**—**(M Series, MX Series, T Series routers, and Branch SRX Series Services Gateways only) (Optional) Install multiple software packages and software add-on packages at the same time.

**unlink****—**(Optional) On J Series Services Routers, this option ensures that the software package is removed at the earliest opportunity in order to make room for the installation to be completed. On M Series, T Series, and MX Series routers, use the **unlink** option to remove the software package from this directory after a successful upgrade is completed.

**upgrade-with-config****—**(Optional) Install one or more configuration files.

**upgrade-with-config-format** *format***—**(Optional) Specify the configuration file format, **text** or **xml**. The default format is **text**.



**NOTE:** The **upgrade-with-config** and **upgrade-with-config-format** options are only available locally on the router or switch. In a routing matrix, the configuration is applied only to the local router and is not propagated to other routers.

The options are validated during the validation process and applied to the router or switch during the upgrade process. If the upgrade process is successful, the options are removed from the configuration. If the upgrade process fails, the configuration file is renamed with the **.failed** suffix.

**validate****—**(Optional) Validate the software package or bundle against the current configuration as a prerequisite to adding the software package or bundle. This is the default behavior when the software package or bundle being added is a different release.



**NOTE:** The **validate** option only works on systems that do not have **graceful-switchover** (GRES) enabled. To use the **validate** option on a system with GRES, either disable GRES for the duration of the installation, or install using the command **request system software in-service-upgrade**, which requires nonstop active routing (NSR) to be enabled when using GRES.

**Additional Information** Before upgrading the software on the router or switch, when you have a known stable system, issue the **request system snapshot** command to back up the software, including

the configuration, to the `/altroot` and `/altconfig` file systems. After you have upgraded the software on the router or switch and are satisfied that the new package or bundle is successfully installed and running, issue the **request system snapshot** command again to back up the new software to the `/altroot` and `/altconfig` file systems.



**NOTE:** The **request system snapshot** command is currently not supported on the QFabric system. Also, you cannot add or install multiple packages on a QFabric system.

After you run the **request system snapshot** command, you cannot return to the previous version of the software, because the running and backup copies of the software are identical.

If you are upgrading more than one package at the same time, delete the operating system package, `jkernel`, last. Add the operating system package, `jkernel`, first and the routing software package, `jroute`, last. If you are upgrading all packages at once, delete and add them in the following order:

```
user@host> request system software add /var/tmp/jbase
user@host> request system software add /var/tmp/jkernel
user@host> request system software add /var/tmp/jpfe
user@host> request system software add /var/tmp/jdocs
user@host> request system software add /var/tmp/jroute
user@host> request system software add /var/tmp/jcrypto
```

By default, when you issue the **request system software add *package-name*** command on a TX Matrix master Routing Engine, all the T640 master Routing Engines that are connected to it are upgraded to the same version of software. If you issue the same command on the TX Matrix backup Routing Engine, all the T640 backup Routing Engines that are connected to it are upgraded to the same version of software.

Likewise, when you issue the **request system software add *package-name*** command on a TX Matrix Plus master Routing Engine, all the T1600 or T4000 master Routing Engines that are connected to it are upgraded to the same version of software. If you issue the same command on the TX Matrix Plus backup Routing Engine, all the T1600 or T4000 backup Routing Engines that are connected to it are upgraded to the same version of software.

**Required Privilege Level**

maintenance

**Related Documentation**

- [request system software delete on page 1307](#)
- [request system software rollback on page 1313](#)
- [request system storage cleanup on page 484](#)
- [Upgrading Software on page 273](#)
- [Upgrading Software on a QFabric System](#)



- *request system software add (Maintenance)*
- *Routing Matrix with a TX Matrix Plus Router Solutions Page*

**List of Sample Output** [request system software add validate on page 1305](#)  
[request system software add \(Mixed EX4200 and EX4500 Virtual Chassis\) on page 1306](#)  
[request system software add component all \(QFabric Systems\) on page 1306](#)

