



Junos[®] OS

Chassis-Level Feature Guide

Release
13.2



Published: 2013-07-24

Juniper Networks, Inc.
1194 North Mathilda Avenue
Sunnyvale, California 94089
USA
408-745-2000
www.juniper.net

This product includes the Envoy SNMP Engine, developed by Epilogue Technology, an Integrated Systems Company. Copyright © 1986-1997, Epilogue Technology Corporation. All rights reserved. This program and its documentation were developed at private expense, and no part of them is in the public domain.

This product includes memory allocation software developed by Mark Moraes, copyright © 1988, 1989, 1993, University of Toronto.

This product includes FreeBSD software developed by the University of California, Berkeley, and its contributors. All of the documentation and software included in the 4.4BSD and 4.4BSD-Lite Releases is copyrighted by the Regents of the University of California. Copyright © 1979, 1980, 1983, 1986, 1988, 1989, 1991, 1992, 1993, 1994. The Regents of the University of California. All rights reserved.

GateD software copyright © 1995, the Regents of the University. All rights reserved. Gate Daemon was originated and developed through release 3.0 by Cornell University and its collaborators. Gated is based on Kirton's EGP, UC Berkeley's routing daemon (routed), and DCN's HELLO routing protocol. Development of Gated has been supported in part by the National Science Foundation. Portions of the GateD software copyright © 1988, Regents of the University of California. All rights reserved. Portions of the GateD software copyright © 1991, D. L. S. Associates.

This product includes software developed by Maker Communications, Inc., copyright © 1996, 1997, Maker Communications, Inc.

Juniper Networks, Junos, Steel-Belted Radius, NetScreen, and ScreenOS are registered trademarks of Juniper Networks, Inc. in the United States and other countries. The Juniper Networks Logo, the Junos logo, and JunosE are trademarks of Juniper Networks, Inc. All other trademarks, service marks, registered trademarks, or registered service marks are the property of their respective owners.

Juniper Networks assumes no responsibility for any inaccuracies in this document. Juniper Networks reserves the right to change, modify, transfer, or otherwise revise this publication without notice.

Products made or sold by Juniper Networks or components thereof might be covered by one or more of the following patents that are owned by or licensed to Juniper Networks: U.S. Patent Nos. 5,473,599, 5,905,725, 5,909,440, 6,192,051, 6,333,650, 6,359,479, 6,406,312, 6,429,706, 6,459,579, 6,493,347, 6,538,518, 6,538,899, 6,552,918, 6,567,902, 6,578,186, and 6,590,785.

Junos® OS Chassis-Level Feature Guide

13.2

Copyright © 2013, Juniper Networks, Inc.
All rights reserved.

The information in this document is current as of the date on the title page.

YEAR 2000 NOTICE

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.

END USER LICENSE AGREEMENT

The Juniper Networks product that is the subject of this technical documentation consists of (or is intended for use with) Juniper Networks software. Use of such software is subject to the terms and conditions of the End User License Agreement ("EULA") posted at <http://www.juniper.net/support/eula.html>. By downloading, installing or using such software, you agree to the terms and conditions of that EULA.

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	Overview	
Chapter 1	Router Chassis Configuration Overview	3
	Router Chassis Configuration Overview	3
	Port-Mirroring Instances Overview	8
	Fabric Fault Handling Overview	9
	Interoperability of Type 3 FPCs and Type 4 FPCs with Type 5 FPCs	12
	Interoperability Between MPC4E (MPC4E-3D-2CGE-8XGE) and 100-Gigabit Ethernet PICs on Type 4 FPC	12
	Fabric Plane Management on AS MLC Modular Carrier Card Overview	13
	Fabric Management on MPC4E Overview	16
	T4000 Power Management Overview	17
	Understanding Operations Support Systems Mapping	19
	Operations Support System Overview	20
	Methods to View the Updated Chassis Name	20
	Supported Platforms	20
	Points to Remember	21
Chapter 2	Router Chassis Clocking and Synchronization Configuration Overview	23
	Interface and Router Clock Sources Overview	23
	Interface and Router Clock Sources Description	23
	Configuring an External Synchronization Interface	24
	Synchronous Ethernet Overview	25
	Synchronous Ethernet on 10-Gigabit Ethernet MIC Overview	28
	Ethernet Synchronization Message Channel Overview	32
	Understanding ESMC Quality Level Mapping	34
	Synchronous Ethernet Mode	34
	Precision Time Protocol Mode	35
	Hybrid Mode	37

	Feature Mode Changes	37
	Precision Time Protocol Overview	38
	Understanding Hybrid Mode	39
	Hybrid Mode Overview	39
	Supporting Platforms	40
Chapter 3	Router Chassis Network Services Configuration Overview	43
	Network Services Mode Overview	43
	Restrictions on Junos OS Ethernet Network Services Mode and Enhanced Ethernet Network Services Mode Features for MX Series Routers	46
Chapter 4	TX Matrix and TX Matrix Plus Router Configuration Overview	47
	TX Matrix Router and T640 Router Configuration Overview	47
	TX Matrix Router and T640 Router-Based Routing Matrix Overview	47
	Running Different Junos OS Releases on the TX Matrix Router and T640 Routers	48
	TX Matrix Router Software Upgrades and Reinstallation	49
	TX Matrix Router Rebooting Process	49
	Committing Configurations on the TX Matrix Router	49
	TX Matrix and T640 Router Configuration Groups	50
	Routing Matrix System Log Messages	50
	TX Matrix Router Chassis and Interface Names	50
	TX Matrix Plus Router Configuration Overview	52
	TX Matrix Plus Router and Router-Based Routing Matrix Overview	52
	Running Different Junos OS Releases on the TX Matrix Plus Router and T1600 or T4000 Routers	53
	TX Matrix Plus Router Software Upgrades and Reinstallation	53
	TX Matrix Plus Router Rebooting Process	54
	TX Matrix Plus Router Routing Engine Rebooting Sequence	54
	TX Matrix Plus Router Management Ethernet Interfaces	54
	TX Matrix Plus Router Internal Ethernet Interfaces	54
	Routing Matrix-Based T1600 or T4000 Router Internal Ethernet Interfaces	54
	Committing Configurations on the TX Matrix Plus Router	55
	Routing Matrix Configuration Groups	55
	Routing Matrix System Log Messages	56
	TX Matrix Plus Router Chassis and Interface Names	56

Part 2	Configuration	
Chapter 5	Configuring TX Matrix Chassis-Level Features	63
	Using the Junos OS to Configure a T640 Router Within a Routing Matrix	63
	Configuring the Junos OS to Upgrade and Downgrade Switch Interface Boards on a TX Matrix Router	64
	Configuring the Junos OS to Upgrade Switch Interface Boards on a TX Matrix Router	64
	Configuring the Junos OS to Downgrade Switch Interface Boards on a TX Matrix Router	65
	Configuring the Junos OS to Enable the TX Matrix Router to Generate an Alarm If a T640 Router Stays Offline	65
	FIB Localization Overview	66
	Configuring FIB Localization	67
	FIB Localization Overview	67
	Example: Configuring Packet Forwarding Engine FIB Localization	68
	Configuration Statements	72
	fib-local	72
	fib-remote	72
	no-route-localize	73
	route-localization	73
	Example: Configuring Packet Forwarding Engine FIB Localization	73
Chapter 6	Configuring TX Matrix Plus Chassis-Level Features	79
	Using the Junos OS to Configure a T1600 or T4000 Router Within a Routing Matrix	79
	Configuring the Junos OS to Enable the TX Matrix Plus Router to Generate an Alarm If a T1600 or T4000 Router Stays Offline	80
	Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform	81
	Preparing the Configuration File and Upgrading the Junos OS on the T1600 Router and SFC	82
	Configuring the Junos OS for Upgrading SIBs on the T1600 Router and Connecting It to the SFC	82
	Upgrading CBs and Routing Engines of the T1600 Router for Control Plane Connectivity	84
	Changing the Management Ethernet Interface Name for the T1600 Router	84
	Transferring Control of the T1600 Router (LCC0) to the SFC	84
	Adding a New T1600 Router to the TX Matrix Plus Routing Platform	85

Downgrading a T1600 Router from the LCC of a TX Matrix Routing Platform to a Standalone T1600 Router	85
Configuring Junos OS to Upgrade the T1600 Router Chassis to LCC 0 of a TX Matrix Plus Router with 3D SIBs	86
Preparing the Configuration File and Upgrading Junos OS on the T1600 Router and the SFC	86
Configuring Junos OS for Upgrading the SIBs on the T1600 Router and Connecting It to the SFC	87
Upgrading the Control Boards, Routing Engines, PEMs, and Rear Fan Tray of the T1600 Router for Control Plane Connectivity	87
Preparing the SFC and the LCC for the Upgrade	87
Upgrading the SIBs	88
Training the Switching Plane Links	89
Activating and Verifying the Switching Planes	91
Transferring Control of the T1600 Router (LCC 0) to the SFC	91
Adding a New T1600 Router to the TX Matrix Plus Routing Matrix	92
Configuring Junos OS to Upgrade a T4000 Router to LCC 0 of a TX Matrix Plus Router with 3D SIBs	92
Preparing the Configuration File and Upgrading Junos OS on the T4000 Router and the SFC	93
Configuring Junos OS for Upgrading the SIBs on the T4000 Router and Connecting the Router to the SFC	93
Upgrading the Control Boards, Routing Engines, PEMs, and Rear Fan Tray of the T4000 Router for Control Plane Connectivity	93
Preparing the SFC and the LCC for the Upgrade	94
Upgrading the SIBs	95
Training the Switching Plane Links	96
Activating and Verifying the Switching Plane	97
Transferring Control of the T4000 Router (LCC 0) to the SFC	98
Adding a New T4000 Router to the TX Matrix Plus Routing Matrix	98
Configuring Junos OS to Upgrade the T640 Router Chassis to LCC 0 of a TX Matrix Plus Router with 3D SIBs	99
Chapter 7	
Configuring M Series Chassis-Level Features	101
Configuring Port-Mirroring Instances on M320 Routers	101
Configuring Port-Mirroring Instances on M120 Routers	102
Configuring the Junos OS to Enable MTU Path Check for a Routing Instance on M Series Routers	102
Enabling MTU Check for a Routing Instance	103
Assigning an IP Address to an Interface in the Routing Instance	103
Configuring the Junos OS to Enable an M160 Router to Operate in Packet Scheduling Mode	104
Configuring the Junos OS to Make an SFM Stay Offline	104
Configuring the Junos OS to Support FPC to FEB Connectivity on M120 Routers	105
Configuring the Junos OS to Support Eight Queues on IQ Interfaces for T Series and M320 Routers	107
Configuring the Junos OS to Support Entry-Level Configuration on an M320 Router with a Minimum Number of SIBs and PIMs	108

Chapter 8	Configuring MX Series Chassis-Level Features	109
	Configuring Port-Mirroring Instances on MX Series 3D Universal Edge Routers	110
	Configuring Port-Mirroring Instances at the DPC Level	110
	Configuring Port-Mirroring Instances at the PIC Level	110
	Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs for MX Series Routers	111
	16-Port 10-Gigabit Ethernet MPC on MX Series Routers (16x10GE 3D MPC)	
	Overview	112
	Configuring the Number of Active Ports on a 16-Port 10-Gigabit Ethernet MPC on MX Series Routers	113
	Configuring Tunnel Interfaces on an MX Series Router with a 16x10GE 3D MPC	115
	MPC3E on MX Series Routers Overview	116
	MPC4E on MX Series Routers Overview	118
	Configuring Tunnel Interfaces on MX Series Routers with the MPC3E	120
	Configuring Tunnel Interfaces on MX Series Routers with MPC4E	121
	Configuring 100-Gigabit Ethernet MICs to Interoperate with Type 4 100-Gigabit Ethernet PICs (PD-1CE-CFP-FPC4) Using SA Multicast Mode	122
	Configuring MPC4E (MPC4E-3D-2CGE-8XGE) to Interoperate with 100-Gigabit Ethernet PICs on Type 4 FPC Using SA Multicast Mode	124
	Configuring SA Multicast Bit Steering Mode on MPC4E	124
	Configuring Two 50-Gigabit Ethernet Physical Interfaces on the Ethernet PIC as One Aggregated Ethernet Interface	125
	Configuring the Power-On Sequence for DPCs on MX Series Routers with the Enhanced AC PEM	126
	Configuring the Junos OS to Support Layer 2 Services on MX Series 3D Universal Edge Routers with MS-DPCs	126
	Configuring the Junos OS to Enable Session Offloading on MX Series 3D Universal Edge Routers with MS-DPCs	127
	Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers	127
	Accounting of the Layer 2 Overhead Attribute in Interface Statistics	128
	Guidelines for Configuring the Computation of Layer 2 Overhead in Interface Statistics	129
	Configuring Layer 2 Overhead Accounting in Interface Statistics	130
	Enabling the Accounting of Layer 2 Overhead in Interface Statistics at the PIC Level	130
	Enabling the Accounting of Layer 2 Overhead in Interface Statistics at the Logical Interface Level	131
	Verifying the Accounting of Layer 2 Overhead in Interface Statistics	133

Chapter 9	Configuring T Series Chassis-Level Features	137
	Configuring the Power-On Sequence for FPCs on T640, T1600, and T4000 Routers	137
	Configuring OSS Mapping to Represent a T4000 Chassis as a T1600 or a T640 Chassis	138
	Configuring T4000 Chassis as a T1600 Chassis	138
	Configuring T4000 Chassis as a T640 Chassis	138
	Disabling the OSS Mapping Feature	139
Chapter 10	Configuring J Series Chassis-Level Features	141
	Configuring the Junos OS to Prevent the Resetting of the Factory Default or Rescue Configuration During Current Configuration Failure on J Series Routers	141
	Configuring the Junos OS to Support the uPIM Mode on J Series Routers	142
	Configuring the Junos OS to Set a PIM Offline on J Series Routers	142
	Configuring the Junos OS to Disable Power Management on the J Series Chassis	143
	Configuring J Series Services Router Switching Interfaces	143
Chapter 11	Configuring PIC-Specific Features	145
	Configuring the Junos OS to Make a Flexible PIC Concentrator Stay Offline	145
	Configuring the Junos OS to Enable SONET/SDH Framing for SONET/SDH PICs	147
	Configuring Junos OS to Enable SONET/SDH Framing for ATM MICs	150
	Configuring the Junos OS to Use ATM Cell-Relay Accumulation Mode on an ATM1 PIC	151
	Configuring the Junos OS to Support the Sparse DLCI Mode on Channelized STM1 or Channelized DS3 PICs	152
	Configuring the Junos OS to Enable a SONET PIC to Operate in Channelized (Multiplexed) Mode	153
	Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs	154
	Ranges for Channelized E1 Interfaces Configuration	155
	Configuring the Junos OS to Support ILMI for Cell Relay Encapsulation on an ATM2 IQ PIC	156
	Configuring the Junos OS to Support the Link Services PIC	157
	Multiclass Extension for Multiple Classes of Service Using MLPPP (RFC 2686)	157
	Configuring the Junos OS to Enable Larger Delay Buffers for T1, E1, and DS0 Interfaces Configured on Channelized IQ PICs	158
	Maximum Delay Buffer with q-pic-large-buffer Statement Enabled	158
	Configuring a Policer Overhead	160
	Configuring a Port Speed	161
Chapter 12	Configuring Resynchronization of FPC Sequence Numbers when a new FPC is Brought Online	165
	Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online	165

Chapter 13	Configuring Chassis Settings to Support Aggregated Devices	167
	Configuring Junos OS for Supporting Aggregated Devices	167
	Configuring Virtual Links for Aggregated Devices	167
	Configuring LACP Link Protection at the Chassis Level	168
	Enabling LACP Link Protection	168
	Configuring System Priority	169
	Configuring the Maximum Links Limit	169
Chapter 14	Configuring Chassis Settings to Support Load Balancing	171
	Configuring ECMP Next Hops for RSVP and LDP LSPs for Load Balancing	171
Chapter 15	Configuring Chassis Settings to Support Channelized Interfaces	175
	Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots	175
	Ranges for Channelized DS3-to-DS0 Configuration	176
	Configuring the Junos OS to Support Channelized STM1 Interface Virtual Tributary Mapping	177
	Configuring the Junos OS to Enable Channelization on DS3/E3 MIC	177
Chapter 16	Configuring Chassis Settings to Support Adaptive Services Interfaces . . .	181
	Configuring the Junos OS to Enable Service Packages on Adaptive Services Interfaces	181
Chapter 17	Configuring Chassis Settings to Support External Clock Synchronization	183
	Configuring the Junos OS to Support an External Clock Synchronization Interface for M Series and T Series Routers	183
	Configuring Clock Synchronization Interface for MX Series Routers	185
	Clock Sources for PTX Series Packet Transport Routers	190
	Configuring an External Clock Synchronization Interface for PTX Series Packet Transport Routers	191
	Example: Configuring Synchronous Ethernet on MX Series Routers	193
	Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC	197
Chapter 18	Configuring Chassis Setting to Support Precision Time Protocol	201
	Configuring Precision Time Protocol	201
	Configuring Precision Time Protocol and its Options	201
	Configuring PTP Options	201
	Configuring Slave Clock Options	202
	Configuring Master Clock Options	203
	Example: Configuring Precision Time Protocol	205
Chapter 19	Configuring Chassis Setting to Support Hybrid Mode	209
	Configuring Hybrid Mode and ESMC Quality Level Mapping	209
	Configuring the Router in Hybrid Mode	210
	Configuring Hybrid Mode with Mapping of the PTP Clock Class to the ESMC Quality Level	210
	Configuring Hybrid Mode with a User-Defined Mapping of the PTP Clock Class to the ESMC Quality Level	211
	Example: Configuring Hybrid Mode and ESMC Quality Level Mapping	212

Chapter 20	Configuring Chassis Settings to Support ATM Devices	219
	Configuring the Junos OS to Enable ATM2 Intelligent Queuing Layer 2 Circuit Transport Mode	219
	Configuring the Junos OS to Enable Idle Cell Format and Payload Patterns for ATM Devices	220
Chapter 21	Configuring Chassis Settings for Routing Engines and Packet Forwarding Engines	223
	Configuring the Junos OS to Support Redundancy on Routers Having Multiple Routing Engines or Switching Boards	223
	Signaling Neighboring Routers of Fabric Down on T640 and T1600 Routers	224
	Traffic Black Hole Caused by Fabric Degradation	225
	Detection and Recovery of Fabric-Related Failures Caused by Traffic Black Holes on MX Series Routers	226
	Fabric-Failure Detection Methods on MX Series Routers	228
	Corrective Actions for Fabric Failures on MX Series Routers	229
	Traffic Black Hole Healing	229
	FPCs with Degraded Fabric	231
	Complete Black Hole Towards a Single Destination Only	231
	Redundancy Fabric Mode on Active Control Boards	231
	Detection and Corrective Actions of FPCs with Degraded Fabric on MX Series Routers	232
	Disabling FPC Restart	234
	Disabling an FPC with Degraded Fabric Bandwidth	234
	Configuring Redundancy Fabric Mode for Active Control Boards on MX Series Routers	235
	Configuring the Junos OS to Allocate More Memory for Routing Tables, Firewall Filters, and Layer 3 VPN Labels	236
	Configuring the Junos OS to Enable a Routing Engine to Reboot on Hard Disk Errors	238
	Associating Sampling Instances for Active Flow Monitoring with a Specific FPC, MPC, or DPC	239
	Configuring a Policer Overhead	239
	Configuring Sanity Polling for FPCs on T Series Routers	240
	Configuring Slow Packet Forwarding Engine Alarm	242
	Enabling Slow Packet Forwarding Engine Alarm	243
	Disabling Slow Packet Forwarding Engine Alarm	243
	Verifying That the Alarm Output and System Log Messages Are Updated	243
Chapter 22	Configuring Chassis Settings for the Craft Interface	245
	Configuring the Junos OS to Disable the Physical Operation of the Craft Interface	245
Chapter 23	Configuring Chassis Settings for PEMs	247
	Configuring the Six-Input DC Power Supply	247
	Configuring the Six-Input DC Power Supply on an LCC Router in a Routing Matrix	248
	Configuring the Six-Input DC Power Supply on T640 and T1600 Routers	248
	Configuring the Six-Input DC Power Supply on T4000 Routers	249

Chapter 24	Configuring Chassis Settings for Alarms	251
	Configuring the Junos OS to Determine Conditions That Trigger Alarms on Different Interface Types	251
	System-Wide Alarms and Alarms for Each Interface Type	252
	Chassis Conditions That Trigger Alarms	253
	Chassis Component Alarm Conditions on M5 and M10 Routers	254
	Chassis Component Alarm Conditions on M7i and M10i Routers	257
	Chassis Component Alarm Conditions on M20 Routers	262
	Chassis Component Alarm Conditions on M40 Routers	265
	Chassis Component Alarm Conditions on M40e and M160 Routers	270
	Chassis Component Alarm Conditions on M120 Routers	275
	Chassis Component Alarm Conditions on M320 Routers	280
	Chassis Component Alarm Conditions on MX Series 3D Universal Edge Routers	285
	Backup Routing Engine Alarms	290
	Silencing External Devices Connected to Alarm Relay Contacts	292
Chapter 25	Examples	293
	Examples: Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs on MX Series Routers	293
	Configuring Symmetrical Hashing for family multiservice on Both Routers	293
	Configuring Symmetrical Hashing for family inet on Both Routers	294
	Configuring Symmetrical Hashing for family inet and family multiservice on the Two Routers	294
	Example: Configuring Tunnel Interfaces on a Gigabit Ethernet 40-Port DPC	295
	Example: Configuring J Series Services Router Switching Interfaces	296
	Example: Configuring Tunnel Interfaces on a 10-Gigabit Ethernet 4-Port DPC	296
	Example: Configuring Tunnel Interfaces on the MPC3E	296
	Example: Configuring Fabric Redundancy Mode on MPC4E	298
	Example: Configuring Centralized Clocking on the Enhanced MX Switch Control Board	300
	Example: Configuring a T4000 Chassis to Represent a T640 Chassis	309
Chapter 26	Configuration Statements	313
	Router Chassis Configuration Statements	313
	[edit protocols ptp] Hierarchy Level	318
	account-layer2-overhead (Interface Level)	319
	account-layer2-overhead (PIC Level)	320
	action-fpc-restart-disable	320
	adaptive-services	321
	aggregate-ports	321
	aggregated-devices	322
	alarm (chassis)	323
	allow-sram-parity-errors	324
	announce-timeout	324
	announce-interval	325
	atm-cell-relay-accumulation	325
	atm-l2circuit-mode	326

bandwidth (Tunnel Services)	327
cel	328
channel-group	329
channelization	329
chassis	330
clock-class	330
clock-class-to-quality-level-mapping	331
clock-source (slave)	332
clock-source (hybrid)	333
clock-mode	334
clock-client	335
clock-step	335
config-button	336
convert-clock-class-to-quality-level	337
craft-lockout	337
ct3	338
degraded-fabric-detection-enable	338
degraded-fpc-bad-plane-threshold	339
delay-request	339
device-count	340
disk-failure-action	340
domain	341
dynamic-profile-options	341
e1	342
egress-policer-overhead	343
enhanced-mode (network-services)	344
ethernet (Chassis)	345
fabric upgrade-mode	345
fabric upgrade-mode 3d-fabric	346
family	347
feeds (T640, T1600, and T4000 Routers with Six-Input DC Power Supply) . . .	348
fib-local	349
fib-remote	349
filter	350
fpc (M320, T320, T640 Routers)	351
fpc (MX Series 3D Universal Edge Routers)	352
fpc (TX Matrix and TX Matrix Plus Routers)	353
fpc-feb-connectivity	354
fpc-resync	355
framing	355
fru-poweron-sequence	356
frequency-only	357
hash-key (Chassis LAG)	358
hybrid	359
idle-cell-format	360
inet (chassis)	361
ingress-policer-overhead	362
input-current (T4000 Routers)	363
lACP	364

lcc	365
lcc-mode	367
linerate-mode	368
link-protection (Protocols LACP)	368
local-ip-address (master)	369
local-ip-address (slave)	369
master	370
maximum-ecmp	371
maximum-links	372
max-queues-per-interface	372
memory-enhanced	373
mlfr-uni-nni-bundles	373
multiservice	374
network-services	375
no-concatenate	376
no-multi-rate	376
no-route-localize	377
non-revertive (Chassis)	377
number-of-ports	378
offline	378
offline-on-fabric-bandwidth-reduction	379
on-disk-failure (Chassis Routing Engine)	379
on-error	380
online-expected	381
oss-map	382
packet-scheduling	383
payload	384
pem (M320 Routers)	385
pem (T640, T1600, and T4000 Routers with Six-Input DC Power Supply)	386
pic (M Series, MX Series, and T Series Routers)	387
pic (TX Matrix and TX Matrix Plus Routers)	388
policer-drop-probability-low	389
port (Chassis)	390
power	390
priority1	391
priority2	392
q-pic-large-buffer	393
quality-level (hybrid)	394
red-buffer-occupancy	395
redundancy-mode	396
retry-count	397
route (chassis)	397
routing-engine (Chassis)	398
route-localization	398
route-memory-enhanced	399
sampling-instance	400
sanity-poll	401
service-package	402
session-offload	402

sfrm (Chassis)	403
sib	403
slow-pfe-alarm	404
sonet	404
slave	405
sparse-dlcis	406
speed	407
symmetric-hash	408
sync-interval	408
synchronization (M Series, T Series, and PTX Series)	409
synchronization (MX Series)	411
synchronous-ethernet-mapping	419
system-priority	420
t1	421
traffic-manager	422
transport (slave)	423
transport (master)	423
tunnel-services (Chassis)	424
ucode-imem-remap	425
unicast-mode (master)	426
unicast-mode (slave)	427
unicast-negotiation	428
vpn-label	428
vrf-mtu-check	429
vtmapping	430

Part 3

Chapter 27

Administration

Administrative Commands	433
clear chassis alarms fabric degraded	434
clear chassis display message	436
request chassis afeb	439
request chassis cb	440
request chassis cfeb	443
request chassis cip	444
request chassis fabric plane	445
request chassis feb	447
request chassis fpc	449
request chassis fpm resync	453
request chassis lcc	455
request chassis mcs	457
request chassis mic	458
request chassis optics	460
request chassis pcg	461
request chassis pic	462
request chassis redundancy feb slot	466
request chassis routing-engine master	467
request chassis scg	472
request chassis sfb	474

	request chassis sfm master switch	475
	request chassis sfm	476
	request chassis sib	477
	request chassis sib f13 train-link-receive slot	479
	request chassis sib f13 train-link-transmit slot	480
	request chassis sib optics lcc	481
	request chassis sib optics sfc	482
	request chassis sib train-link-receive slot	483
	request chassis sib train-link-transmit slot	484
	request chassis spmb restart	485
	request chassis synchronization switch	487
	set chassis display message	489
Chapter 28	Monitoring Commands	493
	show chassis adc	494
	show chassis afeb	496
	show chassis alarms	498
	show chassis cfeb	511
	show chassis cip	513
	show chassis craft-interface	515
	show chassis environment	533
	show chassis environment adc	590
	show chassis environment cb	601
	show chassis environment fpc	620
	show chassis environment fpm	648
	show chassis environment monitored	655
	show chassis environment mcs	669
	show chassis environment pcg	671
	show chassis environment pem	673
	show chassis environment psm	682
	show chassis environment routing-engine	687
	show chassis environment scg	692
	show chassis environment sfb	698
	show chassis environment sfm	708
	show chassis environment sib	712
	show chassis ethernet-switch	740
	show chassis fan	788
	show chassis fabric destinations	801
	show chassis fabric feb	813
	show chassis fabric errors	814
	show chassis fabric fpcs	819
	show chassis fabric map	857
	show chassis fabric optics	864
	show chassis fabric plane	876
	show chassis fabric plane-location	921
	show chassis fabric redundancy-mode	926
	show chassis fabric reachability	927
	show chassis fabric sibs	934
	show chassis fabric topology	944

show chassis fabric degraded-fabric-reachability	967
show chassis fabric unreachable-destinations	969
show chassis feb	971
show chassis firmware	975
show chassis forwarding	986
show chassis fpc	988
show chassis fpc-feb-connectivity	1018
show chassis hardware	1020
show chassis in-service-upgrade	1145
show chassis lccs	1149
show chassis lcc-mode	1151
show chassis location	1153
show chassis mac-addresses	1157
show chassis network services	1163
show chassis oss-map	1165
show chassis pic	1166
show chassis power-ratings	1181
show chassis power	1184
show chassis psd	1196
show chassis redundancy feb	1198
show chassis routing-engine	1201
show chassis scb	1222
show chassis sfb	1224
show chassis sfm	1226
show chassis sibs	1229
show chassis spmb	1240
show chassis spmb sibs	1250
show chassis synchronization	1256
show chassis synchronization (MX Series Routers)	1260
show chassis temperature-thresholds	1268
show chassis zones	1289
show fib-local-accounting ip	1295

Part 4

Index

Index	1299
-----------------	------

List of Figures

Part 1	Overview	
Chapter 2	Router Chassis Clocking and Synchronization Configuration Overview . . .	23
	Figure 1: M120 Router Clock Sources	24
Chapter 4	TX Matrix and TX Matrix Plus Router Configuration Overview	47
	Figure 2: Routing Matrix Composed of a TX Matrix Router and Four T640 Routers	48
Part 2	Configuration	
Chapter 17	Configuring Chassis Settings to Support External Clock Synchronization	183
	Figure 3: Clocking Example for PTX Series Packet Transport Routers	191
Chapter 25	Examples	293
	Figure 4: BITS Retiming with Synchronization Supply Unit (SSU)	302

List of Tables

	About the Documentation	xxiii
	Table 1: Notice Icons	xxv
	Table 2: Text and Syntax Conventions	xxv
Part 1	Overview	
Chapter 1	Router Chassis Configuration Overview	3
	Table 3: FPC Connection Limit Comparison	18
	Table 4: Routers Supporting OSS Mapping	20
Chapter 2	Router Chassis Clocking and Synchronization Configuration Overview . . .	23
	Table 5: Synchronous Ethernet Support on Junos OS	25
	Table 6: Configuration Options	30
	Table 7: Default Quality Level to PTP Clock-Class Mapping	35
	Table 8: Precision Time Protocol Support	39
Chapter 3	Router Chassis Network Services Configuration Overview	43
	Table 9: Network Services Mode Functions	44
	Table 10: Restricted Software Features in Ethernet Network Services Mode . . .	46
Chapter 4	TX Matrix and TX Matrix Plus Router Configuration Overview	47
	Table 11: T640 to Routing Matrix FPC Conversion Chart	51
	Table 12: T1600 Router to Routing Matrix FPC Conversion Chart	57
	Table 13: T4000 Router to Routing Matrix FPC Conversion Chart	59
Part 2	Configuration	
Chapter 8	Configuring MX Series Chassis-Level Features	109
	Table 14: Adjustment Bytes for Logical Interfaces over Ethernet Interfaces	129
Chapter 11	Configuring PIC-Specific Features	145
	Table 15: PICs supporting port level framing	148
	Table 16: Ranges for Channelized E1 Configuration	155
	Table 17: Maximum Delay Buffer with q-pic-large-buffer Statement Enabled . .	159
Chapter 15	Configuring Chassis Settings to Support Channelized Interfaces	175
	Table 18: Ranges for Channelized DS3-to-DS0 Configuration	176
Chapter 24	Configuring Chassis Settings for Alarms	251
	Table 19: Configurable PIC Alarm Conditions	252
	Table 20: Chassis Component Alarm Conditions on M5 and M10 Routers	254
	Table 21: Chassis Component Alarm Conditions on M7i and M10i Routers	258
	Table 22: Chassis Component Alarm Conditions on M20 Routers	262

	Table 23: Chassis Component Alarm Conditions on M40 Routers	265
	Table 24: Chassis Component Alarm Conditions on M40e and M160 Routers . .	271
	Table 25: Chassis Component Alarm Conditions on M120 Routers	275
	Table 26: Chassis Component Alarm Conditions on M320 Routers	281
	Table 27: Chassis Component Alarm Conditions on MX Series 3D Universal Edge Routers	285
	Table 28: Backup Routing Engine Alarms	291
Chapter 26	Configuration Statements	313
	Table 29: Quality Levels	415
	Table 30: SSM-QL Support by Signal Type and Framing	416
Part 3	Administration	
Chapter 28	Monitoring Commands	493
	Table 31: show chassis adc Output Fields	494
	Table 32: show chassis afeb	496
	Table 33: show chassis alarms Output Fields	504
	Table 34: show chassis cfeb Output Fields	511
	Table 35: show chassis cip Output Fields	513
	Table 36: show chassis craft-interface Output Fields	517
	Table 37: show chassis environment Output Fields	539
	Table 38: show chassis environment adc Output Fields	590
	Table 39: show chassis environment cb Output Fields	603
	Table 40: show chassis environment fpc Output Fields	623
	Table 41: show chassis environment fpm Output Fields	649
	Table 42: show chassis environment monitored Output Fields	655
	Table 43: show chassis environment mcs Output Fields	669
	Table 44: show chassis environment pcg Output Fields	671
	Table 45: show chassis environment pem Output Fields	675
	Table 46: show chassis environment psm Output Fields	682
	Table 47: show chassis environment routing-engine Output Fields	689
	Table 48: show chassis environment scg Output Fields	693
	Table 49: show chassis environment sfb Output Fields	698
	Table 50: show chassis environment sfm Output Fields	708
	Table 51: show chassis environment sib Output Fields	714
	Table 52: show chassis ethernet-switch Output Fields	743
	Table 53: show chassis fan Output Fields	790
	Table 54: show chassis fabric destinations Output Fields	801
	Table 55: show chassis fabric feb Output Fields	813
	Table 56: show chassis fabric errors Output Fields	816
	Table 57: show chassis fabric fpcs Output Fields	821
	Table 58: show chassis fabric map Output Fields	858
	Table 59: show chassis fabric optics Output Fields	865
	Table 60: show chassis fabric plane Output Fields	878
	Table 61: show chassis fabric plane-location Output Fields	922
	Table 62: show chassis fabric redundancy mode Output Fields	926
	Table 63: show chassis fabric reachability Output Fields	928
	Table 64: show chassis fabric sibs Output Fields	935
	Table 65: show chassis fabric topology Output Fields	945

Table 66: show chassis fabric degraded-fabric-reachability Output Fields	967
Table 67: show chassis fabric unreachable-destinations Output Fields	969
Table 68: show chassis feb	971
Table 69: show chassis firmware Output Fields	977
Table 70: show chassis forwarding Output Fields	986
Table 71: show chassis fpc Output Fields	995
Table 72: show chassis fpc-feb-connectivity Output Fields	1018
Table 73: Routing Engines Displaying DIMM Information	1022
Table 74: show chassis hardware Output Fields	1025
Table 75: show chassis in-service-upgrade Output Fields	1145
Table 76: show chassis lccs Output Fields	1149
Table 77: show chassis lcc-mode Output Fields	1151
Table 78: show chassis location Output Fields	1155
Table 79: show chassis mac-addresses Output Fields	1159
Table 80: show chassis network services Output Fields	1163
Table 81: show chassis oss-map Output Fields	1165
Table 82: show chassis pic Output Fields	1169
Table 83: show chassis power-ratings Output Fields	1181
Table 84: show chassis power Output Fields	1186
Table 85: show chassis psd Output Fields	1196
Table 86: show chassis redundancy feb Output Fields	1198
Table 87: show chassis routing-engine Output Fields	1203
Table 88: show chassis scb Output Fields	1222
Table 89: show chassis sfb Output Fields	1224
Table 90: show chassis sfm Output Fields	1226
Table 91: show chassis sibs Output Fields	1230
Table 92: show chassis spmb Output Fields	1242
Table 93: show chassis spmb sibs Output Fields	1251
Table 94: show chassis synchronization Output Fields	1257
Table 95: show chassis synchronization Output Fields	1261
Table 96: show chassis temperature-thresholds Output Fields	1270
Table 97: show chassis zones Output Fields	1290

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:

- M Series
- MX Series
- T Series
- J Series
- PTX Series

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.xsl;
    }
  }
}
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 the *CLI User Guide*.

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.

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
Fixed-width text like this	Represents output that appears on the terminal screen.	user@host> show chassis alarms No alarms currently active

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

Convention	Description	Examples
<i>Italic text like this</i>	<ul style="list-style-type: none"> Introduces or emphasizes important new terms. Identifies book 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 System Basics Configuration 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)	Enclose optional keywords or variables.	stub <default-metric <i>metric</i> >;
| (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 (<i>string1</i> | <i>string2</i> | <i>string3</i>)
# (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)	Enclose a variable for which you can substitute one or more values.	community name members [<i>community-ids</i>]
Indentation and braces ({ })	Identify 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.
> (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 send your comments to techpubs-comments@juniper.net, or fill out the documentation feedback form at <https://www.juniper.net/cgi-bin/docbugreport/>. If you are using e-mail, be sure to include the following information with your comments:

- Document or topic name
- URL or page number
- Software release 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 JNASC 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: <https://www.juniper.net/alerts/>

- 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

Overview

- [Router Chassis Configuration Overview on page 3](#)
- [Router Chassis Clocking and Synchronization Configuration Overview on page 23](#)
- [Router Chassis Network Services Configuration Overview on page 43](#)
- [TX Matrix and TX Matrix Plus Router Configuration Overview on page 47](#)

CHAPTER 1

Router Chassis Configuration Overview

- Router Chassis Configuration Overview on page 3
- Port-Mirroring Instances Overview on page 8
- Fabric Fault Handling Overview on page 9
- Interoperability of Type 3 FPCs and Type 4 FPCs with Type 5 FPCs on page 12
- Interoperability Between MPC4E (MPC4E-3D-2CGE-8XGE) and 100-Gigabit Ethernet PICs on Type 4 FPC on page 12
- Fabric Plane Management on AS MLC Modular Carrier Card Overview on page 13
- Fabric Management on MPC4E Overview on page 16
- T4000 Power Management Overview on page 17
- Understanding Operations Support Systems Mapping on page 19

Router Chassis Configuration Overview

The JUNOS Software enables you to configure several properties of the router and many PIC-level features at the **[edit chassis]** hierarchy level. Some of the features are specific to M Series, MX Series, J Series, or T Series routers, while some others are common across all routers.

To configure router chassis properties, you can include the configuration statements available at the **[edit chassis]** hierarchy level:



NOTE: Statements at the **[edit chassis redundancy]** hierarchy level are described in the *JUNOS High Availability Configuration Guide*.

```
chassis {
  aggregated-devices {
    ethernet {
      device-count number;
      lacp {
        system-priority;
        link-protection;
      }
    }
  }
  sonet {
```

```
        device-count number;
    }
}
alarm {
    interface-type {
        alarm-name (red | yellow | ignore);
    }
}
config-button {
    no-clear;
    no-rescue;
}
craft-lockout;
fpc slot-number {
    allow-sram-parity-errors;
    port-mirror-instance port-mirroring-instance-name;
    power (off | on);
    sampling-instance;
    sanity-poll {
        retry-count number;
        on-error {
            raise-alarm;
            power cycle; | power off;
            write-coredump;
        }
    }
}
pic pic-number {
    port-mirror-instance port-mirroring-instance-name;
    framing (t1 | e1);
    port port-number {
        speed (oc3-stm1 | oc12-stm4 | oc48-stm16);
    }
    adaptive-services {
        service-package (layer-2 | layer-3);
    }
    aggregate-ports;
    atm-cell-relay-accumulation;
    atm-l2circuit-mode (cell | aal5 | trunk trunk);
    vtmapping number;
    cel {
        e1 port-number {
            channel-group channel-number timeslots slot-number;
        }
    }
    ct3 {
        port port-number {
            t1 link-number {
                channel-group channel-number timeslots slot-number;
            }
        }
    }
}
egress-policer-overhead bytes;
framing (sdh | sonet);
fru-poweron-sequence;
idle-cell-format {
    itu-t;
```

```

        payload-pattern payload-pattern-byte;
    }
    ingress-policer-overhead bytes;
    linerate-mode;
    max-queues-per-interface (8 | 4);
    mlfr-uni-nni-bundles number;
    number-of-ports;
    no-concatenate;
    q-pic-large-buffer {
        large-scale;
        small-scale;
    }
    red-buffer-occupancy {
        weighted-averaged [ instant-usage-weight-exponent weight-value ];
    }
    sparse-dlcis;
    traffic-manager {
        egress-shaping-overhead number;
        ingress-shaping-overhead number;
        mode {
            egress-only;
            ingress-and-egress;
            session-shaping;
        }
    }
    tunnel-services {
        bandwidth (1g | 10g);
    }
    vtmapping number (itu-t | klm);
}
fpc-resync;
fpc-feb-connectivity {
    fpc slot-number feb (slot-number | none);
}
lcc number {
    fpc number {
        pic number {
            atm-cell-relay-accumulation;
            atm-l2circuit-mode (cell | aal5 | trunk trunk);
            framing (sdh | sonet);
            idle-cell-format {
                itu-t;
                payload-pattern payload-pattern-byte;
            }
            linerate-mode;
            max-queues-per-interface (8 | 4);
            no-concatenate;
            no-multi-rate;
            hash-key {
                family {
                    inet {
                        layer-3;
                        layer-4;
                        symmetric-hash {
                            complement;
                        }
                    }
                }
            }
        }
    }
}

```

```
    }
    multiservice {
        source-mac;
        destination-mac;
        payload {
            ip {
                layer-3;
                layer-4;
            }
        }
        symmetric-hash {
            complement;
        }
    }
}
}
}
}
maximum-ecmp;
offline;
online-expected;
sampling-instance;
}
lcc-mode {
    lcc-number {
        mode mode;
    }
}
memory-enhanced {
    filter;
    route;
    vpn-label;
}
(packet-scheduling | no-packet-scheduling);
pem {
    minimum-number;
    feeds number-of-input-feeds;
    input-current amps-in-each-feed;
}
no-concatenate;
redundancy {
    cfeb slot (always | preferred);
    failover {
        on-disk-failure
        on-loss-of-keepalives;
    }
    feb {
        redundancy-group group-name {
            feb slot-number (backup | primary);
            description description;
            no-auto-failover;
        }
    }
}
port-mirror-instance port-mirroring-instance-name;
graceful-switchover;
keepalive-time seconds;
```

```

routing-engine slot-number (master | backup | disabled);
sfm slot-number (always | preferred);
ssb slot-number (always | preferred);
}
network-services (ethernet | ip);
routing-engine {
  on-disk-failure {
    disk-failure-action (halt | reboot);
  }
}
sfm slot-number {
  power off;
}
sib {
  minimum number;
}
vrf-mtu-check;
vtmapping (itu-t | klm);
synchronization {
  signal-type (e1 | t1);
  switching-mode (revertive | non-revertive);
  y-cable-line-termination;
  transmitter-enable;
  validation-interval seconds;
  primary (external-a | external-b);
  secondary (external-a | external-b);
}
}

```



NOTE: The configuration statements at the [edit chassis lcc] hierarchy level apply only to a routing matrix based on a TX Matrix router or a TX Matrix Plus router. For information about a routing matrix composed of a TX Matrix router and T640 routers, see [“TX Matrix Router and T640 Router Configuration Overview” on page 47](#) and the *TX Matrix Router Hardware Guide*. For information about a routing matrix composed of a TX Matrix Plus router and T1600 or T4000 routers, see [“TX Matrix Plus Router Configuration Overview” on page 52](#) and the *TX Matrix Plus Router Hardware Guide*.



NOTE: The sanity-poll configuration statements at the [edit chassis fpc slot-number] hierarchy level apply only to T Series routers. You can also configure sanity-poll for routing matrix based on a TX Matrix router or TX Matrix Plus router at the hierarchy level [edit chassis lcc number fpc number].

Related Documentation

- [Router Chassis Configuration Statements on page 313](#)

Port-Mirroring Instances Overview

You can configure port mirroring for IPv4 and IPv6 traffic on all M Series, T Series, and MX Series routers. In addition, on the M7i, M10i, M120, M320, and MX Series routers, you can configure port mirroring for Layer 2 VPLS traffic.

You configure global port mirroring by including the **port-mirroring** statement at the **[edit forwarding-options]** hierarchy level. Configuring port-mirroring properties globally results in the properties being applied system-wide to all the Packet Forwarding Engines and their respective ports.

On MX Series, M320, and M120 routers, you can configure named port-mirroring instances for Layer 2 VPLS traffic. Configuring port-mirroring instances enables you to customize each instance with different properties for input-sampling and port-mirroring output destinations, instead of having to use a single system-wide configuration for port mirroring.

You configure multiple port-mirroring instances by including the **instance port-mirroring-instance-name** statement at the **[edit forwarding-options port-mirroring]** hierarchy level. You can then associate individual port-mirroring instances with an FPC, PIC, or FEB (depending on the router).

For more information about configuring port mirroring on all routers, see the *Routing Policy Feature Guide for Routing Devices*. For more information on configuring port mirroring for Layer 2 VPLS traffic on MX Series routers, see the *Junos OS Layer 2 Configuration Guide*.

Related Documentation

- [Configuring Port-Mirroring Instances on MX Series 3D Universal Edge Routers on page 110](#)
- [Configuring Port-Mirroring Instances on M320 Routers on page 101](#)
- [Configuring Port-Mirroring Instances on M120 Routers on page 102](#)

Fabric Fault Handling Overview

The T4000 router consists of a Switch Interface Board (SIB) with fabric bandwidth double the capacity of the T1600 router. The fabric fault management functionality is similar to that in T1600 routers. This topic describes the fabric fault handling functionality on T4000 routers.

The fabric fault management functionality involves monitoring all high-speed links connected to the fabric and the ones within the fabric core for link failures and link errors.