**Output Fields** When you enter this command, you are provided feedback on the status of your request.

## Sample Output

[request system software add validate](#)

```
user@host> request system software add validate /var/tmp/jinstall-7.2R1.7-domestic-signed.tgz
Checking compatibility with configuration
Initializing...
Using jbase-7.1R2.2
Using /var/tmp/jinstall-7.2R1.7-domestic-signed.tgz
Verified jinstall-7.2R1.7-domestic.tgz signed by PackageProduction_7_2_0
Using /var/validate/tmp/jinstall-signed/jinstall-7.2R1.7-domestic.tgz
Using /var/validate/tmp/jinstall/jbundle-7.2R1.7-domestic.tgz
Checking jbundle requirements on /
Using /var/validate/tmp/jbundle/jbase-7.2R1.7.tgz
Using /var/validate/tmp/jbundle/jkernel-7.2R1.7.tgz
Using /var/validate/tmp/jbundle/jcrypto-7.2R1.7.tgz
Using /var/validate/tmp/jbundle/jpfe-7.2R1.7.tgz
Using /var/validate/tmp/jbundle/jdocs-7.2R1.7.tgz
Using /var/validate/tmp/jbundle/jroute-7.2R1.7.tgz
Validating against /config/juniper.conf.gz
mgd: commit complete
Validation succeeded
Validating against /config/rescue.conf.gz
mgd: commit complete
Validation succeeded
Installing package '/var/tmp/jinstall-7.2R1.7-domestic-signed.tgz' ...
Verified jinstall-7.2R1.7-domestic.tgz signed by PackageProduction_7_2_0
Adding jinstall...

WARNING: This package will load JUNOS 7.2R1.7 software.
WARNING: It will save JUNOS configuration files, and SSH keys
WARNING: (if configured), but erase all other files and information
WARNING: stored on this machine. It will attempt to preserve dumps
WARNING: and log files, but this can not be guaranteed. This is the
WARNING: pre-installation stage and all the software is loaded when
WARNING: you reboot the system.

Saving the config files ...
Installing the bootstrap installer ...

WARNING: A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the
WARNING: 'request system reboot' command when software installation is
WARNING: complete. To abort the installation, do not reboot your system,
WARNING: instead use the 'request system software delete jinstall'
WARNING: command as soon as this operation completes.

Saving package file in /var/sw/pkg/jinstall-7.2R1.7-domestic-signed.tgz ...
Saving state for rollback ...
```

## Sample Output


### request system software add (Mixed EX4200 and EX4500 Virtual Chassis)

```
user@switch> request system software add set
[/var/tmp/jinstall-ex-4200-11.1R1.1-domestic-signed.tgz
/var/tmp/jinstall-ex-4500-11.1R1.1-domestic-signed.tgz]
...
```

### request system software add component all (QFabric Systems)

```
user@switch> request system software add /pbdata/packages/jinstall-qfabric-12.2X50-D1.3.rpm
component all
...
```

## request system software delete

|                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                                                                                                                                                                                                                                                                                                                                                                  | <a href="#">Syntax on page 1307</a><br><a href="#">Syntax (TX Matrix Router) on page 1307</a><br><a href="#">Syntax (TX Matrix Plus Router) on page 1307</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Syntax</b>                                                                                                                                                                                                                                                                                                                                                                          | <pre>request system software delete <i>software-package</i> &lt;force&gt; &lt;reboot&gt; &lt;set [<i>package-name package-name</i>]&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Syntax (TX Matrix Router)</b>                                                                                                                                                                                                                                                                                                                                                       | <pre>request system software delete <i>software-package</i> &lt;force&gt; &lt;lcc <i>number</i>   scc&gt; &lt;reboot&gt; &lt;set [<i>package-name package-name</i>]&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Syntax (TX Matrix Plus Router)</b>                                                                                                                                                                                                                                                                                                                                                  | <pre>request system software delete <i>software-package</i> &lt;force&gt; &lt;lcc <i>number</i>   sfc <i>number</i>&gt; &lt;reboot&gt; &lt;set [<i>package-name package-name</i>]&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Release Information</b>                                                                                                                                                                                                                                                                                                                                                             | <p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Option <b>sfc</b> introduced for the TX Matrix Plus router in Junos OS Release 9.6.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Option <b>set [<i>package-name package-name</i>]</b> added in Junos OS Release 12.2 for M Series, MX Series, T Series routers, and Branch SRX Services Gateways.</p> <p>Option <b>reboot</b> introduced in Junos OS Release 12.3.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> |
| <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                     | Remove a software package or bundle from the router or switch.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <div style="display: flex; align-items: center;">  <div style="margin-left: 10px;"> <p><b>CAUTION:</b> Before removing a software package or bundle, make sure that you have already placed the new software package or bundle that you intend to load onto the router or switch.</p> </div> </div> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Options</b>                                                                                                                                                                                                                                                                                                                                                                         | <p><b><i>software-package</i></b>—Software package or bundle name. You can delete any or all of the following software bundles or packages:</p> <ul style="list-style-type: none"> <li>• <b>jbase</b>—(Optional) Junos base software suite</li> <li>• <b>crypto</b>—(Optional, in domestic version only) Junos security software</li> <li>• <b>docs</b>—(Optional) Junos online documentation file</li> <li>• <b>kernel</b>—(Optional) Junos kernel software suite</li> <li>• <b>pf</b>—(Optional) Junos Packet Forwarding Engine support</li> </ul>                                                                      |