Action is taken based on the fault and its location. The actions include:

- Reporting link errors in system log files and sending this information to the Routing Engine.
- Reporting link failures at the Flexible Port Concentrator (FPC) or at the SIB and sending this information to the Routing Engine.
- Marking a SIB in **Check** state.
- Moving a SIB into **Fault** state.

The SIB in T4000 routers forms the core of the fabric with 4:1 redundancy—the redundant SIB becomes active when the active SIB becomes nonfunctional, is deactivated, or is removed. The following are the high-level indications of fabric faults that are monitored by Junos OS:

- An SNMP trap is generated whenever a SIB is reported as **Check** or **Fault**.
- **show chassis alarms**—Indicates that a SIB is in **Check** or **Fault** state.
- **show chassis sibs**—Indicates that a SIB is in **Check** or **Fault** state or that a SIB is in **Offline** state when the SIB initializes (this occurs when the SIB does not power on fully).
- **show chassis fabric fpcs**—Indicates whether any fabric links are in error on the FPCs' side.
- **show chassis fabric sibs**—Indicates whether any fabric links are in error on the SIBs' side.
- The `/var/log/messages` system log messages file at the Routing Engine has error messages with the prefix **CHASSISD_FM_ERROR**.
- The SIBs display the **FAIL** LED.



NOTE:

The fabric planes in the chassis determine whether the chassis is a T640 router, a T1600 router, or a T4000 router. Power entry modules (PEMs), FPCs, or fan trays do not determine chassis personality. Alarms are raised if the old PEMs or fan trays are present in a T4000 chassis. You can identify a router based on its fabric planes:

- If all planes present are F16-based SIBs, the chassis is a T640 chassis.
- If all planes present are SF-based SIBs, the chassis is a T1600 chassis.
- If all planes present are XF-based SIBs, the chassis is a T4000 chassis.

Note that mixing of fabric planes is not a supported configuration except during upgrade. You can change the personality of a chassis without a reboot by changing all the fabric planes and by issuing the `set chassis fabric upgrade-mode` CLI command to check the personality. If you do not issue the `set chassis fabric upgrade-mode` CLI command, the personality does not change until the next boot.

In T4000 routers, you come across the following faults:

- Board-level faults—These faults occur during initialization or during runtime. Power failure during board initialization, high-speed links transmit error, and polled I/O error during runtime are some examples of board-level faults.
- Link-level faults—These faults occur during initialization or during runtime. Link training failure at initialization time (failure of the data plane links between an FPC and a SIB to be trained when the FPC or SIB is initialized), error detected on the channel between the SIB and a Packet Forwarding Engine, cyclic redundancy check (CRC) errors detected at runtime, and Packet Forwarding Engine destination errors are types of link-level faults.
- Faults based on environmental conditions—These faults occur during runtime. Sudden removal of an FPC or a SIB might result in an operator error. When a SIB becomes too hot or when SIB voltages are beyond thresholds, the errors generated are classified into environmental errors.

You can implement one of the following options to handle the faults:

- Log the error and raise an alarm.
- Switch over to the spare plane, if available.
- Continue with a reduced number of parts of a plane.
- Continue with a reduced number of usable planes.
- Use polling-based fault handling.
- Monitor high-speed link errors and manually bring the link down to a suitable threshold.

The polled I/O errors and the link errors are monitored every 500 milliseconds, and the board exhaust temperature and board voltages are monitored every 10 seconds.

Related Documentation

- *Troubleshooting the T4000 SIBs*
- *Troubleshooting the T4000 FPCs*
- [show chassis alarms on page 498](#)
- [show chassis fabric fpcs on page 819](#)
- [show chassis fabric sibs on page 934](#)
- [show chassis sibs on page 1229](#)

Interoperability of Type 3 FPCs and Type 4 FPCs with Type 5 FPCs

Support for interoperability of Type 3 FPCs, Type 4 FPCs, and T640-FPC4-1P-ES with Type 5 FPCs is now possible with fabric notification translation. This feature is supported on T4000 routers.

Basic packet forwarding, IPv4, IPv6, MPLS, and multicast (dataplane) are currently supported through this feature.

- Related Documentation**
- *T4000 FPCs Supported*
 - *T4000 PICs Supported*

Interoperability Between MPC4E (MPC4E-3D-2CGE-8XGE) and 100-Gigabit Ethernet PICs on Type 4 FPC

You can enable interoperability between the MPC4E (MPC4E-3D-2CGE-8XGE) and the 100-Gigabit Ethernet PIC (PD-1CE-CFP-FPC4) by:

- Enabling source address (SA) multicast bit steering mode on the MPC4E.
- Configuring the two 50-Gigabit Ethernet physical interfaces on the 100-Gigabit Ethernet PIC PD-1CE-CFP-FPC4 as one aggregated Ethernet physical interface.

SA multicast mode uses the multicast bit in the source MAC address for packet steering. By default, the SA multicast bit is set to 0 for all packets sent by the MPC4E. The egress packet flow is the traffic flowing from the MPC4E to the 100-Gigabit Ethernet PIC. Because no VLAN tags are available, the SA multicast bit is sent on the outgoing packets. At the other end, the 100-Gigabit Ethernet PIC checks the multicast bit and forwards the packets to either Packet Forwarding Engine 0 or Packet Forwarding Engine 1. The ingress packet flow is the traffic flowing from the 100-Gigabit Ethernet PIC to the MPC4E. When the 100-Gigabit Ethernet PIC sends out a packet, the multicast bit is set based on the packet received from the Packet Forwarding Engine. The multicast bit is then transmitted and the MPC4E checks the multicast bit on ingress.

The 100-Gigabit Ethernet PIC uses a Type 4 FPC and two 50-Gbps Packet Forwarding Engines to achieve a throughput of 100 Gbps. The 50-Gbps physical interfaces are created when the 100-Gigabit Ethernet PIC is plugged in. The two physical interfaces are visible and configuration is allowed on both physical interfaces. The physical interfaces on the 100-Gigabit Ethernet PIC must be configured in static LAG mode without enabling Link Aggregation Control Protocol (LACP). This ensures that a single 100-Gigabit Ethernet aggregated interface is visible on the link connecting to the MPC4E instead of two independent 50-Gbps interfaces.

- Related Documentation**
- *forwarding-mode*
 - *sa-multicast*
 - [Configuring MPC4E \(MPC4E-3D-2CGE-8XGE\) to Interoperate with 100-Gigabit Ethernet PICs on Type 4 FPC Using SA Multicast Mode on page 124](#)

Fabric Plane Management on AS MLC Modular Carrier Card Overview

The Application Services Modular Line Card (AS MLC) provides high application throughput and storage space, and is designed to run services on the MX240, MX480, and MX960 routers. The AS MLC consists of the following components:

- Application Services Modular Carrier Card (AS MCC)
- Application Services Modular Processing Card (AS MXC)
- Application Services Modular Storage Card (AS MSC)

The AS MCC plugs into the chassis and provides the fabric interface.

An MX960 router can support three Switch Control Boards (SCBs) or six fabric planes. The AS MCC supports six fabric planes. An MX240 or MX480 router can support up to two SCBs or two fabric planes. The AS MCC at any time can provide connectivity to only six of the eight fabric planes. Fabric planes 1 and 5, and 3 and 7 use shared physical links. So between fabric planes 1 and 5 only one plane can be active. Similarly between fabric planes 3 and 7, only one plane can be active.

This behavior impacts the output of fabric-related monitoring commands on MX240 and MX480 routers with AS MCCs.

The **show chassis fpc pic-status** command displays the output for an MX480 router with an AS MCC:

```
user@host>show chassis fpc pic-status
Slot 2   Online      MPC Type 1 3D Q
  Slot 1   Online      AS-MCC
    PIC 0   Online      AS-MS
    PIC 2   Online      AS-MXC
Slot 4   Offline     MPC 3D 16x 10GE
Slot 5   Offline     AS-MCC
```

In the **show chassis fpc pic-status** command output, **Slot 1 and 5** are AS MCC, **PIC 0** is the AS MSC, and **PIC 2** is the AS MXC.

The **show chassis fabric fpcs** command displays the output on an MX480 router with an AS MCC.

```
user@hostshow chassis fabric fpcs
FPC 2
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
FPC 4
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
```

```
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Links ok
Plane 5: Links ok
Plane 6: Links ok
Plane 7: Links ok
PFE #2
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Links ok
Plane 5: Links ok
Plane 6: Links ok
Plane 7: Links ok
FPC 5
PFE #0
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Unused
Plane 6: Plane enabled
Plane 7: Unused
```

In the **show chassis fabric fpcs** command output, **FPC 5** is the AS MCC.

The **show chassis fabric plane** command displays the output on an MX480 router with an AS MCC.

```
user@host>show chassis fabric plane
Fabric management PLANE state
Plane 0
  Plane state: ACTIVE
    FPC 2
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 2 :Links ok
    FPC 5
      PFE 0 :Links ok
Plane 1
  Plane state: ACTIVE
    FPC 2
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 2 :Links ok
    FPC 5
      PFE 0 :Links ok
Plane 2
  Plane state: ACTIVE
    FPC 2
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 2 :Links ok
    FPC 5
      PFE 0 :Links ok
Plane 3
```

```

Plane state: ACTIVE
  FPC 2
    PFE 0 :Links ok
  FPC 4
    PFE 0 :Links ok
    PFE 2 :Links ok
  FPC 5
    PFE 0 :Links ok
Plane 4
  Plane state: ACTIVE
    FPC 2
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 2 :Links ok
    FPC 5
      PFE 0 :Links ok
Plane 5
  Plane state: ACTIVE
    FPC 2
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 2 :Links ok
    FPC 5
      PFE 0 :Unused
Plane 6
  Plane state: ACTIVE
    FPC 2
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 2 :Links ok
    FPC 5
      PFE 0 :Links ok
Plane 7
  Plane state: ACTIVE
    FPC 2
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 2 :Links ok
    FPC 5
      PFE 0 :Unused

```

In the **show chassis fabric plane** output, **FPC 5** is the AS MCC.

The term **Unused** in the output for the **show chassis fabric fpcs** and **show chassis fabric plane** command indicates that one fabric plane from each pair that share physical links (1 and 5, and 3 and 7) is inactive.

See *Junos OS System Basics and Services Command Reference* for more information.

- Related Documentation**
- [show chassis fabric plane on page 876](#)
 - [show chassis fabric fpcs on page 819](#)

Fabric Management on MPC4E Overview

MPC4E is a fixed-configuration MPC that provides scalability in bandwidth and services capability of routers. MPC4E is supported on MX240, MX480, MX960, MX2010 and MX2020 routers. The MPC4E plugs into the chassis and provides the fabric interface.

By default, MX240 and MX480 routers with MPC4E support four active fabric planes each. However, this default fabric redundancy mode, also known as redundant fabric mode, makes the MPC run in reduced bandwidth state. In increased bandwidth mode, the MX240 and MX480 routers with MPC4E support six active fabric planes each. You can increase the number of active fabric planes by changing the mode from redundant fabric mode to increased bandwidth mode. To configure the MPC4E to function in increased bandwidth mode, use the existing **redundancy-mode increased-bandwidth** statement at the **[edit chassis fabric]** hierarchy level.

If you do not configure the fabric redundancy mode, MPC4E functions in redundant fabric mode. To configure the redundant fabric mode, use the existing **redundancy-mode redundant** statement at the **[edit chassis fabric]** hierarchy level.

An MX960 router can support three Enhanced MX Switch Control Boards (SCBEs) or six fabric planes. MX240 and MX480 routers can support up to two SCBEs or four fabric planes each. MX2020 routers can support eight Switch Fabric Boards (SFBs) or 24 fabric planes.

At any given time, on MX240 and MX480 routers, MPC4E can provide connectivity to only six of the eight fabric planes. Fabric planes 1 and 5 and fabric planes 3 and 7 use shared physical links. So, among fabric planes 1 and 5, only one plane can be active. Similarly, among fabric planes 3 and 7, only one plane can be active.

On MX240 and MX480 routers with MPC4E, if the fabric redundancy mode is not configured, then fabric planes 0, 1, 2, and 3 are online and active and fabric planes 4, 5, 6, and 7 are spare. If you configure the increased bandwidth mode, then the fabric planes 0, 1, 2, 3, 4, and 6 are active and fabric planes 5 and 7 are spare.

On MX960 routers with MPC4E, if you configure increased bandwidth mode, then fabric planes 0, 1, 2, 3, 4, and 5 are online. When MPC4E is plugged into an MX960 router, it does not have any fabric redundancy.

MX2020 routers with MPC4E do not support the existing **redundancy-mode** statement. Of the 24 fabric planes, all 24 planes are active.

Related Documentation

- [MPC4E on MX Series Routers Overview on page 118](#)
- [Example: Configuring Fabric Redundancy Mode on MPC4E on page 298](#)
- [redundancy-mode on page 396](#)
- [show chassis fabric destinations on page 801](#)
- [show chassis fabric fpcs on page 819](#)
- [show chassis fabric plane on page 876](#)

- [show chassis fabric redundancy-mode on page 926](#)
- *show chassis fabric summary*

T4000 Power Management Overview

Starting with Junos OS Release 12.3, the power management feature is enabled on a Juniper Networks T4000 Core Router. This feature enables you to limit the overall chassis output power consumption. That is, this feature enables you to limit the router from powering on a Flexible PIC Concentrator (FPC) when sufficient output power is not available to power on the FPC.

The power management feature is enabled only when six input feeds with 40 amperes (A) each or four input feeds with 60 A each is configured on the router. The power management feature is *not* enabled for any other input feed—current combination. When the power management feature is *not* enabled, Junos OS tries to power on all the FPCs connected to the router.



CAUTION: If you do not configure the power management feature and the maximum power draw is exceeded by the router, FPCs' states might change from Online to Offline or Present, some traffic might drop, or the interfaces might flap.



TIP: Interface flapping occurs when a router alternately announces the state of the interface to be as *up* and *down* in quick sequence.

After you connect the input feeds to the router, you must configure the number of input feeds connected to the router and the amount of current received at the input feeds. Use the **feeds** statement and the **input current** statement at the **[edit chassis pem]** hierarchy level to configure the number of input feeds and the amount of current received at each input feeds, respectively.



NOTE: You can connect three 80 A DC power cables to the six-input DC power supply by using terminal jumpers. When you do this, ensure that you configure the **feeds** statement to have the value 6 and the **input current** statement to have the value 40. If these configurations are not set, the power management feature is *not* enabled and, therefore, Junos OS tries to power on all the FPCs connected to the router.

When the power management feature is enabled, FPCs connected to the router are powered on based on the power received by the router. If the router receives sufficient power to power on all the FPCs connected to the router, all the FPCs are powered on. If sufficient power is not available, Junos OS limits the number of FPCs brought online.

That is, Junos OS uses the total available chassis output power as a factor to decide whether or not to power on an FPC connected to the router.

Of all the supported FPCs of a T4000 router, the T1600 Enhanced Scaling FPC4 (model number: T1600-FPC4-ES) has the greatest power requirement. [Table 3 on page 18](#) compares the FPC connection limits between a six-input feed 40 A connection and a four-input feed 60 A connection when power management is enabled and T1600-FPC4-ES is connected to router.

Table 3: FPC Connection Limit Comparison

Six Input Feeds with 40 A Connection	Four Input Feeds with 60 A Connection
When T1600-FPC4-ES is <i>not</i> connected: <ul style="list-style-type: none"> All eight FPC slots can be brought online. 	When T1600-FPC4-ES is <i>not</i> connected: <ul style="list-style-type: none"> A maximum of seven other FPCs can be brought online. That is, only seven slots out of the eight FPC slots can be brought online.
When only one T1600-FPC4-ES is connected: <ul style="list-style-type: none"> A maximum of seven other FPCs can be brought online. That is, only seven slots out of the eight FPC slots can be brought online. 	When only one T1600-FPC4-ES is connected: <ul style="list-style-type: none"> A maximum of six other FPCs can be brought online. That is, only six slots out of the eight FPC slots can be brought online.
When only T1600-FPC4-ES FPCs are connected: <ul style="list-style-type: none"> A maximum of six T1600-FPC4-ES FPCs can be brought online. 	More than one T1600-FPC4-ES <i>cannot</i> be brought online.

**NOTE:**

- When the power management feature is enabled, FPC power-on consistency is not maintained across router reboots. That is, the same set of FPCs that were powered on before a reboot might not be powered on after the reboot. Before the router reboot, the FPCs are powered on according to their insertion order in the chassis. After the reboot, the FPCs are powered on according to the FRU power-on sequence configured in the `fru-poweron-sequence` statement at the `[edit chassis]` hierarchy level. If the FRU power-on sequence is not configured, Junos OS uses the ascending order of the slot numbers of the FPCs as the sequence to power on the FPCs.
- Removal of any online FPC from the chassis does not change the state of any other FPC and does not trigger the power management feature to power on the FPCs that were not powered on initially because of the lack of sufficient power. When any online FPC is removed from the chassis, if you need to trigger the power management feature to re-evaluate the situation, you need to reboot or restart the chassis. Alternatively, you can make a configuration change at the `[edit chassis]` hierarchy level and then issue the `commit` command to commit the changes made at the `[edit chassis]` hierarchy level. The power management feature re-evaluates the situation when a configuration change is committed at the `[edit chassis]` hierarchy level.

Related Documentation

- [Configuring the Six-Input DC Power Supply on page 247](#)
- [Configuring the Power-On Sequence for FPCs on T640, T1600, and T4000 Routers on page 137](#)
- [pem on page 386](#)
- [feeds on page 348](#)
- [input-current on page 363](#)
- [fru-poweron-sequence on page 356](#)

Understanding Operations Support Systems Mapping

The operations support systems mapping feature is supported on the T4000 chassis. This feature prevents requalifying of an existing router on the customer's operations support system when a T1600 chassis or a T640 chassis is upgraded to a T4000 chassis.

The following sections explain this feature in detail:

- [Operations Support System Overview on page 20](#)
- [Methods to View the Updated Chassis Name on page 20](#)
- [Supported Platforms on page 20](#)
- [Points to Remember on page 21](#)

Operations Support System Overview

Operations support systems (OSS) is a networking system or software that is used by telecommunication providers and Internet service providers in conjunction with, and to operate, Juniper Networks products. The OSS is used to identify and qualify any existing or new Juniper product that is added to the network. To distinguish the different routers, the OSS uses the **Chassis** field, which is displayed in the output of the **show chassis hardware** operational command.

When a T1600 chassis or a T640 chassis is upgraded to a T4000 chassis, the OSS identifies the new chassis as a new networking element and follows a time-consuming process of qualifying it for the service provider network. The *OSS mapping feature* helps avoid this scenario.

Using the OSS mapping feature, you can map T4000 chassis to a T1600 chassis or a T640 chassis with the **set chassis oss-map model-name t640 | t1600** configuration command. This configuration command overrides the chassis model name (as is seen in the output of the **show chassis hardware** and the **show chassis oss-map** operational mode commands), so that the OSS recognizes the chassis as a known chassis and proceeds without any requalification.



NOTE:

- The **set chassis oss-map model-name t640 | t1600** command is applicable only on T4000 routers. You must explicitly set this command when a T1600 chassis or a T640 chassis is upgraded to a T4000 chassis.
- You can execute the **set chassis oss-map model-name t640** command or the **set chassis oss-map model-name t1600** command if the OSS is compatible with either the T640 chassis or the T1600 chassis, respectively.

Methods to View the Updated Chassis Name

After you execute the **set chassis oss-map model-name t640 | t1600** configuration command, you can view the updated chassis name through one of the following ways:

- Operational commands—The **show chassis hardware**, **show chassis hardware detail**, and **show chassis hardware extensive** operational commands display the configured known chassis name.
- SNMP MIBs—The **show snmp mib walk system** and **show snmp mib walk jnxBoxAnatomy** operational commands display the configured known chassis and object ID.

Supported Platforms

Table 4: Routers Supporting OSS Mapping

Supported Platforms	Junos OS Release
T4000	12.3R3

Table 4: Routers Supporting OSS Mapping (*continued*)

Supported Platforms	Junos OS Release
T4000	13.1R2
T4000	13.2R1

Points to Remember

The following points illustrate the functionality on the T4000 chassis that undergoes a change or remains unchanged as a result of OSS mapping:

- Chassis functionality and behavior remain unchanged.
- No change in field-replaceable unit (FRU) details or model numbers. However, note that new FRUs must be qualified through the normal process.
- The chassis personality is identified only by SIB type.
- No changes in system log messages.
- No change to other MIBs or traps other than system, jnxboxanatomy, and object ID.
- No change in Common Language Equipment Identifier (CLEI) details.
- OSS mapping works even after GRES or unified ISSU is performed. The backup Routing Engine is updated with the latest information after the **commit synchronize** command is executed.

Related Documentation

- [Configuring OSS Mapping to Represent a T4000 Chassis as a T1600 or a T640 Chassis on page 138](#)
- [Example: Configuring a T4000 Chassis to Represent a T640 Chassis on page 309](#)
- [oss-map on page 382](#)
- [show chassis oss-map on page 1165](#)

CHAPTER 2

Router Chassis Clocking and Synchronization Configuration Overview

- [Interface and Router Clock Sources Overview on page 23](#)
- [Synchronous Ethernet Overview on page 25](#)
- [Synchronous Ethernet on 10-Gigabit Ethernet MIC Overview on page 28](#)
- [Ethernet Synchronization Message Channel Overview on page 32](#)
- [Understanding ESMC Quality Level Mapping on page 34](#)
- [Precision Time Protocol Overview on page 38](#)
- [Understanding Hybrid Mode on page 39](#)

Interface and Router Clock Sources Overview

- [Interface and Router Clock Sources Description on page 23](#)
- [Configuring an External Synchronization Interface on page 24](#)

Interface and Router Clock Sources Description

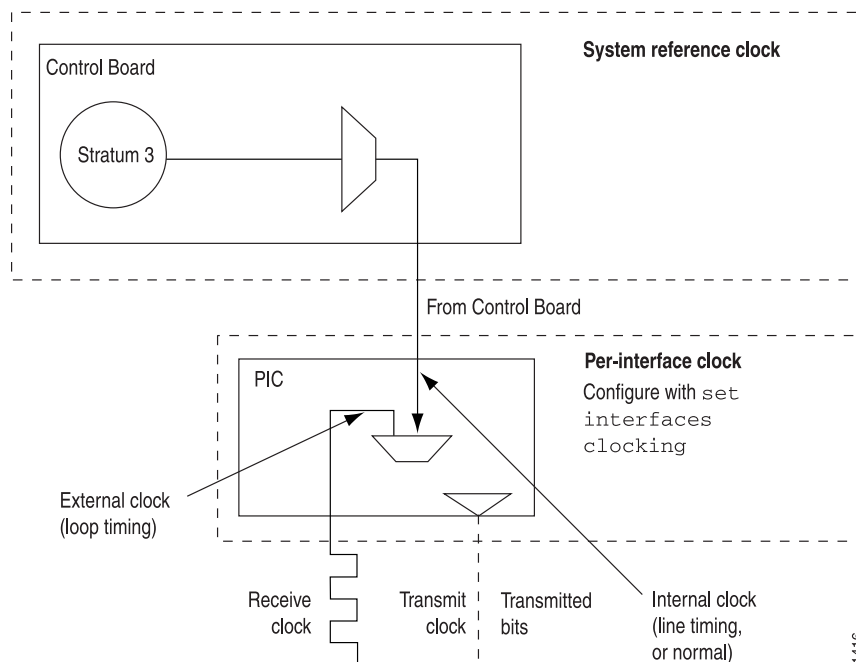
When configuring the router, you can configure the *transmit clock* on each interface; the transmit clock aligns each outgoing packet transmitted over the router's interfaces. For both the router and interfaces, the clock source can be the router's internal Stratum 3 clock, which resides on the control board, or an external clock that is received from the interface you are configuring. For example, interface A can transmit on interface A's received clock (external, loop timing) or the Stratum 3 clock (internal, line timing). Interface A cannot use a clock from any other source.

By default, each interface uses the router's internal Stratum 3 clock. To configure the clock source of each interface, include the **clocking** statement at the **[edit interfaces *interface-name*]** hierarchy level:

```
[edit interfaces interface-name]  
clocking (internal | external);
```

System reference clocks can be generated from different system components, depending on the router type. For example, [Figure 1 on page 24](#) illustrates the different clock sources on the M120 router.

Figure 1: M120 Router Clock Sources



Configuring an External Synchronization Interface

The M40e, M120, M320, T640, and T1600 routers support an external synchronization interface that can be configured to synchronize the internal Stratum 3 clock to an external source, and then synchronize the chassis interface clock to the external source.

This feature can be configured for external primary and secondary interfaces that use Building Integrated Timing System (BITS) or SDH Equipment Timing Source (SETS) timing sources. When internal timing is set for SONET/SDH, Plesiochronous Digital Hierarchy (PDH), and digital hierarchy (DS1) interfaces on the Physical Interface Cards (PICs), the transmit clock of the interface is synchronized to BITS/SETS timing and traceable to timing within the network.

To configure external synchronization on M40e, M120, M320, T640, and T1600 routers, include the **synchronization** statement at the **[edit chassis]** hierarchy level.

For more information about the external synchronization interface, see [“Configuring the Junos OS to Support an External Clock Synchronization Interface for M Series and T Series Routers”](#) on page 183.

Related Documentation

- [Configuring the Junos OS to Support an External Clock Synchronization Interface for M Series and T Series Routers](#) on page 183
- [Synchronous Ethernet Overview](#) on page 25
- [Configuring Clock Synchronization Interface for MX Series Routers](#) on page 185

Synchronous Ethernet Overview

Synchronization is a key requirement for circuit (emulation) services and mobile radio access technologies. Traditionally, mobile networks used SONET/SDH technologies to backhaul voice and data traffic, and the native support for frequency of SONET/SDH to synchronize their radio network. With the need for greater-capacity backhaul networks, packet-based technologies such as Carrier Ethernet (which do not support the transfer of frequency), and wireless technologies such as frequency division duplex and time-division duplex require not only frequency synchronization but also proper time and phase alignment. This requirement is fulfilled by Synchronous Ethernet, which is used for physical layer frequency synchronization of connected access devices (such as base stations, access nodes, and so on). Synchronous Ethernet supports sourcing and transfer of frequency for synchronization purposes for both wireless and wireline services and is primarily used for mobile backhaul and converged transport.

Synchronous Ethernet (ITU-T G.8261 and ITU-T G.8264) is a physical layer technology that functions regardless of the network load and supports hop-by-hop frequency transfer, where all interfaces on the trail must support Synchronous Ethernet. It enables you to deliver synchronization services that meet the requirements of the present-day mobile network, as well as future Long Term Evolution (LTE)–based infrastructures.

[Table 5 on page 25](#) summarizes the first Junos OS release that supports Synchronous Ethernet on the various Juniper Networks routers and their components:

Table 5: Synchronous Ethernet Support on Junos OS

Routers and Components	Junos OS Release
10-Gigabit Ethernet MPC with SFP+ transceivers	11.2R4
MX5, MX10, MX40, and MX80 3D Universal Edge Routers with model numbers MX5-T, MX10-T, MX40-T, and MX80-T	11.2R4
On MX240, MX480, and MX960 3D Universal Edge Routers, only the following Enhanced MPCs (MPCEs) support Synchronous Ethernet: <ul style="list-style-type: none"> • MPC1E (MX-MPC1E-3D) • MPC1E Q (MX-MPC1E-3D-Q) • MPC2E (MX-MPC2E-3D) • MPC2E Q (MX-MPC2E-3D-Q) • MPC2E EQ (MX-MPC2E-3D-EQ) 	11.2R4
On MX240, MX480, and MX960 3D Universal Edge routers, the following Enhanced MPCs (MPCEs) support Synchronous Ethernet: <p>MPC3E (MX-MPC3E-3D)</p>	13.2
10-Gigabit Ethernet MIC with XFP in WAN-PHY framing mode	11.2R4
10-Gigabit Ethernet MIC with XFP in LAN-PHY framing mode	11.4

Table 5: Synchronous Ethernet Support on Junos OS (*continued*)

Routers and Components	Junos OS Release
Juniper Networks PTX Series Packet Transport Switches with their 10-Gigabit Ethernet, 40-Gigabit Ethernet, and 100-Gigabit Ethernet interfaces	12.1
Juniper Networks ACX2000 Series Universal Access routers with Gigabit Ethernet and 10-Gigabit Ethernet SFP and SFP+ transceivers.	12.2

The ingress clock monitoring feature is supported on all MX Series routers including the 16-port 10-Gigabit Ethernet MPC. On these routers, the incoming Synchronous Ethernet signals cannot be monitored on the 16-port 10-Gigabit Ethernet MPC but are monitored by other Modular Port Concentrators (MPCs) in the chassis. Therefore, you can use the 16-port 10-Gigabit Ethernet MPC for incoming Synchronous Ethernet signals if at least one other MPC with an Ethernet Equipment Clock (EEC) is present in the chassis. This behavior is referred to as *ingress clock monitoring*. Note that the 16-port 10-Gigabit Ethernet MPC does not have a built-in EEC or internal clock; therefore, it can only input (accept) a clock signal but cannot act as a clock source.

When an MX Series router is configured for Synchronous Ethernet on the 16-port 10-Gigabit Ethernet MPC and no other MPC with an EEC is present in the chassis, the Synchronous Ethernet feature cannot be supported by the system. The system notifies the user through log messages and CLI output and justifies its inability to support Synchronous Ethernet.

For information about Synchronous Ethernet support on the 10-Gigabit Ethernet MIC, see [“Synchronous Ethernet on 10-Gigabit Ethernet MIC Overview” on page 28](#).

Starting with Junos OS Release 12.1, Synchronous Ethernet is supported on Juniper Networks PTX Series Packet Transport Routers. On the packet transport routers, Synchronous Ethernet is supported on 10-Gigabit Ethernet, 40-Gigabit Ethernet, and 100-Gigabit Ethernet interfaces and is compliant with ITU-T G.8261 and ITU-T G.8262 standards.

Starting with Junos OS Release 12.2, Synchronous Ethernet is supported on Juniper Networks ACX Series Universal Access routers with Gigabit Ethernet and 10-Gigabit Ethernet SFP and SFP+ transceivers and is compliant with the ITU-T G.8261 and G.8264 standards.

Synchronous Ethernet is not supported in the following instances:

- Slot 10 on the MX Series router with Switch Control Board (SCB).
- RJ45 ports
- MPC3E with C form-factor pluggable transceiver (CFP)



NOTE: Note that Synchronous Ethernet is supported on slot 10 on an MX Series router with Enhanced MX Switch Control Board (MX SCBE) and on RJ45 ports on an ACX router.



NOTE: Unified in-service software upgrade (unified ISSU) is currently not supported when clock synchronization is configured for Synchronous Ethernet on MX80 3D Universal Edge routers and on the MICs and MPCEs on MX240, MX480, and MX960 routers.

**Related
Documentation**

- [Clock Sources for PTX Series Packet Transport Routers on page 190](#)
- [Configuring Clock Synchronization Interface for MX Series Routers on page 185](#)
- [*Configuring External Clock Synchronization for ACX Series Routers*](#)
- [Ethernet Synchronization Message Channel Overview on page 32](#)
- [Example: Configuring Synchronous Ethernet on MX Series Routers on page 193](#)
- [Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC on page 197](#)
- [*request chassis synchronization mode*](#)
- [show chassis synchronization \(MX Series Routers\) on page 1260](#)
- [Synchronous Ethernet on 10-Gigabit Ethernet MIC Overview on page 28](#)
- [synchronization on page 411](#)

Synchronous Ethernet on 10-Gigabit Ethernet MIC Overview

Synchronous Ethernet (ITU-T G.8261) is a physical layer technology that functions regardless of the network load. Synchronous Ethernet supports hop-by-hop frequency transfer, where all interfaces on the trail must support Synchronous Ethernet.

Starting with Junos OS Release 11.4, the 10-Gigabit Ethernet MIC with XFP supports Synchronous Ethernet in LAN-PHY framing mode. This is possible only when all the Physical Interface Cards (PICs) under the given Modular Interface Card (MIC) and its ingress interfaces are configured in LAN framing mode. For more information about configuring LAN framing mode, see [“Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC” on page 197](#). In this mode, the LAN frequency is directly supplied by the MIC's on-board clocking circuitry.

On MX80 3D Universal Edge Routers, when the PIC-level framing type is changed, the pluggable MIC (2-port 10-Gigabit Ethernet MIC with XFP) is restarted and the Forwarding Engine Board with the built-in MIC (4-port 10-Gigabit Ethernet MIC with XFP) is restarted.

On MX240, MX480, and MX960 routers, when the PIC-level framing type is changed from LAN mode to non-LAN mode (on a MIC), the entire MPC restarts.



NOTE: The default interface framing mode is LAN-PHY framing mode. For WAN-PHY framing mode operation, interface framing needs to be set to the wan-phy framing option explicitly. For more information about the interface-level and PIC-level configuration combination, see [“Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC” on page 197](#).

Synchronous Ethernet is not supported in the following instances:

- MX240, MX480, and MX960 routers with 10-Gigabit Ethernet MICs or 10-Gigabit Ethernet built-in interfaces do not support Synchronous Ethernet or Ethernet Synchronization Message Channel (ESMC) transmit in LAN physical layer device (LAN-PHY) framing mode. To configure Synchronous Ethernet or ESMC transmit interfaces on these routers with 10-Gigabit Ethernet Interfaces, you must configure all the 10-Gigabit Ethernet interfaces on the MIC in WAN physical layer device (WAN PHY) framing mode.
- Primary and secondary sources cannot be from the same MIC. Alternatively, only the port with the highest quality clock source from a given MIC is used for clock selection.
- Starting with Junos OS Release 11.4, Synchronous Ethernet is not supported on 10-Gigabit Ethernet ports in LAN-PHY mode except for the 10-Gigabit Ethernet MIC with XFP.
- Prior to Junos OS Release 11.4, Synchronous Ethernet was supported only in WAN-PHY framing mode on the 10-Gigabit Ethernet MICs with XFP.

**NOTE:**

On the MX Series 3D Universal Edge Routers, the placement of MICs varies from router to router, the following key points has to be taken into consideration while configuring the MICs:

- On the fixed MX80 chassis, the MICs (10-Gigabit Ethernet MIC) come preinstalled and cannot be replaced. The MIC is labeled as 0/MIC 0 and it consists of four 10-Gigabit Ethernet ports labeled 0 through 3, left to right.
- On the modular MX5, MX10, MX40, and MX80 chassis, there are two MIC slots that are labeled as 1/MIC 0 and 1/MIC 1.
- On the MX240, MX480, and MX960 3D Universal Edge Routers, there are two slots for MICs which are labeled as PIC 0/1 and PIC 2/3 on the Modular Port Concentrators (MPCs).

Note that hereon the term *PIC* is being used in synonymous with the term *MIC slot* or *Ethernet ports* (in the case of fixed MX80 chassis).

You can configure a MIC in LAN-PHY framing mode by configuring all the constituent logical PICs in the same LAN-PHY framing mode on MX80, MX240, MX480, and MX960 routers.

You can also alternatively configure a MIC in WAN-PHY framing mode on MX80, MX240, MX480, and MX960 routers by configuring all the constituent logical PICs in the same WAN-PHY framing mode in any one of the following configurations:

- No framing mode configured on all the constituent logical PICs of the MIC.
- Incompatible framing mode configured on constituent logical PICs of the MIC.
- No framing mode configured on some of the constituent logical PICs of the MIC.



NOTE: All the logical PICs in a single MIC must be configured in the same framing mode.

You can also configure the framing mode at the interface level and at the PIC level. For more information about configuring the framing mode at the PIC level and at the interface level, see [“Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC” on page 197.](#)

When the PIC-level framing type is changed between LAN mode and non-LAN mode on a MIC:

- The Forwarding Engine Board (FEB) is restarted in the case of the built-in MIC (4-port 10-Gigabit Ethernet MIC with XFP) on MX80 routers.
- Only the corresponding MIC is restarted in the case of the pluggable MIC (2-port 10-Gigabit Ethernet MIC with XFP) on MX80 routers.

- The entire MPC restarts in the case of MX240, MX480, and MX960 routers.



NOTE: By default, the PIC-level framing mode is set to WAN framing type, that is, `e1 | e3 | sdh | sonet | t1 | t3`. Synchronous Ethernet works on the 10-Gigabit Ethernet MIC with XFP in LAN-PHY mode only when the PIC-level framing configuration is configured to the `lan` framing type explicitly.

By default, the interface-level framing mode is set to `lan-phy`. For WAN-PHY operation, interface framing needs to be set to `wan-phy` framing explicitly.

Table 6 on page 30 summarizes the possible configuration combination for Synchronous Ethernet on the 10-Gigabit Ethernet MIC with XFP that are available at the interface level and the PIC level:

Table 6: Configuration Options

Framing Configuration		Operation		
PIC Level	Interface Level	Interface Status	Will Synchronous Ethernet Function?	Will Non-Synchronous Ethernet Functions Work?
LAN	LAN-PHY (Default)	Up	Yes	Yes
LAN	WAN-PHY	Down (Framing Conflict)	No	No
WAN (Default)	LAN-PHY (Default)	Up	No	Yes
WAN (Default)	WAN-PHY	Up	Yes	Yes

The following cases and corresponding behaviors explain Table 6 on page 30 in detail.

- The PIC is being brought up online:

This case is applicable when either the MIC is restarted or when the MIC is being brought online by an operational command. In this case, the behavior can be presented as:

- No framing mode is configured for any or all of the constituent logical PICs of the MIC—The MIC is configured to operate in WAN-PHY framing mode as the WAN mode is the default mode.

Here, the WAN-PHY framing-based interfaces operate in normal state and provides Synchronous Ethernet services. However, the LAN-PHY framing-based interfaces operate normally but cannot provide Synchronous Ethernet services.

- All the constituent logical PICs of a MIC are configured in LAN-PHY mode—The MIC is configured to operate in LAN-PHY framing mode.

In this scenario, the WAN-PHY framing-based interfaces cannot operate in normal state. As a result, these interfaces are administratively brought down. The reason for the interface being in **admin-down** state is displayed as **Framing Conflict** in the output of the **show interfaces** operational command. This is because the interface framing configuration (WAN-PHY) is in conflict with the PIC-level framing configuration of LAN-PHY. Because the interfaces are in **admin-down** state, neither the Synchronous Ethernet services nor other services are provided.

Alternatively, all the LAN-PHY framing-based interfaces can operate in normal state and can continue to provide any of the Synchronous Ethernet services.

- The PIC is already online:
 - In WAN-PHY framing mode—The interface framing configuration on the PIC has changed from WAN-PHY to LAN-PHY.
The interface continues to be operational for data transceiving purposes. However, it cannot provide any of the Synchronous Ethernet services.
 - In WAN-PHY framing mode—The interface framing configuration on the PIC has changed from LAN-PHY to WAN-PHY.
The interface continues to be operational for data transceiving purposes, and it can also provide Synchronous Ethernet services.
 - In LAN-PHY framing mode—The interface framing configuration on the PIC has changed from WAN-PHY to LAN-PHY.
The interface is operational for data transceiving purposes, and it can also provide Synchronous Ethernet services.
 - In LAN-PHY framing mode—The interface framing configuration on the PIC has changed from LAN-PHY to WAN-PHY.
The interface is down; therefore, it cannot provide any Synchronous Ethernet services.

Support for Synchronous Ethernet is limited in the following instances:

- Primary and secondary sources cannot be from the same MIC. Alternatively, only the port with the highest quality clock source from a given MIC is used for clock selection.
- Prior to Junos OS Release 11.4, Synchronous Ethernet was supported only in WAN-PHY framing mode on the 10-Gigabit Ethernet MICs with XFP.

Related Documentation

- [Clock Sources for PTX Series Packet Transport Routers on page 190](#)
- [Configuring Clock Synchronization Interface for MX Series Routers on page 185](#)
- [Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC on page 197](#)
- *request chassis synchronization mode*
- [show chassis synchronization \(MX Series Routers\) on page 1260](#)
- [Synchronous Ethernet Overview on page 25](#)

- [synchronization on page 411](#)

Ethernet Synchronization Message Channel Overview

Ethernet Synchronization Message Channel (ESMC) is a logical communication channel. It transmits Synchronization Status Message (SSM) information, which is the quality level of the transmitting synchronous Ethernet equipment clock (EEC), by using ESMC protocol data units (PDUs). ESMC support is based on the ITU G.8264 specification.

A Synchronous Ethernet interface is configured to operate in the following modes:

- Nonsynchronous mode—In this mode, the Synchronous Ethernet interface does not process the ESMC message and does not extract the quality level information.
- Synchronous mode—In this mode, the Synchronous Ethernet interface processes the ESMC message and extracts the quality level information. While operating in synchronous mode, the ESMC messages transmit the quality level.

You can enable ESMC on a Synchronous Ethernet port by adding the port to a list of ESMC interfaces. The ESMC messages are transmitted through the port indicating the quality level of the clock it is capable of driving and the ESMC messages are received (if the other endpoint supports ESMC) with the quality level of the transmitting clock. The MPC receiving the ESMC messages on its configured Synchronous Ethernet ports extracts the quality level and transmits it to the Routing Engine. The clock selection algorithm on the Routing Engine collects the ESMC data from each of the ESMC-enabled ports to select the clock sources.

The clock selection process supports revertive and nonrevertive modes. When the clock selection process has selected two clock sources—a primary and a secondary—and the active primary clock source degrades over a period of time and then improves again, this primary clock source again becomes the active clock source only if revertive mode is enabled. If nonrevertive mode is set and the secondary clock source is currently active (due to a previous degradation of primary clock source), the primary clock source is not reactivated even after its quality improves.

The clock selection is based on the following three operational modes:

- Forced free-run—In this mode, you can set the clock source either from a free-run local oscillator or from an external qualified clock. For MX80 routers, the free-run clock is provided by the local oscillator. For MX240, MX480, and MX960 routers, the free-run clock is provided by the Switching Control Board (SCB).
- Forced holdover—This mode is an internal state the synchronous Ethernet Equipment Clock (EEC) goes into, when an upstream clock source that the system locks on to is no longer available. You cannot configure this mode because it is an internal state.
- Automatic selection—In this mode, the system chooses up to two best upstream clock sources. The system then uses the clock recovered from one of the sources to generate a frequency of 19.44 MHz and clock the transmit side of the Ethernet interfaces. If no upstream clock with acceptable good quality is available or if the system is configured

in free-run mode, the system uses the internal clock. Automatic clock selection is based on the quality level, priority, signal fail, and external commands.

For more information about clock selection, see [“Configuring Clock Synchronization Interface for MX Series Routers” on page 185](#).

The synchronous EEC is in free-run mode when the chassis is switched on or restarted. When a synchronous EEC locks on to an upstream reference clock source at least once for a continuous period of 60 seconds, the EEC will have stored sufficient Synchronous Ethernet data in a replay holdover buffer. In case of failure of a reference clock source, the system goes to holdover mode and uses the replay data in the holdover buffer to service the downstream Synchronous Ethernet clients.

When a Modular Port Concentrator (MPC) with an EEC restarts (because of either a system crash or a manual restart), the holdover buffer data gets erased. Therefore, downstream Synchronous Ethernet clients cannot be serviced. This is also applicable when a new MPC containing an EEC is inserted into the system.

In a practical deployment scenario, the status display of holdover mode is invalid only when the chassis is switched on or restarted.

When an MPC containing an EEC is restarted or a new MPC containing an EEC is inserted into a system that is (already) in holdover mode, the EEC on this MPC cannot be considered to be in holdover mode because it does not have any Synchronous Ethernet replay information in its holdover data buffer. Therefore, you must first fix the system holdover issue before attempting to service the downstream Synchronous Ethernet clients on this MPC. To accomplish this, you must find a suitable upstream reference clock source and let the synchronous EEC lock on to this upstream reference clock source, and then service the downstream Synchronous Ethernet clients on this MPC.

**Related
Documentation**

- [Synchronous Ethernet Overview on page 25](#)
- [Configuring Clock Synchronization Interface for MX Series Routers on page 185](#)
- [Clock Sources for PTX Series Packet Transport Routers on page 190](#)
- [synchronization on page 411](#)
- *request chassis synchronization mode*
- [show chassis synchronization on page 1256](#)

Understanding ESMC Quality Level Mapping

Ethernet Synchronization Message Channel (ESMC) is a logical communication channel. It transmits Synchronization Status Message (SSM) information, which is the quality level of the transmitting synchronous Ethernet equipment clock (EEC), by using ESMC protocol data units (PDUs). ESMC support is based on the ITU G.8264 specification. In order for an interface to receive or transmit ESMC messages, at least one logical interface must be configured on that interface. If the interface is currently not configured with a logical interface, you must configure a logical interface by using the **[set interfaces interface-name unit 0]** statement at the **[edit]** hierarchy level.

The following factors affect the ESMC quality level value that is transmitted out on the interfaces configured at the **[edit chassis synchronization esmc-transmit interfaces]** hierarchy level:

- Quality mode
- Selection mode
- Conversion of PTP clock class flag

Other than the aforementioned factors, the software phase lock loop (spll) state or the hybrid state impacts the transmitted ESMC quality level when the router is in PTP mode or hybrid mode, respectively.

The following sections explain how the ESMC quality level is handled in various situations:

- [Synchronous Ethernet Mode on page 34](#)
- [Precision Time Protocol Mode on page 35](#)
- [Hybrid Mode on page 37](#)
- [Feature Mode Changes on page 37](#)

Synchronous Ethernet Mode

In Synchronous Ethernet mode, the ESMC quality level is handled in the following way:

- In quality mode:
 - If the **quality-mode-enable** option at the **[show chassis synchronization]** hierarchy level is not set, then the configured quality and the priority set for the clock sources are used for the clock selection. The ESMC quality level is based on the configured quality level corresponding to the active clock source.
 - If the **quality-mode-enable** option at the **[show chassis synchronization]** hierarchy level is set, then only those clock sources that receive ESMC quality level is higher than or equal to the configured quality are considered for selection. The ESMC quality level value transmitted also depends on the selection mode option as discussed next.