- **jroute**—(Optional) Junos routing software suite
- **junos**—(Optional) Junos base software



**NOTE:** On EX Series switches, some of the package names are different than those listed. To see the list of packages that you can delete on an EX Series switch, enter the command **show system software**.

**force**—(Optional) Ignore warnings and force removal of the software.

**lcc number**—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, remove an extension or upgrade package from a specific T640 router (line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, remove an extension or upgrade package from a specific router that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**reboot**—As of Junos OS 12.3 and greater, automatically reboot upon completing the **request system software delete** command.

**scc**—(TX Matrix routers only) (Optional) Remove an extension or upgrade package from the TX Matrix router (or switch-card chassis).

**set [package-name package-name]**—(M Series, MX Series, T Series routers, and Branch SRX Series Services Gateways only) (Optional) Install multiple software packages or software add-on packages at the same time.

**sfc number**—(TX Matrix Plus routers only) (Optional) Remove an extension or upgrade package from the TX Matrix Plus router. Replace *number* with 0.

**Additional Information** Before upgrading the software on the router or switch, when you have a known stable system, issue the **request system snapshot** command to back up the software, including the configuration, to the `/altroot` and `/altconfig` file systems (on routers) or the `/`, `/altroot`, `/config`, `/var`, and `/var/tmp` file systems (on switches). After you have upgraded the software on the router or switch and are satisfied that the new packages are successfully installed and running, issue the **request system snapshot** command again to back up the new software to the `/altroot` and `/altconfig` file systems (on routers) or the `/`, `/altroot`,

/config, /var, and /var/tmp file systems (on switches). After you run the **request system snapshot** command, you cannot return to the previous version of the software, because the running and backup copies of the software are identical.

**Required Privilege Level** maintenance

**Related Documentation**

- [request system software add on page 1298](#)
- [request system software rollback on page 1313](#)
- [request system software validate on page 1317](#)
- [Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

**List of Sample Output** [request system software delete jdocs on page 1309](#)

**Output Fields** When you enter this command, you are provided feedback on the status of your request.

## Sample Output

### [request system software delete jdocs](#)

The following example displays the system software packages before and after the **jdocs** package is deleted through the **request system software delete** command:

```
user@host> show system software
Information for jbase:
```

```
Comment:
JUNOS Base OS Software Suite [7.2R1.7]
```

```
Information for jcrypto:
```

```
Comment:
JUNOS Crypto Software Suite [7.2R1.7]
```

```
Information for jdocs:
```

```
Comment:
JUNOS Online Documentation [7.2R1.7]
```

```
Information for jkernel:
```

```
Comment:
JUNOS Kernel Software Suite [7.2R1.7]
```

```
...
```

```
user@host> request system software delete jdocs
Removing package 'jdocs' ...
```

```
user@host> show system software
```

Information for jbase:

Comment:

JUNOS Base OS Software Suite [7.2R1.7]

Information for jcrypto:

Comment:

JUNOS Crypto Software Suite [7.2R1.7]

Information for jkernel:

Comment:

JUNOS Kernel Software Suite [7.2R1.7]

...