- In selection mode:
 - If the **selection-mode** option at the **[show chassis synchronization]** hierarchy level is set to **configured-quality**, then the configured quality for the selected, active source is used as the system ESMC quality level value that is transmitted out.
 - If the **selection-mode** option at the **[show chassis synchronization]** hierarchy level is set to **received-quality**, then the received ESMC quality level value from the selected clock source is transmitted out.
- When no clock sources are locked:
 - a. Do Not Use (DNU)/Don't Use for Synchronization (DUS) quality level is transmitted.
 - b. The ESMC quality level value sent out on the selected, active clock source interface is always DNU/DUS.

Precision Time Protocol Mode

In Precision Time Protocol (PTP) mode, you can transmit ESMC quality level values with the following parameters set:

- The **network-option** option must be configured at the **[edit chassis synchronization]** hierarchy level.
- Synchronous Ethernet sources must not be configured at the **[edit chassis synchronization]** hierarchy level.
- The **convert-clock-class-to-quality-level** option at the **[edit protocols ptp slave]** hierarchy level must be enabled so that the PTP clock class received from the selected master is converted to the appropriate ESMC quality level.

Clock class is a value that ranges from 80 through 109 and is used to map the clock class to the set ESMC quality level. The ESMC quality level value is mapped to the clock class value by one of the following methods:

- Mapping of PTP clock class to ESMC quality level—By default, the standard mappings suggested by ITU-T G.781 specification are used as shown in [Table 7 on page 35](#) and irrespective of the clock being configured in hybrid mode or pure PTP mode, the outgoing quality level is always based on the PTP clock class mapping. To map the PTP clock class to the ESMC quality level, you must set the **convert-clock-class-to-quality-level** option at the **[edit protocols ptp slave]** hierarchy level. For default mapping values, see [Table 7 on page 35](#).

Table 7: Default Quality Level to PTP Clock-Class Mapping

SSM QL (Binary)	Standard Mappings Given in ITU-T G.781 Specification		PTP Clock Class
	Option I	Option II	
0001	-	QL-PRS	80
0000	-	QL-STU	82

Table 7: Default Quality Level to PTP Clock-Class Mapping (*continued*)

SSM QL (Binary)	Standard Mappings Given in ITU-T G.781 Specification		PTP Clock Class
0010	QL-PRC	-	84
0111	-	QL-ST2	86
0011	-	-	88
0100	QL-SSU-A	QL-TNC	90
0101	-	-	92
0110	-	-	94
1000	QL-SSU-B	-	96
1001	-	-	98
1101	-	QL-ST3E	100
1010	-	QL-ST3/ QL-EEC2	102
1011	QL-SEC/ QL-EEC1		104
1100	-	QL-SMC	106
1110	-	QL-PROV	108
1111	QL-DNU	QL-DUS	110

- User-defined mapping of PTP clock class to ESMC quality level—You can manually override the clock class to ESMC mapping by setting the **clock-class** option at the **[edit protocols ptp slave clock-class-to-quality-level-mapping quality level ql-value]** hierarchy level.

Unlike Synchronous Ethernet, the DNU/DUS quality level value is not transmitted on the interface on which the PTP master is configured. In PTP mode, an interface is configured as part of the **[edit chassis esmc-transmit interfaces]** hierarchy level, and an appropriate ESMC quality level value is transmitted through it. Note that when the PTP clock class value received from the master changes, the ESMC quality level transmitted also changes appropriately. If there is no valid clock class value as input, then the DNU/DUS value is transmitted on the interfaces configured under the **esmc-transmit** option at the **[edit chassis synchronization]** hierarchy level.

To view the current mapping between the clock class and the ESMC quality level, run the **show ptp quality-level-mapping** operational mode command.

To display the ESMC quality level currently transmitted by the interface, run the **show ptp global-information** operational mode command in PTP or hybrid mode. Note that when the **convert-clock-class-to-quality-level** option is disabled or when there is no valid clock class as input, the **show ptp global information** command does not display the ESMC quality level value.

To view the ESMC quality level transmitted in all modes, run the **show synchronous-ethernet esmc transmit detail** operational mode command.

Hybrid Mode

Hybrid mode is a combination of PTP and Synchronous Ethernet modes.

The configuration required for transmitting the ESMC quality level in hybrid mode differs from that in PTP mode in the following ways:

- In hybrid mode, synchronous Ethernet source interfaces must be configured at the **[edit chassis synchronization]** hierarchy level.
- In hybrid mode, configuring the **convert-clock-class-to-quality-level** option is optional. When this option is configured, the outgoing ESMC quality level behavior is the same as that in PTP mode. When the **convert-clock-class-to-quality-level** option is not configured, the outgoing ESMC quality level behavior is the same as that in Synchronous Ethernet mode.

Feature Mode Changes

When the router configuration is changed from one feature mode to another mode—that is from or to Synchronous Ethernet, PTP, or hybrid mode—the following occurs:

1. The ESMC quality level is reset to DNU.
2. Based on the new feature mode, the ESMC quality level is decided:
 - When the reference clock qualifies for Synchronous Ethernet mode.
 - When PTP goes into phase-aligned state or hold-over state in PTP mode.
 - When the hybrid state reaches *frequency and phase aligned* state in hybrid mode.

Sometimes PTP is required to drive Synchronous Ethernet and ESMC. This scenario occurs when:

- After certain PTP hops, the network branches out, and one branch of the network requires only frequency synchronization while the other branch requires both phase and frequency synchronization.
- A packet-based distribution network is located between a time-division multiplexing (TDM), a SONET, and a Synchronous Ethernet network.

In such situations, the clock recovered by PTP is sent over the Ethernet physical transceiver for Synchronous Ethernet, and the ESMC quality level value mapping with the PTP clock class is sent over the interfaces.

Related Documentation

- [Configuring Hybrid Mode and ESMC Quality Level Mapping on page 209](#)
- [Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 212](#)
- [Understanding Hybrid Mode on page 39](#)
- [Precision Time Protocol Overview on page 38](#)
- [Synchronous Ethernet Overview on page 25](#)

Precision Time Protocol Overview

Increase in bandwidth requirements on wireless backhaul networks and the need to reduce costs and to improve flexibility have triggered the need for a packet-based backhaul infrastructure. Traditional metro deployments do not cater to the delivery of synchronization services, and this leaves operators with no other choice than to keep older parallel infrastructure. Physical layer-based Synchronous Ethernet and packet-based Precision Time Protocol (PTP) enable MX Series and ACX Series routers to deliver synchronization services that meet the requirements of today's mobile network, as well as future Long Term Evolution (LTE)-based infrastructures. Physical layer-based technologies function regardless of network load, whereas packet-based technologies require careful architecture and capacity planning. For information about Synchronous Ethernet, see "[Synchronous Ethernet Overview](#)" on page 25.

PTP, also known as IEEE 1588v2, is a packet-based technology that enables the operator to deliver synchronization services on packet-based mobile backhaul networks. IEEE 1588 PTP (Version 2) clock synchronization standard is a highly precise protocol for time synchronization that synchronizes clocks in a distributed system. The time synchronization is achieved through packets that are transmitted and received in a session between a master clock and a slave clock.

The system clocks can be categorized based on the role of the node in the network. They are broadly categorized into ordinary clocks and boundary clocks. The master clock and the slave clock are known as ordinary clocks. The boundary clock can operate as either a master clock or a slave clock. The following list explains these clocks in detail:

- **Master clock**—Also called the grandmaster clock, the master clock is located in the PTP server (also called master or master node). The master clock transmits the messages to the PTP clients (also called slave node or boundary node). This allows the clients to establish their relative time distance and offset from the master clock (which is the reference point) for phase synchronization. Delivery mechanism to the clients is either unicast or multicast packets over Ethernet or UDP.
- **Slave clock**—Located in the PTP client (also called slave or slave node), the slave clock performs clock and time recovery operations based on the received and requested timestamps from the master clock.
- **Boundary clock**—The boundary clock operates as a combination of the master and slave clocks. The boundary clock endpoint acts as a slave clock to the master clock, and also acts as the master to all the slaves reporting to the boundary endpoint.

For more information about configuring PTP, see [“Configuring Precision Time Protocol” on page 201](#) and [“Example: Configuring Precision Time Protocol” on page 205](#).

The [Table 8 on page 39](#) summarizes the first Junos OS release that supports PTP on the various Juniper routers and their components:

Table 8: Precision Time Protocol Support

Routers and components	Junos OS Release
MX80 3D Universal Edge Routers with model number MX80-P	12.2
MX-MPC2E-3D-P on MX240, MX480, and MX960 routers	12.2
Ethernet Modular Interface Cards (MICs) on MX240, MX480, and MX960 routers	12.2
ACX Series Universal Access Routers	12.2



NOTE: Unified in-service software upgrade (unified ISSU) is currently not supported when clock synchronization is configured for PTP on the MICs and Enhanced MPCs on MX240, MX480, and MX960 routers.



NOTE: To switch between the PTP and Synchronous Ethernet modes, you must first deactivate the configuration for the current mode and then commit the configuration. Wait for a short period of 30 seconds, configure the new mode and its related parameters, and then commit the configuration.

Related Documentation

- [Configuring Precision Time Protocol on page 201](#)
- [Example: Configuring Precision Time Protocol on page 205](#)
- *IEEE 1588v2 Precision Timing Protocol (PTP) on ACX Series Universal Access Routers*

Understanding Hybrid Mode

The combined operation of Synchronous Ethernet and Precision Time Protocol (PTP) is also known as hybrid mode. The following sections explain hybrid mode in detail:

- [Hybrid Mode Overview on page 39](#)
- [Supporting Platforms on page 40](#)

Hybrid Mode Overview

In hybrid mode, the synchronous Ethernet equipment clock (EEC) on the Modular Port Concentrator (MPC) derives the frequency from Synchronous Ethernet and the phase

and time of day from PTP. Time synchronization includes both phase synchronization and frequency synchronization.

Synchronous Ethernet is a physical layer–based technology that functions regardless of the network load. Synchronous Ethernet supports hop-by-hop frequency transfer, where all interfaces on the trail must support Synchronous Ethernet. PTP (also known as IEEE 1588v2) synchronizes clocks between nodes in a network, thereby enabling the distribution of an accurate clock over a packet-switched network. This synchronization is achieved through packets that are transmitted and received in a session between a master clock (commonly called the master) and a slave clock (also known as the slave in PTP terminology). PTP synchronizes both frequency and phase including time of day. The accuracy of clock synchronization depends on factors such as packet delay variation, quality of oscillator used, network asymmetry, and so on.

Synchronous Ethernet and PTP provide frequency and phase synchronization; however, the accuracy in the order of nanoseconds is difficult to achieve through PTP or Synchronous Ethernet and they do not support a large number of network hops. Hybrid mode resolves these issues by extending the number of network hops and also provides clock synchronization accuracy in the order of tens of nanoseconds.

Hybrid mode is configured on the slave. On the slave, you can configure one or more interfaces as Synchronous Ethernet source interfaces.



NOTE: Router clocks are categorized based on the role of the router in the network. They are broadly categorized into ordinary clocks and boundary clocks. The master clock and the slave clock are known as ordinary clocks. The boundary clock can operate as either a master clock or a slave clock.

For information about configuring hybrid mode, see [“Configuring Hybrid Mode and ESMC Quality Level Mapping” on page 209](#). You can use the **show ptp hybrid status** operational command to find the current operating mode.

Supporting Platforms

Hybrid mode is supported on the Juniper Networks MX240, MX480, and MX960 3D Universal Edge Routers and on the Juniper Networks MX80 3D Universal Edge Routers with precision timing support (MX80-P) and with timing support (MX80-T).

On the MX240, MX480, and MX960 routers, the combined operation is possible only when the PTP client and the Synchronous Ethernet source are on the same enhanced MPC and are traceable to the same primary reference clock (also known as PRC).

When acting as PTP slaves, MX80-P routers can accept any external Synchronous Ethernet clock as reference and do not support building-integrated timing supply (BITS) input as frequency source in hybrid mode of operation. Only Synchronous Ethernet sources are allowed in hybrid mode. Note that when the selected Synchronous Ethernet reference fails, the router continues to work in PTP mode.

Unified in-service software upgrade (unified ISSU) is not supported when clock synchronization is configured for hybrid mode on MX80-P and MX80-T routers, and on the MICs and enhanced MPCs on MX240, MX480, and MX960 routers.



NOTE: To switch between PTP and Synchronous Ethernet modes, you must first deactivate the configuration for the current mode and then commit the configuration. Wait for 30 seconds, configure the new mode and its related parameters, and then commit the configuration.

**Related
Documentation**

- [Configuring Hybrid Mode and ESMC Quality Level Mapping on page 209](#)
- [Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 212](#)
- [Precision Time Protocol Overview on page 38](#)
- [Synchronous Ethernet Overview on page 25](#)

CHAPTER 3

Router Chassis Network Services Configuration Overview

- [Network Services Mode Overview on page 43](#)
- [Restrictions on Junos OS Ethernet Network Services Mode and Enhanced Ethernet Network Services Mode Features for MX Series Routers on page 46](#)

Network Services Mode Overview

You can configure network services modes on MX Series 3D Universal Edge Routers and on T4000 Core Routers with Type 5 FPCs.

- MX Series 3D Universal Edge Routers can be configured to run in IP Network Services mode, Enhanced IP Network Services mode, Ethernet Network Services mode, or Enhanced Ethernet Network Services mode. Each network services mode defines how the chassis recognizes and uses certain modules.



NOTE: You can use either Enhanced IP Network Services mode or Enhanced Ethernet Network Services mode to improve the scaling and performance specific to routing filters in a subscriber access network that uses statically configured subscriber interfaces. For more information about using enhanced network services modes with firewall filters, see *Firewall Filters and Enhanced Network Services Mode Overview* in the *Junos OS Subscriber Management and Services Library*.

- Junos OS Release 12.3 enables improved virtual private LAN service (VPLS) MAC address learning on T4000 routers with Type 5 FPCs by supporting up to 262,143 MAC addresses per VPLS routing instance. In Junos OS releases before Release 12.3, T4000 routers with Type 5 FPCs support only 65,535 MAC addresses per VPLS routing instance.

To improve MAC address learning on T4000 Core Routers with Type 5 FPCs, enable network services mode and then reboot the router. After the router reboots, modify the size of the MAC address table to the new limit—that is, 262,143 addresses.

**NOTE:**

- The MAC address learning limit for each interface remains the same (that is, 65,535 MAC addresses).
- You must reboot the router after configuring the enhanced-mode statement. When the T4000 router reboots, only the T4000 Type 5 FPCs are online while the remaining FPCs are offline.

When configuring chassis network services on the MX Series 3D Universal Edge routers, keep the following considerations in mind:

- You must configure a router chassis that has only MPC-3D-16XGE-SFPP modules installed for Ethernet Network Services mode or Enhanced Ethernet Network Services mode.
- You can configure a router chassis with only MPC-3D-16XGE-SFPP-R-B modules installed for any network services mode. However, this configuration requires installing the appropriate license if you want to use IP Network Services mode or Enhanced IP Network Services mode. However, this configuration requires installing the licensed copies of the IP Network Services mode or Enhanced IP Network Services mode. The licenses for these services are paper licenses.
- You must configure a router chassis that has both MPC-3D-16XGE-SFPP and MPC-3D-16XGE-SFPP-R-B modules installed for Ethernet Network Services mode or Enhanced Ethernet Network Services mode.



NOTE: If Dense Port Concentrators (DPCs) in Ethernet Network Services mode or Enhanced Ethernet Network Services mode are up and running, you cannot configure the system for IP Network Services mode. You must first disable any Ethernet Network Services mode DPCs before switching to IP Network Services mode.

Table 9 on page 44 explains the different module functions when you configure the MX Series 3D Universal Edge router chassis for different network services modes.

Table 9: Network Services Mode Functions

Configuration Upon Boot or Configuration Change	Module Function
IP Network Services mode (default; upon boot)	All modules except DPCE-X and DPCE-X-Q modules are powered on.

Table 9: Network Services Mode Functions (*continued*)

Configuration Upon Boot or Configuration Change	Module Function
Ethernet Network Services mode (upon boot)	<p>All modules are powered on. However, operating in Ethernet Network Services mode restricts certain BGP protocol functions and does not support Layer 3 VPN, unicast RPF, and source and destination class usage (SCU and DCU) functions. In addition, the number of externally configured filter terms is restricted to 64K.</p> <p>Ethernet Network Services mode provides support for only Layer 2.5 functions.</p>
Enhanced IP Network Services mode (upon boot)	<p>Only Trio MPCs and MS-DPCs are powered on.</p> <p>NOTE: Only Multiservices DPCs (MS-DPCs) are powered on with the enhanced network services mode options. No other DPCs function with the enhanced network services mode options.</p>
Enhanced Ethernet Network Services mode (upon boot)	<p>Only Trio MPCs and MS-DPCs are powered on. All restrictions for operating in Ethernet Network Services mode apply.</p> <p>NOTE: Only Multiservices DPCs (MS-DPCs) are powered on with the enhanced network services mode options. No other DPCs function with the enhanced network services mode options.</p>
Change from IP Network Services mode to Ethernet Network Services mode	DPCE-X and DPCE-X-Q modules are powered on; no reboot is required. No impact to Trio MPCs or MS-DPCs.
Change from Ethernet Network Services mode to IP Network Services mode	Invalid modification; no commit occurs; a warning message indicating any FPCs (along with their slot location) must be offline before switching to other network services; no impact to Trio MPCs or MS-DPCs.
Change from Enhanced IP Network Services mode to Enhanced Ethernet Network Services mode	No reboot is required; no impact to Trio MPCs or MS-DPCs.
Change from IP Network Services mode to Enhanced IP Network Services mode	Reboot required.
Change from Ethernet Network Services mode to Enhanced Ethernet Network Services mode	Reboot required.

The details of Layer 2.5 support for Ethernet Network Services mode are shown in [Table 10 on page 46](#).

Related Documentation

- *Firewall Filters and Enhanced Network Services Mode Overview* in the *Junos OS Subscriber Management and Services Library*.
- [Table 10 on page 46](#)
- [enhanced-mode on page 344](#)
- [show chassis fpc on page 988](#)

Restrictions on Junos OS Ethernet Network Services Mode and Enhanced Ethernet Network Services Mode Features for MX Series Routers

Table 10 on page 46 lists Junos OS feature restrictions when running in Ethernet Network Services mode or Enhanced Ethernet Network Services mode.

Table 10: Restricted Software Features in Ethernet Network Services Mode

Software Feature	Restriction in Ethernet Network Services Mode
BGP	<ul style="list-style-type: none"> BGP allows only family L2 VPN to provide IP control plane support. Data plane support applies only to Ethernet and MPLS. BGP does not support inet, inet6, inet-vpn, and inet6-vpn
L3VPN	Layer 3 VPN is not available.
Unicast RPF	Unicast reverse-path forwarding is disabled.
Source and destination class usage (SCU and DCU)	Source and Destination Class Usage is disabled.
Filter terms	The number of externally configured filter terms is restricted to 64 KB.
Prefixes	The number of supported prefixes is restricted to 32 K.



NOTE: MX Series routers supporting Layer 2.5 functions work as full-scale routers and they support interior gateway protocol (IGP), multicast routing protocols, and other routing features. The restrictions applicable on these routers are that the number of routes is limited and you cannot use BGP.

Related Documentation

- [Network Services Mode Overview on page 43](#)
- [Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers on page 127](#)

CHAPTER 4

TX Matrix and TX Matrix Plus Router Configuration Overview

- [TX Matrix Router and T640 Router Configuration Overview on page 47](#)
- [TX Matrix Router Chassis and Interface Names on page 50](#)
- [TX Matrix Plus Router Configuration Overview on page 52](#)
- [TX Matrix Plus Router Chassis and Interface Names on page 56](#)

TX Matrix Router and T640 Router Configuration Overview

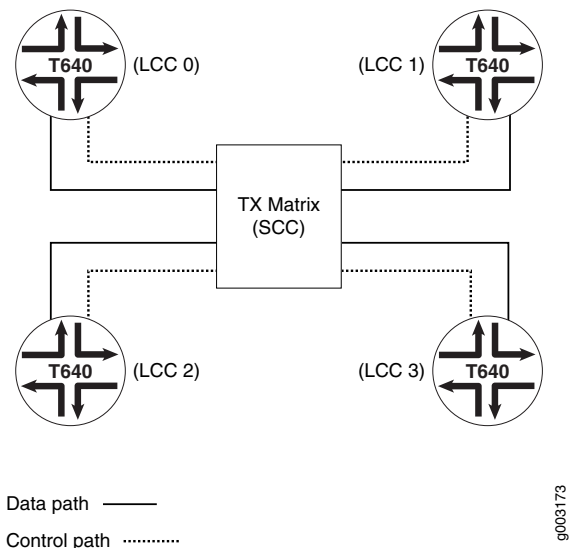
This topic provides an overview of configuring the TX Matrix router and T640 routers.

- [TX Matrix Router and T640 Router-Based Routing Matrix Overview on page 47](#)
- [Running Different Junos OS Releases on the TX Matrix Router and T640 Routers on page 48](#)
- [TX Matrix Router Software Upgrades and Reinstallation on page 49](#)
- [TX Matrix Router Rebooting Process on page 49](#)
- [Committing Configurations on the TX Matrix Router on page 49](#)
- [TX Matrix and T640 Router Configuration Groups on page 50](#)
- [Routing Matrix System Log Messages on page 50](#)

TX Matrix Router and T640 Router-Based Routing Matrix Overview

A routing matrix is a multichassis architecture that consists of a TX Matrix router and from one to four T640 routers. From the perspective of the user interface, the routing matrix appears as a single router. The TX Matrix router controls all the T640 routers in the routing matrix, as shown in [Figure 2 on page 48](#).

Figure 2: Routing Matrix Composed of a TX Matrix Router and Four T640 Routers



You configure and manage the TX Matrix router and its T640 routers in the routing matrix through the CLI on the TX Matrix router. This means that the configuration file on the TX Matrix router is used for the entire routing matrix.

Because all configuration, troubleshooting, and monitoring are performed through the TX Matrix router, we do not recommend accessing its T640 routers directly (through the console port or management Ethernet [fxp0]). If you do, the following messages appear when you first start the CLI through a T640 router:

```
% cli
warning: This chassis is a Line Card Chassis (LCC) in a multichassis system.
warning: Use of interactive commands should be limited to debugging.
warning: Normal CLI access is provided by the Switch Card Chassis (SCC).
warning: Use 'request routing-engine login scc' to log into the SCC.
{master}
```

These messages appear because any configuration you commit on a T640 router is not propagated to the TX Matrix router or other T640 routers in the routing matrix. For details, see [“Committing Configurations on the TX Matrix Router”](#) on page 49.

Running Different Junos OS Releases on the TX Matrix Router and T640 Routers

On a routing matrix, if you elect to run different Junos OS Releases on the TX Matrix router and T640 Routing Engines, a change in Routing Engine mastership can cause one or all T640 routers to be logically disconnected from the TX Matrix router.



NOTE: The routing matrix supports Release 7.0 and later versions of the Junos OS. All the master Routing Engines on the routing matrix must use the same software version. For information about hardware and software requirements, see the *TX Matrix Router Hardware Guide*.

TX Matrix Router Software Upgrades and Reinstallation

By default, when you upgrade or reinstall software on the TX Matrix router, the new software image is distributed to the connected T640 routers. Software installed on a primary TX Matrix router is distributed to all connected primary T640 routers and the backup is distributed to all connected backup routers.

TX Matrix Router Rebooting Process

When you reboot the TX Matrix router master Routing Engine, all the master Routing Engines in the connected T640 routers reboot. In addition, you can selectively reboot the master Routing Engine or any of the connected T640 routers.

Committing Configurations on the TX Matrix Router

In a routing matrix composed of a TX Matrix router and T640 routers, all configuration must be performed on the TX Matrix router. Any configuration you commit on a T640 router is not propagated to the TX Matrix router or other T640 routers. Only configuration changes you commit on the TX Matrix router are propagated to all T640 routers. A commit on a TX Matrix router overrides any changes you commit on a T640 router.

If you issue the **commit** command, you commit the configuration to all the master Routing Engines in the routing matrix.

```
user@host# commit
scc-re0:
configuration check succeeds
lcc0-re0:
commit complete
lcc1-re0:
commit complete
scc-re0:
commit complete
```



NOTE: If a commit operation fails on any node, then the commit operation is not completed for the entire TX Matrix router.

If you issue the **commit synchronize** command on the TX Matrix router, you commit the configuration to all the master and backup Routing Engines in the routing matrix.

```
user@host# commit synchronize
scc-re0:
configuration check succeeds
lcc0-re1:
commit complete
lcc0-re0:
commit complete
lcc1-re1:
commit complete
lcc1-re0:
commit complete
scc-re1:
```

```
commit complete
scc-re0:
commit complete
```

TX Matrix and T640 Router Configuration Groups

For routers that include two Routing Engines, you can specify two special group names—**re0** and **re1**. These two special group names apply to the Routing Engines in slots 0 and 1 of the TX Matrix router. In addition, the routing matrix supports group names for the Routing Engines for each T640 router: **lcc *n*-re0** and **lcc *n*-re1**. *n* identifies a T640 router from 0 through 3.

Routing Matrix System Log Messages

You configure the T640 routers to forward their system log messages to the TX Matrix router at the **[edit system syslog host scc-master]** hierarchy level. For information about how to configure system log messages in a routing matrix, see *Junos OS System Log Configuration Overview* and *Configuring System Logging for a TX Matrix Router*.

Related Documentation

- [Using the Junos OS to Configure a T640 Router Within a Routing Matrix on page 63](#)

TX Matrix Router Chassis and Interface Names

The output from some CLI commands uses the terms SCC and **scc** (for *switch-card chassis*) to refer to the TX Matrix router. Similarly the terms LCC, and **lcc** as a prefix (for *line-card chassis*) refer to a T640 router in a routing matrix.

T640 routers are assigned LCC index numbers, 0 through 3, depending on the hardware setup of the routing matrix. A routing matrix can have up to four T640 routers, and each T640 router has up to eight FPCs. Therefore, the routing matrix can have up to 32 FPCs (0 through 31). The FPCs are configured at the **[edit chassis lcc *number*]** hierarchy level.

In the Junos OS CLI, an interface name has the following format:

type-fpc/pic/port

When you specify the FPC number, the Junos OS determines which T640 router contains the specified FPC based on the following assignment:

- On LCC 0, FPC hardware slots 0 through 7 correspond to FPC software numbers 0 through 7.
- On LCC 1, FPC hardware slots 0 through 7 correspond to FPC software numbers 8 through 15.
- On LCC 2, FPC hardware slots 0 through 7 correspond to FPC software numbers 16 through 23.
- On LCC 3, FPC hardware slots 0 through 7 correspond to FPC software numbers 24 through 31.

To convert FPC numbers in the T640 routers to the correct FPC in a routing matrix, use the conversion chart shown in [Table 11 on page 51](#). You can use the converted FPC number to configure the interfaces on the TX Matrix router in your routing matrix.

Table 11: T640 to Routing Matrix FPC Conversion Chart

FPC Numbering	T640 Routers							
LCC 0								
T640 FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	0	1	2	3	4	5	6	7
LCC 1								
T640 FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	8	9	10	11	12	13	14	15
LCC 2								
T640 FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	16	17	18	19	20	21	22	23
LCC 3								
T640 FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	24	25	26	27	28	29	30	31

Some examples include:

- In a routing matrix that contains **lcc 0** through **lcc 2**, **so-20/0/1** refers to FPC slot **4** of **lcc 2**.
- If you have a Gigabit Ethernet interface installed in FPC slot **7**, PIC slot **0**, port **0** of T640 router **LCC 3**, you can configure this interface on the TX Matrix router by including the **ge-31/0/0** statement at the **[edit interfaces]** hierarchy level.

```
[edit]
interfaces {
  ge-31/0/0 {
    unit 0 {
      family inet {
        address ip-address;
      }
    }
  }
}
```

- Related Documentation**
- [Using the Junos OS to Configure a T640 Router Within a Routing Matrix on page 63](#)

TX Matrix Plus Router Configuration Overview

This topic provides an overview of configuring the TX Matrix Plus router and its connected routers.

- [TX Matrix Plus Router and Router-Based Routing Matrix Overview on page 52](#)
- [Running Different Junos OS Releases on the TX Matrix Plus Router and T1600 or T4000 Routers on page 53](#)
- [TX Matrix Plus Router Software Upgrades and Reinstallation on page 53](#)
- [TX Matrix Plus Router Rebooting Process on page 54](#)
- [TX Matrix Plus Router Routing Engine Rebooting Sequence on page 54](#)
- [TX Matrix Plus Router Management Ethernet Interfaces on page 54](#)
- [TX Matrix Plus Router Internal Ethernet Interfaces on page 54](#)
- [Routing Matrix-Based T1600 or T4000 Router Internal Ethernet Interfaces on page 54](#)
- [Committing Configurations on the TX Matrix Plus Router on page 55](#)
- [Routing Matrix Configuration Groups on page 55](#)
- [Routing Matrix System Log Messages on page 56](#)

TX Matrix Plus Router and Router-Based Routing Matrix Overview

A routing matrix based on a Juniper Networks TX Matrix Plus Router is a multichassis architecture composed of one TX Matrix Plus router and one of the following line-card chassis (LCC) configurations:

- TXP-T1600 configuration—Supports up to four interconnected Juniper Networks T1600 Core Routers.
- TXP-T1600-3D configuration—Supports up to eight interconnected Juniper Networks T1600 Core Routers.
- TXP-4000-3D configuration—Supports up to four interconnected Juniper Networks T4000 Core Routers.
- TXP-Mixed-LCC-3D configuration—Supports the following combinations of T1600 and T4000 routers:
 - Six T1600 routers and one T4000 router
 - Four T1600 routers and two T4000 routers
 - Two T1600 routers and three T4000 routers



NOTE: The TXP-T1600-3D, TXP-T4000-3D, and TXP-Mixed-LCC-3D configurations use 3D SIBs (TXP-F13-3D and TXP-F2S-3D SIBs on the switch-fabric chassis or the SFC and TXP-LCC-3D SIB on the LCCs). For more details on the hardware components used in the routing matrix with TX Matrix Plus Router, see the *TX Matrix Plus Router Hardware Guide*.

From the perspective of the user interface, the routing matrix appears as a single router. The TX Matrix Plus router controls all the T1600 or T4000 routers in the routing matrix.

You configure and manage the TX Matrix Plus router and its T1600 or T4000 routers in the routing matrix through the CLI on the TX Matrix Plus router. This means that the configuration file on the TX Matrix Plus router is used for the entire routing matrix.

Because all configuration, troubleshooting, and monitoring are performed through the TX Matrix Plus router, we do not recommend accessing its T1600 or T4000 routers directly (through the console port or management Ethernet interface [em0]). If you do, the following messages appear when you first start the CLI through a T1600 or T4000 router:

warning: This chassis is a Line Card Chassis (LCC) in a multichassis system.
 warning: Use of interactive commands should be limited to debugging.
 warning: Normal CLI access is provided by the Switch Fabric Chassis (SFC).
 warning: Please logout and log into the SFC to use CLI.

These messages appear because any configuration you commit on a T1600 or a T4000 router is not propagated to the TX Matrix Plus router or other T1600 or T4000 routers in the routing matrix. For details, see “Committing Configurations on the TX Matrix Plus Router” on page 55.

Running Different Junos OS Releases on the TX Matrix Plus Router and T1600 or T4000 Routers

On a routing matrix composed of a TX Matrix Plus router and T1600 or T4000 routers, if you elect to run different Junos OS Releases on the TX Matrix Plus router and T1600 or T4000 Routing Engines, a change in Routing Engine mastership can cause one or all T1600 or T4000 routers to be logically disconnected from the TX Matrix Plus router.



NOTE: All the master Routing Engines on the routing matrix must use the same Junos OS version. For information about hardware and software requirements, see the *TX Matrix Plus Router Hardware Guide*.

TX Matrix Plus Router Software Upgrades and Reinstallation

By default, when you upgrade or reinstall software on the TX Matrix Plus router, the new software image is distributed to the connected routers.

TX Matrix Plus Router Rebooting Process

When you reboot the master Routing Engine of TX Matrix Plus router, all the master Routing Engines in the connected routers reboot. In addition, you can selectively reboot the master Routing Engine or any of the connected routers.

TX Matrix Plus Router Routing Engine Rebooting Sequence

The Routing Engines on the TX Matrix Plus router and T1600 or T4000 routers in the routing matrix boot from the storage media in this order: the USB device (if present), the Compact Flash card (if present), the disk (if present) in slot 1, and then the LAN.

TX Matrix Plus Router Management Ethernet Interfaces

The management Ethernet interface used for the TX Matrix Plus router and the T1600 or T4000 routers in a routing matrix is **em0**. This interface provides an out-of-band method for connecting to the routers in the routing matrix. The Junos OS automatically creates the router's management Ethernet interface, **em0**. To use **em0** as a management port, you must configure its logical port, **em0.0**, with a valid IP address.



NOTE:

- The Routing Engines in the TX Matrix Plus router and in the T1600 or T4000 routers configured in a routing matrix do not support the management Ethernet interface **fxp0** or the internal Ethernet interfaces **fxp1** or **fxp2**.
- Automated scripts that have been developed for standalone routers (T1600 routers not configured in a routing matrix) might contain references to the **fxp0**, **fxp1**, or **fxp2** interfaces. Before reusing the scripts on T1600 routers in a routing matrix, edit any command lines that reference the T1600 router management Ethernet interface **fxp0** by replacing “**fxp0**” with “**em0**”.

TX Matrix Plus Router Internal Ethernet Interfaces

On a TX Matrix Plus router, the Routing Engine (RE-TXP-SFC) and Control Board (TXP-CB) function as a unit, or a host subsystem. For each host subsystem in the router, Junos OS automatically creates two internal Ethernet interfaces, **ixgbe0** and **ixgbe1**, for the two 10-Gigabit Ethernet ports on the Routing Engine.

Routing Matrix-Based T1600 or T4000 Router Internal Ethernet Interfaces

On a T1600 or a T4000 router configured in a routing matrix, the Routing Engine (RE-TXP-LCC) and Control Board (LCC-CB) function as a unit, or a host subsystem. For each host subsystem in the router, Junos OS automatically creates two internal Ethernet interfaces, **bcm0** and **em1**, for the two Gigabit Ethernet ports on the Routing Engine.

For more information about the management Ethernet interface and internal Ethernet interfaces on a TX Matrix Plus router and T1600 or T4000 LCCs configured in a routing matrix, see *Junos OS Network Interfaces Library for Routing Devices*.

Committing Configurations on the TX Matrix Plus Router

In a routing matrix composed of a TX Matrix Plus router and T1600 or T4000 routers, all configuration must be performed on the TX Matrix Plus router. Any configuration you commit on a T1600 or a T4000 router is not propagated to the TX Matrix Plus router or other T1600 or T4000 routers. Only configuration changes you commit on the TX Matrix Plus router are propagated to all routers. A commit operation on the a TX Matrix Plus router overrides any changes you commit on a T1600 or a T4000 router.

If you issue the **commit** command, you commit the configuration to all the master Routing Engines in the routing matrix.

```
user@host# commit
sfc-re0:
configuration check succeeds
lcc0-re0:
commit complete
lcc1-re0:
commit complete
sfc-re0:
commit complete
```



NOTE: If a commit operation fails on any node, then the commit operation is not completed for the entire routing matrix.

If you issue the **commit synchronize** command on the TX Matrix Plus router, you commit the configuration to all the master and backup Routing Engines in the routing matrix.

```
user@host# commit synchronize
sfc-re0:
configuration check succeeds
lcc0-re1:
commit complete
lcc0-re0:
commit complete
lcc1-re1:
commit complete
lcc1-re0:
commit complete
sfc-re1:
commit complete
sfc-re0:
commit complete
```

Routing Matrix Configuration Groups

For routers that include two Routing Engines, you can specify two special group names—**re0** and **re1**. These two special group names apply to the Routing Engines in slots 0 and 1 of the TX Matrix Plus router. In addition, the routing matrix supports group names for the Routing Engines for each T1600 or T4000 router: **lcc n-re0** and **lcc n-re1**. *n* identifies a T1600 or T4000 router depending on the LCC configuration.

Routing Matrix System Log Messages

You configure the T1600 or T4000 routers to forward their system log messages to the TX Matrix Plus router at the **[edit system syslog host sfc0-master]** hierarchy level. For information about how to configure system log messages on a routing matrix based on a TX Matrix Plus router and T1600 or T4000 LCCs, see *Configuring System Logging for a TX Matrix Plus Router*.

Related Documentation

- [Using the Junos OS to Configure a T1600 or T4000 Router Within a Routing Matrix on page 79](#)
- [TX Matrix Plus Router Chassis and Interface Names on page 56](#)
- [Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 81](#)
- [Overview of a Routing Matrix with a TX Matrix Plus Router](#)

TX Matrix Plus Router Chassis and Interface Names

The output from some CLI commands uses the terms SFC and **sfc** (for *switch-fabric chassis*) to refer to the TX Matrix Plus router. Similarly the terms LCC, and **lcc** as a prefix (for *line-card chassis*) refer to a T1600 or T4000 router in a routing matrix composed of a TX Matrix Plus router and T1600 or T4000 routers.

T1600 routers are assigned LCC index numbers, 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix. T1600 routers are assigned LCC index numbers, 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix. The current supported configuration of the routing matrix, can have up to eight T1600 routers, and each T1600 router has up to eight FPCs. Therefore, the routing matrix can have up to 64 FPCs (0 through 63). The FPCs are configured at the **[edit chassis lcc number]** hierarchy level.

In the Junos OS CLI, an interface name has the following format:

type-fpc/pic/port

When you specify the FPC number, the Junos OS determines which T1600 router contains the specified FPC based on the following assignment:

- On LCC 0, FPC hardware slots 0 through 7 correspond to FPC software numbers 0 through 7.
- On LCC 1, FPC hardware slots 0 through 7 correspond to FPC software numbers 8 through 15.
- On LCC 2, FPC hardware slots 0 through 7 correspond to FPC software numbers 16 through 23.
- On LCC 3, FPC hardware slots 0 through 7 correspond to FPC software numbers 24 through 31.

- On LCC 4, FPC hardware slots 0 through 7 correspond to FPC software numbers 32 through 39.
- On LCC 5, FPC hardware slots 0 through 7 correspond to FPC software numbers 40 through 47.
- On LCC 6, FPC hardware slots 0 through 7 correspond to FPC software numbers 48 through 55.
- On LCC 7, FPC hardware slots 0 through 7 correspond to FPC software numbers 56 through 63.

To convert FPC numbers in the T1600 routers to the correct FPC in a routing matrix, use the conversion chart shown in [Table 12 on page 57](#). You can use the converted FPC number to configure the interfaces on the TX Matrix Plus router in your routing matrix.

Table 12: T1600 Router to Routing Matrix FPC Conversion Chart

FPC Numbering	T1600 Routers							
LCC 0								
T1600 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	0	1	2	3	4	5	6	7
LCC 1								
T1600 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	8	9	10	11	12	13	14	15
LCC 2								
T1600 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	16	17	18	19	20	21	22	23
LCC 3								
T1600 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	24	25	26	27	28	29	30	31
LCC 4								
T1600 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	32	33	34	35	36	37	38	39
LCC 5								
T1600 Router FPC Slots	0	1	2	3	4	5	6	7

Table 12: T1600 Router to Routing Matrix FPC Conversion Chart (*continued*)

FPC Numbering	T1600 Routers							
Routing Matrix FPC Slots Equivalent	40	41	42	43	44	45	46	47
LCC 6								
T1600 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	48	49	50	51	52	53	54	55
LCC 7								
T1600 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	56	57	58	59	60	61	62	63

For example, in a routing matrix that contains **lcc 0** through **lcc 2**, **so-20/0/1** refers to FPC slot 4 of **lcc 2**.

T4000 routers are assigned LCC index numbers, 0, 2, 4, and 6 when T4000 routers are connected to a TX Matrix Plus router in a routing matrix. The current supported configuration of the routing matrix, can have up to four T4000 routers, and each T4000 router has up to eight FPCs. Therefore, the routing matrix can have up to 32 FPCs (0 through 63). The odd numbered LCCs and the FPC slots of these LCCs are unused, when T4000 routers are connected to TX Matrix Plus router in a routing matrix. The FPCs are configured at the **[edit chassis lcc number]** hierarchy level.

In the Junos OS CLI, an interface name has the following format:

type-fpc/pic/port

When you specify the FPC number, the Junos OS determines which T4000 router contains the specified FPC based on the following assignment:

- On LCC 0, FPC hardware slots 0 through 7 correspond to FPC software numbers 0 through 7.
- On LCC 2, FPC hardware slots 0 through 7 correspond to FPC software numbers 16 through 23.
- On LCC 4, FPC hardware slots 0 through 7 correspond to FPC software numbers 32 through 39.
- On LCC 6, FPC hardware slots 0 through 7 correspond to FPC software numbers 48 through 55.

To convert FPC numbers in the T4000 routers to the correct FPC in a routing matrix, use the conversion chart shown in [Table 13 on page 59](#). You can use the converted FPC number to configure the interfaces on the TX Matrix Plus router in your routing matrix.

Table 13: T4000 Router to Routing Matrix FPC Conversion Chart

FPC Numbering	T4000 Routers							
LCC 0								
T4000 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	0	1	2	3	4	5	6	7
LCC 2								
T4000 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	16	17	18	19	20	21	22	23
LCC 4								
T4000 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	32	33	34	35	36	37	38	39
LCC 6								
T4000 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	48	49	50	51	52	53	54	55

Related Documentation

- [TX Matrix Plus Router Configuration Overview on page 52](#)
- [Using the Junos OS to Configure a T1600 or T4000 Router Within a Routing Matrix on page 79](#)
- [Configuring the Junos OS to Enable the TX Matrix Plus Router to Generate an Alarm If a T1600 or T4000 Router Stays Offline on page 80](#)

PART 2

Configuration

- [Configuring TX Matrix Chassis-Level Features on page 63](#)
- [Configuring TX Matrix Plus Chassis-Level Features on page 79](#)
- [Configuring M Series Chassis-Level Features on page 101](#)
- [Configuring MX Series Chassis-Level Features on page 109](#)
- [Configuring T Series Chassis-Level Features on page 137](#)
- [Configuring J Series Chassis-Level Features on page 141](#)
- [Configuring PIC-Specific Features on page 145](#)
- [Configuring Resynchronization of FPC Sequence Numbers when a new FPC is Brought Online on page 165](#)
- [Configuring Chassis Settings to Support Aggregated Devices on page 167](#)
- [Configuring Chassis Settings to Support Load Balancing on page 171](#)
- [Configuring Chassis Settings to Support Channelized Interfaces on page 175](#)
- [Configuring Chassis Settings to Support Adaptive Services Interfaces on page 181](#)
- [Configuring Chassis Settings to Support External Clock Synchronization on page 183](#)
- [Configuring Chassis Setting to Support Precision Time Protocol on page 201](#)
- [Configuring Chassis Setting to Support Hybrid Mode on page 209](#)
- [Configuring Chassis Settings to Support ATM Devices on page 219](#)
- [Configuring Chassis Settings for Routing Engines and Packet Forwarding Engines on page 223](#)
- [Configuring Chassis Settings for the Craft Interface on page 245](#)
- [Configuring Chassis Settings for PEMs on page 247](#)
- [Configuring Chassis Settings for Alarms on page 251](#)
- [Examples on page 293](#)
- [Configuration Statements on page 313](#)

CHAPTER 5

Configuring TX Matrix Chassis-Level Features

- [Using the Junos OS to Configure a T640 Router Within a Routing Matrix on page 63](#)
- [Configuring the Junos OS to Upgrade and Downgrade Switch Interface Boards on a TX Matrix Router on page 64](#)
- [Configuring the Junos OS to Enable the TX Matrix Router to Generate an Alarm If a T640 Router Stays Offline on page 65](#)
- [FIB Localization Overview on page 66](#)
- [Configuring FIB Localization on page 67](#)
- [Example: Configuring Packet Forwarding Engine FIB Localization on page 73](#)

Using the Junos OS to Configure a T640 Router Within a Routing Matrix

A routing matrix composed of a TX Matrix router and T640 routers supports the same chassis configuration statements as a standalone router (except **ce1**, **ct3**, **mlfr-uni-nni-bundles**, **sparse-dlcis**, and **vtmapping**). By including the **lcc** statement at the **[edit chassis]** hierarchy level, you configure PIC-specific features, such as framing, on specific T640 routers. In addition, a routing matrix has two more chassis configuration statements, **online-expected** and **offline**.

To configure a T640 router that is connected to a TX Matrix router, include the **lcc** statement at the **[edit chassis]** hierarchy level:

```
[edit chassis]
lcc number;
```

number can be 0 through 3.

To configure a T640 router within a routing matrix, include the following statements at the **[edit chassis *lcc number*]** hierarchy level:

```
[edit chassis lcc number]
fpc slot-number { # Use the hardware FPC slot number
pic pic-number {
    atm-cell-relay-accumulation;
    atm-l2circuit-mode (cell | aal5 | trunk trunk);
    framing (sdh | sonet);
    idle-cell-format {
```

```
itu-t;  
  payload-pattern payload-pattern-byte;  
}  
max-queues-per-interface (8 | 4);  
no-concatenate;  
}  
offline;  
online-expected;  
q-pic-large-buffer {  
  large-scale;  
}
```



NOTE: For the FPC slot number, specify the actual hardware slot number (numbered 0 through 7) as labeled on the T640 router chassis. Do not use the corresponding software FPC number shown in [Table 11 on page 51](#).

For information about how to configure the **online-expected** and **offline** configuration statements, see “[Configuring the Junos OS to Enable the TX Matrix Router to Generate an Alarm If a T640 Router Stays Offline](#)” on page 65.

**Related
Documentation**

- [TX Matrix Router and T640 Router Configuration Overview on page 47](#)
- [TX Matrix Router Chassis and Interface Names on page 50](#)
- [Configuring the Junos OS to Upgrade and Downgrade Switch Interface Boards on a TX Matrix Router on page 64](#)
- [Configuring the Junos OS to Enable the TX Matrix Router to Generate an Alarm If a T640 Router Stays Offline on page 65](#)

Configuring the Junos OS to Upgrade and Downgrade Switch Interface Boards on a TX Matrix Router

The Junos OS does not support mixed mode operation of Switch Interface Boards (SIBs). To successfully upgrade 1.0 SIBs to 2.0 SIBs in a TX Matrix environment, you must force all newly installed 2.0 SIBs to operate in 1.0 mode until the upgrade is complete.

1. [Configuring the Junos OS to Upgrade Switch Interface Boards on a TX Matrix Router on page 64](#)
2. [Configuring the Junos OS to Downgrade Switch Interface Boards on a TX Matrix Router on page 65](#)

Configuring the Junos OS to Upgrade Switch Interface Boards on a TX Matrix Router

To configure the TX Matrix router to support a SIB upgrade, include the **fabric upgrade-mode** statement at the **[edit chassis]** hierarchy level and commit the changes to update the configuration. Configuration changes that you commit on the TX Matrix router are propagated to all T640 routers in a routing matrix.

```
[edit chassis]  
user@host# set chassis fabric upgrade-mode
```



```
user@host# commit
```

The **fabric upgrade-mode** statement instructs the newly installed 2.0 boards to operate in 1.0 mode. When all 1.0 boards have been replaced by 2.0 boards, remove the **fabric upgrade-mode** statement from the configuration hierarchy, and commit the changes again.

```
[edit chassis]
user@host# delete chassis fabric upgrade-mode
user@host# commit
```

In the TX Matrix routing environment, use the **request chassis sib (offline | online)** command sequence to power cycle the newly installed 2.0 SIBs. Power cycling is not needed in a single chassis T640 environment.

```
user@host> request chassis sib offline slot slot-number
user@host> request chassis sib online slot slot-number
```

As the system discovers each new board, the 2.0 ASIC enables 2.0 features, and the upgrade is complete.

Configuring the Junos OS to Downgrade Switch Interface Boards on a TX Matrix Router

To downgrade your 2.0 SIBs to 1.0 SIBs, follow the upgrade procedure. When you replace the first 2.0 SIB with a 1.0 SIB, the system operates in a downgraded 1.0 mode until all 2.0 SIBs are replaced, and the newly installed 1.0 SIBs are power cycled using a **request chassis sib (offline | online)** command sequence.



NOTE: The TX Matrix switch fabric supports 2.0 SIBs for enabling Gigabit FPC-4 and Type 4 PICs. Gigabit FPC-4 devices are not compatible with 1.0 SIBs. Therefore, if you are planning to downgrade from 2.0 SIBs to 1.0 SIBs, you must take all Gigabit FPC-4 devices offline to ensure that the link between the new SIBs and the FPC does not fail.

Related Documentation

- [TX Matrix Router and T640 Router Configuration Overview on page 47](#)
- [Using the Junos OS to Configure a T640 Router Within a Routing Matrix on page 63](#)

Configuring the Junos OS to Enable the TX Matrix Router to Generate an Alarm If a T640 Router Stays Offline

By default, the Junos OS enables all the T640 routers in the routing matrix to come online. The Junos OS also allows you to configure all the T640 routers so that if they do not come online, an alarm is sent by the TX Matrix router.

To configure this alarm, include the **online-expected** statement at the **[edit chassis lcc *number*]** hierarchy level:

```
[edit chassis lcc number]
online-expected;
```

If you do not want a T640 router to be part of the routing matrix, you can configure it to be offline. This is useful when you are performing maintenance on a T640 router. When the T640 router is ready to come back online, delete the **offline** configuration statement.

To configure a T640 router so that it is offline, include the **offline** statement at the **[edit chassis lcc *number*]** hierarchy level:

```
[edit chassis lcc number]  
offline;
```



NOTE: If you do not configure the **online-expected** or **offline** statement, any T640 router that is part of the routing matrix is allowed to come online. However, if a T640 router does not come online, the TX Matrix router does not generate an alarm.

**Related
Documentation**

- [TX Matrix Router and T640 Router Configuration Overview on page 47](#)
- [Using the Junos OS to Configure a T640 Router Within a Routing Matrix on page 63](#)

FIB Localization Overview

On Juniper Networks routers, the forwarding table on the Packet Forwarding Engine, also referred to as forwarding information base (FIB), maintains the complete set of active IPv4 (inet) and IPv6 (inet6) routes. In Junos OS Release 11.4 and later, you can configure FIB localization for a Packet Forwarding Engine. FIB-localization characterizes Packet Forwarding Engines in a router as either “FIB-remote” or “FIB-local”.

FIB-local Packet Forwarding Engines install all routes from the default inet and inet6 route tables into the Packet Forwarding Engine forwarding hardware. FIB-remote Packet Forwarding Engines do not install all the routes for the inet and inet6 routing tables. However, they do maintain local and multicast routes.

FIB-remote Packet Forwarding Engines create a default (0/0) route in the Packet Forwarding Engine forwarding hardware for the inet and inet6 table. The default route references a next-hop or a unilist of next-hops that identify the FIB-local Packet Forwarding Engines that can perform full IP table lookups for received packets.

FIB-remote Packet Forwarding Engines forward received packets to the set of FIB-local Packet Forwarding Engines. The FIB-local Packet Forwarding Engines then perform full IP longest-match lookup on the destination address and forward the packet appropriately. The packet might be forwarded out of an egress interface on the same FIB-local Packet Forwarding Engine that performed the lookup or an egress interface on a different FIB-local or FIB-remote Packet Forwarding Engine. The packet might also be forwarded out of an FPC where FIB localization is not configured. The packet might also be received locally at the Routing Engine.

When FIB localization is configured on a router with some Flexible PIC Concentrators (FPCs) being FIB-remote and some others being FIB-local, packets arriving on the interface

of the FIB-remote FPC are forwarded to one of the FIB-local FPCs for route lookup and forwarding.

The advantage of configuring FIB localization is that it enables upgrading the hardware forwarding table capacity of FIB-local Packet Forwarding Engines while not requiring upgrades to the FIB-remote Packet Forwarding Engines. In a typical network deployment, FIB-local Packet Forwarding Engines are core-facing, while FIB-remote Packet Forwarding Engines are edge-facing. The FIB-remote Packet Forwarding Engines also load-balance traffic over the available set of FIB-local Packet Forwarding Engines.

FIB localization is currently supported on T320, T640, T1600, and MX Series routers.

**Related
Documentation**

- [Example: Configuring Packet Forwarding Engine FIB Localization on page 68](#)

Configuring FIB Localization

- [FIB Localization Overview on page 67](#)
- [Example: Configuring Packet Forwarding Engine FIB Localization on page 68](#)
- [Configuration Statements on page 72](#)

FIB Localization Overview

On Juniper Networks routers, the forwarding table on the Packet Forwarding Engine, also referred to as forwarding information base (FIB), maintains the complete set of active IPv4 (inet) and IPv6 (inet6) routes. In Junos OS Release 11.4 and later, you can configure FIB localization for a Packet Forwarding Engine. FIB-localization characterizes Packet Forwarding Engines in a router as either “FIB-remote” or “FIB-local”.

FIB-local Packet Forwarding Engines install all routes from the default inet and inet6 route tables into the Packet Forwarding Engine forwarding hardware. FIB-remote Packet Forwarding Engines do not install all the routes for the inet and inet6 routing tables. However, they do maintain local and multicast routes.

FIB-remote Packet Forwarding Engines create a default (0/0) route in the Packet Forwarding Engine forwarding hardware for the inet and inet6 table. The default route references a next-hop or a unilist of next-hops that identify the FIB-local Packet Forwarding Engines that can perform full IP table lookups for received packets.

FIB-remote Packet Forwarding Engines forward received packets to the set of FIB-local Packet Forwarding Engines. The FIB-local Packet Forwarding Engines then perform full IP longest-match lookup on the destination address and forward the packet appropriately. The packet might be forwarded out of an egress interface on the same FIB-local Packet Forwarding Engine that performed the lookup or an egress interface on a different FIB-local or FIB-remote Packet Forwarding Engine. The packet might also be forwarded out of an FPC where FIB localization is not configured. The packet might also be received locally at the Routing Engine.

When FIB localization is configured on a router with some Flexible PIC Concentrators (FPCs) being FIB-remote and some others being FIB-local, packets arriving on the interface

of the FIB-remote FPC are forwarded to one of the FIB-local FPCs for route lookup and forwarding.

The advantage of configuring FIB localization is that it enables upgrading the hardware forwarding table capacity of FIB-local Packet Forwarding Engines while not requiring upgrades to the FIB-remote Packet Forwarding Engines. In a typical network deployment, FIB-local Packet Forwarding Engines are core-facing, while FIB-remote Packet Forwarding Engines are edge-facing. The FIB-remote Packet Forwarding Engines also load-balance traffic over the available set of FIB-local Packet Forwarding Engines.

FIB localization is currently supported on T320, T640, T1600, and MX Series routers.

Example: Configuring Packet Forwarding Engine FIB Localization

This example shows how to configure Packet Forwarding Engine FIB localization.

- [Requirements on page 68](#)
- [Overview on page 68](#)
- [Configuration on page 68](#)
- [Verification on page 70](#)

Requirements

Before you begin:

1. Configure device interfaces and loopback interface addresses.
2. Configure static routes.
3. Configure OSPF and OSPFv3 and make sure that OSPF adjacencies and OSPF routes to loopback addresses are established.

This example uses the following hardware and software components:

- A T320, T640, T1600, or MX Series router.
- Junos OS Release 11.4 or later running on the router for T-Series routers. Junos OS Release 12.3 or later running on the router for MX Series routers..

Overview

In this example, you configure the chassis for IPv4 and IPv6 routes and FIB localization on Router R0 and then configure the edge-facing Packet Forwarding Engines on FPC0 as **fib-remote** and the core-facing Packet Forwarding Engines on FPC1 and FPC2 as **fib-local**. You then configure a routing policy named **fib-policy** with the **no-route-localize** option to ensure that all routes from a specified route filter are installed on the FIB-remote FPC.

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.

```
R0 set chassis fpc 0 route-localization fib-remote
set chassis fpc 1 route-localization fib-local
set chassis fpc 2 route-localization fib-local
set chassis route-localization inet
set chassis route-localization inet6
set policy-options policy-statement fib-policy term a from route-filter 4.4.4.4/32 exact
set policy-options policy-statement fib-policy term a then no-route-localize
set policy-options policy-statement fib-policy term b from route-filter fec0:4444::4/128
exact
set policy-options policy-statement fib-policy term b then no-route-localize
set policy-options policy-statement fib-policy then accept
```

Step-by-Step Procedure The following example requires you to navigate various levels in the configuration hierarchy. For information about navigating the CLI, see the *CLI User Guide*.

To configure Packet Forwarding Engine FIB localization:

1. Configure route localization or FIB localization for IPv4 and IPv6 traffic.

```
[edit chassis]
user@R0# set route-localization inet
user@R0# set route-localization inet6
```
2. Configure the Packet Forwarding Engine of an FPC as either **fib-local** or **fib-remote**.

```
[edit chassis]
user@R0# set fpc 0 route-localization fib-remote
user@R0# set fpc 1 route-localization fib-local
user@R0# set fpc 2 route-localization fib-local
```
3. Configure the routing policy by including the **no-route-localize** statement to enable the forwarding table policy to mark route prefixes such that the routes are installed into forwarding hardware on the FIB-remote Packet Forwarding Engines.

```
[edit policy-options]
user@R0# set policy-statement fib-policy term a from route-filter 4.4.4.4/32 exact
user@R0# set policy-statement fib-policy term a then no-route-localize
user@R0# set policy-statement fib-policy term b from route-filter fec0:4444::4/128
exact
user@R0# set policy-statement fib-policy term b then no-route-localize
user@host# set policy-statement fib-policy then accept
```



NOTE: At least, one Packet Forwarding Engine must be configured as **fib-local** for the commit operation to be successful. If you do not configure **fib-local** for the Packet Forwarding Engine, the CLI displays an appropriate error message and the commit fails.

Results From configuration mode, confirm your configuration by entering the **show chassis** and **show policy-options** commands. If the output does not display the intended configuration, repeat the instructions in this example to correct the configuration.

```
user@R0# show chassis
fpc 0 {
    route-localization fib-remote;
}
fpc 1 {
    route-localization fib-local;
}
fpc 2 {
    route-localization fib-local;
}
route-localization {
    inet;
    inet6;
}

user@R0# show policy-options
policy-statement fib-policy {
    term a {
        from {
            route-filter 4.4.4.4/32 exact;
        }
        then no-route-localize;
    }
    term b {
        from {
            route-filter fec0:4444::4/128 exact;
        }
        then no-route-localize;
    }
    then accept;
}
}
```

Verification

Confirm that the configuration is working properly.

- [Verifying Policy Configuration on page 70](#)
- [Verifying FIB-Localization Configuration on page 71](#)
- [Verifying Routes After the Policy Is Applied on page 71](#)

Verifying Policy Configuration

Purpose Verify that the configured policy exists.

Action Issue the **show policy fib-policy** command to check that the configured policy *fib-policy* exists.

```
user@R0> show policy fib-policy
Policy fib-policy:
  Term a:
    from
      route filter:
        4.4.4.4/32 exact
    then no-route-localize
  Term b:
```

```

from
    route filter:
        fec0:4444::4/128 exact
    then no-route-localize
Term unnamed:
    then accept

```

Verifying FIB-Localization Configuration

Purpose Verify FIB-localization configuration details by using the **show route localization** and **show route localization detail** commands.

Action user@R0> **show route localization**
 FIB localization ready FPCs (and FIB-local Forwarding Engine addresses)
 FIB-local: FPC2(4,5)
 FIB-remote: FPC0, FPC1
 Normal: FPC3, FPC4, FPC5, FPC6, FPC7

user@R0> **show route localization detail**
 FIB localization ready FPCs (and FIB-local Forwarding Engine addresses)
 FIB-local: FPC2(4,5)
 FIB-remote: FPC0, FPC1
 Normal: FPC3, FPC4, FPC5, FPC6, FPC7
 FIB localization configuration
 Protocols: inet, inet6
 FIB-local: FPC2
 FIB-remote: FPC0, FPC1
 Forwarding Engine addresses
 FPC0: 1
 FPC1: 2
 FPC2: 4, 5
 FPC3: 6
 FPC4: 8
 FPC5: 11
 FPC6: 13
 FPC7: 15

Verifying Routes After the Policy Is Applied

Purpose Verify that routes with the **no-route-localize** policy option are installed on the fib-remote FPC.

Action user@R0> show route 4.4.4.4/32 extensive

```
inet.0: 30 destinations, 30 routes (29 active, 0 holddown, 1 hidden)
4.4.4.4/32 (1 entry, 1 announced)
TSI:
KRT in-kernel 4.4.4.4/32 -> {130.168.0.2 Flags no-localize}
                               ^^^^^^^^^^^^^^^^^^^^^^^^^
*Static Preference: 5
  Next hop type: Router, Next hop index: 629
  Next-hop reference count: 3
  Next hop: 130.168.0.2 via ge-1/0/4.0, selected
  State: <Active Int="">
Age: 10:33
Task: RT
Announcement bits (1): 0-KRT
AS path: I</Active
>
```

Configuration Statements

fib-local

Syntax	fib-local;
Hierarchy Level	[edit chassis fpc <i>fpc-number</i> route-localization]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Configure the Packet Forwarding Engine on an FPC as FIB-local.



NOTE: At least, one Packet Forwarding Engine must be configured as **fib-local** for the commit operation to be successful. If you do not configure **fib-local** for the Packet Forwarding Engine, the CLI displays an appropriate error message and the commit fails.

Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
---------------------------------	---

fib-remote

Syntax	fib-remote;
Hierarchy Level	[edit chassis fpc <i>fpc-number</i> route-localization]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Configure the Packet Forwarding Engine on an FPC as FIB-remote.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.

no-route-localize

Syntax	no-route-localize;
Hierarchy Level	[edit policy-options policy-statement <i>policy-name</i> term <i>term-name</i> then]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Enforce installation of routes on all FIB-remote Packet Forwarding Engines.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

route-localization

Syntax	route-localization { inet; inet6; }
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Configure FIB localization for IPv4 and IPv6 routes.
Options	inet —Configure FIB localization for IPv4 routes. inet6 —Configure FIB localization for IPv6 routes.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.

Example: Configuring Packet Forwarding Engine FIB Localization

This example shows how to configure Packet Forwarding Engine FIB localization.

- [Requirements on page 73](#)
- [Overview on page 74](#)
- [Configuration on page 74](#)
- [Verification on page 76](#)

Requirements

Before you begin:

1. Configure device interfaces and loopback interface addresses.
2. Configure static routes.

3. Configure OSPF and OSPFv3 and make sure that OSPF adjacencies and OSPF routes to loopback addresses are established.

This example uses the following hardware and software components:

- A T320, T640, T1600, or MX Series router.
- Junos OS Release 11.4 or later running on the router for T-Series routers. Junos OS Release 12.3 or later running on the router for MX Series routers..

Overview

In this example, you configure the chassis for IPv4 and IPv6 routes and FIB localization on Router R0 and then configure the edge-facing Packet Forwarding Engines on FPC0 as **fib-remote** and the core-facing Packet Forwarding Engines on FPC1 and FPC2 as **fib-local**. You then configure a routing policy named **fib-policy** with the **no-route-localize** option to ensure that all routes from a specified route filter are installed on the FIB-remote FPC.

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.

```
R0    set chassis fpc 0 route-localization fib-remote
      set chassis fpc 1 route-localization fib-local
      set chassis fpc 2 route-localization fib-local
      set chassis route-localization inet
      set chassis route-localization inet6
      set policy-options policy-statement fib-policy term a from route-filter 4.4.4.4/32 exact
      set policy-options policy-statement fib-policy term a then no-route-localize
      set policy-options policy-statement fib-policy term b from route-filter fec0:4444::4/128
      exact
      set policy-options policy-statement fib-policy term b then no-route-localize
      set policy-options policy-statement fib-policy then accept
```

Step-by-Step Procedure The following example requires you to navigate various levels in the configuration hierarchy. For information about navigating the CLI, see the *CLI User Guide*.

To configure Packet Forwarding Engine FIB localization:

1. Configure route localization or FIB localization for IPv4 and IPv6 traffic.

```
[edit chassis]
user@R0# set route-localization inet
user@R0# set route-localization inet6
```
2. Configure the Packet Forwarding Engine of an FPC as either **fib-local** or **fib-remote**.

```
[edit chassis]
user@R0# set fpc 0 route-localization fib-remote
user@R0# set fpc 1 route-localization fib-local
user@R0# set fpc 2 route-localization fib-local
```

3. Configure the routing policy by including the **no-route-localize** statement to enable the forwarding table policy to mark route prefixes such that the routes are installed into forwarding hardware on the FIB-remote Packet Forwarding Engines.

[edit policy-options]

```
user@R0# set policy-statement fib-policy term a from route-filter 4.4.4.4/32 exact
```

```
user@R0# set policy-statement fib-policy term a then no-route-localize
```

```
user@R0# set policy-statement fib-policy term b from route-filter fec0:4444::4/128 exact
```

```
user@R0# set policy-statement fib-policy term b then no-route-localize
```

```
user@host# set policy-statement fib-policy then accept
```



NOTE: At least, one Packet Forwarding Engine must be configured as **fib-local** for the commit operation to be successful. If you do not configure **fib-local** for the Packet Forwarding Engine, the CLI displays an appropriate error message and the commit fails.

Results From configuration mode, confirm your configuration by entering the **show chassis** and **show policy-options** commands. If the output does not display the intended configuration, repeat the instructions in this example to correct the configuration.

```
user@R0# show chassis
```

```
fpc 0 {
  route-localization fib-remote;
}
```

```
fpc 1 {
  route-localization fib-local;
}
```

```
fpc 2 {
  route-localization fib-local;
}
route-localization {
  inet;
  inet6;
}
```

```
user@R0# show policy-options
```

```
policy-statement fib-policy {
  term a {
    from {
      route-filter 4.4.4.4/32 exact;
    }
    then no-route-localize;
  }
  term b {
    from {
      route-filter fec0:4444::4/128 exact;
    }
    then no-route-localize;
  }
  then accept;
}
```

```
}
```

Verification

Confirm that the configuration is working properly.

- [Verifying Policy Configuration on page 76](#)
- [Verifying FIB-Localization Configuration on page 76](#)
- [Verifying Routes After the Policy Is Applied on page 77](#)

Verifying Policy Configuration

Purpose Verify that the configured policy exists.

Action Issue the **show policy fib-policy** command to check that the configured policy *fib-policy* exists.

```
user@R0> show policy fib-policy
Policy fib-policy:
  Term a:
    from
      route filter:
        4.4.4.4/32 exact
    then no-route-localize
  Term b:
    from
      route filter:
        fec0:4444::4/128 exact
    then no-route-localize
  Term unnamed:
    then accept
```

Verifying FIB-Localization Configuration

Purpose Verify FIB-localization configuration details by using the **show route localization** and **show route localization detail** commands.

```

Action user@R0> show route localization
FIB localization ready FPCs (and FIB-local Forwarding Engine addresses)
  FIB-local: FPC2(4,5)
  FIB-remote: FPC0, FPC1
  Normal: FPC3, FPC4, FPC5, FPC6, FPC7

user@R0> show route localization detail
FIB localization ready FPCs (and FIB-local Forwarding Engine addresses)
  FIB-local: FPC2(4,5)
  FIB-remote: FPC0, FPC1
  Normal: FPC3, FPC4, FPC5, FPC6, FPC7
FIB localization configuration
  Protocols: inet, inet6
  FIB-local: FPC2
  FIB-remote: FPC0, FPC1
Forwarding Engine addresses
  FPC0: 1
  FPC1: 2
  FPC2: 4, 5
  FPC3: 6
  FPC4: 8
  FPC5: 11
  FPC6: 13
  FPC7: 15

```

Verifying Routes After the Policy Is Applied

Purpose Verify that routes with the **no-route-localize** policy option are installed on the fib-remote FPC.

```

Action user@R0> show route 4.4.4.4/32 extensive

inet.0: 30 destinations, 30 routes (29 active, 0 holddown, 1 hidden)
4.4.4.4/32 (1 entry, 1 announced)
TSI:
KRT in-kernel 4.4.4.4/32 -> {130.168.0.2 Flags no-localize}
                             ^^^^^^^^^^^^^^^^^^^^^^^^^
      *Static Preference: 5
      Next hop type: Router, Next hop index: 629
      Next-hop reference count: 3
      Next hop: 130.168.0.2 via ge-1/0/4.0, selected
      State: <Active Int="">
      Age: 10:33
      Task: RT
      Announcement bits (1): 0-KRT
      AS path: I</Active
>

```

Related Documentation

- [FIB Localization Overview on page 66](#)
- [fib-local on page 72](#)
- [fib-remote on page 72](#)
- [no-route-localize on page 73](#)
- [route-localization on page 73](#)

CHAPTER 6

Configuring TX Matrix Plus Chassis-Level Features

- Using the Junos OS to Configure a T1600 or T4000 Router Within a Routing Matrix on page 79
- Configuring the Junos OS to Enable the TX Matrix Plus Router to Generate an Alarm If a T1600 or T4000 Router Stays Offline on page 80
- Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 81
- Configuring Junos OS to Upgrade the T1600 Router Chassis to LCC 0 of a TX Matrix Plus Router with 3D SIBs on page 86
- Configuring Junos OS to Upgrade a T4000 Router to LCC 0 of a TX Matrix Plus Router with 3D SIBs on page 92
- Configuring Junos OS to Upgrade the T640 Router Chassis to LCC 0 of a TX Matrix Plus Router with 3D SIBs on page 99

Using the Junos OS to Configure a T1600 or T4000 Router Within a Routing Matrix

A routing matrix composed of a TX Matrix Plus router and T1600 or T4000 routers supports the same chassis configuration statements as a standalone router (except **ce1**, **ct3**, **mlfr-uni-nni-bundles**, **sparse-dlcis**, and **vtmapping**). By including the **lcc** statement at the **[edit chassis]** hierarchy level, you configure PIC-specific features, such as framing, on specific T1600 or T4000 routers. In addition, a TX Matrix Plus router has two more chassis configuration statements, **online-expected** and **offline**.

To configure a T1600 router that is connected to a TX Matrix Plus router, include the **lcc** statement at the **[edit chassis]** hierarchy level:

```
[edit chassis]
lcc number;
```

Replace *number* with the following values depending on the LCC configuration:

- 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.

To configure a T1600 or T4000 router within a routing matrix, include the following statements at the **[edit chassis lcc number]** hierarchy level:

```
[edit chassis lcc number]
fpc slot-number { # Use the hardware FPC slot number
pic pic-number {
  atm-cell-relay-accumulation;
  atm-l2circuit-mode (cell | aal5 | trunk trunk);
  framing (sdh | sonet);
  idle-cell-format {
    itu-t;
    payload-pattern payload-pattern-byte;
  }
  max-queues-per-interface (8 | 4);
  no-concatenate;
}
offline;
online-expected;
q-pic-large-buffer {
  large-scale;
}
```



NOTE: For the FPC slot number, specify the actual hardware slot number (numbered 0 through 7) as labeled on the T1600 or T4000 router chassis. Do not use the corresponding software FPC number shown in the “TX Matrix Plus Router Chassis and Interface Names” on page 56.

For information about how to configure the **online-expected** and **offline** configuration statements, see “Configuring the Junos OS to Enable the TX Matrix Plus Router to Generate an Alarm If a T1600 or T4000 Router Stays Offline” on page 80.

Related Documentation

- [TX Matrix Plus Router Configuration Overview on page 52](#)
- [TX Matrix Plus Router Chassis and Interface Names on page 56](#)
- [Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 81](#)

Configuring the Junos OS to Enable the TX Matrix Plus Router to Generate an Alarm If a T1600 or T4000 Router Stays Offline

By default, the Junos OS enables all the T1600 or T4000 routers in the routing matrix to come online. The Junos OS also enables you to configure all the T1600 or T4000 routers so that if they do not come online, an alarm is sent by the TX Matrix Plus router.

To configure this alarm, include the **online-expected** statement at the **[edit chassis lcc number]** hierarchy level:

```
[edit chassis lcc number]
```


`online-expected;`

If you do not want a T1600 or T4000 router to be part of the routing matrix, you can configure it to be offline. This is useful when you are performing maintenance on a T1600 or T4000 router. When the T1600 or T4000 router is ready to come back online, delete the **offline** configuration statement.

To configure a T1600 or T4000 router so that it is offline, include the **offline** statement at the `[edit chassis lcc number]` hierarchy level:

```
[edit chassis lcc number]
offline;
```



NOTE: If you do not configure the `online-expected` or `offline` statement, any T1600 or T4000 router that is part of the routing matrix is allowed to come online. However, if a T1600 or T4000 router does not come online, the TX Matrix Plus router does not generate an alarm.

Related Documentation

- [TX Matrix Plus Router Configuration Overview on page 52](#)
- [Using the Junos OS to Configure a T1600 or T4000 Router Within a Routing Matrix on page 79](#)
- [Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 81](#)

Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform

This topic provides an overview of the T1600 router configuration in order to upgrade it to the LCC0 of a newly configured TX Matrix Plus router. The routing matrix with TX Matrix Plus router consists of one TX Matrix Plus router that acts as the switch-fabric chassis (SFC) and from one to four T1600 routers that act as the line-card chassis (LCC). To perform the in-service upgrade, manually upgrade the Switch Interface Boards (SIBs), Control Boards (CBs) and Routing Engines of the T1600 router, and connect the upgraded T1600 router to the corresponding components of the TX Matrix Plus router with fiber-optic cables. When the SIBs of the T1600 router are upgraded and the data plane connection between the SFC and LCC is set up, the traffic flows in and out of the TX Matrix Plus routing platform through the data plane. When you upgrade the Routing Engines and CBs, the control plane connectivity between the SFC and LCC is set up. For information about the hardware and the installation requirements, see the *TX Matrix Plus Router Hardware Guide*.

This section discusses the following procedures to upgrade a standalone T1600 router to the LCC0 of a TX Matrix Plus routing platform:

- [Preparing the Configuration File and Upgrading the Junos OS on the T1600 Router and SFC on page 82](#)
- [Configuring the Junos OS for Upgrading SIBs on the T1600 Router and Connecting It to the SFC on page 82](#)
- [Upgrading CBs and Routing Engines of the T1600 Router for Control Plane Connectivity on page 84](#)
- [Changing the Management Ethernet Interface Name for the T1600 Router on page 84](#)
- [Transferring Control of the T1600 Router \(LCC0\) to the SFC on page 84](#)
- [Adding a New T1600 Router to the TX Matrix Plus Routing Platform on page 85](#)
- [Downgrading a T1600 Router from the LCC of a TX Matrix Routing Platform to a Standalone T1600 Router on page 85](#)

Preparing the Configuration File and Upgrading the Junos OS on the T1600 Router and SFC

To prepare the configuration file and upgrade the Junos OS, follow these steps:

1. Save and archive a copy of the active configuration of the T1600 router.
2. Update the active configuration to make it applicable to the LCC.
3. Transfer the file configuration to the SFC (to be applied later).
4. Upgrade the T1600 router and SFC with Junos OS Release 10.1 or later, and reboot.

Configuring the Junos OS for Upgrading SIBs on the T1600 Router and Connecting It to the SFC

Upgrade the Control Boards (CBs) and Routing Engines of the T1600 router by replacing the T-CBs with LCC-CBs and RE 2000 with LCC-RE. To configure the T1600 router to support a SIB upgrade and connect it to the SFC, follow these steps:

1. Issue the **fabric upgrade-mode** CLI command at the **[edit chassis]** hierarchy level and commit the changes to update the configuration. This change in the configuration enables the T1600 chassis to be upgraded with the TXP-T1600 SIBs.

```
[edit]
user@host# set chassis fabric upgrade-mode
user@host# commit
```

You must also modify the configuration of the SFC by including **fabric upgrade-mode** statement at the **[edit chassis]** hierarchy level and commit the configuration on the SFC.

2. Take the backup SIB-I-T1600 offline by issuing the **request chassis sib slot slot-number offline** command.

```
user@host> request chassis sib slot 0 offline
```

3. Replace the offline SIB-I-T1600 with SIB-TXP-T1600.
4. Bring the replaced SIB-TXP-T1600 online, by issuing the **request chassis sib slot slot-number online** command.

```
user@host> request chassis sib slot 0 online
```

The T1600 router automatically updates the links between the replaced SIB-TXP-T1600 and the Flexible PIC Concentrators (FPCs).

5. Establish the data plane connectivity by connecting the SIB-TXP-T1600 on the T1600 router to the ABS-SIB-F13 on the SFC with fiber-optic cables and configuring both routers (T1600 and SFC) for transmitting and receiving traffic on the TX Matrix Plus routing platform. Use the following CLI commands, to manually update the link between the T1600 router and SFC before the data plane is activated:

- To configure the SFC to receive traffic from the T1600 router, issue the **request chassis sib f13 train-link-receive slot *SFC-SIB-F13-slot-num*** command.

SFC-SIB-F13-slot-num is the slot in the SFC chassis where the ABS-SIB-F13 must be manually connected to SIB-TXP-T1600 in a slot (from 0 through 4) on the T1600 router. You can configure this for a value of 0, 3, 6, 8, or 11.

- To configure the T1600 router to receive traffic from the SFC, issue the **request chassis sib train-link-receive slot *LCC-SIB-ST-SIB-L-slot-num*** command.

LCC-SIB-ST-SIB-L-slot-num is the slot in the T1600 router chassis where SIB-TXP-T1600 must be manually connected to ABS-SIB-F13 in a slot (0, 3, 6, 8 or 11) on the SFC. You can configure this to be a value in the range from 0 through 4.

- To configure the SFC to transmit traffic to the T1600 router, issue the **request chassis sib f13 train-link-transmit slot *SFC-SIB-F13-slot-num*** command.

SFC-SIB-F13-slot-num is the slot in the SFC chassis where the ABS-SIB-F13 must be manually connected to SIB-TXP-T1600 in a slot (from 0 through 4) on the T1600 router. You can configure this for a value of 0, 3, 6, 8, or 11.

- To configure the T1600 router to transmit traffic to the SFC, issue the **request chassis sib train-link-transmit slot *LCC-SIB-ST-SIB-L-slot-num*** command.

LCC-SIB-ST-SIB-L-slot-num is the slot in the T1600 router chassis where SIB-TXP-T1600 must be manually connected to ABS-SIB-F13 in a slot (0, 3, 6, 8 or 11) on the SFC. You can configure this to be a value in the range from 0 through 4.

6. Using the SIB LEDs, manually verify the link between the T1600 router and the SFC. The FPCs will send traffic using the SIB-TXP-T1600 and ABS-SIB-F13.
7. Repeat Steps 2 through 4 for all the SIB-I-T1600s.
8. When all the SIBs are upgraded, delete the fabric upgrade-mode statement from the configuration hierarchy, and commit the changes on both the T1600 router and the SFC.

```
[edit chassis]
```

```
user@host# delete chassis fabric upgrade-mode
```

```
user@host# commit
```



WARNING: You must upgrade the CBs and the Routing Engines of the T1600 router before you upgrade the SIBs.

Upgrading CBs and Routing Engines of the T1600 Router for Control Plane Connectivity

The CBs and the Routing Engines of the T1600 router are upgraded by replacing the T-CBs with LCC-CBs and RE-2000 with LCC-RE. To establish the control plane connectivity, connect the Ethernet cables from the T1600 router to the SFC. For more information about hardware requirements, see the *TX Matrix Plus Router Hardware Guide*.

Changing the Management Ethernet Interface Name for the T1600 Router

The Junos OS automatically configures management Ethernet interfaces for both the master and the backup Routing Engines, **fxp0**. However, after you upgrade both Routing Engines (master and backup), you must change the management Ethernet interface name to **em0**.

To change the management Ethernet interface name for the master Routing Engine, include the **interfaces em0** statement at the **[edit groups re0]** hierarchy level.

```
[edit groups re0]
user@host# set interfaces em0
user@host# commit
```



WARNING: If you do not change the management Ethernet interface from **fxp0** to **em0** for each upgraded LCC-RE, you cannot access the router remotely through services such as Telnet, SSH, and so on.

Transferring Control of the T1600 Router (LCC0) to the SFC

To transfer control from a T1600 router to the SFC, follow these steps:

1. Manually set the M/S switch on both replaced CBs of the T1600 router to M (multichassis).
2. Configure the T1600 router as LCC0 by including the **lcc number** statement at the **[edit chassis]** hierarchy level:

```
[edit chassis]
user@host> set lcc number
```



NOTE: When you upgrade the other T1600 routers to LCC, you must set the LCC number from 1 to 3.

3. After you configure the LCC0, reboot it for the changes to take effect. This rebooting process establishes the forwarding state of the new LCC in the TX Matrix Plus routing platform by bringing up the SIBs automatically. For more information on hardware connectivity for the control plane, see the *TX Matrix Plus Router Hardware Guide*.

Adding a New T1600 Router to the TX Matrix Plus Routing Platform

The in-service upgrade of new operational T1600 routers to LCC1, LCC2, and LCC3 using the Junos OS CLI is not supported. To add a second LCC to the TX Matrix Plus routing platform, follow these steps:

1. Upgrade both the CBs and Routing Engines on the T1600 router. For details, see [“Upgrading CBs and Routing Engines of the T1600 Router for Control Plane Connectivity” on page 84](#).
2. Upgrade the T1600 router with the same version of the Junos OS as on the SFC.
3. Upgrade the SIBs of the T1600 router and connect the new SIBs to the SFC. For details, see [“Configuring the Junos OS for Upgrading SIBs on the T1600 Router and Connecting It to the SFC” on page 82](#).
4. Connect Ethernet links of the control plane from the T1600 router to the SFC.
5. Reboot the T1600 router. After rebooting, the router becomes a part of the TX Matrix Plus routing platform and is connected to the SFC on the control plane.

Downgrading a T1600 Router from the LCC of a TX Matrix Routing Platform to a Standalone T1600 Router

To downgrade any LCC to a standalone T1600 router, follow these steps:

1. Transfer the control to the LCC from the SFC:
 - a. Roll back the configuration of the SFC and LCC to the configuration before the T1600 router was added and commit the configuration. For more information about configuring the T1600 router to LCC, see [“Preparing the Configuration File and Upgrading the Junos OS on the T1600 Router and SFC” on page 82](#).
 - b. Manually set the M/S switch to single-chassis on the T1600 router on both CBs.
 - c. Reboot both the master and backup Routing Engines on the T1600.
2. Downgrade the SIBs of the LCC and remove the data plane connections:
 - a. Take the spare SIB-TXP-T1600 on the LCC offline by issuing the **request chassis sib slot *slot-number* offline** command.

```
user@host> request chassis sib slot 0 offline
```
 - b. Remove the data plane connections from the SIB-TXP-T1600 to the SFC.
 - c. Replace the SIB-TXP-T1600 with SIB-I-T1600 and bring it online.
 - d. Repeat these steps for all SIB-TXP-T1600s.
3. Remove the control plane connectivity by disconnecting the Ethernet cables of the control plane from the T1600 router to the SFC.

The LCC becomes a standalone T1600 router out of the TX Matrix Plus routing platform.

Configuring Junos OS to Upgrade the T1600 Router Chassis to LCC 0 of a TX Matrix Plus Router with 3D SIBs

This topic describes how to configure Junos OS when you upgrade a T1600 router to LCC 0 of a TX Matrix Plus router with 3D SIBs. A routing matrix with a TX Matrix Plus router consists of one TX Matrix Plus router that acts as the switch-fabric chassis (SFC) and up to eight T1600 routers, or up to four T4000 routers, or a mix of T1600 and T4000 routers that act as the line-card chassis (LCCs). To perform the in-service upgrade, manually upgrade the Switch Interface Boards (SIBs), Control Boards (CBs), and Routing Engines of the T1600 router, and connect the upgraded T1600 router to the corresponding components of the TX Matrix Plus router with fiber-optic cables. When the SIBs of the T1600 router are upgraded and the data plane connection between the SFC and LCC is set up, the traffic flows in and out of the TX Matrix Plus router through the data plane. For information about the hardware and the installation requirements, see the [TX Matrix Plus Hardware Guide](#).

This topic discusses the following procedures to upgrade a standalone T1600 router to LCC 0 of a TX Matrix Plus routing matrix and to configure Junos OS on the LCC and the SFC for the upgrade. The Junos OS configuration includes setting the LCC mode and training and verifying the links between the LCC and the SFC.



NOTE:

- The upgraded LCC becomes LCC 0.
 - In-service upgrade for a standalone LCC applies only for the first standalone LCC becoming part of the routing matrix.
 - No other LCC must be already connected to the SFC.
-
- [Preparing the Configuration File and Upgrading Junos OS on the T1600 Router and the SFC on page 86](#)
 - [Configuring Junos OS for Upgrading the SIBs on the T1600 Router and Connecting It to the SFC on page 87](#)
 - [Transferring Control of the T1600 Router \(LCC 0\) to the SFC on page 91](#)
 - [Adding a New T1600 Router to the TX Matrix Plus Routing Matrix on page 92](#)

Preparing the Configuration File and Upgrading Junos OS on the T1600 Router and the SFC

To prepare the configuration file and upgrade the Junos OS:

1. Save and archive a copy of the active configuration of Junos OS on the T1600 router.
2. Update the active configuration to make it applicable to the LCC 0.
3. Transfer the modified configuration file that you have prepared to an intermediate server on the out-of-band management network accessible by the standalone router and the TX Matrix Plus router.
4. Transfer the configuration file to the SFC (to be applied later).

5. Upgrade the T1600 router with Junos OS Release 13.2 or later, and reboot.
6. Upgrade the SFC with Junos OS Release 13.2 or later, and reboot.

Configuring Junos OS for Upgrading the SIBs on the T1600 Router and Connecting It to the SFC

To upgrade and integrate a T1600 router to LCC 0 of the routing matrix with 3D SIBs perform the following tasks:

- [Upgrading the Control Boards, Routing Engines, PEMs, and Rear Fan Tray of the T1600 Router for Control Plane Connectivity on page 87](#)
- [Preparing the SFC and the LCC for the Upgrade on page 87](#)
- [Upgrading the SIBs on page 88](#)
- [Training the Switching Plane Links on page 89](#)
- [Activating and Verifying the Switching Planes on page 91](#)

Upgrading the Control Boards, Routing Engines, PEMs, and Rear Fan Tray of the T1600 Router for Control Plane Connectivity

For control plane connectivity, upgrade the Control Boards (CBs), and Routing Engines of the T1600 router by replacing the T-CBs with LCC-CBs, and RE 2000 with LCC-RE. Replace the power entry module (PEM) with PWR-T-6-60-DC-BB and the rear fan tray with FAN-R-TXP-3D-LCC. See the [TX Matrix Plus Hardware Guide](#) for the installation procedures.

Preparing the SFC and the LCC for the Upgrade

To prepare the SFC and the LCC for the upgrade:

1. Use the **show pfe statistics traffic** command to verify that the level of traffic on each Packet Forwarding Engine in the LCC is within the recommended range for upgrade (which is approximately 50% of line rate).
2. Use the **show chassis fabric plane** command to verify that four planes are active and one plane is spare.

```
user@host> show chassis fabric plane
Plane State Uptime
0 Online 15 hours, 42 minutes, 9 seconds
1 Online 15 hours, 42 minutes, 9 seconds
2 Spare
3 Online 15 hours, 42 minutes, 9 seconds
4 Online 15 hours, 42 minutes, 9 seconds
```

3. a. Ensure that the **CONFIG-SIZE** dial on the SFC is set to **3** and all the SIBs are online before configuring the **upgrade-mode** statement.
- b. Configure the upgrade mode on the LCC by using the **fabric upgrade-mode 3d-fabric** statement at the **[edit chassis]** hierarchy level and commit the changes. This configuration enables the T1600 chassis to be upgraded with the TXP-3D-LCC SIBs.

```
[edit chassis]
user@host# set fabric upgrade-mode 3d-fabric
user@host# commit
```

This step also checks for the compatibility of Routing Engines, CBs, and FPCs.



NOTE:

The following FPCs are not supported:

- T640-FPC1-E and T640-FPC1-E2
- T640-FPC2, T640-FPC2-E, and T640-FPC2-E2
- T640-FPC3, T640-FPC3-E, and T640-FPC3-E2
- T640-FPC4-1P-ES

- c. Configure the upgrade mode on the SFC by including the **fabric upgrade-mode 3d-fabric** statement at the **[edit chassis]** hierarchy level and commit the configuration on the SFC.

```
[edit chassis]
user@host# set fabric upgrade-mode 3d-fabric
user@host# commit
```

4. Set the LCC mode on the SFC's master Routing Engine to **t1600**:

```
[edit chassis]
user@host# set lcc-mode lcc 0 mode t1600
user@host# commit
```

Confirm that the output of **show chassis hardware** on LCC indicates that the chassis is T1600.

Upgrading the SIBs

You must upgrade the existing SIBs on the LCC to 3D SIBs for the LCC to operate as LCC 0 in the routing matrix of the TX Matrix Plus router with 3D SIBs. To upgrade the SIBs on the LCC follow these steps:

1. Verify that the same planes are spare on the SFC and the LCC by using the **show chassis fabric plane** command. If the same planes are not **spare**, use the **request chassis fabric plane** command to change the states of the required planes.

The output of **show chassis fabric plane** command must show four active planes on the SFC and the LCC. Spare plane numbers must be identical on the SFC and the LCC.

2. Take the spare SIB-I-T1600 offline by issuing the **request chassis sib slot *slot-number* offline** command.
3. Replace the offline SIB-I-T1600 on the T1600 with SIB-TXP-3D-LCC. See [Replacing the SIB](#) for the replacement procedure.
4. Connect the SIBs on the LCC to the SIBs on the SFC by using fiber-optic cables. See [Connecting the Switching Plane Cables](#) for the connection procedure.
5. Bring the replaced SIB-TXP-3D-LCC online by issuing the **request chassis sib slot *slot-number* online** command.

For example, for plane 0:

```
user@host> request chassis sib slot 0 online
```

6. Issue the **show chassis fabric optics** command to verify that all the cables are in **CABLE_CONNECTED** state on the SFC and the LCC.

```
user@host> show chassis fabric optics
Port      Cable state      Module Type
1cc0-sib0:
0          CABLE_CONNECTED  AOC
1          CABLE_CONNECTED  AOC
2          CABLE_CONNECTED  AOC
3          CABLE_CONNECTED  AOC
4          CABLE_CONNECTED  AOC
5          CABLE_CONNECTED  AOC
6          CABLE_CONNECTED  AOC
7          CABLE_CONNECTED  CXP Module
1cc0-sib1:
0          CABLE_CONNECTED  CXP Module
1          CABLE_NOT_CONNECTED  AOC
2          CABLE_CONNECTED  AOC
...
```

Until all mandatory cables show the **CABLE_CONNECTED** state, do not proceed to the next step.



NOTE: In a T1600 LCC, the mandatory cables 0, 2, 4, and 6 must be in the **CABLE_CONNECTED** state.

7. Verify that the newly inserted SIB is in **Spare** state and there are no alarms due to faulty hardware by using the **show chassis sibs** and **show chassis alarms** commands. Until the SIB shows the **Spare** state, and there are no alarms, do not proceed to train the switching plane links.