## request system software download

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax (QFabric System)</b>  | <code>request system software download <i>path package-name</i></code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Release Information</b>      | Command introduced in Junos OS Release 11.3 for the QFX Series.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Description</b>              | Download a software package from a location on the Director device, mounted external USB flash drive, remote FTP or SCP location, or other location.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Options</b>                  | <p><b><i>path</i></b>—Location where the software package is located. For example:</p> <ul style="list-style-type: none"> <li>• <b><i>/pbdata/packages/package-name</i></b>—For a software package that is being installed from a local directory on the switch.</li> <li>• <b><i>protocol://hostname/pathname/package-name</i></b>—For a software package or bundle that is to be downloaded and installed from a remote location. Replace <b><i>protocol</i></b> with one of the following: <ul style="list-style-type: none"> <li>• <b><i>ftp</i></b>—File Transfer Protocol.<br/>Use <b><i>ftp://hostname/pathname/package-name</i></b>. To specify authentication credentials, use <b><i>ftp://&lt;username&gt;:&lt;password&gt;@hostname/pathname/package-name</i></b>. To have the system prompt you for the password, specify <b><i>prompt</i></b> in place of the password. If a password is required, and you do not specify the password or <b><i>prompt</i></b>, an error message is displayed.</li> <li>• <b><i>scp</i></b>—Secure copy (available only for Canada and U.S. version).<br/>Use <b><i>scp://hostname/pathname/package-name</i></b>. To specify authentication credentials, use <b><i>scp://&lt;username&gt;:&lt;password&gt;@hostname/pathname/package-name</i></b>.</li> </ul> </li> </ul> |
| <b>Required Privilege Level</b> | maintenance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">request system software add on page 1298</a></li> <li>• <a href="#">request system software delete on page 1307</a></li> <li>• <a href="#">request system software rollback on page 1313</a></li> <li>• <a href="#">request system storage cleanup on page 484</a></li> <li>• <a href="#">Upgrading Software on page 273</a></li> <li>• <a href="#">Upgrading Software on a QFabric System</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>List of Sample Output</b>    | <a href="#">request system software download on page 1312</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Output Fields</b>            | When you enter this command, you are provided feedback on the status of your request.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

## Sample Output

### request system software download

```

user@switch> request system software download
ftp://ftp.install-directory/jinstall-qfabric-11.3X30.6.rpm
% Total % Received % Xferd Average Speed Time Time Time Current
 Dload Upload Total Spent Left Speed
100 186M 100 186M 0 0 18.4M 0 0:00:10 0:00:10 --:--:-- 18.6M

```



## request system software rollback

|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                 | <a href="#">Syntax on page 1313</a><br><a href="#">Syntax (EX Series Switches) on page 1313</a><br><a href="#">Syntax (TX Matrix Router) on page 1313</a><br><a href="#">Syntax (TX Matrix Plus Router) on page 1313</a><br><a href="#">Syntax (MX Series Router) on page 1313</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Syntax</b>                         | request system software rollback                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Syntax (EX Series Switches)</b>    | request system software rollback<br><all-members><br><local><br><member <i>member-id</i> ><br><reboot>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Syntax (TX Matrix Router)</b>      | request system software rollback<br><lcc <i>number</i>   scc><br><reboot>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Syntax (TX Matrix Plus Router)</b> | request system software rollback<br><lcc <i>number</i>   sfc <i>number</i> ><br><reboot>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Syntax (MX Series Router)</b>      | request system software rollback<br><all-members><br><local><br><member <i>member-id</i> ><br><reboot>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Release Information</b>            | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br>Option <b>sfc</b> introduced for the TX Matrix Plus router in Junos OS Release 9.6.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.<br>Command behavior changed in Junos OS Release 12.1.<br>Option <b>reboot</b> introduced in Junos OS Release 12.3.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Description</b>                    | <p>For all versions of Junos OS up to and including Junos OS 11.4, revert to the software that was loaded at the last successful <b>request system software add</b> command.</p> <p>As of Junos OS 12.1 and greater, revert to the last known good state before the most recent <b>request system software (add   delete)</b> command. For example, using rollback in Junos OS 12.1 after using <b>request system software add</b> restores the system to a known good state prior to using the <b>add</b> command. Similarly, using rollback in Junos OS 12.1 after using <b>request system software delete</b> restores the system to a known good state prior to using the <b>delete</b> command.</p> <p>A software rollback fails if any required package (or a <b>bundle</b> package containing the required package) cannot be found in <code>/var/sw/pkg</code>.</p> <p><i>Additional Information</i></p> |

- On M Series and T Series routers, if **request system software add <jinstall> reboot** was used for the previous installation, then **request system software rollback** has no effect. In this case, use **jinstall** to reinstall the required package.
- On M Series and T Series routers, if **request system software add <sdk1>** was used for the previous installation, then **request system software rollback** removes the last installed SDK package (**sdk1** in this example).
- On SRX Series devices with dual root systems, when **request system software rollback** is run, the system switches to the alternate root. Each root can have a different version of Junos OS. Rollback takes each root back to the previously installed image.
- On QFX3500 and QFX3600 devices in a mixed Virtual Chassis, when the **request system software rollback** command is issued, the system does not rollback to the image stored in the alternate partition.
- On QFX5100 switches, the **reboot** option has been removed. To reboot the switch after a software rollback, issue the **request system reboot** command as a separate, secondary command.

**Options** **all-members**—(EX4200 switches and MX Series routers only) (Optional) Attempt to roll back to the previous set of packages on all members of the Virtual Chassis configuration.

**lcc number**—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, attempt to roll back to the previous set of packages on a T640 router connected to the TX Matrix router. On a TX Matrix Plus router, attempt to roll back to the previous set of packages on a connected router connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(EX4200 switches and MX Series routers only) (Optional) Attempt to roll back to the previous set of packages on the local Virtual Chassis member.

**member member-id**—(EX4200 switches and MX Series routers only) (Optional) Attempt to roll back to the previous set of packages on the specified member of the Virtual Chassis configuration. For EX4200 switches, replace *member-id* with a value from 0 through 9. For an MX Series Virtual Chassis, replace *member-id* with a value of 0 or 1.

**none**—For all versions of Junos OS up to and including Junos OS 11.4, revert to the set of software as of the last successful **request system software add**. As of Junos OS 12.1 and greater, revert to the last known good state before the most recent **request system software (add | delete)** command.

**reboot**—As of Junos OS 12.3 and greater, automatically reboot upon completing the **request system software rollback** command.

**scc**—(TX Matrix routers only) (Optional) Attempt to roll back to the previous set of packages on the TX Matrix router (or switch-card chassis).

**sfc number**—(TX Matrix Plus routers only) (Optional) Attempt to roll back to the previous set of packages on the TX Matrix Plus router. Replace *number* with 0.

**Required Privilege Level**

maintenance

**Related Documentation**

- *request system software abort*
- [request system software add on page 1298](#)
- [request system software delete on page 1307](#)
- [request system software validate on page 1317](#)
- [request system configuration rescue delete on page 467](#)
- [request system configuration rescue save on page 468](#)
- *Routing Matrix with a TX Matrix Plus Router Solutions Page*

**List of Sample Output** [request system software rollback on page 1316](#)

**Output Fields** When you enter this command, you are provided feedback on the status of your request.

## Sample Output

### request system software rollback

```
user@host> request system software rollback
Verified SHA1 checksum of ./jbase-7.2R1.7.tgz
Verified SHA1 checksum of ./jdocs-7.2R1.7.tgz
Verified SHA1 checksum of ./jroute-7.2R1.7.tgz
Installing package './jbase-7.2R1.7.tgz' ...
Available space: 35495 require: 7335
Installing package './jdocs-7.2R1.7.tgz' ...
Available space: 35339 require: 3497
Installing package './jroute-7.2R1.7.tgz' ...
Available space: 35238 require: 6976
NOTICE: uncommitted changes have been saved in
/var/db/config/juniper.conf.pre-install
Reloading /config/juniper.conf.gz ...
Activating /config/juniper.conf.gz ...
mgd: commit complete
Restarting mgd ...
Restarting aprobed ...
Restarting apsd ...
Restarting cosd ...
Restarting fsad ...
Restarting fud ...
Restarting gcdrd ...
Restarting ilmid ...
Restarting irsd ...
Restarting l2tpd ...
Restarting mib2d ...
Restarting nasd ...
Restarting pppoed ...
Restarting rdd ...
Restarting rmopd ...
Restarting rtspd ...
Restarting sampled ...
Restarting serviced ...
Restarting snmpd ...
Restarting spd ...
Restarting vrrpd ...

WARNING: cli has been replaced by an updated version:
CLI release 7.2R1.7 built by builder on 2005-04-22 02:03:44 UTC
Restart cli using the new version ? [yes,no] (yes) yes

Restarting cli ...
user@host
```