Training the Switching Plane Links

For the SIBs on the LCC and the SFC to communicate with each other, the links are trained using the **train-link-transmit** and **train-link-receive** commands on the LCC and the SFC. After the links are trained, they are verified using the **show chassis fabric optical-links**, **show chassis fabric plane extensive**, and **show chassis fabric topology** commands.

To manually train the link between the LCC and the SFC before the data plane is activated, perform the following steps:

1. For the SFC to receive traffic from the LCC, issue the **request chassis sib f13 slot f13 slot train-link-receive** command.

f13 slot is the slot in the SFC where the SIB-TXP-F13-3D must be manually connected to SIB-TXP-3D-LCC in a slot (from 0 through 4) in the LCC. The SFC's **f13 slot** has a value of 0, 3, 6, 8, or 11.

SIB Slots on the LCC	SIB Slots on the SFC
0	0
1	3
2	6
3	8
4	11

2. To train the links on the LCC to receive traffic from the SFC, issue the **request chassis sib slot sibSlot train-link-receive** command.

sibSlot is the slot in the LCC where SIB-TXP-3D-LCC must be manually connected to SIB-TXP-F13-3D in a slot (0, 3, 6, 8, or 11) on the SFC. You can configure the LCC's **sibSlot** to be a value in the range from 0 through 4.

3. To train the links on the SFC to transmit traffic to the LCC, issue the **request chassis sib f13 slot f13 slot train-link-transmit** command.

f13 slot is the slot in the SFC where the SIB-TXP-F13-3D must be manually connected to SIB-TXP-3D-LCC in a slot (from 0 through 4) in the T1600 router. **f13 slot** has a value of 0, 3, 6, 8, or 11.

4. To train the links on the LCC to transmit traffic to the SFC, issue the **request chassis sib slot sibSlot train-link-transmit** command.

sibSlot is the slot in the LCC where SIB-TXP-3D-LCC must be manually connected to SIB-TXP-F13-3D in a slot (0, 3, 6, 8, or 11) in the SFC. You can configure **sibSlot** to be a value in the range from 0 through 4.

5. Verify the links between the LCC and the SFC by using the following commands:

- **show chassis fabric optical-links**
- **show chassis fabric plane extensive**
- **show chassis fabric topology**

6. If errors occur at this stage, take the SIB on the LCC offline and bring it back online. On the SFC, take the F13 SIB offline and bring it back online. Start training the links again.

Activating and Verifying the Switching Planes

To activate and verify the upgraded switching plane:

1. To activate the switching plane with the new SIB, take another switching plane offline:

On the SFC, issue the **request chassis fabric plane *plane-num* offline sfc 0** command.

On the LCC, issue the **request chassis sib slot *sibSlot* offline** command.

For example, on the SFC:

```
user@host# request chassis fabric plane 1 offline sfc 0
```

On the LCC:

```
user@host# request chassis sib slot 1 offline
```

2. Use the **show chassis fabric stats rates summary** command on the LCC and **show chassis fabric stats f13 actPlaneSib1# rates summary** command on the SFC to verify that the traffic is flowing through all the planes in the LCC and the SFC, respectively.

If traffic is flowing smoothly, the statistics for **Data/sec** under **Received** and **Sent** shows a nonzero number.

3. Follow the procedures in [“Upgrading the SIBs” on page 88](#), [“Training the Switching Plane Links” on page 89](#), and [“Activating and Verifying the Switching Planes” on page 91](#) for all the T1600 SIBs in the other planes.

Transferring Control of the T1600 Router (LCC 0) to the SFC

After upgrading the SIBs of a standalone T1600 router and integrating it into a routing matrix, transfer the control of the T1600 router to the SFC in the routing matrix:

1. On the SFC, confirm that the dial on the left, **CHASSIS ID**, displays **00**, and that on right, **CONFIG-SIZE**, displays **03**.
2. Connect the Ethernet links from the T1600 CBs to the connector interface panel (CIP) on the SFC. Verify that the Ethernet connection LED is lit on the CIP.
3. Manually set the **M/S** switch on both the replaced CBs of the T1600 router to **M** (multichassis).
4. Configure the T1600 router as LCC 0 by including the **lcc number** statement at the **[edit chassis]** hierarchy level.

```
[edit chassis]
user@host>set lcc number
```

5. When all the SIBs are upgraded, delete the **fabric upgrade-mode** statement from the configuration hierarchy, and commit the changes on both the LCC and the SFC.

```
[edit chassis]
user@host# delete chassis fabric upgrade-mode 3d-fabric
user@host# commit
```

6. After you configure LCC 0, reboot it for the changes to take effect. Reboot the SFC also. This rebooting process establishes the forwarding state of the new LCC in the

TX Matrix Plus routing matrix by bringing up the SIBs automatically. For more information about hardware connectivity for the control plane, see the [TX Matrix Plus Hardware Guide](#).

Adding a New T1600 Router to the TX Matrix Plus Routing Matrix

Junos OS does not support the in-service upgrade of T1600 routers to LCC 1 though LCC 7. To add a second LCC to the TX Matrix Plus routing matrix:

1. Upgrade both the CBs and Routing Engines on the T1600 router. For details, see “Upgrading CBs and Routing Engines of the T1600 Router for Control Plane Connectivity” on page 84.
2. Upgrade the T1600 router with the same version of Junos OS as that on the SFC.
3. Upgrade the SIBs of the T1600 router and connect the new SIBs to the SFC. For details, see “Configuring Junos OS for Upgrading the SIBs on the T1600 Router and Connecting It to the SFC” on page 87.
4. Connect Ethernet links of the control plane from the T1600 router to the SFC.
5. Set the LCC mode on SFC’s master Routing Engine to **t1600** by using the following commands:

```
user@host# set chassis lcc-mode lcc 0 mode t1600
user@host# commit
```
6. Reboot the T1600 router. After rebooting, the router becomes part of the TX Matrix Plus routing matrix and is connected to the SFC on the control plane.

Configuring Junos OS to Upgrade a T4000 Router to LCC 0 of a TX Matrix Plus Router with 3D SIBs

This topic describes how to configure Junos OS when you upgrade a T4000 router to LCC 0 of a TX Matrix Plus router with 3D SIBs. A TX Matrix Plus routing matrix consists of one TX Matrix Plus router that acts as the switch-fabric chassis (SFC) and up to eight T1600 routers, or up to four T4000 routers, or a mix of T1600 and T4000 routers that act as the line-card chassis (LCCs). To perform the in-service upgrade, manually upgrade the Switch Interface Boards (SIBs), Control Boards (CBs), and Routing Engines of the T4000 router, and connect the upgraded T4000 router to the corresponding components of the TX Matrix Plus router with fiber-optic cables. When the SIBs of the T4000 router are upgraded and the data plane connection between the SFC and LCC is set up, the traffic flows in and out of the TX Matrix Plus router through the data plane. For information about the hardware and the installation requirements, see the [TX Matrix Plus Hardware Guide](#).

This topic discusses the following procedures to upgrade a standalone T4000 router to LCC 0 of a TX Matrix Plus routing matrix and to configure Junos OS on the LCC and the SFC for the upgrade. The Junos OS configuration includes setting the LCC mode and training and verifying the links between the LCC and the SFC.

**NOTE:**

- The upgraded LCC becomes LCC 0.
- In-service upgrade for a standalone LCC applies only for the first standalone LCC that becomes part of the routing matrix.
- No other LCC must be already connected to the SFC.

- [Preparing the Configuration File and Upgrading Junos OS on the T4000 Router and the SFC on page 93](#)
- [Configuring Junos OS for Upgrading the SIBs on the T4000 Router and Connecting the Router to the SFC on page 93](#)
- [Transferring Control of the T4000 Router \(LCC 0\) to the SFC on page 98](#)
- [Adding a New T4000 Router to the TX Matrix Plus Routing Matrix on page 98](#)

Preparing the Configuration File and Upgrading Junos OS on the T4000 Router and the SFC

To prepare the configuration file and upgrade Junos OS:

1. Save and archive a copy of the active configuration of Junos OS on the T4000 router.
2. Update the active configuration to make it applicable to the LCC 0.
3. Transfer the modified configuration file that you have prepared to an intermediate server on the out-of-band management network accessible by the standalone router and the TX Matrix Plus router.
4. Transfer the configuration file to the SFC (to be applied later).
5. Upgrade the T4000 router with Junos OS Release 13.2 or later, and reboot.
6. Upgrade the SFC with Junos OS Release 13.2 or later, and reboot.

Configuring Junos OS for Upgrading the SIBs on the T4000 Router and Connecting the Router to the SFC

To upgrade and integrate a T4000 router to LCC 0 of the routing matrix with 3D SIBs, perform the following tasks:

- [Upgrading the Control Boards, Routing Engines, PEMs, and Rear Fan Tray of the T4000 Router for Control Plane Connectivity on page 93](#)
- [Preparing the SFC and the LCC for the Upgrade on page 94](#)
- [Upgrading the SIBs on page 95](#)
- [Training the Switching Plane Links on page 96](#)
- [Activating and Verifying the Switching Plane on page 97](#)

Upgrading the Control Boards, Routing Engines, PEMs, and Rear Fan Tray of the T4000 Router for Control Plane Connectivity

For control plane connectivity, upgrade the Control Boards (CBs) and Routing Engines of the T4000 router by replacing the T-CBs with LCC-CBs, and RE 2000 with LCC-RE.

Replace the power entry module (PEM) with PWR-T-6-60-DC-BB and the rear fan tray with FAN-R-TXP-3D-LCC. See the [TX Matrix Plus Hardware Guide](#) for the installation procedures.

Preparing the SFC and the LCC for the Upgrade

To prepare the SFC and the LCC for the upgrade:

1. Use the **show pfe statistics traffic** command to verify that the level of traffic on each Packet Forwarding Engine in the LCC is within the recommended range for upgrade (which is approximately 50% of line rate).
2. Use the **show chassis fabric plane** command to verify that four data planes are active and one plane is spare.

```
user@host> show chassis fabric plane
Plane State Uptime
0 Online 15 hours, 42 minutes, 9 seconds
1 Online 15 hours, 42 minutes, 9 seconds
2 Spare
3 Online 15 hours, 42 minutes, 9 seconds
4 Online 15 hours, 42 minutes, 9 seconds
```

3. a. Ensure that the **CONFIG-SIZE** dial on the SFC is set to **3** and all the SIBs are online before configuring the **upgrade-mode** statement.
- b. Configure the upgrade mode on the LCC by using the **fabric upgrade-mode 3d-fabric** statement at the **[edit chassis]** hierarchy level and commit the changes. This configuration enables the T4000 chassis to be upgraded with the TXP-3D-LCC SIBs.

```
[edit chassis]
user@host# set fabric upgrade-mode 3d-fabric
user@host# commit
```

This step also checks for the compatibility of Routing Engines, CBs, and FPCs.



NOTE:

The following FPCs are not supported:

- T640-FPC1-E and T640-FPC1-E2
- T640-FPC2, T640-FPC2-E, and T640-FPC2-E2
- T640-FPC3, T640-FPC3-E, and T640-FPC3-E2
- T640-FPC4-1P-ES

- c. Configure the upgrade-mode on the SFC by including the **fabric upgrade-mode 3d-fabric** statement at the **[edit chassis]** hierarchy level and commit the configuration on the SFC.

```
[edit chassis]
user@host# set fabric upgrade-mode 3d-fabric
user@host# commit
```

4. Configure the LCC mode on the SFC's master Routing Engine to **t4000**:

```
[edit chassis]
user@host# set lcc-mode lcc 0 mode t4000
user@host# set lcc-mode lcc 1 mode empty
user@host# commit
```



NOTE: If you configure `lcc-mode` for LCC 0, LCC 2, LCC 4, and LCC 6 as `t4000`, for the next LCC, `lcc-mode` must be `empty`— that is, `lcc-mode` for LCC 3, LCC 5, and LCC 7 must be `empty`.

Upgrading the SIBs

You must upgrade the existing SIBs on the LCC to 3D SIBs for the LCC to operate as LCC 0 in the routing matrix of the TX Matrix Plus router with 3D SIBs. To upgrade the SIBs on the LCC:

1. Verify that the same planes are spare on the SFC and the LCC by using the **show chassis fabric plane** command. If the same planes are not spare, use the **request chassis fabric plane** command to change the states of the required planes.

The output of **show chassis fabric plane** command must show four active planes on the SFC and the LCC. Spare plane numbers must be identical on the SFC and the LCC.

2. Take the spare SIB-I-T4000 offline by issuing the **request chassis sib slot *slot-number* offline** command.
3. Replace the offline SIB-I-T4000 with SIB-TXP-3D-LCC. See the [Replacing the SIB](#) for the replacement procedure.
4. Connect the SIBs on the LCC to the SIBs on the SFC by using fiber-optic cables. See the [Connecting the Switching Plane Cables](#) for the connection procedure.
5. Bring the replaced SIB-TXP-3D-LCC online by issuing the **request chassis sib slot *slot-number* online** command.

For example, for plane 0:

```
user@host> request chassis sib slot 0 online
```

6. Issue the **show chassis fabric optics** command to verify that all the cables are in **CABLE_CONNECTED** state on the SFC and the LCC.

```
user@host> show chassis fabric optics
Port      Cable state      Module Type
lcc0-sib0:
0          CABLE_CONNECTED  AOC
1          CABLE_CONNECTED  AOC
2          CABLE_CONNECTED  AOC
3          CABLE_CONNECTED  AOC
4          CABLE_CONNECTED  AOC
5          CABLE_CONNECTED  AOC
6          CABLE_CONNECTED  AOC
7          CABLE_CONNECTED  CXP Module
lcc0-sib1:
0          CABLE_CONNECTED  CXP Module
1          CABLE_NOT_CONNECTED  AOC
```

```
2          CABLE_CONNECTED          AOC
...
```

Until all mandatory cables show the **CABLE_CONNECTED** state, do not proceed to the next step.



NOTE: All the eight cables (0 through 7) on a SIB in the T4000 LCC 0 must be in **CABLE_CONNECTED** state.

7. Verify that the newly inserted SIB is in **Spare** state and there are no alarms due to faulty hardware by using the **show chassis sibs** and **show chassis alarms** commands. Until the SIB shows the **Spare** state, and there are no alarms, do not proceed to train the switching plane links.

Training the Switching Plane Links

For the SIBs on the LCC and the SFC to communicate with each other, the links are trained using the **train-link-transmit** and **train-link-receive** commands on the LCC and the SFC. After the links are trained, they are verified using the **show chassis fabric optical-links**, **show chassis fabric plane extensive**, and **show chassis fabric topology** commands.

To manually train the link between the LCC and the SFC before the data plane is activated, perform these steps:

1. For the SFC to receive traffic from the LCC, issue the **request chassis sib f13 slot f13 slot train-link-receive** command.

f13 slot is the slot in the SFC where the SIB-TXP-F13-3D must be manually connected to SIB-TXP-3D-LCC in a slot (from 0 through 4) in the LCC. The SFC's **f13 slot** has a value of 0, 3, 6, 8, or 11.

SIB Slots on the LCC	SIB Slots on the SFC
0	0
1	3
2	6
3	8
4	11

2. To train the links on the LCC to receive traffic from the SFC, issue the **request chassis sib slot sibSlot train-link-receive** command.

sibSlot is the slot in the LCC where SIB-TXP-3D-LCC must be manually connected to SIB-TXP-F13-3D in a slot (0, 3, 6, 8, or 11) in the SFC. You can configure the LCC's **sibSlot** to be a value in the range from 0 through 4.

3. To train the links on the SFC to transmit traffic to the LCC, issue the **request chassis sib f13 slot *f13 slot* train-link-transmit** command.

f13 slot is the slot in the SFC where the SIB-TXP-F13-3D must be manually connected to SIB-TXP-3D-LCC in a slot (from 0 through 4) in the T4000 router. ***f13 slot*** has a value of 0, 3, 6, 8, or 11.

4. To train the links on the LCC to transmit traffic to the SFC, issue the **request chassis sib slot *sibSlot* train-link-transmit** command.

sibSlot is the slot in the LCC where SIB-TXP-3D-LCC must be manually connected to SIB-TXP-F13-3D in a slot (0, 3, 6, 8, or 11) in the SFC. You can configure ***sibSlot*** to be a value in the range from 0 through 4.

5. Verify the links between the LCC and the SFC by using the following commands:

- **show chassis fabric optical-links**
- **show chassis fabric plane extensive**
- **show chassis fabric topology**

6. If errors occur at this stage, take the SIB on the LCC offline and bring it back online. On the SFC, take the F13 SIB offline and bring it back online. Start training the links again.

Activating and Verifying the Switching Plane

To activate and verify the upgraded switching plane:

1. To activate the switching plane with the new SIB, take another switching plane offline:

On the SFC, issue the **request chassis fabric plane *plane-num* offline sfc 0** command.

On the LCC, issue the **request chassis sib slot *sibSlot* offline** command.

For example, on the SFC:

```
user@host# request chassis fabric plane 1 offline sfc 0
```

On the LCC:

```
user@host# request chassis sib slot 1 offline
```

2. Use the **show chassis fabric stats rates summary** command on the LCC and **show chassis fabric stats f13 actPlaneSib1# rates summary** command on the SFC to verify that the traffic is flowing through all the planes in the LCC and the SFC, respectively.

If traffic is flowing smoothly, the statistics for **Data/sec** under **Received** and **Sent** shows a nonzero number.

3. Follow the procedures in [“Upgrading the SIBs” on page 95](#), [“Training the Switching Plane Links” on page 96](#), and [“Activating and Verifying the Switching Plane” on page 97](#) for upgrading all the T4000 SIBs in the other planes.

Transferring Control of the T4000 Router (LCC 0) to the SFC

After upgrading the SIBs of a standalone T4000 router and integrating it into a routing matrix, transfer the control of the T4000 router to the SFC in the routing matrix:

1. On the SFC, confirm that the dial on the left, **CHASSIS ID**, displays **00** and that on the right, **CONFIG-SIZE**, displays **03**.
2. Connect the Ethernet links from the T4000 CBs to the CIP on the SFC. Verify that the Ethernet connection LED is lit on the CIP.
3. Manually set the **M/S** switch on both the replaced CBs of the T4000 router to **M** (multichassis).
4. Configure the T4000 router as LCC 0 by including the **lcc number** statement at the **[edit chassis]** hierarchy level.

```
[edit chassis]
user@host>set lcc number
```

5. When all the SIBs are upgraded, delete the **fabric upgrade-mode** statement from the configuration hierarchy, and commit the changes on both the LCC and the SFC.

```
[edit chassis]
user@host# delete chassis fabric upgrade-mode 3d-fabric
user@host# commit
```

6. After you configure LCC 0, reboot it for the changes to take effect. Reboot the SFC also. This rebooting process establishes the forwarding state of the new LCC in the TX Matrix Plus routing matrix by bringing up the SIBs automatically. For more information about hardware connectivity for the control plane, see the [TX Matrix Plus Hardware Guide](#).

Adding a New T4000 Router to the TX Matrix Plus Routing Matrix

Junos OS does not support in-service upgrade of T4000 routers to LCC 2, LCC 4, and LCC 6. To add a second LCC to the TX Matrix Plus routing matrix:



NOTE: When you upgrade other T4000 routers to LCCs in the routing matrix, you must set the LCC number (*lcc-number*) to 2, 4, or 6.

1. Upgrade both the CBs and Routing Engines on the T4000 router. For details, see “Upgrading the Control Boards, Routing Engines, PEMs, and Rear Fan Tray of the T4000 Router for Control Plane Connectivity” on page 93.
2. Upgrade the T4000 router with the same version of Junos OS as that on the SFC.
3. Upgrade the SIBs of the T4000 router and connect the new SIBs to the SFC. For details, see “Configuring Junos OS for Upgrading the SIBs on the T4000 Router and Connecting the Router to the SFC” on page 93.
4. Connect Ethernet links of the control plane from the T4000 router to the SFC.

5. Set the LCC mode on the SFC's master Routing Engine to **t4000** by using the following commands:

```
user@host# set chassis lcc-mode lcc 0 mode t4000
user@host# set chassis lcc-mode lcc 1 mode empty
user@host# commit
```



NOTE: If you set `lcc-mode` for LCC 0, LCC 2, LCC 4, and LCC 6 as `t4000`, the `lcc-mode` value for the next LCC must be `empty`. `lcc-mode` for LCC 3, LCC 5, and LCC 7 must be `empty` in a routing matrix configuration with four T4000 LCCs.

6. Reboot the T4000 router. After rebooting, the router becomes part of the TX Matrix Plus routing matrix and is connected to the SFC on the control plane.

Configuring Junos OS to Upgrade the T640 Router Chassis to LCC 0 of a TX Matrix Plus Router with 3D SIBs

The procedure for upgrading a T640 router to LCC 0 of a TX Matrix Plus routing matrix is the same as the procedure for upgrading a T1600 router. See “[Configuring Junos OS to Upgrade the T1600 Router Chassis to LCC 0 of a TX Matrix Plus Router with 3D SIBs](#)” on page 86.

Related Documentation

- [Configuring Junos OS to Upgrade a T4000 Router to LCC 0 of a TX Matrix Plus Router with 3D SIBs on page 92](#)
- [Configuring Junos OS to Upgrade the T1600 Router Chassis to LCC 0 of a TX Matrix Plus Router with 3D SIBs on page 86](#)
- [Upgrading an Operational Standalone Router and Integrating It into a TX Matrix Plus Routing Matrix with 3D SIBs](#)

CHAPTER 7

Configuring M Series Chassis-Level Features

- [Configuring Port-Mirroring Instances on M320 Routers on page 101](#)
- [Configuring Port-Mirroring Instances on M120 Routers on page 102](#)
- [Configuring the Junos OS to Enable MTU Path Check for a Routing Instance on M Series Routers on page 102](#)
- [Configuring the Junos OS to Enable an M160 Router to Operate in Packet Scheduling Mode on page 104](#)
- [Configuring the Junos OS to Make an SFM Stay Offline on page 104](#)
- [Configuring the Junos OS to Support FPC to FEB Connectivity on M120 Routers on page 105](#)
- [Configuring the Junos OS to Support Eight Queues on IQ Interfaces for T Series and M320 Routers on page 107](#)
- [Configuring the Junos OS to Support Entry-Level Configuration on an M320 Router with a Minimum Number of SIBs and PIMs on page 108](#)

Configuring Port-Mirroring Instances on M320 Routers

You can associate only one port-mirroring instance with a specific FPC on an M320 router.

To associate a port-mirroring instance with a specific FPC, include the **port-mirror-instance** *port-mirroring-instance-name* statement at the **[edit chassis fpc slot-number]** hierarchy level:

```
[edit chassis]
fpc slot-number {
  port-mirror-instance port-mirroring-instance-name;
}
```

The properties of the port-mirroring instance associated with an FPC override any global port-mirroring properties (configured by including the **port-mirroring** statement at the **[edit forwarding-options]** hierarchy level.)

**NOTE:**

- Layer 2 VPLS port mirroring is supported only for Enhanced III FPCs on M320 routers.
- Ensure that the *port-mirroring-instance-name* specified at the [edit chassis fpc slot-number] hierarchy level matches the *port-mirroring-instance-name* configured at the [edit forwarding-options port-mirroring instance port-mirroring-instance-name] hierarchy level.

Related Documentation

- [Port-Mirroring Instances Overview on page 8](#)

Configuring Port-Mirroring Instances on M120 Routers

You can associate only one port-mirroring instance with a specific FEB on an M120 router.

To associate a port-mirroring instance with a FEB, include the **port-mirror-instance** *port-mirroring-instance-name* statement at the [edit chassis feb slot-number] hierarchy level:

```
[edit chassis]
feb slot-number {
  port-mirror-instance port-mirroring-instance-name;
}
```

The properties of the port-mirroring instance associated with the FEB override any global port-mirroring properties (configured by including the **port-mirroring** statement at the [edit forwarding-options] hierarchy level.)



NOTE: In a FEB redundancy group, you must associate a port-mirroring instance only with the primary FEB. During failover or switchover, the port-mirroring instance is automatically associated with the backup FEB that fails over or switches over as the primary FEB.

For information about configuring FPC-to-FEB connectivity on an M120 router, see [“Configuring the Junos OS to Support FPC to FEB Connectivity on M120 Routers” on page 105](#).

Related Documentation

- [Port-Mirroring Instances Overview on page 8](#)

Configuring the Junos OS to Enable MTU Path Check for a Routing Instance on M Series Routers

By default, the maximum transmission unit (MTU) check for routing instance is disabled on M Series routers (except the M120 and M320 routers), and enabled for all T Series and J Series routers.



NOTE: The MTU check is automatically present for interfaces belonging to the main router.

On M Series routers (except the M120 and M320 routers) you can configure MTU path checks on the outgoing interface for unicast traffic routed on a virtual private network (VPN) routing and forwarding (VRF) routing instance. When you enable MTU check, the router sends an Internet Control Message Protocol (ICMP) message when the size of a unicast packet traversing a VRF routing instance or virtual-router routing instance has exceeded the MTU size and when an IP packet is set to "do not fragment". The ICMP message uses the routing instance local address as its source address.

For an MTU check to work in a routing instance, you must include the **vrf-mtu-check** statement at the **[edit chassis]** hierarchy level and assign at least one interface containing an IP address to the routing instance.

To configure path MTU checks, complete the following tasks:

1. [Enabling MTU Check for a Routing Instance on page 103](#)
2. [Assigning an IP Address to an Interface in the Routing Instance on page 103](#)

Enabling MTU Check for a Routing Instance

To enable MTU check for a routing instance, include the **vrf-mtu-check** statement at the **[edit chassis]** hierarchy level:

```
[edit chassis]
vrf-mtu-check;
```

Assigning an IP Address to an Interface in the Routing Instance

To assign an IP address to an interface in the VRF or virtual-router routing instance, configure the local address for that routing instance. A local address is any IP address derived from an interface that is assigned to the routing instance.

To assign an interface to a routing instance, include the **interface** statement at the **[edit routing-instances *routing-instance-name*]** hierarchy level:

```
[edit routing-instances routing-instance-name]
interface interface-name;
```

To configure an IP address for a loopback interface, include the **address** statement at the **[edit interfaces *interface-name* unit *logical-unit-number* family inet]** hierarchy level:

```
[edit interfaces interface-name unit logical-unit-number family inet]
address address;
```



NOTE: If you are assigning Internet Protocol Security (IPsec) or generic routing encapsulation (GRE) tunnel interfaces without IP addresses in the routing instance, include a loopback interface to the routing instance. To do this, include the `lo0.n` option at the `[edit routing-instances routing-instance-name interface]` hierarchy level. *n* cannot be 0, because `lo0.0` is reserved for the main router (and not appropriate for use with routing instances). Also, an IP address must be assigned to this loopback interface in order to work. To set an IP address for a loopback interface, include the `address` statement at the `[edit interfaces lo0 unit logical-unit-number family inet]` hierarchy level.

Configuring the Junos OS to Enable an M160 Router to Operate in Packet Scheduling Mode

By default, packet scheduling is disabled on M160 Routers. To configure a router to operate in packet-scheduling mode, include the `packet-scheduling` statement at the `[edit chassis]` hierarchy level:

```
[edit chassis]
packet-scheduling;
```

To explicitly disable the `packet-scheduling` statement, include the `no-packet-scheduling` statement at the `[edit chassis]` hierarchy level:

```
[edit chassis]
no-packet-scheduling;
```

When you enable packet-scheduling mode, the Packet Director application-specific integrated circuit (ASIC) schedules packet dispatches to compensate for transport delay differences. This preserves the interpacket gaps as the packets are distributed from the Packet Director ASIC to the Packet Forwarding Engine.

Whenever you change the configuration for packet-scheduling, the system stops all SFMs and FPCs and restarts them in the new mode.



NOTE: Packet scheduling is for M160 routers only.

Configuring the Junos OS to Make an SFM Stay Offline

By default, if you use the `request chassis sfm` CLI command to take a Switching and Forwarding Module (SFM) offline, the SFM attempts to restart when you enter a `commit` CLI command. To prevent a restart, you can configure an SFM to stay offline. This feature is useful for repair situations.

To configure an SFM to stay offline, include the `sfm` statement at the `[edit chassis]` hierarchy level:

```
[edit chassis]
sfm slot-number {
```



```
power off;
}
```

- **slot number**—Slot number in which the SFM is installed.
- **power off**—Take the SFM offline and configure it to remain offline.

For example, the following statement takes an SFM in slot 3 offline:

```
[edit chassis]
sfm 3 power off;
```

Use the **show chassis sfm** CLI command to confirm the offline status:

```
user@host# show chassis sfm
```

Slot	State	Temp (C)	CPU Utilization (%)		Memory Utilization (%)		
			Total	Interrupt	DRAM (MB)	Heap	Buffer
0	Online	34	2	0	64	16	47
1	Online	38	2	0	64	16	47
2	Online	42	2	0	64	16	47
3	Offline	--- Configured power off ---					

To bring the SFM back online, delete the **edit chassis sfm** statement and then commit the configuration.

Related Documentation

- [Router Chassis Configuration Statements on page 313](#)

Configuring the Junos OS to Support FPC to FEB Connectivity on M120 Routers

The M120 router supports six Forwarding Engine Boards (FEBs) and six Flexible PIC Concentrators (FPCs). The supported FPCs include:

- Two compact FPCs:
 - OC192 compact FPC (supported only on the D4 chip-based compact FPC)
 - 10-Gigabit Ethernet compact FPC
- Up to four Type 1, Type 2, or Type 3 FPCs

On the M120 router, you can map a connection between any FPC and any FEB. This capability allows you to configure resources for a chassis that contains empty slots, supporting configurations where the FPC and FEB pairs are not in slot order. You do not have to populate every empty slot position, but you must configure a FEB for every FPC.

If you do not want to map a connection between an FPC and a FEB, you must explicitly configure the FPC not to connect to the FEB. To do so, include the **none** option at the **[edit chassis fpc-feb-connectivity fpc number feb]** hierarchy level. If you do not configure FPC and FEB connectivity, it is automatically assigned in the following order: FPC 0 to FEB 0, FPC 1 to FEB 1, and so on.

For each FEB, you can map a maximum of two Type 1 FPCs or one Type 2, Type 3, or compact FPC.

The following restrictions apply when you configure FPC and FEB connectivity:

- When an FPC is configured not to connect to any FEB, interfaces on that FPC are not created.
- If a PIC comes online, but the FEB to which the FPC is configured to connect is not online, the physical interfaces for the PIC are not created. For example, PIC 1 on FPC 2 comes online. The configuration specifies that FPC 2 connects to FEB 3. If FEB 3 is not online at the time PIC 1 comes online, the physical interfaces corresponding to PIC 1 on FPC 2 are not created. If FEB 3 subsequently comes online, the physical interfaces are created.
- If a FEB is brought offline or removed, any interfaces on the FPCs connected to the FEB are deleted. If the FEB is subsequently brought back online, the interfaces are restored.
- FPCs and FEBs might reboot following a change in the FPC and FEB connectivity configuration. If an FPC connects to a different FEB as a result of the configuration change, the FPC is rebooted following the commit. As a result of the reboot, interfaces on the FPC are deleted.
- If a FEB connects to a different FPC or set of FPCs after a connectivity configuration change, the FEB is rebooted. The exception is if the FEB is already connected to one or two Type 1 FPCs and the change only results in the FEB being connected either to one additional or one fewer Type 1 FPC.

To configure a connection between an FPC and a FEB, include the **fpc-feb-connectivity** statement at the **[edit chassis]** hierarchy level:

```
[edit chassis]
fpc-feb-connectivity {
  fpc number feb (slot-number | none);
}
```

For **fpc number**, enter a value from 0 through 5. For **feb slot-number**, enter a value from 0 through 5 or none. The **none** option disconnects the FPC from the FEB.

To view the current FPC and FEB mapping and the status of each FPC and FEB, issue the **show chassis fpc-feb-connectivity** operational mode command. For more information, see the [Junos System Basics and Services Command Reference](#).



NOTE: FPC-to-FEB connectivity is supported only on the M120 router.

In this example, FPC 3 is already mapped to FEB 3 by default. You are also mapping a connection between FPC 2 and FEB 3.

```
[edit chassis]
fpc-feb-connectivity {
  fpc 2 feb 3;
}
```

However, this configuration results in a mismatch between the FPC type and the FEB type. For example, FPC 3 is not a Type 1 FPC. You can map only one FPC that is not a Type 1 FPC to a FEB. Use the **fpc-feb-connectivity** statement to explicitly disconnect FPC 3 from FEB 3. To do so, include the **none** option at the **[edit chassis fpc-feb-connectivity fpc number feb]** hierarchy level:

```
[edit chassis]
fpc-feb-connectivity {
  fpc 2 feb 3;
  fpc 3 feb none;
}
```

Related Documentation

- [Configuring the Junos OS to Support an External Clock Synchronization Interface for M Series and T Series Routers on page 183](#)
- [Configuring Port-Mirroring Instances on M120 Routers on page 102](#)

Configuring the Junos OS to Support Eight Queues on IQ Interfaces for T Series and M320 Routers

By default, IQ PICs on T Series and M320 routers are restricted to a maximum of four egress queues per interface. To configure a maximum of eight egress queues on IQ interfaces, include the **max-queues-per-interface** statement at the **[edit chassis fpc slot-number pic pic-number]** hierarchy level:

```
[edit chassis fpc slot-number pic pic-number]
max-queues-per-interface (8 | 4);
```

On a TX Matrix or TX Matrix Plus router, include the **max-queues-per-interface** statement at the **[edit chassis lcc number fpc slot-number pic pic-number]** hierarchy level:

```
[edit chassis lcc number fpc slot-number pic pic-number]
max-queues-per-interface (8 | 4);
```



NOTE: The configuration at the **[edit class-of-service]** hierarchy level must also support eight queues per interface.

The maximum number of queues per IQ PIC can be 4 or 8. If you include the **max-queues-per-interface** statement, all ports on the IQ PIC use configured mode and all interfaces on the IQ PIC have the same maximum number of queues.

If you include the **max-queues-per-interface 4** statement, you can configure all four ports and configure up to four queues per port.

For 4-port OC3c/STM1 Type I and Type II PICs on M320 and T Series routers, when you include the **max-queues-per-interface 8** statement, you can configure up to eight queues on ports 0 and 2. After you commit the configuration, the PIC goes offline and comes back online with only ports 0 and 2 operational. No interfaces can be configured on ports 1 and 3.

For Quad T3 and Quad E3 PICs, when you include the **max-queues-per-interface 8** statement, you can configure up to eight queues on ports 0 and 2. After you commit the configuration, the PIC goes offline and comes back online with only ports 0 and 2 operational. No interfaces can be configured on ports 1 and 3.

When you include the **max-queues-per-interface** statement and commit the configuration, all physical interfaces on the IQ PIC are deleted and readded. Also, the PIC is taken offline

and then brought back online immediately. You do not need to take the PIC offline and online manually. You should change modes between four queues and eight queues only when there is no active traffic going to the IQ PIC.

- Related Documentation**
- [Configuring the Junos OS to Support ILMI for Cell Relay Encapsulation on an ATM2 IQ PIC on page 156](#)
 - [Configuring the Junos OS to Enable Larger Delay Buffers for T1, E1, and DS0 Interfaces Configured on Channelized IQ PICs on page 158](#)

Configuring the Junos OS to Support Entry-Level Configuration on an M320 Router with a Minimum Number of SIBs and PIMs

An M320 router can include an entry-level configuration with a minimum number of SIBs and PEMs. With this configuration, the router may have fewer than four SIBs or four PEMs.

To prevent unwanted alarms from occurring with this entry-level configuration, include the **pem minimum** and **sib minimum** statements at the **[edit chassis]** hierarchy level:

```
[edit chassis]
pem {
  minimum number;
}
sib {
  minimum number;
}
```

minimum *number* can be 0 through 3. With this configuration, SIB absent or PEM absent alarms are generated only if the SIB or PEM count falls below the minimum specified. For example, set this number to 2 for an entry-level configuration with 2 Switch Interface Boards and 2 Power Entry Modules.

- Related Documentation**
- [Configuring Port-Mirroring Instances on M320 Routers on page 101](#)
 - [Configuring the Junos OS to Support an External Clock Synchronization Interface for M Series and T Series Routers on page 183](#)
 - [Configuring the Junos OS to Support Eight Queues on IQ Interfaces for T Series and M320 Routers on page 107](#)

CHAPTER 8

Configuring MX Series Chassis-Level Features

- [Configuring Port-Mirroring Instances on MX Series 3D Universal Edge Routers on page 110](#)
- [Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs for MX Series Routers on page 111](#)
- [16-Port 10-Gigabit Ethernet MPC on MX Series Routers \(16x10GE 3D MPC\) Overview on page 112](#)
- [Configuring the Number of Active Ports on a 16-Port 10-Gigabit Ethernet MPC on MX Series Routers on page 113](#)
- [Configuring Tunnel Interfaces on an MX Series Router with a 16x10GE 3D MPC on page 115](#)
- [MPC3E on MX Series Routers Overview on page 116](#)
- [MPC4E on MX Series Routers Overview on page 118](#)
- [Configuring Tunnel Interfaces on MX Series Routers with the MPC3E on page 120](#)
- [Configuring Tunnel Interfaces on MX Series Routers with MPC4E on page 121](#)
- [Configuring 100-Gigabit Ethernet MICs to Interoperate with Type 4 100-Gigabit Ethernet PICs \(PD-1CE-CFP-FPC4\) Using SA Multicast Mode on page 122](#)
- [Configuring MPC4E \(MPC4E-3D-2CGE-8XGE\) to Interoperate with 100-Gigabit Ethernet PICs on Type 4 FPC Using SA Multicast Mode on page 124](#)
- [Configuring the Power-On Sequence for DPCs on MX Series Routers with the Enhanced AC PEM on page 126](#)
- [Configuring the Junos OS to Support Layer 2 Services on MX Series 3D Universal Edge Routers with MS-DPCs on page 126](#)
- [Configuring the Junos OS to Enable Session Offloading on MX Series 3D Universal Edge Routers with MS-DPCs on page 127](#)
- [Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers on page 127](#)
- [Accounting of the Layer 2 Overhead Attribute in Interface Statistics on page 128](#)
- [Configuring Layer 2 Overhead Accounting in Interface Statistics on page 130](#)
- [Verifying the Accounting of Layer 2 Overhead in Interface Statistics on page 133](#)

Configuring Port-Mirroring Instances on MX Series 3D Universal Edge Routers

You can configure port-mirroring instances both at the DPC level and at the PIC level on MX Series routers, as described in the following topics:

- [Configuring Port-Mirroring Instances at the DPC Level on page 110](#)
- [Configuring Port-Mirroring Instances at the PIC Level on page 110](#)

Configuring Port-Mirroring Instances at the DPC Level

A port-mirroring instance configured at the FPC level for the DPC is bound to all the Packet Forwarding Engines on the DPC.

To associate a port-mirroring instance with a specific DPC and its Packet Forwarding Engines, include the **port-mirror-instance** *port-mirroring-instance-name* statement at the **[edit chassis fpc slot-number]** hierarchy level:

```
[edit chassis]
fpc slot-number {
  port-mirror-instance port-mirroring-instance-name;
}
```

The properties of the port-mirroring instance associated with the DPC override any global port-mirroring properties (configured by including the **port-mirroring** statement at the **[edit forwarding-options]** hierarchy level).

Configuring Port-Mirroring Instances at the PIC Level

For MX Series routers, there is a one-to-one mapping of Packet Forwarding Engines and PICs. Therefore, a port-mirroring instance configured at the PIC level is bound to its Packet Forwarding Engines and ports.

To associate a port-mirroring instance with a specific Packet Forwarding Engine, include the **port-mirror-instance** *port-mirroring-instance-name* statement at the **[edit chassis fpc slot-number pic slot-number]** hierarchy level:

```
[edit chassis]
fpc slot-number {
  port-mirror-instance port-mirroring-instance-name-a;
  pic slot-number {
    port-mirror-instance port-mirroring-instance-name-b;
  }
}
```

The properties of the port-mirroring instance associated with the PIC override the properties of the port-mirroring instance associated with the DPC (configured by including the **port-mirroring** *port-mirroring-instance-name* statement at the **[edit chassis fpc slot-number]** hierarchy level).

For more information about configuring port mirroring for Layer 2 VPLS traffic on MX Series routers, see the *Junos MX Series Ethernet Services Routers Layer 2 Configuration Guide*.

Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs for MX Series Routers

Symmetrical hashing for load balancing on an 802.3ad Link Aggregation Group (LAG) is useful when two MX Series routers (for example, Router A and Router B) are connected transparently through Deep Packet Inspection (DPI) devices over a LAG bundle. The DPI devices keep track of traffic flows in both the forward and reverse directions.

If symmetrical hashing is configured, the reverse flow of traffic is also directed through the same child link on the LAG and is bound to flow through the same DPI device. This enables proper accounting on the DPI of the traffic in both the forward and reverse flows.

If symmetrical hashing is not configured, a different child link on the LAG might be chosen for the reverse flow of traffic through a different DPI device. This results in incomplete information about the forward and reverse flows of traffic on the DPI device leading to incomplete accounting of the traffic by the DPI device.

Symmetrical hashing is computed based on fields like source address and destination address. You can configure symmetrical hashing both at the chassis level and the PIC level for load balancing based on Layer 2, Layer 3, and Layer 4 data unit fields for family inet (IPv4 protocol family) and multiservice (switch or bridge) traffic. Symmetrical hashing configured at the chassis level is applicable to the entire router, and is inherited by all its PICs and Packet Forwarding Engines. Configuring PIC-level symmetrical hashing provides you more granularity at the Packet Forwarding Engine level.

For the two routers connected through the DPI devices over a LAG bundle, you can configure **symmetric-hash** on one router and **symmetric-hash complement** on the remote-end router or vice-versa.

To configure symmetrical hashing at the chassis level, include the **symmetric-hash** or the **symmetric-hash complement** statements at the **[edit forwarding-options hash-key family]** hierarchy level. For information about configuring symmetrical hashing at the chassis level and configuring the link index, see the *Junos OS Network Interfaces Library for Routing Devices* and the *Junos OS VPNs Library for Routing Devices*.



NOTE: On MX Series DPCs, configuring symmetrical hashing at the PIC level refers to configuring symmetrical hashing at the Packet Forwarding Engine level.

To configure symmetrical hashing at the PIC level on the inbound traffic interface (where traffic enters the router), include the **symmetric-hash** or **symmetric-hash complement** statement at the **[edit chassis fpc slot-number pic pic-number hash-key]** hierarchy level:

```
[edit chassis fpc slot-number pic pic-number hash-key]
family multiservice {
  source-mac;
  destination-mac;
  payload {
    ip {
```

```
        layer-3 (source-ip-only | destination-ip-only);
        layer-4;
    }
}
symmetric-hash {
    complement;
}
}

family inet {
    layer-3;
    layer-4;
    symmetric-hash {
        complement;
    }
}
```

**NOTE:**

- PIC-level symmetrical hashing overrides the chassis-level symmetrical hashing configured at the [edit chassis forwarding-options hash-key] hierarchy level.
- Symmetrical hashing for load balancing on 802.3ad Link Aggregation Groups is currently supported for the VPLS, INET and bridged traffic only.
- Any change in the hash-key configuration requires rebooting the FPC for the changes to take effect.
- Hash key configuration on a PIC or Packet Forwarding Engine can be either in the “symmetric hash” or the “symmetric hash complement” mode, but not both at the same time.

Related Documentation

- [Examples: Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs on MX Series Routers on page 293](#)
- [family on page 347](#)
- [hash-key on page 358](#)
- [inet on page 361](#)
- [multiservice on page 374](#)
- [payload on page 384](#)
- [symmetric-hash on page 408](#)

16-Port 10-Gigabit Ethernet MPC on MX Series Routers (16x10GE 3D MPC) Overview

In Junos OS Release 10.1 and later, MX960, MX480, and MX240 routers support the 16-port 10-Gigabit Ethernet MPC (16x10GE 3D MPC) with model numbers MPC-3D-16XGE-SFPP-R-B and MPC-3D-16XGE-SFPP. This MPC provides scalability in bandwidth, subscribers, and services capabilities of the routers.

The following are some of the key features of the 16x10GE 3D MPC:

- Contains 16 built-in 10-Gigabit Ethernet ports in groups of four each. It does not contain separate slots for Modular Interface Cards (MICs).
- Supports up to 120 Gbps of full-duplex traffic.
- Supports LAN-PHY mode at 10.3125 Gbps.



NOTE: The 16x10GE 3D MPC does not support WAN-PHY mode.

- Supports small form-factor pluggable transceivers of the SFP+ standard. For a list of supported SFPs, see the [MX Series Interface Module Reference](#).
- Supports an effective line rate of twelve 10-Gigabit Ethernet ports. If all sixteen 10-Gigabit Ethernet ports are used, the line card is oversubscribed in the ratio of 4:3.
- Supports intelligent oversubscription services.
- Supports one full-duplex 10-Gigabit Ethernet tunnel interface for each Packet Forwarding Engine. .

For information about the supported and unsupported Junos OS features for this MPC, see “Protocols and Applications Supported by MX Series MPCs” in the [MX Series Interface Module Reference](#).

Related Documentation

- [16x10GE MPC](#)
- [MX Series Interface Module Reference](#).
- [Configuring the Number of Active Ports on a 16-Port 10-Gigabit Ethernet MPC on MX Series Routers on page 113](#)
- [Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers on page 127](#)
- [Configuring Tunnel Interfaces on MX Series Routers](#)

Configuring the Number of Active Ports on a 16-Port 10-Gigabit Ethernet MPC on MX Series Routers

The Junos OS provides the **number-of-ports active-ports** configuration statement at the **[edit chassis fpc slot-number]** hierarchy level. This statement can be used for enabling or disabling the physical ports on the Packet Forwarding Engines of a 16-port 10-Gigabit Ethernet MPC (16x10GE 3D MPC). This configuration can be used for the following purposes:

- **Enabling Switch Control Board (SCB) redundancy**—For maximum bandwidth capabilities (12-port line-rate bandwidth), the 16x10GE 3D MPC uses all the available SCBs (three SCBs for an MX960 router, two SCBs for an MX480 or MX240 router) actively in the chassis.