## request system software validate

|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                 | <a href="#">Syntax on page 1317</a><br><a href="#">Syntax (TX Matrix Router) on page 1317</a><br><a href="#">Syntax (TX Matrix Plus Router) on page 1317</a><br><a href="#">Syntax (MX Series Router) on page 1317</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Syntax</b>                         | <pre>request system software validate <i>package-name</i> &lt;set [<i>package-name package-name</i>]&gt; &lt;upgrade-with-config&gt; &lt;upgrade-with-config-format <i>format</i>&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Syntax (TX Matrix Router)</b>      | <pre>request system software validate <i>package-name</i> &lt;lcc <i>number</i>   scc&gt; &lt;set [<i>package-name package-name</i>]&gt; &lt;upgrade-with-config&gt; &lt;upgrade-with-config-format <i>format</i>&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Syntax (TX Matrix Plus Router)</b> | <pre>request system software validate <i>package-name</i> &lt;lcc <i>number</i>   sfc <i>number</i>&gt; &lt;set [<i>package-name package-name</i>]&gt; &lt;upgrade-with-config&gt; &lt;upgrade-with-config-format <i>format</i>&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Syntax (MX Series Router)</b>      | <pre>request system software validate <i>package-name</i> &lt;member <i>member-id</i>&gt; &lt;set [<i>package-name package-name</i>]&gt; &lt;upgrade-with-config&gt; &lt;upgrade-with-config-format <i>format</i>&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Release Information</b>            | <p>Command introduced before Junos OS Release 7.4.</p> <p><b>sfc</b> option introduced for the TX Matrix Plus router in Junos OS Release 9.6.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p><b>set [<i>package-name package-name</i>]</b> option added in Junos OS Release 12.2 for M Series, MX Series, T Series routers, and Branch SRX Series Services Gateways.</p> <p><b>upgrade-with-config</b> and <b>upgrade-with-config-format <i>format</i></b> options added in Junos OS Release 12.3 for M Series routers, MX Series routers, and T Series routers.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> |
| <b>Description</b>                    | Validate candidate software against the current configuration of the router.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Options</b>                        | <p><b>lcc <i>number</i></b>—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, validate the software bundle or package on a specific T640 router (or line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, validate the software bundle or package for a specific router that is connected to the TX Matrix Plus router.</p>                                                                                                                                                                                                                                                                               |

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**member *member-id***—(MX Series routers only) (Optional) Validate the software bundle or package on the specified member of the Virtual Chassis configuration. For an MX Series Virtual Chassis, replace *member-id* with a value of 0 or 1.

**package-name**—Name of the software bundle or package to test.

**scc**—(TX Matrix routers only) (Optional) Validate the software bundle or package for the TX Matrix router (or switch-card chassis).

**set [*package-name package-name*]**—(M Series, MX Series, T Series routers, and Branch SRX Series Services Gateways only) (Optional) Install multiple software packages or software add-on packages at the same time.

**sfc *number***—(TX Matrix Plus routers only) (Optional) Validate the software bundle or package for the TX Matrix Plus router.

**upgrade-with-config**—(Optional) Install one or more configuration files.

**upgrade-with-config-format *format***—(Optional) Specify the configuration file format, **text** or **xml**. The default format is **text**.



**NOTE:** The **upgrade-with-config** and **upgrade-with-config-format** options are only available locally on the router or switch. In a routing matrix, the configuration is applied only to the local router and is not propagated to other routers.

The options are validated during the validation process and applied to the router or switch during the upgrade process. If the upgrade process is successful, the options are removed from the configuration. If the upgrade process fails, the configuration file is renamed with the **.failed** suffix.

---

**Additional Information** By default, when you issue the **request system software validate** command on a TX Matrix master Routing Engine, all the T640 master Routing Engines that are connected to it are validated. If you issue the same command on the TX Matrix backup Routing Engine, all

the T640 backup Routing Engines that are connected to it are upgraded to the same version of software.

Likewise, if you issue the **request system software validate** command on a TX Matrix Plus master Routing Engine, all the T1600 or T4000 master Routing Engines that are connected to it are validated. If you issue the same command on a TX Matrix Plus backup Routing Engine, all the T1600 or T4000 backup Routing Engines that are connected to it are upgraded to the same version of software.

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Required Privilege Level</b> | maintenance                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <i>request system software abort</i></li> <li>• <a href="#">request system software add on page 1298</a></li> <li>• <a href="#">request system software delete on page 1307</a></li> <li>• <a href="#">request system software rollback on page 1313</a></li> <li>• <a href="#">Routing Matrix with a TX Matrix Plus Router Solutions Page</a></li> </ul> |
| <b>List of Sample Output</b>    | <a href="#">request system software validate (Successful Case) on page 1319</a><br><a href="#">request system software validate (Failure Case) on page 1319</a>                                                                                                                                                                                                                                    |
| <b>Output Fields</b>            | When you enter this command, you are provided feedback on the status of your request.                                                                                                                                                                                                                                                                                                              |

## Sample Output

### request system software validate (Successful Case)

```

user@host> request system software validate /var/sw/pkg/jbundle-5.3I20020124_0520_sjg.tgz
Checking compatibility with configuration
Initializing...
Using /packages/jbase-5.3I20020122_1901_sjg
Using /var/sw/pkg/jbundle-5.3I20020124_0520_sjg.tgz
Using /var/chroot/var/tmp/jbundle/jbase-5.3I20020124_0520_sjg.tgz
Using /var/chroot/var/tmp/jbundle/jkernel-5.3I20020124_0520_sjg.tgz
Using /var/chroot/var/tmp/jbundle/jcrypto-5.3I20020124_0520_sjg.tgz
Using /var/chroot/var/tmp/jbundle/jpfe-5.3I20020124_0520_sjg.tgz
Using /var/chroot/var/tmp/jbundle/jdocs-5.3I20020124_0520_sjg.tgz
Using /var/chroot/var/tmp/jbundle/jroute-5.3I20020124_0520_sjg.tgz
Validating against /config/juniper.conf.gz
mgd: commit complete

WARNING: cli has been replaced by an updated version:
CLI release 5.3I0 built by sjg on 2002-01-24 05:23:53 UTC
Restart cli using the new version ? [yes,no] (yes)

```

### request system software validate (Failure Case)

```

user@host> request system software validate 6.3/
Pushing bundle to lcc0-re0
error: Failed to transfer package to lcc0-re0

user@host> request system software validate test

```

```
Pushing bundle to lcc0-re0
Pushing bundle to lcc2-re0
```


```
lcc0-re0:
gzip: stdin: not in gzip format
tar: child returned status 1
ERROR: Not a valid package: /var/tmp/test
```



## rollback

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>rollback &lt;number   rescue&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Release Information</b>      | <p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Description</b>              | <p>Return to a previously committed configuration. The software saves the last 50 committed configurations, including the rollback number, date, time, and name of the user who issued the <b>commit</b> configuration command.</p> <p>The currently operational Junos OS configuration is stored in the file <b>juniper.conf</b>, and the last three committed configurations are stored in the files <b>juniper.conf.1</b>, <b>juniper.conf.2</b>, and <b>juniper.conf.3</b>. These four files are located in the directory <b>/config</b>, which is on the router's flash drive. The remaining 46 previous committed configurations, the files <b>juniper.conf.4</b> through <b>juniper.conf.49</b>, are stored in the directory <b>/var/db/config</b>, which is on the router's hard disk.</p> <p>During rollback, the configuration you specify is loaded from the associated file. Only objects in the rollback configuration that differ from the previously loaded configuration are marked as changed (equivalent to <b>load update</b>).</p> |
| <b>Options</b>                  | <p>none (Optional)—Return to the most recently saved configuration.</p> <p><b>number</b>—(Optional) Configuration to return to. The range of values is from <b>0</b> through <b>49</b>. The most recently saved configuration is number <b>0</b>, and the oldest saved configuration is number <b>49</b>. The default is <b>0</b>.</p> <p><b>rescue</b>—(Optional) Return to the rescue configuration.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Required Privilege Level</b> | rollback—To roll back to configurations other than the one most recently committed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li><i>Returning to a Previously Committed Junos OS Configuration</i></li> <li><i>Creating and Returning to a Rescue Configuration</i></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

## show system rollback

|                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                                                                                                                                                                                                                                                                  | <code>show system rollback <i>number</i></code><br><code>&lt;compare <i>number</i>&gt;</code>                                                                                                                                                                                                                                                                                                                                |
| <b>Release Information</b>                                                                                                                                                                                                                                                     | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br>Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.<br>Command introduced in Junos OS Release 11.1 for the QFX Series.                                                                                                                                                      |
| <b>Description</b>                                                                                                                                                                                                                                                             | Display the contents of a previously committed configuration, or the differences between two previously committed configurations.                                                                                                                                                                                                                                                                                            |
| <div>  <b>NOTE:</b> The <code>show system rollback</code> command is a purely operational mode command and cannot be issued with <code>run</code> from the configuration mode.         </div> |                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Options</b>                                                                                                                                                                                                                                                                 | <p><b><i>number</i></b>—Number of a configuration to view. The output displays the configuration. The range of values is 0 through 49.</p> <p><b><code>compare <i>number</i></code></b>—(Optional) Number of another previously committed (rollback) configuration to compare to rollback <b><i>number</i></b>. The output displays the differences between the two configurations. The range of values is 0 through 49.</p> |
| <b>Required Privilege Level</b>                                                                                                                                                                                                                                                | view                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>List of Sample Output</b>                                                                                                                                                                                                                                                   | <a href="#">show system rollback compare on page 1322</a>                                                                                                                                                                                                                                                                                                                                                                    |