If SCB redundancy (2+1 SCBs on an MX960 router or 1+1 SCB on an MX480 or MX240 router) is required, ports on the line card can be disabled by setting the number of usable ports per line card to **8**. In such a case, the third and fourth ports (ports 0/2-3, 1/2-3, 2/2-3, 3/2-3) on every Packet Forwarding Engine are disabled.

- **Ensuring guaranteed bandwidth by preventing oversubscription**—The 16x10GE 3D MPC supports one 10-Gigabit Ethernet tunnel interface for each Packet Forwarding Engine. The effective line-rate bandwidth of the MPC is 12 ports because of an oversubscription ratio of 4:3. Therefore, configuring a tunnel interface might further result in the Packet Forwarding Engines being oversubscribed. To prevent such oversubscription and to ensure a guaranteed bandwidth, include the **number-of-ports** configuration statement to disable one or two ports per Packet Forwarding Engine.

To configure the number of active ports on the MPC, include the **number-of-ports active-ports** configuration statement at the **[edit chassis fpc slot-number]** hierarchy level:

```
[edit chassis fpc slot-number]
number-of-ports (8 | 12);
```

Specify either 8 or 12 ports using this statement. When eight active ports are configured, two ports per Packet Forwarding Engine are disabled, and the LEDs on the MPC are set to **yellow**. When you specify 12 active ports, one port per Packet Forwarding Engine is disabled and the corresponding LED is set to **yellow**. When you do not include this statement in the configuration, all 16 default ports on the MPC are active.



NOTE:

- Committing the configuration after including the **number-of-ports active-ports** configuration statement brings down the Ethernet interfaces for all the ports on the MPC before the ports configuration becomes active.
- A minimum of one high-capacity fan tray is necessary for meeting the cooling requirements of the MPC. The Junos OS generates a chassis Yellow alarm recommending fan tray upgrade for optimal performance, if the MX router chassis contains an old fan tray.

For more information about the 16x10GE 3D MPC, see the [MX Series Interface Module Reference](#).

Related Documentation

- [16-Port 10-Gigabit Ethernet MPC on MX Series Routers \(16x10GE 3D MPC\) Overview on page 112](#)
- [Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers on page 127](#)
- [Configuring Tunnel Interfaces on MX Series Routers](#)
- [number-of-ports on page 378](#)

Configuring Tunnel Interfaces on an MX Series Router with a 16x10GE 3D MPC

MX960, MX480, and M240 routers support the 16-port 10-Gigabit Ethernet MPC (16x10GE 3D MPC) fixed configuration Field Replaceable Unit (FRU). Each Packet Forwarding Engine on a 16x10GE MPC can support a full-duplex 10Gbps tunnel without losing line-rate capacity. For example, a full-duplex 10Gbps tunnel can be hosted on a 10-Gigabit-Ethernet port, while two other 10-Gigabit-Ethernet ports on the same PFE can concurrently forward line-rate traffic.

To configure an MPC and its corresponding Packet Forwarding Engine to use tunneling services, include the **tunnel-services** statement at the **[edit chassis fpc slot-number pic pic-number]** hierarchy level. The Junos OS creates tunnel interfaces **gr-fpc/pic/port.0**, **vt-fpc/pic/port.0**, and so on. You also configure the amount of bandwidth reserved for tunnel services.

```
[edit chassis]
fpc slot-number {
  pic number {
    tunnel-services {
      bandwidth 10g;
    }
  }
}
```

fpc slot-number is the slot number of the MPC. If two SCBs are installed, the range is 0 through 11. If three SCBs are installed, the range is 0 through 5 and 7 through 11.

pic number is the number of the Packet Forwarding Engine on the MPC. The range is 0 through 3.

bandwidth 10g is the amount of bandwidth to reserve for tunnel traffic on each Packet Forwarding Engine.

In the following example, you create tunnel interfaces on Packet Forwarding Engine 0 of MPC 4 with 10 Gbps of bandwidth reserved for tunnel traffic. With this configuration, the tunnel interfaces created are **gr-4/0/0**, **pe-4/0/0**, **pd-4/0/0**, **vt-4/0/0**, and so on.

```
[edit chassis]
fpc 4 pic 0 {
  tunnel-services {
    bandwidth 10g;
  }
}
```

Related Documentation

- [16-Port 10-Gigabit Ethernet MPC on MX Series Routers \(16x10GE 3D MPC\) Overview on page 112](#)
- [Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers on page 127](#)

MPC3E on MX Series Routers Overview

MX960, MX480, MX240, and MX 2020 routers support the MPC3E (MX-MPC3E-3D) with two MIC slots. The MPC provides the connection between the customer's Ethernet interfaces and the routing fabric of the MX Series chassis. The MPC is inserted into a MIC slot in an MX Series router. MICs provide the physical interface and are installed into the MPCs.

The MPC3E supports these MICs as field replaceable units (FRUs):

- *100-Gigabit Ethernet MIC with CFP* (model number MIC3-3D-1X100GE-CFP)
- *100-Gigabit Ethernet MIC with CXP* (model number MIC3-3D-1X100GE-CXP)
- *10-Port Gigabit Ethernet MIC with SFPP* (model number MIC3-3D-10XGE-SFPP)
- *2-port 40-Gigabit Ethernet MIC with QSFP+* (model number MIC3-3D-2X40GE-QSFP)

The MPC3E also supports these legacy MICs:

- *20-port Gigabit Ethernet MIC with SFP* (model number MIC-3D-20GE-SFP)
- *2-port 10-Gigabit Ethernet MICs with XFP* (model number MIC-3D-2XGE-XFP)

The MPC3E requires the Enhanced MX Switch Control Board (SCB) for fabric redundancy. You can also continue to use existing SCBs without fabric redundancy. The MPC interoperates with existing MX Series line cards, including Dense Port Concentrators (DPCs) and Modular Port Concentrators (MPCs).

You can also configure the 100-Gigabit Ethernet MIC (MIC3-3D-1X100GE-CFP) to interoperate with routers using the 100-Gigabit Ethernet PIC (Type 4 1X100GE PIC for STFC4 FPC) by using the **forwarding-mode** statement with the **sa-multicast** option at the **[edit chassis fpc slot pic slot]** hierarchy level. For more information, see [“Configuring 100-Gigabit Ethernet MICs to Interoperate with Type 4 100-Gigabit Ethernet PICs \(PD-ICE-CFP-FPC4\) Using SA Multicast Mode” on page 122](#).

The MPC3E is based on a new Juniper Networks chipset for increased scalability for bandwidth, subscribers, and service capabilities of the routers.

The MPC3E supports these key features:

- 100-Gigabit Ethernet interfaces
- Two separate slots for MICs
- The following MICs:
 - MIC3-3D-1X100GE-CFP
 - MIC3-3D-1X100GE-CXP
 - MIC3-3D-10XGE-SFPP
 - MIC3-3D-2X40GE-QSFP

- MIC-3D-20GE-SFP
- MIC-3D-2XGE-XFP
- Up to 100 Gbps per MIC slot
- Up to 200 Gbps aggregate WAN bandwidth connectivity for the two MIC slots; the line card is oversubscribed in the ratio of 1.5:1.
- Up to four full-duplex tunnel interfaces on the line card
- Intelligent oversubscription services
- Configuration of Virtual Chassis ports in an MX Series Virtual Chassis member router

The MPC3E supports all MX Series Virtual Chassis features, including Layer 2 and IEEE 802.3ad link aggregation features. An MX Series Virtual Chassis configuration does not currently support the Spanning Tree Protocol (STP).

For more information about supported Junos OS features on the MPC3E, see *Protocols and Applications Supported by the MX240, MX480, MX960, and MX2020 MPC3E* in the [MX Series Interface Module Reference](#).

The MPC3E supports feature parity with the following software features:

- Basic Layer 2 features and virtual private LAN service (VPLS) functionality
- Layer 3 routing protocols
- MPLS
- Multicast forwarding
- Firewall filters and policers
- Class-of-service (CoS) support
- Synchronous Ethernet
- Tunnel support
- Interoperability with existing DPCs and MPCs

At a high level, the MPC3E does not currently support these features:

- Fine-grained queuing and input queuing
- Unified in-service software upgrade (ISSU)
- Multilink services
- Precision time protocol (IEEE 1588)
- Internet Group Management Protocol (IGMP) snooping with bridging, integrated routing and bridging (IRB), or VPLS
- Intelligent hierarchical policers

For information about the supported and unsupported Junos OS features for this MPC, see *Protocols and Applications Supported by the MX240, MX480, MX960, and MX2020 MPC3E* in the [MX Series Interface Module Reference](#).

Related Documentation

- [MPC3E MIC Overview](#)
- [Protocols and Applications Supported by the MX240, MX480, MX960, and MX2020 MPC3E](#)
- [Configuring Tunnel Interfaces on MX Series Routers with the MPC3E on page 120](#)
- [Configuring 100-Gigabit Ethernet MICs to Interoperate with Type 4 100-Gigabit Ethernet PICs \(PD-ICE-CFP-FPC4\) Using SA Multicast Mode on page 122](#)
- [2-port 10-Gigabit Ethernet MICs with XFP](#)
- [MX Series Interface Module Reference](#).

MPC4E on MX Series Routers Overview

In Junos OS Release 12.3R2 and later, MX2020, MX2010, MX960, MX480, and MX240 routers support a new MPC, MPC4E. MPC4E is a fixed-configuration MPC that provides scalability in bandwidth and services capability of the routers. MPC4E is available in two models—MPC4E-3D-32XGE-SFPP and MPC4E-3D-2CGE-8XGE.

Type of MPC4E	Ports	Interfaces	Optical Transceiver Support	Initial Release
MPC4E-3D-32XGE-SFPP	32 built-in 10-Gigabit Ethernet ports	10-Gigabit Ethernet interfaces	10GBASE-LR, 10GBASE-SR, 10GBASE-ER, 10GBASE-ZR	12.3R2
MPC4E-3D-2CGE-8XGE	2 built-in 100-Gigabit Ethernet ports and 8 built-in 10-Gigabit Ethernet ports	10-Gigabit Ethernet and 100-Gigabit Ethernet interfaces	100GBASE-LR4, 100GBASE-SR10, 10GBASE-LR, 10GBASE-SR, 10GBASE-ER, 10GBASE-ZR	12.3R2



NOTE: Both models of MPC4E are supported only on the MX960, MX480, and MX240 routers with high-capacity power supplies and high-capacity fan trays.

MPC4E does not support legacy SCBs. It interoperates with existing MX Series line cards, including Dense Port Concentrators (DPCs) and Modular Port Concentrators (MPCs).

MPC4E is a fixed-configuration MPC and does not contain separate slots for Modular Interface Cards (MICs). It contains two Packet Forwarding Engines (PFEs)—PFE0 hosts PIC0 and PIC1 while PFE1 hosts PIC2 and PIC3.

You can also configure the MPC4E to interoperate with routers that use the 100-Gigabit Ethernet PIC (Type 4 PIC on Type 4 FPC) by using the **forwarding-mode** statement with the **sa-multicast** option at the **[edit chassis fpc slot pic slot]** hierarchy level. For more

information, see [“Configuring MPC4E \(MPC4E-3D-2CGE-8XGE\) to Interoperate with 100-Gigabit Ethernet PICs on Type 4 FPC Using SA Multicast Mode”](#) on page 124.

MPC4E supports:

- Forwarding capability of up to 130 Gbps per Packet Forwarding Engine. On MX240, MX480, and MX960 routers with Enhanced MX Switch Control Boards (SCBEs), each Packet Forwarding Engine can forward up to 120 Gbps because of the Packet Forwarding Engine and fabric limitations. On M2020 and MX2010 routers, each Packet Forwarding Engine can forward up to 130 Gbps.
- Small form-factor pluggable (SFP) and C form-factor pluggable (CFP) transceivers for connectivity.
- Up to 260 Gbps of full-duplex traffic.
- Effective line rate of 200 Gbps for packets larger than 300 bytes.
- Intelligent oversubscription services.
- WAN-PHY mode on 10-Gigabit Ethernet interfaces on a per-port basis.
- Up to four full-duplex tunnel interfaces on each MPC4E.



NOTE: On MX480 routers, only 5 out of 6 FPC slots can be populated with MPC4Es. One of the slots from 2 through 5 must be populated with a 16-port 10-Gigabit Ethernet MPC (model numbers MPC-3D-16XGE-SFPP-R-B and MPC-3D-16XGE-SFPP). Slots 0 and 1 can both be populated with MPC4Es. This is a power restriction. On MX960 routers, only 10 out of 11 FPC slots can be populated with MPC4Es. One of the slots from 0 through 5 must be populated with a 16-port 10-Gigabit Ethernet MPC (model numbers MPC-3D-16XGE-SFPP-R-B and MPC-3D-16XGE-SFPP). All slots from 7 through 11 can be populated with MPC4Es. This is a power restriction. Also, on MX960 router, FPC slot 11 is not NEBS compliant beyond 40°C. This is a cooling restriction.

For more information about the supported and unsupported Junos OS software features for this MPC, see *Protocols and Applications Supported by the MX240, MX480, MX960, and MX2000 MPC4E* in the *MX Series Line Card Guide*.

Related Documentation

- *2x100GE + 8x10GE MPC4E*
- *32x10GE MPC4E*
- *Protocols and Applications Supported by the MX240, MX480, MX960, and MX2000 MPC4E*

Configuring Tunnel Interfaces on MX Series Routers with the MPC3E

Because the MX Series routers do not support Tunnel Services PICs, you create tunnel interfaces on MX Series routers by including the following statements at the **[edit chassis]** hierarchy level:

```
[edit chassis]
fpc slot-number {
  pic number {
    tunnel-services {
      bandwidth (1g | 10g | 20g | 40g);
    }
  }
}
```

fpc slot-number is the slot number of the DPC, MPC, or MIC. On the MX80 router, the range is 0 through 1. On other MX series routers, if two SCBs are installed, the range is 0 through 11. If three SCBs are installed, the range is 0 through 5 and 7 through 11.

The **pic number** On MX80 routers, if the FPC is 0, the PIC number can only be 0. If the FPC is 1, the PIC range is 0 through 3. For all other MX series routers, the range is 0 through 3.

bandwidth (1g | 10g | 20g | 40g) is the amount of bandwidth to reserve for tunnel traffic on each Packet Forwarding Engine.



NOTE: When you use MPCs and MICs, tunnel interfaces are soft interfaces and allow as much traffic as the forwarding-path allows, so it is advantageous to setup tunnel services without artificially limiting traffic by use of the **bandwidth** option. However, you *must* specify **bandwidth** when configuring tunnel services for MX Series routers with DPCs or FPCs.

Bandwidth rates of 20 gigabits per second and 40 gigabits per second require use of an MX Series router with the 100-Gigabit Ethernet Modular Port Concentrator (MPC) and the 100-Gigabit CFP MIC.

1g indicates that 1 gigabit per second of bandwidth is reserved for tunnel traffic.

10g indicates that 10 gigabits per second of bandwidth is reserved for tunnel traffic.

20g indicates that 20 gigabits per second of bandwidth is reserved for tunnel traffic.

40g indicates that 40 gigabits per second of bandwidth is reserved for tunnel traffic.

If you specify a bandwidth that is not compatible, tunnel services are not activated. For example, you cannot specify a bandwidth of 1 Gbps for a Packet Forwarding Engine on a 10-Gigabit Ethernet 4-port DPC.

To verify that the tunnel interfaces have been created, issue the **show interfaces terse** operational mode command. For more information, see the *Junos Interfaces Command Reference*.

- Related Documentation**
- [Example: Configuring Tunnel Interfaces on a Gigabit Ethernet 40-Port DPC on page 295](#)
 - [Example: Configuring Tunnel Interfaces on a 10-Gigabit Ethernet 4-Port DPC on page 296](#)
 - [Example: Configuring Tunnel Interfaces on the MPC3E on page 296](#)
 - [bandwidth \(Tunnel Services\) on page 327](#)
 - [tunnel-services \(Chassis\) on page 424](#)
 - [\[edit chassis\] Hierarchy Level](#)

Configuring Tunnel Interfaces on MX Series Routers with MPC4E

MX Series routers do not support Tunnel Services PICs. However, you can create a set of tunnel interfaces per PIC slot up to a maximum of four slots from 0 through 3 on MX Series routers with MPC4E.

To configure the tunnel interfaces, include the **tunnel-services** statement and an optional bandwidth of (**1g | 10g | 20g | 30g | 40g**) at the **[edit chassis]** hierarchy level. When no tunnel bandwidth is specified, the tunnel interface can have a maximum bandwidth of up to 60 Gbps.

In the following example, you create tunnel interfaces on **PIC 1** of **MPC 4** with 40 Gbps of bandwidth reserved for tunnel traffic. **fpc slot-number** is the slot number of the MPC. In this configuration, the tunnel interfaces created are gr-4/1/1, pe-4/1/1, pd-4/1/1, vt-4/1/1, and so on.

1. To create a 40-Gbps tunnel interface, use the following configuration:

```
[edit chassis]
fpc 4 pic 1 {
  tunnel-services {
    bandwidth 40g;
  }
}
```

- Related Documentation**
- [bandwidth \(Tunnel Services\) on page 327](#)
 - [tunnel-services \(Chassis\) on page 424](#)
 - [\[edit chassis\] Hierarchy Level](#)
 - [Configuring Tunnel Interfaces on MX Series Routers](#)

Configuring 100-Gigabit Ethernet MICs to Interoperate with Type 4 100-Gigabit Ethernet PICs (PD-1CE-CFP-FPC4) Using SA Multicast Mode

To configure a 100-Gigabit Ethernet MIC (MIC3-3D-1X100GE-CFP) or (MIC3-3D-1X100GE-CFP) to interoperate with Juniper Networks Type 4 100-Gigabit Ethernet PICs (model number PD-1CE-CFP-FPC4), you can use the **forwarding-mode** statement with the **sa-multicast** option at the **[edit chassis fpc slot pic slot]** hierarchy level.

SA multicast mode uses the multicast bit in the source MAC address for packet steering. By default, the SA multicast bit is set to 0 for all packets sent by the 100-Gigabit Ethernet MIC. The egress packet flow is the traffic flowing from the 100-Gigabit Ethernet MIC to the 100-Gigabit Ethernet PIC. Since no VLAN tags are available, the SA multicast bit is sent on the outgoing packets. At the other end, the 100-Gigabit Ethernet PIC looks at the bit and forwards the packets to either Packet Forwarding Engine 0 or 1. The ingress packet flow is the traffic flowing from a 100-Gigabit Ethernet PIC to a 100-Gigabit Ethernet MIC. When the 100-Gigabit Ethernet PIC is sending out a packet, the multicast bit is set based on the Packet Forwarding Engine packet received. The multicast bit is then transmitted and the MPC3E sees the multicast bit on ingress.



NOTE: The SA multicast bit is ignored by MPC3E while learning the source MAC addresses.

Configuring 100-Gigabit Ethernet MICs

The interoperability mode between the 100-Gigabit Ethernet MIC and the 100-Gigabit Ethernet PIC is configured on a PIC basis. The MPC3E has two MIC slots. A 100-Gigabit Ethernet MIC installed in slot 0 corresponds to **pic 0** and the MIC installed in slot 1 corresponds to **pic 2**.



NOTE: The configuration is valid only on PIC 0 and PIC 2.

To configure SA multicast mode on a Juniper Networks 100-Gigabit Ethernet MIC in MPC 0, PIC 0 for interconnection with another Juniper Networks 100-Gigabit Ethernet PIC, use the **set chassis fpc slot pic slot forwarding-mode sa-multicast** command, as follows:

```
[edit chassis fpc slot pic slot]
forwarding-mode {
  sa-multicast;
}
```

You can use the **show forwarding-mode** command to view the resulting configuration, as follows:

```
[edit chassis fpc slot pic slot]
user@host# show forwarding-mode
```

Configuring 100-Gigabit Ethernet PIC (PD-ICE-CFP-FPC4)

The default packet steering mode for the 100-Gigabit Ethernet PIC (PD-ICE-CFP-FPC4) is SA multicast bit mode. There is no SA multicast configuration required on the 100-Gigabit Ethernet PIC to enable this mode.



NOTE: SA multicast mode can be configured, but it is not necessary.

The 100-Gigabit Ethernet PIC uses a Type 4 FPC and two 50 Gbps Packet Forwarding Engines to achieve 100 Gbps throughput. The 50 Gbps physical interfaces are created when the 100-Gigabit Ethernet PIC is installed. The two physical interfaces are visible and configuration is allowed on both physical interfaces. The physical interfaces on the 100-Gigabit Ethernet PIC should be configured in static LAG mode without enabling Link Aggregation Control Protocol (LACP). This ensures that a single 100-Gigabit aggregated interface is visible on the link connecting to the 100-Gigabit Ethernet MIC instead of two independent 50 Gbps interfaces.

When the PIC is in aggregated Ethernet mode, the two physical interfaces on the same PIC are aggregated into one AE physical interface. When the PIC is configured with two physical interfaces, it creates the physical interfaces **et-fpc/pic/0:0** and **et-fpc/pic/0:1** where *fpc* is the FPC slot number and *pic* is the PIC slot number. The example shows how to configure two physical interfaces for PIC 0 in FPC 5:

```
chassis {
  aggregated-devices {
    ethernet {
      device-count 1;
    }
  }
}
interfaces {
  et-5/0/0:0 {
    gether-options {
      802.3ad ae0;
    }
  }
  et-5/0/0:1 {
    gether-options {
      802.3ad ae0;
    }
  }
}
```

Related Documentation

- *forwarding-mode (100-Gigabit Ethernet)*
- *sa-multicast (100-Gigabit Ethernet)*

Configuring MPC4E (MPC4E-3D-2CGE-8XGE) to Interoperate with 100-Gigabit Ethernet PICs on Type 4 FPC Using SA Multicast Mode

You can enable interoperability between the MPC4E and the 100-Gigabit Ethernet PIC by performing the following tasks:

- [Configuring SA Multicast Bit Steering Mode on MPC4E on page 124](#)
- [Configuring Two 50-Gigabit Ethernet Physical Interfaces on the Ethernet PIC as One Aggregated Ethernet Interface on page 125](#)

Configuring SA Multicast Bit Steering Mode on MPC4E

The interoperability mode between the MPC4E and the 100-Gigabit Ethernet PIC is configured on a PIC basis. MPC4E-3D-2CGE-8XGE is a fixed-configuration MPC and does not contain separate slots for Modular Interfaces Cards (MICs). MPC4E contains two Packet Forwarding Engines—PFE 0 hosts PIC 0 and PIC 1 and PFE 1 hosts PIC 2 and PIC 3.



NOTE: This configuration is valid only on PIC 1 and PIC 3.

To configure SA multicast mode on PIC 1 of an MX480 router with MPC4E for interconnection with the 100-Gigabit Ethernet PIC:

1. To specify the forwarding mode as **sa-multicast**, include the **forwarding-mode** statement at the `[edit chassis fpc slot pic slot]` hierarchy level.

```
[edit chassis]  
user@host # set fpc 3 pic 1 forwarding-mode sa-multicast
```
2. To verify that the forwarding mode is set to **sa-multicast**, issue the following command:

```
[edit chassis fpc 3 pic 1]  
user@host # show forwarding-mode
```

Configuring Two 50-Gigabit Ethernet Physical Interfaces on the Ethernet PIC as One Aggregated Ethernet Interface

When the PIC is in aggregated Ethernet mode, the two physical interfaces on the same PIC are aggregated into one aggregated Ethernet physical interface. When the PIC is configured with two physical interfaces, it creates the physical interfaces `et-x/y/0:0` and `et-x/y/0:1` where `x` is the FPC slot number and `y` is the PIC slot number.

The default packet steering mode for the 100-Gigabit Ethernet PIC is SA multicast bit mode. No SA multicast configuration is required on the 100-Gigabit Ethernet PIC to enable this mode.



NOTE: SA multicast mode can be configured, but it is not necessary.

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

```
[edit chassis aggregated-devices ethernet]
user@host # set device-count 2
```

2. To specify the members to be included within the aggregated Ethernet bundle:

```
[edit interfaces]
user@host # set et-4/3/0:0 gigether-options 802.3ad ae0
user@host # set ey-4/3/0:1 gigether-options 802.3ad ae0
```

3. Verify the configuration at the interface.

```
[edit]
user@host # show interfaces

..
et-4/3/0:0 {
  gigether-options {
    802.3ad ae0;
  }
}
et-4/3/0:1 {
  gigether-options {
    802.3ad ae0;
  }
}
```

Related Documentation

- [*sa-multicast*](#)
- [*forwarding-mode*](#)
- [Interoperability Between MPC4E \(MPC4E-3D-2CGE-8XGE\) and 100-Gigabit Ethernet PICs on Type 4 FPC on page 12](#)

Configuring the Power-On Sequence for DPCs on MX Series Routers with the Enhanced AC PEM

MX Series routers running Junos OS Release 10.0 and later support an enhanced AC Power Entry Module (PEM) to provide the necessary power infrastructure to support up to twelve higher-capacity DPCs with higher port density and slot capacity. To support the cooling requirements for the enhanced AC PEMs, the routers support enhanced fan trays and fans. The Junos OS enables you to configure the power-on sequence for the DPCs on an MX Series router chassis containing the new AC PEM. This enables you to redistribute the available power to the DPCs based on your requirements and the calculated power consumption of the DPCs. To configure the power-on sequence, include the **fru-poweron-sequence** statement at the **[edit chassis]** hierarchy level:

```
[edit chassis]
fru-poweron-sequence;
```

Issue the **show chassis power** command to view power limits and usage details for the DPCs. Issue the **show chassis power sequence** command to view details on the power-on sequence for the DPCs. For more information about these commands, see the *Junos OS Operational Mode Commands*.

If the power-on sequence is not configured by including the **fru-poweron-sequence** statement, the Junos OS uses the ascending order of the slot numbers of the DPCs as the sequence to power-on the DPCs.

Related Documentation • [fru-poweron-sequence on page 356](#)

Configuring the Junos OS to Support Layer 2 Services on MX Series 3D Universal Edge Routers with MS-DPCs

The Junos OS supports Layer 2 link services on MX Series 3D Universal Edge routers with MS-DPCs and MX-FPCs with non-Ethernet IQE PICs that bundle PPP links from the Type 2 channelized SONET PICs. To enable the Layer 2 service packages such as LSQ interfaces, include the **service-package layer-2** statement at the **[edit chassis fpc slot-number pic pic-number adaptive-services]** hierarchy level:

```
[edit chassis fpc slot-number pic pic-number adaptive-services]
service-package (layer-2 | layer-3);
```

Configuring the supported link services such as Multilink PPP (MLPPP), Compressed Real-Time Transport Protocol (CRTP), real-time performance monitoring (RPM) is identical to configuring these link services for a multiservices PIC. For more information about Layer 2 link services, see the *Junos OS Services Interfaces Library for Routing Devices*.

Related Documentation • [Configuring the Junos OS to Enable Service Packages on Adaptive Services Interfaces on page 181](#)

Configuring the Junos OS to Enable Session Offloading on MX Series 3D Universal Edge Routers with MS-DPCs

The Junos OS enables you to configure session offloading for Multiservices DPCs on MX Series routers. This enables Fast Update Filters (FUF) at the PIC level for a multiservices interface (***ms-fpc-pic-port***). To configure session offloading, include the **session-offload** statement at the **[edit chassis fpc slot-number pic number adaptive-services service-package extension-provider]** hierarchy level:

```
[edit chassis fpc slot-number pic number adaptive-services service-package
 extension-provider]
 session-offload;
```

Currently, session offloading is supported only for a maximum of one multiservices interface.



NOTE: When session offloading is enabled for a Multiservices PIC, we recommend that you limit dynamic application awareness features for Intrusion Detection and Prevention (IDP) only for that interface.

Related Documentation

- [session-offload on page 402](#)

Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers

You can configure MX Series 3D Universal Edge Routers to run in different network services modes. Each network services mode defines how the chassis recognizes and uses certain modules.

To configure the network services mode of an MX Series router:

1. Access the chassis hierarchy.

```
[edit]
user@host# edit chassis
```

2. Specify the network services mode that you want the router to use.

```
[edit chassis]
user@host# set network-services service
```

Related Documentation

- [Network Services Mode Overview on page 43](#)
- *Firewall Filters and Enhanced Network Services Mode Overview* in the *Junos OS Subscriber Management and Services Library*
- [Restrictions on Junos OS Ethernet Network Services Mode and Enhanced Ethernet Network Services Mode Features for MX Series Routers on page 46](#)
- [16-Port 10-Gigabit Ethernet MPC on MX Series Routers \(16x10GE 3D MPC\) Overview on page 112](#)

- [network-services on page 375](#)

Accounting of the Layer 2 Overhead Attribute in Interface Statistics

On MX Series routers, you can configure the physical interface and logical interface statistics to include the Layer 2 overhead size (header and trailer bytes) for both ingress and egress interfaces. Both the transit and total statistical information are computed and displayed for each logical interface. This functionality is supported on 1-Gigabit and 10-Gigabit Ethernet interfaces on Dense Port Concentrators (DPCs) and Modular Port Concentrators (MPCs). Also, this feature is supported on 10-Gigabit Ethernet interfaces on MX Series routers with MPC4E. To enable the Layer 2 overhead bytes to be counted in the interface statistics at the PIC level, you must use the **account-layer2-overhead** statement at the **[edit chassis fpc slot-number pic pic-number]** hierarchy level.

You can also enable the Layer 2 overhead bytes for computation in the logical interface statistics by configuring the **account-layer2-overhead (value | <ingress bytes | egress bytes>)** statement at the **[edit interface interface-name unit logical-unit-number]** hierarchy level. If you configure this capability, all the Layer 2 header details (Layer 2 header and cyclic redundancy check [CRC]) based on the Layer 2 encapsulation configured for an interface are calculated and displayed in the physical and logical interface statistics for ingress and egress interfaces in the output of the **show interfaces interface-name** commands. For physical and logical interfaces, the **Input bytes** and **Output bytes** fields under the Traffic statistics section in the output of the **show interfaces interface-name <detail | extensive>** command include the Layer 2 overhead of the packets. For physical and logical interfaces, the Input rate and Output rate fields under the Traffic statistics section in the output of the **show interfaces interface-name <media | statistics>** command include the Layer 2 overhead of the packets. For logical interfaces, the values for the newly added **Egress accounting overhead** and **Ingress accounting overhead** fields display the Layer 2 overhead size for transmitted and received packets respectively.

The input and output octets at the physical or logical interface configured on the PIC includes all the Layer 2 headers. All the logical interfaces on the PIC, including the ae and the non-ae interfaces, are processed for Layer 2 overhead accounting for the arriving and exiting packets. This method of operation impacts the transit statistics that are primarily used for subscriber accounting and billing purposes in customer networks.

[Table 14 on page 129](#) lists the adjustment bytes that are counted based on the encapsulation on the logical interface over the Ethernet interface, when you enable accounting of Layer 2 overhead in interface statistics at the PIC level. The values for the adjustment bytes that are listed for all types of encapsulation are the same for DPCs and MPCs, with the only exception being for the VLAN CCC adjustment value. On DPCs, the VLAN CCC adjustment value is -4 bytes and on MPCs, the VLAN CCC adjustment value is +4 bytes.

Table 14: Adjustment Bytes for Logical Interfaces over Ethernet Interfaces

Encapsulation Type on Logical Interfaces	Number of Adjustment Bytes	Description
Ethernet DIXv2 (IP datagrams over Ethernet)	18	Untagged (includes CRC)
Ethernet DIXv2 (IP datagrams over Ethernet)	22	Single-tagged (includes CRC)
Ethernet DIXv2 (IP datagrams over Ethernet)	26	Double-tagged (includes CRC)
VLAN Bridge	4	CRC
VLAN CCC	4	CRC
VLAN TCC	18	Untagged (includes CRC)
VLAN TCC	22	Single-tagged (includes CRC)
VLAN TCC	26	Double-tagged (includes CRC)
VLAN VPLS	4	CRC

Guidelines for Configuring the Computation of Layer 2 Overhead in Interface Statistics

Keep the following points in mind when you configure the feature to compute Layer 2 overhead in interface statistics:

- When you configure a native VLAN ID on a logical interface, the Layer 2 header adjustment for input statistics is different for tagged and untagged packets. For such interfaces, if you configure the setting to account for Layer 2 overhead, incorrect statistics might be displayed.
- An untagged packet is considered as a tagged packet and an additional 4 bytes are appended to the counter values displayed in the output of the **show interface** command.
- The computed statistics might not be completely accurate in scenarios where the packets are dropped after they have been included in the interface statistics, but before the packets reach the destination.
- Label-switched interface (LSI) statistics on the ingress direction of interfaces do not include the Layer 2 overhead bytes because this functionality of accounting Layer 2 overhead is not supported for such LSI interfaces.
- Layer 2 overhead accounting is not supported for inline service (si) interfaces.
- The total statistics of physical interfaces do not indicate the complete Layer 2 adjusted statistics. This behavior occurs because the total statistics count is the sum of transit and local statistics. Only the transit statistics are adjusted for Layer 2 and the local statistics are not adjusted for Layer 2.
- Statistics on ae interfaces are calculated in the same manner as non-ae interfaces.

- Adjustment bytes are applicable only for transit statistics that are displayed for logical interfaces.
- For physical interfaces, the adjustment bytes for transit traffic and the non-adjusted bytes for local or protocol-specific traffic are combined and displayed in the output of the **show interfaces** command. (Segregation is not possible.)
- If you configure the **account-layer2-overhead (value | <ingress bytes | egress bytes>)** statement at the **[edit interface interface-name unit logical-unit-number]** hierarchy level, the Layer 2 overhead computation might not work correctly for logical interfaces over an aggregated Ethernet (ae) interface that is created across two different line cards having different forwarding hardware (such as MPCs and DPCs). This method of processing applies only for VLAN circuit cross-connect (CCC) encapsulation.
- The Layer 2 overhead bytes in interface statistics are saved across a unified ISSU or a graceful Routing Engine switchover (GRES) operation.

Related Documentation

- [Configuring Layer 2 Overhead Accounting in Interface Statistics on page 130](#)
- [Verifying the Accounting of Layer 2 Overhead in Interface Statistics on page 133](#)
- [account-layer2-overhead \(Interface Level\) on page 319](#)
- [account-layer2-overhead \(PIC Level\) on page 320](#)
- [Ethernet Interfaces](#)

Configuring Layer 2 Overhead Accounting in Interface Statistics

This topic contains the following sections that describe the configuration of Layer 2 overhead accounting for interface statistics at the PIC level and logical interface level:

- [Enabling the Accounting of Layer 2 Overhead in Interface Statistics at the PIC Level on page 130](#)
- [Enabling the Accounting of Layer 2 Overhead in Interface Statistics at the Logical Interface Level on page 131](#)

Enabling the Accounting of Layer 2 Overhead in Interface Statistics at the PIC Level

You can configure the **account-layer2-overhead** statement at the **edit chassis fpc slot-number pic pic-number** hierarchy level to enable accounting of Layer 2 overhead bytes in the ingress and egress interface statistics at the PIC level.



CAUTION: If you modify the setting for accounting of Layer 2 overhead bytes at the PIC level, the PIC is rebooted, causing all of the physical and logical interfaces to be deleted and readded on the PIC. Due to this behavior, we recommend that you exercise caution while using this feature.

The computation method of Layer 2 overhead on different interface types is as follows:

- For Ethernet interfaces, all the Layer 2 headers are counted.

- For non-Ethernet interfaces, the Frame Relay, PPP, or Cisco HDLC headers are counted, while the bit or byte stuffing headers are excluded.

To enable accounting of Layer 2 overhead at the PIC level for ingress and egress traffic on interfaces:

1. Access a DPC or an MPC-occupied slot and the PIC where the interface is to be enabled.

```
[edit chassis]
user@host# edit fpc slot-number pic number
```

2. Specify the Layer 2 overhead value in bytes that is the octet adjustment per packet added to the total octet count for ingress and egress traffic on all the interfaces in the PIC.

```
[edit chassis fpc slot-number pic number]
user@host# set account-layer2-overhead
```

Enabling the Accounting of Layer 2 Overhead in Interface Statistics at the Logical Interface Level

You can configure the **account-layer2-overhead (value | <ingress bytes | egress bytes>)** statement at the **[edit interface interface-name unit logical-unit-number]** hierarchy level to enable accounting of Layer 2 overhead bytes in the ingress and egress interface statistics. If you do not configure this setting at the logical interface level, the Layer 2 overhead value is assumed as 0.

Both the options of enabling Layer 2 overhead accounting at the PIC level and the logical interface level are disabled by default. You can configure either of the options or both the options at the same time. If you enable Layer 2 overhead accounting at both the PIC level and the logical interface level, the logical interface-level setting takes precedence over the PIC-level setting. When both the options are configured, if you configure only the **account-layer2-overhead ingress bytes** statement at the **[edit interface interface-name unit logical-unit-number]** hierarchy level, then the ingress Layer 2 overhead is counted with the explicit adjustment value you specify. Egress Layer 2 overhead is adjusted automatically based on the encapsulation on the logical interface. Similarly, if you configure the Layer 2 overhead accounting only at the egress side using this statement, the egress overhead is calculated using the value you specify, whereas the ingress overhead is adjusted automatically.

The counted Layer 2 overhead bytes are displayed in the interface statistics.



CAUTION: If you modify the setting for accounting of Layer 2 overhead bytes at the interface level, the changed setting is effective on the packets that are received or transmitted from that time. The logical interface is deleted and readded. All the prior statistics are lost and the traffic is disrupted. Due to this behavior, we recommend that you exercise caution while using this feature.

The overhead value option and the ingress or egress options are mutually exclusive. You can either specify the overhead value option to account for Layer 2 overhead in both the ingress and egress traffic, or the ingress and egress options separately to account for Layer 2 overhead to the ingress and egress traffic respectively. The Layer 2 overhead byte can be a number in the range -128 through +127.

To configure accounting of Layer 2 overhead at the logical interface level:

1. Access the logical interface.

```
[edit interfaces]
user@host# edit interface-name unit logical-unit-number
```

2. (Optional; for both ingress and egress traffic) Specify the Layer 2 overhead value in bytes that is the octet adjustment per packet added to the total octet count for ingress and egress traffic on the logical interface.

```
[edit interfaces interface-name unit logical-unit-number]
user@host# set account-layer2-overhead 127
```

In this example, 127 bytes are added per packet for ingress and egress traffic on the logical interface.



NOTE: The overhead value *bytes* option and the ingress *bytes* or egress *bytes* options are mutually exclusive. You can either specify the overhead value *bytes* option to account for Layer 2 overhead in both the ingress and egress traffic, or the ingress *bytes* and egress *bytes* options separately to account for Layer 2 overhead to the ingress and egress traffic respectively.

3. (Optional; for ingress traffic only) Specify the Layer 2 overhead value in bytes that is the octet adjustment per packet added to the total octet count for ingress traffic on the logical interface.

```
[edit interfaces interface-name unit logical-unit-number]
user@host# set account-layer2-overhead overhead ingress 100
```

In this example, 100 bytes are added per packet for ingress traffic on the logical interface. For egress traffic, Layer 2 overhead is adjusted automatically based on the encapsulation on the logical interface.

4. (Optional; for egress traffic only) Specify the Layer 2 overhead value in bytes that is the octet adjustment per packet added to the total octet count for egress traffic on the logical interface.

```
[edit interfaces interface-name unit logical-unit-number]
user@host# set account-layer2-overhead overhead egress 100
```

In this example, 100 bytes are added per packet for egress traffic on the logical interface. For ingress traffic, Layer 2 overhead is adjusted automatically based on the encapsulation on the logical interface.

Verifying the Accounting of Layer 2 Overhead in Interface Statistics

Purpose Display information about the Layer 2 overhead bytes that are counted in interface statistics for egress and ingress traffic on Ethernet interfaces.

Action • To display information about the Layer 2 overhead bytes that are counted in interface statistics:



NOTE: For physical and logical interfaces, the values displayed for the **Input rate** and **Output rate** fields under the **Traffic statistics** section include the Layer 2 overhead of the packets.

```
user@host> show interfaces ge-5/2/0 statistics detail
```

```
Physical interface: ge-5/2/0, Enabled, Physical link is Up
  Interface index: 146, SNMP ifIndex: 519, Generation: 149
  Link-level type: Ethernet, MTU: 1514, Speed: 1000mbps, BPDU Error: None,
  MAC-REWRITE Error: None, Loopback: Disabled,
  Source filtering: Disabled, Flow control: Enabled, Auto-negotiation: Enabled,
  Remote fault: Online
  Device flags   : Present Running
  Interface flags: SNMP-Traps Internal: 0x4000
  Link flags     : None
  CoS queues     : 8 supported, 8 maximum usable queues
  Hold-times     : Up 0 ms, Down 0 ms
  Current address: 00:1d:b5:61:d9:74, Hardware address: 00:1d:b5:61:d9:74
  Last flapped   : 2009-11-11 11:24:00 PST (09:23:08 ago)
  Statistics last cleared: 2009-11-11 17:50:58 PST (02:56:10 ago)
  Traffic statistics:
    Input bytes :                271524                0 bps
    Output bytes :             37769598             352 bps
    Input packets:                 3664                0 pps
    Output packets:             885790                0 pps
  IPv6 transit statistics:
    Input bytes :                   0
    Output bytes :             16681118
    Input packets:                   0
    Output packets:             362633
  Multicast statistics:
    IPV4 multicast statistics:
      Input bytes :             112048                0 bps
      Output bytes :          20779920                0 bps
      Input packets:              1801                0 pps
      Output packets:          519498                0 pps
    IPV6 multicast statistics:
      Input bytes :             156500                0 bps
      Output bytes :          16681118                0 bps
      Input packets:              1818                0 pps
      Output packets:          362633                0 pps
  Input errors:
    Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Policed discards: 0, L3
incompletes: 0, L2 channel errors: 0,
    L2 mismatch timeouts: 0, FIFO errors: 0, Resource errors: 0
  Output errors:
    Carrier transitions: 0, Errors: 0, Drops: 0, Collisions: 0, Aged packets:
```

```

0, FIFO errors: 0, HS link CRC errors: 0, MTU errors: 0,
  Resource errors: 0
Egress queues: 8 supported, 4 in use
Queue counters:      Queued packets  Transmitted packets      Dropped packets

  0 best-effort              882558              882558
0
  1 expedited-fo              0              0
0
  2 assured-forw              0              0
0
  3 network-cont             3232              3232
0
Active alarms   : None
Active defects  : None

Logical interface ge-5/2/0.0 (Index 71) (SNMP ifIndex 573) (Generation 135)
Flags: SNMP-Traps 0x4000 Encapsulation: ENET2
Egress accounting overhead: 100
Ingress accounting overhead: 90
Traffic statistics:
  Input bytes   :          271524
  Output bytes  :       37769598
  Input packets :          3664
  Output packets:       885790
IPv6 transit statistics:
  Input bytes   :          0
  Output bytes  :       16681118
  Input packets :          0
  Output packets:       362633
Local statistics:
  Input bytes   :          271524
  Output bytes  :       308560
  Input packets :          3664
  Output packets:       3659
Transit statistics:
  Input bytes   :          0
  Output bytes  :       37461038
  Input packets :          0
  Output packets:       882131
IPv6 transit statistics:
  Input bytes   :          0
  Output bytes  :       16681118
  Input packets :          0
  Output packets:       362633
Multicast statistics:
IPv4 multicast statistics:
  Input bytes   :          112048
  Output bytes  :       20779920
  Input packets :          1801
  Output packets:       519498
IPv6 multicast statistics:
  Input bytes   :          156500
  Output bytes  :       16681118
  Input packets :          1818
  Output packets:       362633
Protocol inet, MTU: 1500, Generation: 151, Route table: 0
  Addresses, Flags: Is-Preferred Is-Primary
    Destination: 40.40.40.0/30, Local: 40.40.40.2, Broadcast: 40.40.40.3,
Generation: 167
  Protocol inet6, MTU: 1500, Generation: 152, Route table: 0

```

```
Addresses, Flags: Is-Preferred Is-Primary
  Destination: ::40.40.40.0/126, Local: ::40.40.40.2
Generation: 169
Addresses, Flags: Is-Preferred
  Destination: fe80::/64, Local: fe80::21d:b5ff:fe61:d974
Protocol multiservice, MTU: Unlimited, Generation: 171
Generation: 153, Route table: 0
Policer: Input: __default_arp_policer__
```

For more information about the **show interfaces statistics** command, see *show interfaces statistics* in the *Junos OS Operational Mode Commands*.

**Related
Documentation**

- [Accounting of the Layer 2 Overhead Attribute in Interface Statistics on page 128](#)
- [Configuring Layer 2 Overhead Accounting in Interface Statistics on page 130](#)
- *show interfaces (Gigabit Ethernet)*
- *Ethernet Interfaces*

CHAPTER 9

Configuring T Series Chassis-Level Features

- [Configuring the Power-On Sequence for FPCs on T640, T1600, and T4000 Routers on page 137](#)
- [Configuring OSS Mapping to Represent a T4000 Chassis as a T1600 or a T640 Chassis on page 138](#)

Configuring the Power-On Sequence for FPCs on T640, T1600, and T4000 Routers

Starting with Junos OS Release 12.3, you can configure the power-on sequence for the Flexible PIC Concentrators (FPCs) on T640, T1600, and T4000 routers. This configuration enables you to redistribute the available power to the FPCs on the basis of your requirements and the calculated power consumption of the FPCs.

To configure the power-on sequence:

1. At the **[edit chassis]** hierarchy level, configure the **fru-poweron-sequence** statement indicating the order in which the FPCs need to be powered on.

```
[edit chassis]
user@host# set fru-poweron-sequence fru-poweron-sequence
```

For example:

```
[edit chassis]
user@host# set fru-poweron-sequence "0 2 1"
```

2. Verify the configuration by using the **show** command at the **[edit chassis]** hierarchy level:

```
[edit chassis]
user@host# show
fru-poweron-sequence "0 2 1";
```

**NOTE:**

- If the configured sequence contains invalid numbers, Junos OS considers only the valid numbers in the sequence. The invalid numbers are silently discarded.
- If the power-on sequence is not configured by including the `fru-poweron-sequence` statement, Junos OS uses the ascending order of the slot numbers of the FPCs as the sequence to power on the FPCs.

Related Documentation

- [Configuring the Six-Input DC Power Supply on page 247](#)
- [fru-poweron-sequence on page 356](#)

Configuring OSS Mapping to Represent a T4000 Chassis as a T1600 or a T640 Chassis

You can configure the operations support systems (OSS) mapping feature to represent a T4000 chassis as a T1600 chassis or a T640 chassis. This topic includes the following tasks:

- [Configuring T4000 Chassis as a T1600 Chassis on page 138](#)
- [Configuring T4000 Chassis as a T640 Chassis on page 138](#)
- [Disabling the OSS Mapping Feature on page 139](#)

Configuring T4000 Chassis as a T1600 Chassis

To configure a T4000 chassis as a T1600 chassis:

1. In configuration mode, go to the **[edit chassis]** hierarchy level.

```
[edit]
user@T4000# edit chassis
```

2. Configure the OSS mapping feature to map the T4000 chassis to a T1600 chassis.

```
[edit chassis]
user@T4000# set oss-map model-name t1600
```

Configuring T4000 Chassis as a T640 Chassis

To configure a T4000 chassis as a T640 chassis:

1. In configuration mode, go to the **[edit chassis]** hierarchy level.

```
[edit]
user@T4000# edit chassis
```

2. Configure the OSS mapping feature to map the T4000 chassis to a T640 chassis.

```
[edit chassis]
user@T4000# set oss-map model-name t640
```



NOTE: By default, the OSS mapping feature is disabled.

Disabling the OSS Mapping Feature

To disable the OSS mapping feature:

1. In configuration mode, go to the **[edit chassis]** hierarchy level.

```
[edit]
user@T4000# edit chassis
```

2. Disable the OSS mapping feature that maps a T4000 chassis to a T640 chassis.

```
[edit chassis]
user@T4000# delete oss-map model-name t640
```

3. Disable the OSS mapping feature that maps a T4000 chassis to a T1600 chassis.

```
[edit chassis]
user@T4000# delete oss-map model-name t1600
```



NOTE:

- The **set chassis oss-map model-name t640 | t1600** command is applicable only on T4000 routers. You must explicitly set this command when a T1600 chassis or a T640 chassis is upgraded to a T4000 chassis.
- You can execute the **set chassis oss-map model-name t640** command or the **set chassis oss-map model-name t1600** command if the OSS is compatible with either the T640 chassis or the T1600 chassis, respectively.

CHAPTER 10

Configuring J Series Chassis-Level Features

- [Configuring the Junos OS to Prevent the Resetting of the Factory Default or Rescue Configuration During Current Configuration Failure on J Series Routers on page 141](#)
- [Configuring the Junos OS to Support the uPIM Mode on J Series Routers on page 142](#)
- [Configuring the Junos OS to Set a PIM Offline on J Series Routers on page 142](#)
- [Configuring the Junos OS to Disable Power Management on the J Series Chassis on page 143](#)
- [Configuring J Series Services Router Switching Interfaces on page 143](#)

Configuring the Junos OS to Prevent the Resetting of the Factory Default or Rescue Configuration During Current Configuration Failure on J Series Routers

On J Series Services Routers, if the current configuration fails, you can load a rescue configuration or the factory default configuration by pressing the **CONFIG** (Reset) button:

- **Rescue configuration**—When you press and quickly release the **CONFIG** button, the configuration LED blinks green and the rescue configuration is loaded and committed. The rescue configuration is user defined and must be set previously for this operation to be successful.
- **Factory defaults**—When you hold the **CONFIG** button for more than 15 seconds, the configuration LED blinks red and the router is set back to the factory default configuration.



CAUTION: When you set the router back to the factory default configuration, the current committed configuration and all previous revisions of the router's configuration are deleted.

To limit how the **CONFIG** button resets a router configuration, include one or both of the following statements at the **[edit chassis]** hierarchy level:

```
[edit chassis]
config-button {
  no-clear;
```

```
no-rescue;  
}
```

no-clear—Prevents resetting the router to the factory default configuration. You can still press and quickly release the button to reset to the rescue configuration (if one was set previously).

no-rescue—Prevents resetting the router to the rescue configuration. You can still press and hold the button for more than 15 seconds to reset to the factory default configuration.

When both the **no-clear** and **no-rescue** statements are present, the **CONFIG** button does not reset to either configuration.

Configuring the Junos OS to Support the uPIM Mode on J Series Routers

The 6-port, 8-port, and 16-port Gigabit Ethernet uPIMs used on the J Series routers (J2320, J2350, J4350, and J6350) support Layer 2 switching and can forward traffic at both Layer 2 (switching) and Layer 3 (routing). You can configure a uPIM to run in either routing mode (the default) or switching mode.

Routing mode provides the standard routing services. Switching mode allows traffic forwarding at both Layer 2 and Layer 3. At Layer 2, a uPIM can switch intra-LAN traffic from one LAN host to another, such as from one port on a uPIM to another on the same uPIM. At Layer 3, a uPIM can route traffic to WAN interfaces and other PIMs present on the chassis.

To configure the PIM mode, include the following statements at the **[edit chassis fpc]** hierarchy level:

```
[edit chassis]  
fpc fpc-slot {  
  pic pim-slot {  
    ethernet {  
      pic-mode (switching | routing);  
    }  
  }  
}
```

Related Documentation

- [Configuring the Junos OS to Set a PIM Offline on J Series Routers on page 142](#)
- [Configuring the Junos OS to Disable Power Management on the J Series Chassis on page 143](#)

Configuring the Junos OS to Set a PIM Offline on J Series Routers

On J Series routers, the system monitors the PIMs and verifies that a newly inserted PIM falls within the power capacity of the chassis. PIMs that fall outside of acceptable power ranges can be taken offline or disabled for power management purposes.

This operation differs from the **power-off** option used on non-J Series products.

To take a PIM offline, include the **offline** statement at the **[edit chassis fpc slot-number]** hierarchy level:

```
[edit chassis fpc slot-number]
offline;
```

**Related
Documentation**

- [Configuring the Junos OS to Support the uPIM Mode on J Series Routers on page 142](#)
- [Configuring the Junos OS to Disable Power Management on the J Series Chassis on page 143](#)

Configuring the Junos OS to Disable Power Management on the J Series Chassis

Instead of setting a PIM offline, the power management feature on a chassis can be disabled. The **disable-power-management** statement disables power management on the chassis and, when used, causes any PIMs disabled because of exceeding chassis power limits to come online.

It is important to consider power management carefully before enabling disabled PIMs. If the PIMs have been disabled because they exceeded power limits, they should not be enabled.

To disable power management on the J Series chassis, include the **disable-power-management** statement at the **[edit chassis]** hierarchy level:

```
[edit chassis]
disable-power-management;
```

**Related
Documentation**

- [Configuring the Junos OS to Set a PIM Offline on J Series Routers on page 142](#)
- [Configuring the Junos OS to Support the uPIM Mode on J Series Routers on page 142](#)

Configuring J Series Services Router Switching Interfaces

In access switching mode, only one physical interface is configured for the entire Gigabit Ethernet uPIM. The single physical interface serves as a virtual router interface (VRI). Configuration of the physical port characteristics is done under the single physical interface.

To configure Gigabit Ethernet uPIM physical Ethernet interface properties, include the **switch-port** statement at the **[edit interfaces ge-pim/0/0 switch-options]** hierarchy level:

```
[edit interfaces ge-pim /0/0 switch-options]
switch-port port-number {
  (auto-negotiation | no-auto-negotiation);
  speed (10m | 100m | 1g);
  link-mode (full-duplex | half-duplex);
}
```

**Related
Documentation**

- [Example: Configuring J Series Services Router Switching Interfaces on page 296](#)

CHAPTER 11

Configuring PIC-Specific Features

- [Configuring the Junos OS to Make a Flexible PIC Concentrator Stay Offline on page 145](#)
- [Configuring the Junos OS to Enable SONET/SDH Framing for SONET/SDH PICs on page 147](#)
- [Configuring Junos OS to Enable SONET/SDH Framing for ATM MICs on page 150](#)
- [Configuring the Junos OS to Use ATM Cell-Relay Accumulation Mode on an ATM1 PIC on page 151](#)
- [Configuring the Junos OS to Support the Sparse DLCI Mode on Channelized STM1 or Channelized DS3 PICs on page 152](#)
- [Configuring the Junos OS to Enable a SONET PIC to Operate in Channelized \(Multiplexed\) Mode on page 153](#)
- [Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 154](#)
- [Ranges for Channelized E1 Interfaces Configuration on page 155](#)
- [Configuring the Junos OS to Support ILMI for Cell Relay Encapsulation on an ATM2 IQ PIC on page 156](#)
- [Configuring the Junos OS to Support the Link Services PIC on page 157](#)
- [Multiclass Extension for Multiple Classes of Service Using MLPPP \(RFC 2686\) on page 157](#)
- [Configuring the Junos OS to Enable Larger Delay Buffers for T1, E1, and DS0 Interfaces Configured on Channelized IQ PICs on page 158](#)
- [Maximum Delay Buffer with q-pic-large-buffer Statement Enabled on page 158](#)
- [Configuring a Policer Overhead on page 160](#)
- [Configuring a Port Speed on page 161](#)

Configuring the Junos OS to Make a Flexible PIC Concentrator Stay Offline

By default, a Flexible PIC Concentrator (FPC) is configured to restart after a system reboot. To configure an FPC to stay offline and prevent it from restarting, include the **power off** statement at the **[edit chassis fpc slot-number]** hierarchy level:

```
[edit chassis fpc slot-number]  
power off;
```



NOTE: You can use the `request chassis fpc operational mode` command to take an FPC offline, but the FPC attempts to restart when you enter a `commit` CLI command.

To bring an FPC online that is configured to stay offline and configure it to stay online, include the `power on` statement at the `[edit chassis fpc slot-number]` hierarchy level:

```
[edit chassis fpc slot-number]  
power on;
```

**Related
Documentation**

- [Configuring the Junos OS to Make an SFM Stay Offline on page 104](#)
- [Router Chassis Configuration Statements on page 313](#)

Configuring the Junos OS to Enable SONET/SDH Framing for SONET/SDH PICs

In Junos OS Release 8.4 and later, the family of next-generation SONET Phase I PICs includes Type 1 and Type 2 PICs. Each PIC type has three varieties.

Type 1 PICs include:

- 2-port OC3
- 4-port OC3
- 1-port OC12

Type 2 PICs include:

- 1-port OC48
- 4-port OC3
- 4-port OC12

The PICs are supported on Type 1 and Type 2 FPC interfaces. Hot-pluggable SFPs are used as optical transponders. The PICs provide unprecedented flexibility by allowing the user to configure a variety of modes on them through the configuration of concatenation/nonconcatenation and speed.

The 4-port OC48 PIC with SFP installed, the next-generation SONET/SDH PICs with SFP, and the 4-port OC192 PIC on M Series and T Series routers, support SONET or SDH framing on a per-port basis. This functionality allows you to mix SONET and SDH modes on interfaces on a single PIC.

Port level framing is supported for only the PICs listed below in Table 1. This is expected behavior.

Table 15: PICs supporting port level framing

I2C-ID Name	Model Number	PIC Type
1xCOC12 Q2 PIC	1x CHOC12 IQE SONET	Type 1
4xCOC12 Q2 PIC	4x CHOC12 IQE SONET	Type 2
4xCOC12 Q2 TYPE3 PIC	4x CHOC12 (TYPE3) IQE SONET	Type 3
1x COC48 Q2 PIC	1x CHOC48 IQE SONET	Type 2
1x OC12 Q2 PIC	1x OC12 IQE SONET	Type 1
2xCOC3 Q2 PIC	2x CHOC-3 IQE SONET	Type 1
4xOC3 Q2 PIC	4x OC-3 IQE SONET	Type 1
8OC3OC12 4OC48 MIC	MIC-3D-8OC3OC12-4OC48	—
4OC3OC12 1OC48 MIC	MIC-3D-4OC3OC12-1OC48	—

Table 15: PICs supporting port level framing (*continued*)

I2C-ID Name	Model Number	PIC Type
8CHOC3 4CHOC12 MIC	MIC-3D-8CHOC3-4CHOC12	—
4CHOC3 2CHOC12 MIC	MIC-3D-4CHOC3-2CHOC12	—
1CHOC48 MIC	MIC-3D-1CHOC48 SFP	—
1OC192 HO VCAT MIC	MIC-3D-1OC192-XFP	—
IQECC 4XOC48 TYPE3 PIC	4x OC-48 IQE SONET	Type 3
CE 4xCOC3 SFP PIC	4x CHOC3 SONET CE SFP	—
2XOC12 8XOC3 ATM SFP MIC	2xOC12/8xOC3 CC-CE	—

For information about configuring port speed for concatenate mode on a next-generation PIC, see the *Junos OS Hardware Network Operations Guide*.

By default, SONET/SDH PICs use SONET framing. For a discussion of the differences between the two standards, see the *Junos OS SONET/SDH Interfaces Configuration Guide*.

To configure a PIC to use SDH framing, include the **framing** statement at the **[edit chassis fpc slot-number pic pic-number]** hierarchy level, specifying the **sdh** option:

```
[edit chassis]
user@host# set fpc slot-number pic pic-number framing sdh
[edit chassis]
user@host# show
fpc slot-number {
  pic pic-number {
    framing sdh;
  }
}
```

On a TX Matrix or TX Matrix Plus router, include the **framing** statement at the **[edit chassis lcc number fpc slot-number pic pic-number]** hierarchy level, specifying the **sdh** option:

```
[edit chassis lcc number]
user@host# set fpc slot-number pic pic-number framing sdh
[edit chassis lcc number]
user@host# show
fpc slot-number {
  pic pic-number {
    framing sdh;
  }
}
```

To explicitly configure a PIC to use SONET framing, include the **framing** statement at the **[edit chassis fpc slot-number pic pic-number]** hierarchy level, specifying the **sonet** option:

```
[edit chassis]
```

```

user@host# set fpc slot-number pic pic-number framing sonet
[edit chassis]
user@host# show
fpc slot-number {
  pic pic-number {
    framing sonet;
  }
}

```

On a TX Matrix or TX Matrix Plus router, include the **framing** statement at the **[edit chassis lcc number fpc slot-number pic pic-number]** hierarchy level, specifying the **sonet** option:

```

user@host# set fpc slot-number pic pic-number framing sonet
[edit chassis lcc number]
user@host# show
fpc slot-number {
  pic pic-number {
    framing sonet;
  }
}

```

Related Documentation

- [TX Matrix Router and T640 Router Configuration Overview on page 47](#)
- [TX Matrix Plus Router Configuration Overview on page 52](#)
- [Configuring the Junos OS to Enable a SONET PIC to Operate in Channelized \(Multiplexed\) Mode on page 153](#)

Configuring Junos OS to Enable SONET/SDH Framing for ATM MICs

In Junos OS Release 12.1 and later, the ATM MIC enables support for ATM pseudowire on MX Series routers. ATM MICs are rate-selectable at the following rates: 2-port OC12 or 8-port OC3. The MICs are supported on MPC interfaces. Hot-pluggable SFPs are used as optical transponders. The MICs allow the user to configure both the mode and the speed. The ATM MIC (2-port OC12 and the 8-port OC3) with SFP installed support SONET or SDH framing on a per-port or per-PIC basis. To enable the entire MIC to function in either SONET or SDH mode, you can configure framing at the MIC level. To enable the framing on a port-by-port basis, you can configure framing at the port level.



NOTE: This topic uses the term PIC for ATM MICs and the term FPC for MPC where the reference is to a CLI or Junos OS entity.

By default, ATM MICs use SONET framing. For a discussion of the differences between the two standards, see the [Junos OS SONET/SDH Interfaces Configuration Guide](#).

To configure the MIC to use SDH framing on a per-PIC basis:

1. At the **[edit chassis]** hierarchy level in configuration mode, specify the PIC and the framing mode to be configured.

```

[edit chassis]
user@host# set fpc fpc-slot pic pic-number framing sdh;

```

For example:

```
[edit chassis]
user@host# set fpc 2 pic 0 framing sdh;
```

2. Verify the configuration.

```
[edit chassis]
user@host# show
fpc 2 {
  pic 0 {
    framing sdh;
  }
}
```

To configure the MIC to use SDH framing on a per-port basis:

1. At the **[edit chassis]** hierarchy level in configuration mode, specify the PIC, port number, and the framing mode to be configured.

```
[edit chassis]
user@host# set fpc fpc-slot pic pic-number port port-number framing sdh;
```

For example:

```
[edit chassis]
user@host# set fpc 2 pic 0 port 0 framing sdh;
```

2. Verify the configuration.

```
[edit chassis]
user@host# show
fpc 2 {
  pic 0 {
    port 0 {
      framing sdh;
    }
  }
}
```

Related Documentation

- [Configuring a Port Speed on page 161](#)

Configuring the Junos OS to Use ATM Cell-Relay Accumulation Mode on an ATM1 PIC

You can configure an Asynchronous Transfer Mode (ATM) 1 PIC to use cell-relay accumulation mode. In this mode, the incoming cells (one to eight cells) are packaged into a single packet and forwarded to the label-switched path (LSP). At the edge router, this packet is divided into individual cells and transmitted over the ATM interface.



NOTE: When you configure an ATM PIC to use cell-relay accumulation, all ports on the ATM PIC use cell-relay accumulation mode.

To configure an ATM PIC to use cell-relay accumulation mode, include the **atm-cell-relay-accumulation** statement at the `[edit chassis fpc slot-number pic pic-number]` hierarchy level:

```
[edit chassis fpc slot-number pic pic-number ]
atm-cell-relay-accumulation;
```

On a TX Matrix or TX Matrix Plus router, include the **atm-cell-relay-accumulation** statement at the `[edit chassis lcc number fpc slot-number pic pic-number]` hierarchy level:

```
[edit chassis lcc number fpc slot-number pic pic-number]
atm-cell-relay-accumulation;
```

**Related
Documentation**

- [Configuring the Junos OS to Enable ATM2 Intelligent Queuing Layer 2 Circuit Transport Mode on page 219](#)
- [Configuring the Junos OS to Support ILMI for Cell Relay Encapsulation on an ATM2 IQ PIC on page 156](#)
- [Configuring the Junos OS to Enable Idle Cell Format and Payload Patterns for ATM Devices on page 220](#)
- [atm-cell-relay-accumulation on page 325](#)

Configuring the Junos OS to Support the Sparse DLCI Mode on Channelized STM1 or Channelized DS3 PICs

By default, original channelized DS3 and original channelized STM1-to-E1 (or T1) interfaces can support a maximum of 64 data-link connection identifiers (DLCIs) per channel—as many as 1792 DLCIs per DS3 interface or 4032 DLCIs per STM1 interface (0 through 63).

In sparse DLCI mode, the full DLCI range (1 through 1022) is supported. This allows you to use circuit cross-connect (CCC) and translation cross-connect (TCC) features by means of Frame Relay on T1 and E1 interfaces.



NOTE: Sparse DLCI mode requires a Channelized STM1 or Channelized DS3 PIC.

DLCI 0 is reserved for Local Management Interface (LMI) signaling.

Channelized T3 (CT3) intelligent queuing (IQ) and STM1 IQ interfaces support a maximum of 64 DLCIs, numbered 0 through 1022, and therefore do not require sparse mode.

The CT3 PIC must use field-programmable gate array (FPGA) hardware revision 17 to run sparse DLCI mode.

To configure the router to use sparse DLCI mode, include the **sparse-dlcis** statement at the `[edit chassis fpc slot-number pic pic-number]` hierarchy level:

```
[edit chassis fpc slot-number pic pic-number ]
sparse-dlcis;
```


- Related Documentation**
- [Configuring the Junos OS to Enable a SONET PIC to Operate in Channelized \(Multiplexed\) Mode on page 153](#)
 - [Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 175](#)
 - [Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 154](#)
 - [Configuring the Junos OS to Support Channelized STM1 Interface Virtual Tributary Mapping on page 177](#)
 - [Configuring the Junos OS to Enable Larger Delay Buffers for T1, E1, and DS0 Interfaces Configured on Channelized IQ PICs on page 158](#)

Configuring the Junos OS to Enable a SONET PIC to Operate in Channelized (Multiplexed) Mode

By default, SONET PICs (interfaces with names *so-fpc/pic/port*) operate in concatenated mode, a mode in which the bandwidth of the interface is in a single channel.

To configure a PIC to operate in channelized (multiplexed) mode, include the **no-concatenate** statement at the `[edit chassis fpc slot-number pic pic-number]` hierarchy level:

```
[edit chassis]
user@host# set fpc slot-number pic pic-number no-concatenate
[edit chassis]
user@host# show
fpc slot-number {
  pic pic-number {
    no-concatenate;
  }
}
```

On a TX Matrix or TX Matrix Plus router, include the **no-concatenate** statement at the `[edit chassis lcc number fpc slot-number pic pic-number]` hierarchy level:

```
[edit chassis lcc number]
user@host# set fpc slot-number pic pic-number no-concatenate
[edit chassis lcc number]
user@host# show
fpc slot-number {
  pic pic-number {
    no-concatenate;
  }
}
```

When configuring and displaying information about interfaces that are operating in channelized mode, you must specify the channel number in the interface name (*physical:channel*); for example, *so-2/2/0:0* and *so-2/2/0:1*.



NOTE: On SONET OC48 interfaces that are configured for channelized (multiplexed) mode, the `bytes e1-quiet` and `bytes f1` options in the `sonet-options` statement have no effect. The `bytes f2`, `bytes z3`, `bytes z4`, and `path-trace` options work correctly on channel 0. These bytes work in the transmit direction only on channels 1, 2, and 3.

The M160 four-port SONET/SDH OC12 PIC can run each of the OC12 links in concatenated mode only and requires a Type 2 M160 FPC. Similarly, the 4-port SONET/SDH OC3 PIC cannot run in nonconcatenated mode on any platform.

Related Documentation

- [Configuring the Junos OS to Enable SONET/SDH Framing for SONET/SDH PICs on page 147](#)
- [Configuring the Junos OS to Support the Sparse DLCI Mode on Channelized STM1 or Channelized DS3 PICs on page 152](#)

Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs

Each Channelized E1 PIC has 10 E1 ports that you can channelize to the *NxDS0* level. Each E1 interface has 32 time slots (DS0), in which time slot 0 is reserved. You can combine one or more of these timeslots (DS-0) to create a channel group (*NxDS-0*). There can be a maximum of 32 channel groups per E1 interface. Thus, you can configure as many as 320 channel groups per PIC (10 ports x 32 channel groups per port).

To specify the DS0 channel group number in the interface name, include a colon (:) as a separator. For example, a Channelized E1 PIC might have the following physical and virtual interfaces:

`ds-0/0/0:x`

where *x* is a DS0 channel group ranging from 0 through 23. (See [Table 16 on page 155](#) for more information about ranges.)

You can use any of the values within the range available for *x*; you do not have to configure the links sequentially. The software applies the interface options you configure according to the following rules:

- You can configure the `e1-options` statement for channel group 0 only; for example, `ds-0/0/0:0`.
- There are no restrictions on changing the default `ds0-options`.
- If you delete a configuration you previously committed for channel group 0, the options return to the default values.

To configure the channel groups and time slots for a Channelized E1 interface, include the `channel-group` and `timeslots` statements at the `[edit chassis fpc slot-number pic pic-number ce1 e1 port-number]` hierarchy level:

```
[edit chassis fpc slot-number pic pic-number ce1 e1 port-number]
channel-group channel-number timeslots slot-number;
```



NOTE: If you commit the interface name but do not include the [edit chassis] configuration, the Channelized E1 PIC behaves like a standard E1 PIC: none of the DS0 functionality is accessible.



NOTE: The FPC slot range depends on the platform. The maximum range of 0 through 7 applies to M40 routers; for M20 routers, the range is 0 through 3; for M10 routers the range is 0 through 1; for M5 routers, the only applicable value is 0. The Channelized E1 PIC is not supported on M160 routers.

The theoretical maximum number of channel groups possible per PIC is 10 x 24 = 240. This is within the maximum bandwidth available.

There are 32 time slots on an E1 interface. You can designate any combination of time slots for usage.

To use time slots 1 through 10, designate *slot-number* as in this example:

```
[edit chassis fpc 1 pic 2 ce1 e1 6]
channel-group 3 timeslots 1-10;
```

To use time slots 1 through 5, time slot 10, and time slot 24, designate *slot-number* as in this example:

```
[edit chassis fpc 3 pic 0 ce1 e1 2]
channel-group 1 timeslots 1-5,10,24;
```

Do not include spaces in a list of time slot numbers.

Related Documentation

- [Ranges for Channelized E1 Interfaces Configuration on page 155](#)

Ranges for Channelized E1 Interfaces Configuration

Table 16 on page 155 shows the ranges for configuring channel groups and time slots for Channelized E1 Interfaces.

Table 16: Ranges for Channelized E1 Configuration

Item	Variable	Range
FPC slot	<i>slot-number</i>	0 through 7 (see note below)
PIC slot	<i>pic-number</i>	0 through 3
E1 port	<i>port-number</i>	0 through 9

Table 16: Ranges for Channelized E1 Configuration (*continued*)

Item	Variable	Range
DSO channel group	<i>group-number</i>	0 through 23
Time slot	<i>slot-number</i>	1 through 32



NOTE: The FPC slot range depends on the router. For the TX Matrix and TX Matrix Plus routers, the range is from 0 through 31. For the TX Matrix Plus routers with 3D SIBs, the range is from 0 through 63. For M40, M40e, M160, M320, M120, and other T Series routers, the range is from 0 through 7. For M20 routers, the range is from 0 through 3. For M10 and M10i routers, the range is from 0 through 1. For M5 and M7i routers, the only applicable value is 0.

- Related Documentation**
- [Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 154](#)

Configuring the Junos OS to Support ILMI for Cell Relay Encapsulation on an ATM2 IQ PIC

Integrated Local Management Interface (ILMI) is supported on AAL5 interfaces, regardless of transport mode. To enable ILMI on interfaces with cell-relay encapsulation, you must configure an ATM2 IQ PIC to use Layer 2 circuit trunk transport mode.

To configure ILMI on an interface with cell-relay encapsulation, include the following statements:

```
[edit chassis fpc slot-number pic pic-number]
  atm-l2circuit-mode trunk trunk;
[edit interfaces at-fpc/pic/port]
  encapsulation atm-ccc-cell-relay;
  atm-options {
    ilmi;
    pic-type atm2;
  }
  unit logical-unit-number {
    trunk-id number;
  }
```

For an example on how to enable ILMI for cell relay, see the [Junos OS ATM Interfaces Configuration Guide](#).

- Related Documentation**
- [Configuring the Junos OS to Enable ATM2 Intelligent Queuing Layer 2 Circuit Transport Mode on page 219](#)

Configuring the Junos OS to Support the Link Services PIC

The Multilink Protocol enables you to split, recombine, and sequence datagrams across multiple logical data links. The goal of multilink operation is to coordinate multiple independent links between a fixed pair of systems, providing a virtual link with greater bandwidth than any of the members.

The Link Services PIC supports the following Multilink Protocol encapsulation types at the logical unit level:

- Multilink Point-to-Point Protocol (MLPPP)
- Multilink Frame Relay (MLFR FRF.15)

The Link Services PIC also supports the Multilink Frame Relay UNI and NNI (MLFR FRF.16) encapsulation type at the physical interface level.

MLFR (FRF.16) is supported on a channelized interface, **ls-fpc/pic/port:channel**, which denotes a single MLFR (FRF.16) bundle. For MLFR (FRF.16), multiple links are combined to form one logical link. Packet fragmentation and reassembly occur on a per-virtual circuit (VC) basis. Each bundle can support multiple VCs. The physical connections must be E1, T1, channelized DS3 to DS1, channelized DS3 to DS0, channelized E1, channelized STM 1, or channelized IQ interfaces.

The default number of bundles per Link Services PIC is 16, ranging from **ls-fpc/pic/port:0** to **ls-fpc/pic/port:15**.

To configure the number of bundles on a Link Services PIC, include the **mlfr-uni-nni-bundles** statement at the **[edit chassis fpc slot-number pic pic-number]** hierarchy level:

```
[edit chassis fpc slot-number pic pic-number]
  mlfr-uni-nni-bundles number;
```

The maximum number of MLFR UNI NNI bundles each Link Services PIC can accommodate is 128. A link can associate with one link services bundle only.



NOTE: The Link Services PIC is not compatible with the M160 or T Series routers.

Related Documentation

- [Multiclass Extension for Multiple Classes of Service Using MLPPP \(RFC 2686\) on page 157](#)

Multiclass Extension for Multiple Classes of Service Using MLPPP (RFC 2686)

The multiclass extension to the MLPPP extension enables multiple classes of service using MLPPP. For more information, see RFC 2686, *The Multi-Class Extension to Multi-Link PPP*. The Junos OS PPP implementation does not support the negotiation of address field compression and protocol field compression PPP NCP options. The software always sends a full 4-byte PPP header.

- Related Documentation**
- [Configuring the Junos OS to Support the Link Services PIC on page 157](#)

Configuring the Junos OS to Enable Larger Delay Buffers for T1, E1, and DS0 Interfaces Configured on Channelized IQ PICs

By default, T1, E1, and NxDS0 interfaces configured on channelized IQ PICs are limited to 100,000 microseconds of delay buffer. (The default average packet size on the IQ PIC is 40 bytes.) For these interfaces, it might be necessary to configure a larger buffer size to prevent congestion and packet dropping.

To ensure traffic is queued and transmitted properly, you can configure a buffer size larger than the default maximum. To set the average packet size used to calculate the number of notification queue entries in the IQ PIC to 256 bytes, include the **q-pic-large-buffer large-scale** statement at the `[edit chassis fpc slot-number pic pic-number]` hierarchy level:

```
[edit chassis fpc slot-number pic pic-number]
q-pic-large-buffer {
  large-scale;
}
```

On a TX Matrix router or a TX Matrix Plus router, include the **q-pic-large-buffer large-scale** statement at the `[edit chassis lcc number fpc slot-number pic pic-number]` hierarchy level:

```
[edit chassis lcc number fpc slot-number pic pic-number]
q-pic-large-buffer {
  large-scale;
}
```



NOTE: When you commit the configuration after including the **q-pic-large-buffer** statement for a PIC, the Junos OS temporarily takes the PIC offline and brings it back online before the new configuration is activated and becomes the current operational configuration.

This statement sets the maximum buffer size. (See [Table 17 on page 159](#).)

For information on configuring the buffer size, see the *Junos Class of Service Configuration Guide*.

- Related Documentation**
- [Maximum Delay Buffer with q-pic-large-buffer Statement Enabled on page 158](#)

Maximum Delay Buffer with q-pic-large-buffer Statement Enabled

[Table 17 on page 159](#) lists the maximum delay buffer that can be configured for T1, E1, and DS0 interfaces configured on Channelized IQ PICs:

Table 17: Maximum Delay Buffer with q-pic-large-buffer Statement Enabled

Platform, PIC, or Interface Type	Maximum Buffer Size
With Large Buffer Sizes Not Enabled	
T Series and M320 routers	50,000 microseconds
Other M Series routers	200,000 microseconds
IQ PICs on all routers	100,000 microseconds
Channelized T1/E1 interface on J Series Services Routers	400,000 microseconds
With Large Buffer Sizes Enabled	
Channelized T3 and channelized OC3 DLCIs—Maximum sizes vary by shaping rate:	
With shaping rate from 64,000 through 255,999 bps	4,000,000 microseconds
With shaping rate from 256,000 through 511,999 bps	2,000,000 microseconds
With shaping rate from 512,000 through 1,023,999 bps	1,000,000 microseconds
With shaping rate from 1,024,000 through 2,048,000 bps	500,000 microseconds
With shaping rate from 2,048,001 bps through 10 Mbps	400,000 microseconds
With shaping rate from 10,000,001 bps through 20 Mbps	300,000 microseconds
With shaping rate from 20,000,001 bps through 30 Mbps	200,000 microseconds
With shaping rate from 30,000,001 bps through 40 Mbps	150,000 microseconds
With shaping rate up to 40,000,001 bps or higher	100,000 microseconds
NxDSO IQ Interfaces—Maximum sizes vary by channel size:	
1xDSO through 3xDSO	4,000,000 microseconds
4xDSO through 7xDSO	2,000,000 microseconds
8xDSO through 15xDSO	1,000,000 microseconds

Table 17: Maximum Delay Buffer with q-pic-large-buffer Statement Enabled (*continued*)

Platform, PIC, or Interface Type	Maximum Buffer Size
16xDSO through 32xDSO	500,000 microseconds
Other IQ interfaces	500,000 microseconds

- Related Documentation**
- [Configuring the Junos OS to Enable Larger Delay Buffers for T1, E1, and DSO Interfaces Configured on Channelized IQ PICs on page 158](#)

Configuring a Policer Overhead

Configuring a policer overhead allows you to control the rate of traffic sent or received on an interface. When you configure a policer overhead, the configured policer overhead value (bytes) is added to the length of the final Ethernet frame. This calculated length of frame is used to determine the policer or the rate limit action. Therefore, the policer overhead enables you to control the rate of traffic sent or received on an interface. You can configure the policer overhead to rate-limit queues and Layer 2 and MAC policers. The policer overhead and the shaping overhead can be configured simultaneously on an interface.

This feature is supported on M Series and T Series routers with IQ2 PICs or IQ2E PICs, and on MX Series DPCs.

To configure a policer overhead for controlling the rate of traffic sent or received on an interface:

1. In the **[edit chassis]** hierarchy level in configuration mode, create the interface on which to add the policer overhead to input or output traffic.

```
[edit chassis]
user@host# edit fpc fpc pic pic
```

For example:

```
[edit chassis]
user@host# edit fpc 0 pic 1
```

2. Configure the policer overhead to control the input or output traffic on the interface. You could use either statement or both the statements for this configuration.

```
[edit chassis fpc fpc pic pic]
user@host# set ingress-policer-overhead bytes;
user@host# set egress-policer-overhead bytes;
```

For example:

```
[edit chassis fpc 0 pic 1]
user@host# set ingress-policer-overhead 10;
user@host# set egress-policer-overhead 20;
```

3. Verify the configuration:


```
[edit chassis]
user@host# show
fpc 0 {
  pic 1 {
    ingress-policer-overhead 10;
    egress-policer-overhead 20;
  }
}
```



NOTE: When the configuration for the policer overhead bytes on a PIC is changed, the PIC goes offline and then comes back online. In addition, the configuration in the CLI is on a per-PIC basis and, therefore, applies to all the ports on the PIC.

**Related
Documentation**

- [egress-policer-overhead on page 343](#)
- [ingress-policer-overhead on page 362](#)

Configuring a Port Speed

Configuring a port speed allows you to enable rate-selectability on a per-port basis. When you configure a speed on a per-port basis, you can use the same MIC hardware as you upgrade your network from OC3 to OC12 or OC48 speeds.

This feature is supported on MX Series routers with SONET/SDH OC3/STM1 (Multi-Rate) MICs (MIC-3D-8OC3OC12-4OC48-SFP and MIC-3D-4OC3OC12-1OC48-SFP), Channelized SONET/SDH OC3/STM1 (Multi-Rate) MICs with SFP (MIC-3D-8CHOC3-4CHOC12 and MIC-3D-4CHOC3-2CHOC12), and ATM MICs with SFP (MIC-3D-8OC3-2OC12-ATM).

To configure a port speed on the chassis for enabling rate-selectability on a per-port basis:

1. At the **[edit chassis]** hierarchy level in configuration mode, specify the port and the port speed that need to be configured. You can use one of the following speed attributes for this configuration.

```
[edit chassis]
user@host# set fpc fpc-slot pic pic-number port port-number speed oc12-stm4 ;
user@host# set fpc fpc-slot pic pic-number port port-number speed oc3-stm1 ;
user@host# set fpc fpc-slot pic pic-number port port-number speed oc48-stm16 ;
```



NOTE: You can configure the `oc12-stm4`, `oc3-stm1`, and `oc48-stm16` port speed options for SONET/SDH OC3/STM1 (Multi-Rate) MICs. However, for Channelized SONET/SDH OC3/STM1 (Multi-Rate) MICs with SFP and ATM MICs, you can configure only the `oc12-stm4` and `oc3-stm1` port speed options.

Also, for ATM MICs, you can configure the `oc12-stm4` port speed option only for ports 0 and 4. If you configure the `oc12-stm4` port speed option for port 0, then ports 1, 2, and 3 are disabled. Similarly, if you configure the `oc12-stm4` port speed for port 4, then ports 5, 6, and 7 are disabled.

For example:

```
[edit chassis]
user@host# set fpc 3 pic 0 port 0 speed oc12-stm4
```

2. Verify the configuration:

```
[edit chassis]
user@host# show
fpc 3 {
  pic 0 {
    port 0 {
      speed oc12-stm4;
    }
  }
}
```

By default, rate-selectability is enabled on MX Series routers with SONET/SDH OC3/STM1 (Multi-Rate) MICs, Channelized SONET/SDH OC3/STM1 (Multi-Rate) MICs with SFP, and ATM MICs. However, rate-selectability can be disabled only on the 8-port SONET/SDH OC3/STM1 (Multi-Rate) MIC.

To disable rate-selectability on the 8-port SONET/SDH OC3/STM1 (Multi-Rate) MIC:

1. At the **[edit chassis]** hierarchy level in configuration mode, disable rate-selectability by using the **`no-multi-rate`** statement.

```
[edit chassis]
user@host# set fpc fpc-slot pic pic-number no-multi-rate
```

For example:

```
[edit chassis]
user@host# set fpc 3 pic 0 no-multi-rate
```

2. Verify the configuration:

```
[edit chassis]
user@host# show
fpc 3 {
  pic 0 {
    no-multi-rate;
  }
}
```



NOTE: You can disable rate-selectability by using the `no-multi-rate` statement only on the 8-port SONET/SDH OC3/STM1 (Multi-Rate) MIC with SFP. The `no-multi-rate` statement has no effect on the 4-port SONET/SDH OC3/STM1 (Multi-Rate) MIC with SFP, the Channelized SONET/SDH OC3/STM1 (Multi-Rate) MICs with SFP, or the ATM MIC.

Related
Documentation

- [speed on page 407](#)
- [no-multi-rate on page 376](#)

Configuring Resynchronization of FPC Sequence Numbers when a new FPC is Brought Online

- [Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online on page 165](#)

Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online

On M320, T320, T640, T1600, T4000, TX Matrix, and TX Matrix Plus routers, when you bring a Flexible PIC Concentrator (FPC) online, the sequence number on the FPC may not be synchronized with the other active FPCs in the router, which may result in the loss of a small amount of initial traffic.

To avoid any traffic loss, include the **fpc-resync** statement at the **[edit chassis]** hierarchy level. This ensures that the sequence numbers of the FPC that is brought online is resynchronized with the other active FPCs in the router.

```
[edit chassis]
fpc-resync;
```



NOTE: In order to prevent traffic blackholing, the **fpc-resync** command will have no effect if a single LMNR based FPC and one or more I-chip FPCs exist in the same chassis.

Related Documentation

- [fpc-resync on page 355](#)

Configuring Chassis Settings to Support Aggregated Devices

- [Configuring Junos OS for Supporting Aggregated Devices on page 167](#)

Configuring Junos OS for Supporting Aggregated Devices

Junos OS supports the aggregation of physical devices into defined virtual links, such as the link aggregation of Ethernet interfaces defined by the IEEE 802.3ad standard.

Tasks for configuring aggregated devices are:

- [Configuring Virtual Links for Aggregated Devices on page 167](#)
- [Configuring LACP Link Protection at the Chassis Level on page 168](#)
- [Enabling LACP Link Protection on page 168](#)
- [Configuring System Priority on page 169](#)
- [Configuring the Maximum Links Limit on page 169](#)

Configuring Virtual Links for Aggregated Devices

To define virtual links, you need to specify the associations between physical and logical devices within the **[edit interfaces]** hierarchy, and assign the correct number of logical devices by including the **device-count** statement at the **[edit chassis aggregated-devices ethernet]** and **[edit chassis aggregated-devices sonet]** hierarchy levels:

```
[edit chassis]
aggregated-devices {
  ethernet {
    device-count number;
  }
  sonet {
    device-count number;
  }
}
```

The maximum number of Ethernet logical interfaces that you can configure is 128. On M Series and T Series routers, you can configure a maximum number of 128 aggregated interfaces. On MX Series routers, you can configure a maximum of 480 aggregated interfaces. The aggregated interfaces are numbered from **ae0** through **ae127** for M Series

and T Series routers, and the aggregated interfaces (LAG bundles) are numbered from **ae0** through **ae479** on MX Series routers. The maximum number of SONET/SDH logical interfaces is 16. The aggregated SONET/SDH interfaces are numbered from **as0** through **as15**.

Configuring LACP Link Protection at the Chassis Level

Link Aggregation Control Protocol (LACP) is one method of bundling several physical interfaces to form one logical interface. You can configure both VLAN-tagged and untagged aggregated Ethernet with or without LACP enabled. LACP exchanges are made between actors and partners. An actor is the local interface in an LACP exchange. A partner is the remote interface in an LACP exchange.

LACP link protection enables you to force active and standby links within an aggregated Ethernet. You configure LACP link protection by using the **link-protection** and **system-priority** statements at either the chassis or interface level and by configuring port priority at the interface level using the **system-priority** statement. Configuring LACP parameters at the chassis level results in all aggregated Ethernet interfaces using the defined values unless overridden by the LACP configuration on a specific interface.

```
[edit chassis]
aggregated-devices {
  ethernet {
    lacp {
      link-protection {
        non-revertive;
      }
      system-priority priority;
    }
  }
}
```



NOTE: LACP link protection also uses port priority. You can configure port priority at the Ethernet interface **[gigether-options]** hierarchy level using the **port-priority** statement. If you choose not to configure port priority, LACP link protection uses the default value for port priority (127).

Enabling LACP Link Protection

To enable LACP link protection for aggregated Ethernet interfaces on the chassis, use the **link-protection** statement at the **[edit chassis aggregated-devices ethernet lacp]** hierarchy level:

```
[edit chassis aggregated-devices ethernet lacp]
link-protection {
  non-revertive;
}
```

By default, LACP link protection reverts to a higher-priority (lower-numbered) link when that higher-priority link becomes operational or a link is added to the aggregator that is determined to be higher in priority. However, you can suppress link calculation by adding

the **non-revertive** statement to the LACP link protection configuration. In nonrevertive mode, after a link is active and collecting and distributing packets, the subsequent addition of a higher-priority (better) link does not result in a switch, and the current link remains active.



CAUTION: If both ends of an aggregator have LACP link protection enabled, make sure to configure both ends of the aggregator to use the same mode. Mismatching LACP link protection modes can result in lost traffic.

Configuring System Priority

To configure LACP system priority for aggregated Ethernet interfaces on the chassis, use the **system-priority** statement at the **[edit chassis aggregated-devices ethernet lacp]** hierarchy level:

```
[edit chassis aggregated-devices ethernet lacp]
system-priority priority;
```

The system priority is a 2-octet binary value that is part of the LACP system ID. The LACP system ID consists of the system priority as the two most-significant octets and the interface MAC address as the six least-significant octets. The system with the numerically lower value for system priority has the higher priority. By default, system priority is 127, with a range of 0 through 65,535.

Configuring the Maximum Links Limit

To configure the maximum links limit, use the **maximum-links** statement at the **[edit chassis aggregated-devices]** hierarchy level:

```
[edit chassis aggregated-devices]
maximum-links maximum-links-limit;
```

Related Documentation

- *Configuring an Aggregated Ethernet Interface*
- *Ethernet Interfaces*
- *Configuring Aggregated Ethernet Interfaces on PTX Series Packet Transport Routers*

Configuring Chassis Settings to Support Load Balancing

- [Configuring ECMP Next Hops for RSVP and LDP LSPs for Load Balancing on page 171](#)

Configuring ECMP Next Hops for RSVP and LDP LSPs for Load Balancing

The Junos OS supports configurations of 16, 32, or 64 equal-cost multipath (ECMP) next hops for RSVP and LDP LSPs on M10i routers with an Enhanced CFEB, and M320, M120, MX Series, and T Series routers. For networks with high-volume traffic, this provides more flexibility to load-balance the traffic over as many as 64 LSPs.

To configure the maximum limit for ECMP next hops, include the **maximum-ecmp next-hops** statement at the **[edit chassis]** hierarchy level:

```
[edit chassis]
maximum-ecmp next-hops;
```

You can configure a maximum ECMP next-hop limit of **16**, **32**, or **64** using this statement. The default limit is **16**.



NOTE: MX Series routers with one or more Modular Port Concentrator (MPC) cards and with Junos OS 11.4 or earlier installed, support the configuration of the **maximum-ecmp** statement with only 16 next hops. You should *not* configure the **maximum-ecmp** statement with 32 or 64 next hops. When you commit the configuration with 32 or 64 next hops, the following warning message appears:

Error: Number of members in Unilist NH exceeds the maximum supported 16 on Trio.