## Sample Output

### show system rollback compare

```

user@host> show system rollback 3 compare 1
[edit]
+ interfaces {
+ ge-1/1/1 {
+ unit 0 {
+ family inet {
+ filter {
+ input mf_plp;
+ }
+ address 14.1.1.1/30;
+ }
+ }
+ }
+ ge-1/2/1 {
+ unit 0 {
+ family inet {
+ filter {
+ input mf_plp;
+ }
+ address 13.1.1.1/30;

```

```
+ }
+ }
+ }
+ ge-1/3/0 {
+ unit 0 {
+ family inet {
+ filter {
+ input mf_plp;
+ }
+ address 12.1.1.1/30;
+ }
+ }
+ }
+}
```



## CHAPTER 37

# System Snapshot Operational Commands

- request system snapshot

## request system snapshot

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|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <pre>request system snapshot &lt;config-partition&gt; &lt;media&gt; &lt;partition&gt; &lt;root-partition&gt; slice alternate</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Release Information</b>      | Command introduced in Junos OS Release 11.3 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Description</b>              | Copy the currently running Junos OS and configuration to alternate media. This command takes a snapshot of the contents of the / (root), and /var partitions on the media used to boot the switch and then copies the snapshot to alternate media. If the switch was booted from internal flash memory, the snapshot is copied to an external USB flash drive. If the switch was booted from an external USB flash drive, the snapshot is copied to internal flash memory.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Options</b>                  | <p><b>none</b>—Create a snapshot on the alternate media—that is, the external media if you booted the switch using software stored on internal media or internal media if you booted the switch using software stored on external media.</p> <p><b>config-partition</b>—(Optional) Create a snapshot of the configuration partition only and store it onto the default /altconfig on the hard disk device or an /altconfig on a USB device.</p> <p><b>media type</b>—(Optional) Specify the boot device the software is copied to:</p> <ul style="list-style-type: none"><li>• compact-flash—Copy software to the primary compact flash drive.</li><li>• external—Copy software to an external mass storage device, such as a USB flash drive. If a USB drive is not connected, the switch displays an error message.</li><li>• internal—Copy software to an internal flash drive.</li><li>• removable-compact-flash—Copy software to the removable compact flash drive.</li></ul> <p><b>partition</b>—(Optional) Partition the destination media before copying over the snapshot.</p> <p><b>root-partition</b>—(Optional) Create a snapshot of the root partition only and store it onto the default /altroot on the hard disk device or an /altroot on a USB device.</p> <p><b>slice alternate</b>—(Optional) Take a snapshot of the active root partition and copy it to the alternate slice on the boot media.</p> |
| <b>Required Privilege Level</b> | view                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <i>show system snapshot</i></li><li>• <a href="#">Creating a Snapshot and Using It to Boot a QFX3500 and QFX3600 Series Switch on page 242</a></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

- [Verifying That a System Snapshot Was Created on a QFX Series Switch on page 287](#)

List of Sample Output    [request system snapshot partition on page 1327](#)

## Sample Output

### [request system snapshot partition](#)

```
user@switch> request system snapshot partition
Clearing current label...
Partitioning external media (da1) ...
Verifying compatibility of destination media partitions...
Running newfs (334MB) on external media / partition ...
Running newfs (404MB) on external media /config partition ...
Running newfs (222MB) on external media /var partition ...
Copying '/dev/da0s2a' to '/dev/da1s1a' .. (this may take a few minutes)
Copying '/dev/da0s3e' to '/dev/da1s3e' .. (this may take a few minutes)
Copying '/dev/da0s2f' to '/dev/da1s1f' .. (this may take a few minutes)
The following filesystems were archived: / /config /var
```