The following types of routes support the ECMP maximum next-hop configuration for as many as **64** ECMP gateways:

- Static IPv4 and IPv6 routes with direct and indirect next-hop ECMPs
- LDP ingress and transit routes learned through associated IGP routes
- RSVP ECMP next hops created for LSPs

- OSPF IPv4 and IPv6 route ECMPs
- ISIS IPv4 and IPv6 route ECMPs
- EBGp IPv4 and IPv6 route ECMPs
- IBGP (resolving over IGP routes) IPv4 and IPv6 route ECMPs

The enhanced ECMP limit of up to 64 ECMP next hops is also applicable for Layer 3 VPNs, Layer 2 VPNs, Layer 2 circuits, and VPLS services that resolve over an MPLS route, because the available ECMP paths in the MPLS route can also be used by such traffic.

**NOTE:**

The following FPCs on M320, T640, and T1600 routers only support 16 ECMP next hops:

- (M320, T640, and T1600 routers only) Enhanced II FPC1
- (M320, T640, and T1600 routers only) Enhanced II FPC2
- (M320 and T640 routers only) Enhanced II FPC3
- (T640 and T1600 routers only) FPC2
- (T640 and T1600 routers only) FPC3

If a maximum ECMP next-hop limit of 32 or 64 is configured on an M320, T640, or T1600 router with any of these FPCs installed, the Packet Forwarding Engines on these FPCs use only the first 16 ECMP next hops. For Packet Forwarding Engines on FPCs that support only 16 ECMP next hops, the Junos OS generates a system log message if a maximum ECMP next-hop limit of 32 or 64 is configured. However, for Packet Forwarding Engines on other FPCs installed on the router, a maximum configured ECMP limit of 32 or 64 ECMP next hops is applicable.



NOTE: If RSVP LSPs are configured with bandwidth allocation, for ECMP next hops with more than 16 LSPs, traffic is not distributed optimally based on bandwidths configured. Some LSPs with smaller allocated bandwidths receive more traffic than the ones configured with higher bandwidths. Traffic distribution does not strictly comply with the configured bandwidth allocation. This caveat is applicable to the following routers:

- T1600 and T640 routers with Enhanced Scaling FPC1, Enhanced Scaling FPC2, Enhanced Scaling FPC3, Enhanced Scaling FPC 4, and all Type 4 FPCs
- M320 routers with Enhanced III FPC1, Enhanced III FPC2, and Enhanced III FPC3
- MX Series routers with all types of FPCs and DPCs, excluding MPCs. This caveat is not applicable to MX Series routers with line cards based on the Junos Trio chipset.
- M120 routers with Type 1, Type 2, and Type 3 FPCs
- M10i routers with Enhanced CFEB

Next-hop cloning and permutations are disabled on T Series routers with Enhanced Scaling FPCs (Enhanced Scaling FPC1, Enhanced Scaling FPC2, Enhanced Scaling FPC3, and Enhanced Scaling FPC 4) that support enhanced load-balancing capability. As a result, memory utilization is reduced for a highly scaled system with a high number of next hops on ECMP or aggregated interfaces. Next-hop cloning and permutations are also disabled on T Series routers with Type-4 FPCs.

To view the details of the ECMP next hops, issue the **show route** command. The **show route summary command** also shows the current configuration for the maximum ECMP limit. To view details of the ECMP LDP paths, issue the **traceroute mpls ldp** command.

Related Documentation

- [maximum-ecmp on page 371](#)

Configuring Chassis Settings to Support Channelized Interfaces

- [Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 175](#)
- [Ranges for Channelized DS3-to-DS0 Configuration on page 176](#)
- [Configuring the Junos OS to Support Channelized STM1 Interface Virtual Tributary Mapping on page 177](#)
- [Configuring the Junos OS to Enable Channelization on DS3/E3 MIC on page 177](#)

Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots

You can configure 28 T1 channels per T3 interface. Each T1 link can have up to eight channel groups, and each channel group can hold any combination of DS0 time slots. To specify the T1 link and DS0 channel group number in the name, use colons (:) as separators. For example, a Channelized DS3-to-DS0 PIC might have the following physical and virtual interfaces:

`ds-0/0/0:x:y`

where *x* is a T1 link ranging from 0 through 27 and *y* is a DS0 channel group ranging from 0 through 7. (See [Table 18 on page 176](#) for more information about ranges.)

You can use any of the values within the range available for *x* and *y*; you do not have to configure the links sequentially. The software applies the interface options you configure according to the following rules:

- You can configure **t3-options** for t1 link 0 and channel group 0 only; for example, **ds-0/0/0:0:0**.
- You can configure **t1-options** for any t1 link value, but only for channel group 0; for example, **ds-0/0/0:x:0**.
- There are no restrictions on changing the default **ds0-options**.
- If you delete a configuration you previously committed for channel group 0, the options return to the default values.

To configure the channel groups and time slots for a channelized DS3 interface, include the **channel-group** and **timeslots** statements at the `[edit chassis fpc slot-number pic pic-number ct3 port port-number t1 link-number]` hierarchy level:

```
[edit chassis fpc slot-number pic pic-number ct3 port port-number t1 link-number]
channel-group channel-number timeslots slot-number;
```



NOTE: If you commit the interface name but do not include the `[edit chassis]` configuration, the Channelized DS3-to-DS0 PIC behaves like a Channelized DS3-to-DS1 PIC: none of the DS0 functionality is accessible.



NOTE: The FPC slot range depends on the platform. The maximum range of 0 through 7 applies to M40 routers; for M20 routers, the range is 0 through 3; for M10 routers the range is 0 through 1; for M5 routers, the only applicable value is 0. The Multichannel DS3 (Channelized DS3-to-DS0) PIC is not supported on M160 routers.

Bandwidth limitations restrict the interface to a maximum of 128 channel groups per T3 port, rather than the theoretical maximum of $8 \times 28 = 224$.

There are 24 time slots on a T1 interface. You can designate any combination of time slots for usage, but you can use each time slot number on only one channel group within the same T1 link.

To use time slots 1 through 10, designate **slot-number** as in this example:

```
[edit chassis fpc 0 pic 1 ct3 port 5 t1 22]
channel-group 7 timeslots 1-10;
```

To use time slots 1 through 5, time slot 10, and time slot 24, designate **slot-number** as in this example:

```
[edit chassis fpc 2 pic pic-number1 ct3 port 0 t1 8]
channel-group 4 timeslots 1-5,10,24;
```

Do not include spaces in the list of time slot numbers.

Related Documentation

- [Ranges for Channelized DS3-to-DS0 Configuration on page 176](#)

Ranges for Channelized DS3-to-DS0 Configuration

Table 18 on page 176 shows the ranges for each of the quantities in the preceding configuration.

Table 18: Ranges for Channelized DS3-to-DS0 Configuration

Item	Variable	Range
FPC slot	<i>slot-number</i>	0 through 7 (see note below)

Table 18: Ranges for Channelized DS3-to-DS0 Configuration (*continued*)

Item	Variable	Range
PIC slot	<i>pic-number</i>	0 through 3
Port	<i>port-number</i>	0 through 1
T1 link	<i>link-number</i>	0 through 27
DS0 channel group	<i>group-number</i>	0 through 7
time slot	<i>slot-number</i>	1 through 24

- Related Documentation**
- [Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 175](#)

Configuring the Junos OS to Support Channelized STM1 Interface Virtual Tributary Mapping

By default, virtual tributary mapping uses KLM mode. You can configure virtual tributary mapping to use KLM or ITU-T mode. On the original Channelized STM1 PIC, to configure virtual tributary mapping, include the **vtmapping** statement at the **[edit chassis fpc slot-number pic pic-number]** hierarchy level:

```
[edit chassis fpc slot-number pic pic-number]
  vtmapping (klm | itu-t);
```

For the Channelized STM1 PIC with IQ, you can configure virtual tributary mapping by including the **vtmapping** statement at the **[edit interfaces cau4 fpc slot-number pic pic-number sonet-options]** hierarchy level.

- Related Documentation**
- [Configuring the Junos OS to Support the Sparse DLCI Mode on Channelized STM1 or Channelized DS3 PICs on page 152](#)
 - [Configuring Virtual Tributary Mapping of Channelized STM1 Interfaces](#)

Configuring the Junos OS to Enable Channelization on DS3/E3 MIC

By default, the DS3/E3 MIC functions in clear-channel mode. To enable the DS3/E3 MIC to function in channelized mode, you need to use the software license S-MIC-3D-8CHDS3. To enable channelization, set the **channelization** statement at the **[edit chassis fpc MPC-slot-number pic MIC-slot-number]** hierarchy level. You can use the **channelization** option to channelize only individual DS3 interfaces.

**NOTE:**

- You can configure the **channelization** statement to enable channelization for the DS3/E3 MIC only. Moreover, you can use the **channelization** statement only on MX Series routers with Queuing and Enhanced Queuing MPCs (MX-MPC1-3D-Q, MX-MPC2-3D-Q, and MX-MPC2-3D-EQ) or on MX80 routers. Configuring the **channelization** statement on other MPCs does not have any effect, and the MICs continue to operate in clear-channel mode.
- Only clear-channel E3 mode is supported on the DS3/E3 MIC. Therefore, configuring the **channelization** statement does not impact the E3 functionality.

To configure channelization on the DS3/E3 MIC:

1. At the **[edit chassis]** hierarchy level in configuration mode, navigate to the hierarchy level that indicates the slot on which the DS3/E3 MIC is located.

```
[edit chassis]
user@host# edit fpc MPC-slot-number pic MIC-slot-number
```

For example, to navigate to the **[edit chassis fpc 1 pic 2]** hierarchy level:

```
[edit chassis]
user@host# edit fpc 1 pic 2
```

2. Configure the **channelization** statement.

```
[edit chassis fpc MPC-slot-number pic MIC-slot-number]
user@host# set channelization
```

For example:

```
[edit chassis fpc 1 pic 2]
user@host# set channelization
```

3. Verify the configuration by using the **show** command at the **[edit chassis]** hierarchy level:

```
[edit chassis]
user@host# show
fpc 1 {
  pic 2 {
    channelization;
  }
}
```

To enable the DS3/E3 MIC to function in clear-channel mode, you need to disable channelization. To do this, delete the **channelization** option at the **[chassis fpc MPC-slot-number pic MIC-slot-number]** hierarchy level.

To disable channelization on the DS3/E3 MIC:

1. At the **[edit chassis]** hierarchy level in configuration mode, navigate to the hierarchy level that indicates the slot on which the DS3/E3 MIC is located.

```
[edit chassis]
user@host# edit fpc MPC-slot-number pic MIC-slot-number
```

For example:

```
[edit chassis]
user@host# edit fpc 1 pic 2
```

2. Delete the **channelization** statement.

```
[edit chassis fpc MPC-slot-number pic MIC-slot-number]
user@host# delete channelization
```

For example:

```
[edit chassis fpc 1 pic 2]
user@host# delete channelization
```

Related Documentation • [channelization on page 329](#)

Configuring Chassis Settings to Support Adaptive Services Interfaces

- [Configuring the Junos OS to Enable Service Packages on Adaptive Services Interfaces on page 181](#)

Configuring the Junos OS to Enable Service Packages on Adaptive Services Interfaces

For Adaptive Services (AS) PICs, MultiServices PICs, and the internal Adaptive Services Module (ASM) in the M7i platform, there are two service packages: Layer 2 and Layer 3. Both service packages are supported on all adaptive services interfaces, but you can enable only one service package per PIC, with the exception of the combined package supported on the ASM. On a single router, you can enable both service packages by installing two or more PICs on the platform.

You enable service packages per PIC, not per port. For example, if you configure the Layer 2 service package, the entire PIC uses the configured package. To enable a service package, include the **service-package** statement at the **[edit chassis fpc slot-number pic pic-number adaptive-services]** hierarchy level, and specify **layer-2** or **layer-3**:

```
[edit chassis fpc slot-number pic pic-number adaptive-services]
service-package (layer-2 | layer-3);
```

To determine which package an AS PIC supports, issue the **show chassis hardware** command: if the PIC supports the Layer 2 package, it is listed as **Link Services II**, and if it supports the Layer 3 package, it is listed as **Adaptive Services II**. To determine which package a MultiServices PIC supports, issue the **show chassis pic fpc-slot slot-number pic-slot slot-number** command. The **Package** field displays the value **layer-2** or **layer-3**.



NOTE: The ASM has a default option that combines the features available in the Layer 2 and Layer 3 service packages.

After you commit a change in the service package, the PIC is taken offline and then brought back online immediately. You do not need to manually take the PIC offline and online.



.....

NOTE: Changing the service package causes all state information associated with the previous service package to be lost. You should change the service package only when there is no active traffic going to the PIC.

.....

The services supported in each package differ by PIC and platform type.

**Related
Documentation**

- [Configuring the Junos OS to Support Layer 2 Services on MX Series 3D Universal Edge Routers with MS-DPCs on page 126](#)

CHAPTER 17

Configuring Chassis Settings to Support External Clock Synchronization

- [Configuring the Junos OS to Support an External Clock Synchronization Interface for M Series and T Series Routers on page 183](#)
- [Configuring Clock Synchronization Interface for MX Series Routers on page 185](#)
- [Clock Sources for PTX Series Packet Transport Routers on page 190](#)
- [Configuring an External Clock Synchronization Interface for PTX Series Packet Transport Routers on page 191](#)
- [Example: Configuring Synchronous Ethernet on MX Series Routers on page 193](#)
- [Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC on page 197](#)

Configuring the Junos OS to Support an External Clock Synchronization Interface for M Series and T Series Routers

The M40e, M120, M320, T640, and T1600 routers support an external synchronization interface that can be configured to synchronize the internal Stratum 3 clock to an external source, and then synchronize the chassis interface clock to that source.

This feature can be configured for external primary and secondary interfaces that use building-integrated timing system (BITS), SDH Equipment Timing Source (SETS) timing sources, or an equivalent quality timing source. When internal timing is set for SONET/SDH, Plesiochronous Digital Hierarchy (PDH), or digital hierarchy (DS-1) interfaces on the Physical Interface Cards (PICs), the transmit clock of the interface is synchronized to BITS/SETS timing and is traceable to timing within the network.

Routers and switches that support an external clock synchronization interface include:

- M40e, M120, and M320 routers
- T640 and T1600 routers

To configure external synchronization on the router, include the **synchronization** statement at the **[edit chassis]** hierarchy level:

```
[edit chassis]
synchronization {
```

```
signal-type (t1 | e1);
switching--mode (revertive | non-revertive);
y-cable-line-termination;
transmitter-enable;
validation-interval seconds;
primary (external-a | external-b);
secondary (external-a | external-b);
}
```

Use the **synchronization** statement options to specify a primary and secondary timing source. To do this, configure the following options:

- For the M120 and M320 routers, specify a signal type mode for interfaces, either **t1** or **e1**. For the M40e, T640, and T1600 routers, only the **t1** signal type mode is supported. The default setting is **t1**.
- For the T640 and T1600 routers, external clock interfaces are supported on the SONET Clock Generators (SCG-T-EC). The external clock interfaces on the SONET Clock Generators (SCG-T) are not supported.
- Specify the switching mode as **revertive** if a lower-priority synchronization can be switched to a valid, higher-priority synchronization.
- For the M320 router, specify that a single signal should be wired to both Control Boards (CBs) using a Y-cable. For the M40e router, the signal is wired to the CIP and Y-cable functionality is embedded in this system.

The **y-cable-line-termination** option is not available on the M40e, M120, T640, and T1600 routers.

- Control whether the diagnostic timing signal is transmitted.

The **transmitter-enable** option is not available on the M120, T640, and T1600 routers.

- Set a validation interval. The **validation-interval** option validates the synchronized deviation of the synchronization source. If revertive switching is enabled and a higher-priority clock is validated, the clock module is directed to the higher-priority clock, and all configured and active synchronizations are validated. The validation timer resumes after the current validation interval expires. The validation interval can be a value from 90 through 86,400 seconds. The default value is 90 seconds. For the M120 router, the range for the **validation-interval** option is 30 through 86,400 and the default value is **30**.
- Specify the primary external timing source by using the **primary (external-a | external-b)** statement.
- Specify the secondary external timing source by using the **secondary (external-a | external-b)** statement.

**Related
Documentation**

- [Configuring an External Clock Synchronization Interface for PTX Series Packet Transport Routers on page 191](#)

Configuring Clock Synchronization Interface for MX Series Routers

MX5-T, MX10-T, MX40-T, MX80, MX80-T, MX240, MX480, and MX960 routers support external clock synchronization using Synchronous Ethernet.

Configuring external clock synchronization requires making clock selection, quality level (QL), and priority considerations. The clock selection algorithm is used to pick the two best clock sources, primary and secondary, from among all the various sources, based on system configuration and execution criteria such as QL, priority, hardware restrictions, and so on, and is achieved using the following logic and restrictions:

- QL must be configured for non-external clocks, whether or not QL is enabled.
- In the case of option-1, QL must be configured for external clocks (external-a or external-b), whether or not QL is enabled.
- In the case of option-2, the default QL for the external clocks is QL_STU, whether or not QL is enabled.
- Starting with Junos OS Release 12.2R1, the quality level (QL) parameter for a Synchronous Ethernet interface is optional when **quality-mode** is enabled and the **selection-mode** is set to **receive-quality**. The default QL for a Synchronous Ethernet interface is **SEC** for the **option-1** network type and **ST3** for the **option-2** network type.
- When QL is enabled, the received QL must be equal to or better than the configured QL for that particular source or else that source will not be considered for clock selection. This is so that a downstream client is guaranteed clock quality of a certain level (that 'certain level' being the configured QL).
- Configuring priority is optional. When not specified, external-a has a higher default priority than external-b, and external-b has a higher default priority than Ethernet based sources such as ge or xe clock sources, which have the lowest default priority. Configured priority is higher than any default priority.
- The 10-Gigabit Ethernet MIC with XFP supports Synchronous Ethernet, which requires both the MIC and interface configured in LAN framing mode. In LAN mode, the LAN frequency is directly supplied by the MIC's on-board clocking circuitry.
- During clock selection:
 - The active source with highest QL is selected.
 - If QL is the same for two or more sources, then the source with highest priority wins.
 - If two or more sources have the same QL and priority, then currently active source, if any, among these sources wins.
 - If two or more sources have the same QL and priority, and none of these is currently active, then any one of these may be picked.
 - The configured (or default) QL of the selected clock source is used for Ethernet Synchronization Messaging Channel (ESMC).

- If the primary clock source is `ge|x/x/y/z`, where `y` is even (0 or 2), then the secondary cannot be `ge|x/x/y/*` or `ge|x/x/y + 1/*`. E.g., if `ge-1/2/3` is the primary clock source, then the secondary cannot be `ge-1/2/*` or `ge-1/3/*` for an MX80 or MX240 router.
- If the primary clock source is `ge|x/x/y/z`, where `y` is odd (1 or 3), then the secondary cannot be `ge|x/x/y/*` or `ge|x/x/y - 1/*`. E.g., if `xe-2/3/4` is the primary, then the secondary cannot be `xe-2/2/*` or `xe-2/3/*` for an MX80 or MX240 router.
- If the primary clock source is `ge|x/x/y/z`, then the secondary cannot be `ge|x/x/y/*` in the case of 12-16x10G DPC on an MX Series router e.g., if `ge-0/1/2`, is primary, then `ge-0/1/*` cannot be the secondary clock source, but `ge-0/0/*` may be the secondary.
- In order to receive or transmit ESMC messages out of an interface, at least one logical interface should be configured on that interface. If the interface is currently not configured with a logical interface, you may do so using the **set interfaces *interface-name* unit 0** statement at the **edit** hierarchy level.

Setting the clock type

To set the clock type, use the following command:

```
set chassis synchronization network-option (option-1 | option-2)
```

EEC-1 maps to G.813 option 1 and EEC-2 maps to G.812 type IV clock.

Setting the clock mode

To set the mode of operation to select the clock source either from free-run local oscillator or from an external qualified clock, use the following command:

```
set chassis synchronization clock-mode (free-run | auto-select)
```

For MX80 routers, the free-run clock is provided by the local oscillator..

For MX240 routers, the free-run clock is provided by the SCB..

The default for both routers is auto-select mode.

Setting the quality mode

To set the synchronization quality mode, use the following command:

```
set chassis synchronization quality-mode-enable
```

The default is disable.

Setting the selection mode

To configure the ESMC or SSM quality-based clock selection mode, use the following command:

```
set chassis synchronization selection-mode (configured-quality|received-quality)
```

When the **selection-mode** statement is set as **configured-quality**, the clock source selection algorithm uses the ESMC or SSM quality level configured for a qualifying interface.

When the **selection-mode** statement is set as **received-quality**, the clock source selection algorithm uses the ESMC or SSM quality level received on the qualifying interface.



NOTE: For the **selection-mode** statement configuration to take effect, you must set the **quality-mode-enable** statement at the [edit chassis synchronization] hierarchy level.

Setting the switchover, config-change, or reboot times

To set the switchover, configuration-change, or restart time, use the following command:

```
set chassis synchronization hold-interval (configuration-change | restart | switchover) seconds
```

This sets the time interval to wait before selecting the new clock source during.

The default switchover time is 30 seconds and cold boot time is 120 seconds.

Setting the synchronization switchover mode

To set the synchronization switchover mode, use the following command:

```
set chassis synchronization switchover-mode (revertive | non-revertive)
```

In revertive mode, the system switches from a lower to a higher quality clock source whenever the higher clock source becomes available.

In non-revertive mode, the system continues to use the current clock source as long as it is valid.

The default mode is revertive.

Setting the clock source

To set the clock source, use the following command:

```
set chassis synchronization source (external-a | external-b | interfaces interface-name)
```

The clock source is specified using the clock selection process.

Setting ESMC packet transmit

To enable ESMC packet transmit, use the following command:

```
set chassis synchronization esmc-transmit interfaces interface-name
```

Setting the synchronization source quality level

To set the synchronization source quality level, use the following command:

```
set chassis synchronization source (external-a | external-b | interfaces interface-name) quality-level (prc | prs | sec | smc | ssu-a | ssu-b | st2 | st3 | st3e | st4 | stu | tnc)
```

Both option I and option II SSM quality levels are supported.

The quality level is set to DNU for network-option 1 and set to DUS for network-option 2, if quality-level not configured and no ESMC messages received.

On selected active source (primary or secondary which is active), even if ESMC transmit is not enabled, a DNU ESMC will be sent out if network-option is 1, and DUS ESMC will be sent out if network-option is 2. This is applicable only for Ethernet interface type sources. This is done to avoid the source looping, as per the standard requirement.

Setting the synchronization source priority

To set the synchronization source priority, use the following command:

```
set chassis synchronization source (external-a | external-b | interfaces interface-name) priority number
```

Setting the

To set the synchronization source wait to restore time, use the following command:

**synchronization source
wait to restore time**

```
set chassis synchronization source interfaces interface-name wait-to-restore
minutes
```

A wait-to-restore time can be configured for each port. When a port's signal transitions out of the signal fail state it must be fault free for the wait-to-restore time before it is again considered by the selection process.

The range is from **0** through **12** minutes.

The default time is 5 minutes.

**Setting the
synchronization source
lockout**

To set the synchronization source lockout, use the following command:

```
set chassis synchronization source (external-a | external-b | interfaces
interface-name) request lockout
```

Lockout may be configured for any source. When configured, that source will not be considered by the selection process.

**Setting the forced
switch**

To set the forced switch, use the following command:

```
set chassis synchronization source (external-a | external-b | interfaces
interface-name) request force-switch
```

Forces a switch to the source provided the source is enabled and not locked out. Only one configured source may be force-switched.

**Setting the MIC level
framing mode for the
10-Gigabit Ethernet
MIC with XFP**

To configure the LAN framing mode on the 10-Gigabit Ethernet MIC with XFP, use the following command:

```
set chassis fpc fpc-slot pic pic-slot framing <lan>
```

Operation in LAN framing mode on the 10-Gigabit Ethernet MIC with XFP also requires interface framing mode configuration of the MIC interface.

**Setting the interface
framing mode for the
10-Gigabit Ethernet
MIC with XFP**

To configure the interface framing mode on the 10-Gigabit Ethernet MIC with XFP, use the following command:

```
set interfaces xe-fpc/pic/port framing-mode <lan-phy | wan-phy>
```

Operation in LAN framing mode on the 10-Gigabit Ethernet MIC with XFP also requires MIC level framing mode configuration.

To verify the configuration, see ["Example: Configuring Synchronous Ethernet on MX Series Routers" on page 193](#).

**Related
Documentation**

- [Clock Sources for PTX Series Packet Transport Routers on page 190](#)
- [Example: Configuring Synchronous Ethernet on MX Series Routers on page 193](#)
- [Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC on page 197](#)
- [request chassis synchronization mode](#)
- [show chassis synchronization \(MX Series Routers\) on page 1260](#)

- [synchronization \(MX Series\) on page 411](#)
- [Synchronous Ethernet Overview on page 25](#)

Clock Sources for PTX Series Packet Transport Routers

System clocking on PTX Series Packet Transport Routers is controlled by a Centralized Clock Generator (CCG). The CCG is capable of deriving a master clock from a valid source and synchronizing all interfaces on the chassis to this master clock. The CCG plugs into the rear of the chassis. A pair of CCGs installed in the chassis provide a redundant fallback option.

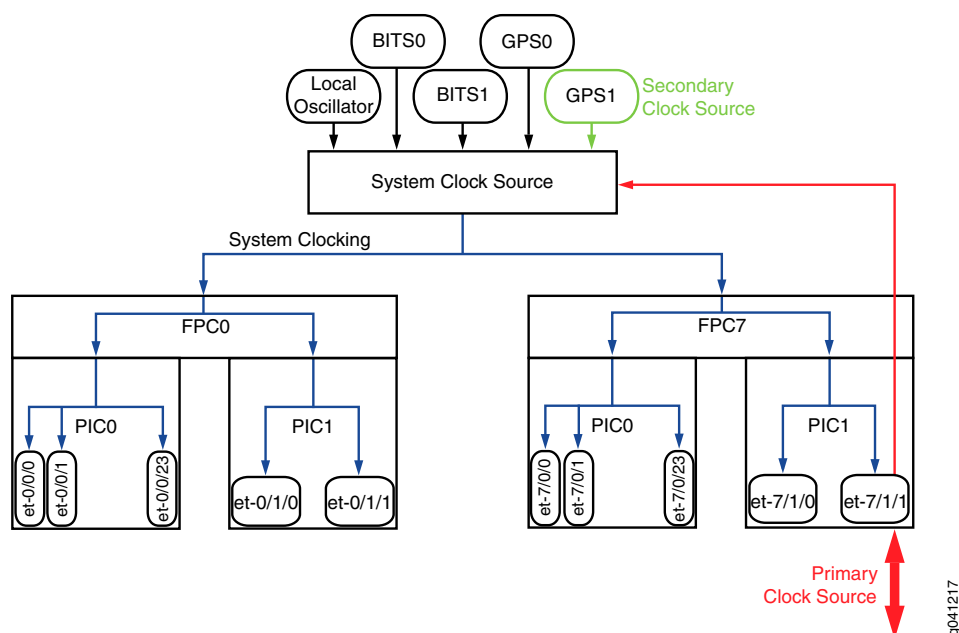
PTX Series Packet Transport Routers can use an internal clock source or it can extract clocking from an external source.

Clock sources and specifications include:

- The PTX Series Packet Transport Router clock is a Stratum 3E-compliant clock with Free Run +/- 4.6 ppm/20 years, Holdover +/- 0.01 ppm/24 hours, and Drift +/- 0.001 ppm/24 hours.
- The internal clock is based on Freerun OCXO with +/- 10 ppb accuracy.
- External clocking includes a choice of GPS-based clock recovery (5 MHz and 10 MHz) or BITS-T1/E1 Line synchronization (1.544 MHz and 2.048 MHz)
- Synchronous Ethernet is supported based on the ITU G.8261 and G.8262 specifications with line timing from the 10-Gigabit Ethernet, 40-Gigabit Ethernet, or 100-Gigabit Ethernet interface.

Synchronous Ethernet is a key requirement for circuit (emulation) services and mobile radio access technologies. Synchronous Ethernet supports sourcing and transfer of frequency for synchronization purposes for both wireless and wireline services and is primarily used for mobile backhaul and converged transport.

Figure 3: Clocking Example for PTX Series Packet Transport Routers



g041217

In this example, the primary clock source is configured as interface **et-7/1/1** and the secondary clock source is configured as **gps1**.

Related Documentation

- [Configuring an External Clock Synchronization Interface for PTX Series Packet Transport Routers on page 191](#)
- *recovered-clock*
- [synchronization on page 409](#)

Configuring an External Clock Synchronization Interface for PTX Series Packet Transport Routers

The PTX Series Packet Transport Routers support an external synchronization interface that can be configured to synchronize the internal Stratum 3 clock to an external source, and then synchronize the chassis interface clock to that source.

This feature can be configured for external primary and secondary interfaces that use building-integrated timing system (BITS), SDH Equipment Timing Source (SETS) timing sources, or an equivalent quality timing source. On the Physical Interface Cards (PICs), the transmit clock of the interface is synchronized to BITS/SETS timing and is traceable to timing within the network.

The PTX Series Packet Transport Routers include a Centralized Clock Generator (CCG) that is used to generate systemwide interface timing signals. The CCG:

- Provides a synchronous Ethernet clock source to the chassis.

- Accepts a BITS clock from CCG bulkhead to use as the basis for the Stratum clock source.
- Accepts an RX recovered clock from an FPC to use as input for the Stratum clock source.

The sources can be BITS, GPS, freerunning, or RX recovered line timing.

To configure a recovered clock for an FPC, include the **recovered-clock** statement at the **[edit chassis fpc slot-number pic pic-number]** hierarchy level:

```
[edit chassis fpc slot-number pic pic-number]
recovered-clock {
  port port-number;
}
```

To configure external synchronization on the router, include the **synchronization** statement at the **[edit chassis]** hierarchy level:

```
[edit chassis]
synchronization {
  signal-type (t1 | e1);
  switching--mode (revertive | non-revertive);
  transmitter-enable;
  primary (external-a | external-b | fpc-slot-number | gps-0-10mhz | gps-0-5mhz |
    gps-1-10mhz | gps-1-5mhz | bits-a | bits-b);
  secondary (external-a | external-b | fpc-slot-number | gps-0-10mhz | gps-0-5mhz |
    gps-1-10mhz | gps-1-5mhz | bits-a | bits-b);
}
```

Use the **synchronization** statement options to specify a primary and secondary timing source. To do this, configure the following options:

- For the PTX Series Packet Transport Routers, specify a signal type mode for interfaces, either **t1** or **e1**.
- Specify the switching mode as **revertive** if a lower-priority synchronization can be switched to a valid, higher-priority synchronization.
- Specify the primary external timing source by using the **primary (fpc-slot-number | gps-0-10mhz | gps-0-5mhz | gps-1-10mhz | gps-1-5mhz | bits-a | bits-b)** statement.
- Specify the secondary external timing source by using the **secondary (fpc-slot-number | gps-0-10mhz | gps-0-5mhz | gps-1-10mhz | gps-1-5mhz | bits-a | bits-b)** statement.

For the PTX 5000 Packet Transport Router, the supported clock sources are:

- **fpc-0**, **fpc-1**, **fpc-2**, **fpc-3**, **fpc-4**, **fpc-5**, **fpc-6**, or **fpc-7**.
- **gps-0-10mhz**, **gps-0-5mhz**, **gps-1-10mhz**, or **gps-1-5mhz**.
- **bits-a** or **bits-b**

**Related
Documentation**

- [Clock Sources for PTX Series Packet Transport Routers on page 190](#)
- *recovered-clock*

- [synchronization on page 409](#)

Example: Configuring Synchronous Ethernet on MX Series Routers

- [Requirements on page 193](#)
- [Overview on page 193](#)
- [Configuration on page 193](#)
- [Verification on page 195](#)

Requirements

This example uses the following hardware and software components:

- One MX80-T, MX5-T, MX10-T, MX40-T, MX80, MX240, MX480, or MX960 router
- Junos OS Release 10.4 or later for MX80 3D Universal Edge Routers and 11.2R4 or later for MX80-T, MX5, MX10, MX40, MX240, MX480, and MX960 routers.

Overview

You can configure Synchronous Ethernet on MX5-T, MX10-T, MX40-T, MX80, MX80-T, MX240, MX480, and MX960 routers, which enables you to synchronize clocks between nodes in a network through frequency synchronization.



NOTE: You can set the values for each parameter according to your requirement. The values given in this example are for illustration purposes only.

Configuration

- [\[xref target has no title\]](#)

CLI Quick Configuration

To quickly configure synchronization on the aforementioned routers, copy the following commands, paste them in a text file, remove any line breaks, and then copy and paste the commands into the CLI.

[edit]

```
set chassis synchronization clock-mode auto-select
set chassis synchronization network-type option-1
set chassis synchronization quality-mode-enable
set chassis synchronization selection-mode configured-quality
set chassis synchronization switchover-mode revertive
set chassis synchronization hold-interval configuration-change 1 restart 1 switchover 1
set chassis synchronization esmc-transmit interfaces ge-2/0/0
set chassis synchronization source external-a priority 2 quality-level prc request
force-switch
```

```
set chassis synchronization interfaces ge-2/0/0 priority 1 quality-level prc request
force-switch wait-to-restore 1
```

Step-by-Step Procedure The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

For step-by-step configuration, see [“Configuring Clock Synchronization Interface for MX Series Routers” on page 185](#).

To configure Synchronous Ethernet, perform the following tasks:

1. Configure the clock mode, network type, quality mode, selection mode, and switchover mode.

```
[edit chassis synchronization]
user@host# set clock-mode auto-select network-type option-1 quality-mode-enable
selection-mode configured-quality switchover-mode revertive
```
2. Configure the hold interval for configuration change, restart interval, and the switchover interval in seconds.

```
[edit chassis synchronization]
user@host# set hold-interval configuration-change 1 restart 1 switchover 1
```
3. Configure the interfaces for transmitting ESMC.

```
[edit chassis synchronization]
user@host# set esmc-transmit interfaces ge-2/0/0
```
4. Configure the source node with its quality level, priority, and request type.

```
[edit chassis synchronization]
user@host# set source external-a priority 2 quality-level prc request force-switch
```
5. Configure the interfaces with priority, quality level, request type, and time to restore the interface to default.

```
[edit chassis synchronization]
user@host# set interfaces ge-2/0/0 priority 1 quality-level prc request force-switch
wait-to-restore 1
```

Results Display the results of the configuration:

```
user@host# show chassis
synchronization {
  clock-mode (auto-select | free-run);
  esmc-transmit {
    interfaces (all | interface-name);
  }
  hold-interval {
    configuration-change seconds;
    restart seconds;
    switchover seconds;
  }
  network-type (option-1 | option-2);
  quality-mode-enable;
```

```

selection-mode (configured-quality|received-quality);
switchover-mode (revertive | non-revertive);
source {
  (external-a | external-b) {
    priority number;
    quality-level (prc | prs | sec | smc | ssu-a | ssu-b | st2 | st3 | st3e | st4 | stu | tnc);
    request (force-switch | lockout);
  }
  interfaces interface-name {
    priority number;
    quality-level (prc | prs | sec | smc | ssu-a | ssu-b | st2 | st3 | st3e | st4 | stu | tnc);
    request (force-switch | lockout);
    wait-to-restore minutes;
  }
}
}

```

Verification

Confirm that the configuration is working properly.

- [Verifying the Basic Parameters for Synchronization on page 195](#)
- [Verifying All the Parameters for Synchronization on page 195](#)
- [Verifying the Global Configuration on page 196](#)
- [Verifying the ESMC Transmit Parameters on page 196](#)
- [Verifying the ESMC Statistics Parameters on page 196](#)
- [Verifying That the ESMC Statistics Are Cleared on page 196](#)

Verifying the Basic Parameters for Synchronization

Purpose	Verify that the basic synchronization parameters such as the current clock status, clock locked to, and configured sources are working as expected.
Action	From operational mode, enter the run show chassis synchronization command to display the synchronization details.
Meaning	The output displays the basic synchronization parameters configured on the interface.

Verifying All the Parameters for Synchronization

Purpose	Verify that all the synchronization parameters are working as expected.
Action	From operational mode, enter the run show chassis synchronization extensive command to display all the synchronization details.
Meaning	The output displays all the synchronization parameters configured on the interface.

Verifying the Global Configuration

- Purpose** Verify that all the global configuration parameters are working as expected.
- Action** From operational mode, enter the **run show synchronous-ethernet global-information** command to display the set parameters for the global configuration.
- Meaning** The output displays global information about the configured node.

Verifying the ESMC Transmit Parameters

- Purpose** Verify that the transmission parameters of ESMC on the interface are working as expected.
- Action** From operational mode, enter the **run show synchronous-ethernet esmc transmit detail** command to display the set parameters for the ESMC transmission.
- Meaning** The output displays all the transmission details about the configured ESMC interface.

Verifying the ESMC Statistics Parameters

- Purpose** Verify the statistics related to ESMC on the interface.
- Action** From operational mode, enter the **run show synchronous-ethernet esmc statistics** command to display the statistics for the ESMC transmission.
- Meaning** The output displays information about the ESMC statistics.

Verifying That the ESMC Statistics Are Cleared

- Purpose** Clear the statistics related to ESMC on the interface.
- Action** From operational mode, enter the **clear synchronous-ethernet esmc statistics** command to clear the statistics for the ESMC transmission.
- Meaning** The output displays the message that the ESMC statistics have been cleared.

- Related Documentation**
- [Clock Sources for PTX Series Packet Transport Routers on page 190](#)
 - [Configuring Clock Synchronization Interface for MX Series Routers on page 185](#)
 - [Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC on page 197](#)
 - *request chassis synchronization mode*
 - [show chassis synchronization \(MX Series Routers\) on page 1260](#)
 - [synchronization \(MX Series\) on page 411](#)
 - [Synchronous Ethernet Overview on page 25](#)

Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC

- [Requirements on page 197](#)
- [Overview on page 197](#)
- [Configuration on page 198](#)

Requirements

This example uses the following hardware and software components:

- Junos OS Release 11.4 or later for MX80-T, MX240, MX480, or MX960 routers
- One MX80-T, MX240, MX480, and MX960 router with 10-Gigabit Ethernet MIC with XFP

Overview

You can set the framing mode at the PIC level and at the interface level with various configuration combinations. For more information about the various configuration combinations, see [“Synchronous Ethernet on 10-Gigabit Ethernet MIC Overview” on page 28](#).

This example provides information about configuring framing mode at the interface level and the PIC level for Synchronous Ethernet on the 10-Gigabit Ethernet MIC with XFP.

The 10-Gigabit Ethernet MIC with XFP supports Synchronous Ethernet in LAN-PHY framing mode. This is possible only when all the logical PICs under the given Modular Interface Card (MIC) and its ingress interfaces are configured in LAN framing mode.

You can also alternatively configure a MIC in WAN-PHY framing mode on MX80, MX240, MX480, and MX960 routers by configuring all the constituent logical PICs in the same WAN-PHY framing mode in any one of the following configurations:

- No framing mode configured on all the constituent logical PICs of the MIC.
- Incompatible framing mode configured on constituent logical PICs of the MIC.
- No framing mode configured on some of the constituent logical PICs of the MIC.



NOTE: By default, the PIC-level framing mode is set to WAN framing type, that is `e1 | e3 | sdh | sonet | t1 | t3`. Synchronous Ethernet works on 10-Gigabit Ethernet MIC with XFP in LAN-PHY mode only when the PIC level framing configuration is configured to `lan` framing type explicitly.

By default, the interface-level framing mode is set to `lan-phy`. For WAN-PHY operation, interface framing needs to be set to `wan-phy` framing explicitly.



NOTE: You can set the values for each parameter according to your requirement. The values given in this example are for illustration purposes only.

Configuration

CLI Quick Configuration To quickly configure PIC-level framing and interface-level framing on the 10-Gigabit Ethernet MIC with XFP, copy the following commands and paste it into the CLI.

[edit]

```
set chassis fpc 2 pic 0 framing lan
set chassis fpc 2 pic 1 framing lan
set interfaces xe-2/1/0 framing-mode lan-phy
```

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

For step-by-step configuration of Synchronous Ethernet, see [“Configuring Clock Synchronization Interface for MX Series Routers” on page 185](#).

Step-by-Step Procedure To configure PIC-level framing on the 10-Gigabit Ethernet MIC with XFP, perform the following tasks:

1. In configuration mode, go to the **[edit chassis]** hierarchy level.

```
[edit]
user@host# edit chassis
```

2. Configure the FPC slot and the first PIC slot.

```
[edit chassis]
user@host# edit fpc 2 pic 0
```

3. Configure the framing type as LAN on the first PIC slot.

```
[edit chassis fpc2 pic 0]
user@host# set framing lan
```

4. Configure the FPC slot and the second PIC slot.

```
[edit chassis]
user@host# edit fpc 2 pic 1
```

5. Configure the framing type as LAN on the second PIC slot.

```
[edit chassis fpc2 pic 0]
user@host# set framing lan
```

Step-by-Step Procedure To configure interface-level framing on the 10-Gigabit Ethernet MIC with XFP, perform the following tasks:

1. In configuration mode, go to the **[edit interfaces]** hierarchy level and set the interface as **xe-2/1/0**.

```
[edit]
user@host# edit interfaces xe-2/1/0
```

2. Configure the interface in LAN-PHY framing mode.

```
[edit interfaces xe-2/1/0]
user@host# set framing-mode lan-phy
```

Results

Display the results of the configuration at the PIC level:

```
[edit]
user@host# show
chassis {
  fpc 2 {
    pic 0 {
      framing lan;
    }
  }
  fpc 2 {
    pic 1 {
      framing lan;
    }
  }
}
```

Display the results of the configuration at the interface level:

```
[edit]
user@host# show
interfaces xe-2/1/0 {
  framing-mode lan-phy;
}
```

Related Documentation

- [Clock Sources for PTX Series Packet Transport Routers on page 190](#)
- [Configuring Clock Synchronization Interface for MX Series Routers on page 185](#)
- [*request chassis synchronization mode*](#)
- [show chassis synchronization \(MX Series Routers\) on page 1260](#)
- [Synchronous Ethernet Overview on page 25](#)
- [Synchronous Ethernet on 10-Gigabit Ethernet MIC Overview on page 28](#)
- [synchronization \(MX Series\) on page 411](#)

CHAPTER 18

Configuring Chassis Setting to Support Precision Time Protocol

- [Configuring Precision Time Protocol on page 201](#)
- [Example: Configuring Precision Time Protocol on page 205](#)

Configuring Precision Time Protocol

You can configure the master clock and the slave clock for Precision Time Protocol (PTP) to help synchronize clocks in a distributed system. This time synchronization is achieved through packets that are transmitted and received in a session between the master clock and the slave clock.

- [Configuring Precision Time Protocol and its Options on page 201](#)

Configuring Precision Time Protocol and its Options

This topic includes the following tasks:

1. [Configuring PTP Options on page 201](#)
2. [Configuring Slave Clock Options on page 202](#)
3. [Configuring Master Clock Options on page 203](#)

Configuring PTP Options

To configure PTP options:

1. In configuration mode, go to the **[edit protocols ptp]** hierarchy level:

```
[edit]  
user@host# edit protocols ptp
```

2. Configure the clock mode as either boundary or ordinary. This attribute is mandatory and has no default value.

The **boundary** option signifies that the clock can be both a master clock and a slave clock. The **ordinary** option signifies that the clock is either a master clock or a slave clock.

```
[edit protocols ptp]  
user@host# set clock-mode (boundary | ordinary)
```

3. Configure the PTP domain option with values from 0 through 127. The default value is 0.

```
[edit protocols ptp]
user@host# set domain domain-value
```

4. Configure the **priority1** option with values from 0 through 254. The default value is 128.

The **priority1** value determines the best master clock. The *priority1-value* is also advertised in the master clock's announce message to other slaves.

```
[edit protocols ptp]
user@host# set priority1 priority1-value
```

5. Configure the **priority2** option with values from 0 through 255. The default value is 128.

The **priority2** value differentiates and prioritizes the master clock to avoid confusion when *priority1-value* is the same for different master clocks in a network.

```
[edit protocols ptp]
user@host# set priority2 priority2-value
```

6. Configure the **unicast-negotiation** option to enable unicast negotiation.

Unicast negotiation is a method by which the announce, sync, and delay response packet rates are negotiated between the master clock and the slave clock before a PTP session is established.

```
[edit protocols ptp]
user@host# set unicast-negotiation
```



NOTE: Unicast negotiation, when enabled, does not allow you to commit any packet rate–related configuration.

Configuring Slave Clock Options

Configure the following options after the aforementioned PTP options have been set.

1. Configure the slave clock.

```
[edit protocols ptp]
user@host# edit slave
```

2. Configure the **announce-timeout** option in the slave node with values from 2 through 10. The default value is 3.

The announce timeout value signifies the number of times an announce interval message has to pass through the slave without receiving the announce message—that is, the timeout period for announce messages.

```
[edit protocols ptp slave]
user@host# set announce-timeout announce-timeout-value
```

3. Configure the **delay-request** option in the slave node with values from –6 through 6. The default value is –4.

The delay request value is the logarithmic mean interval in seconds between the delay request messages sent by the slave to the master.

```
[edit protocols ptp slave]
user@host# set delay-request delay-request-value
```

4. Configure the **frequency-only** option to enable only frequency synchronization in the slave.

```
[edit protocols ptp slave]
user@host# set frequency-only
```



NOTE: This option is configured only when PTP is used for frequency synchronization and not for phase synchronization. Also, note that this option can only be set for an ordinary clock acting as slave.

5. Configure the interface for the slave.

```
[edit protocols ptp slave]
user@host# edit interface interface-name
```

6. Configure the **unicast-mode** option for the slave. You can set this option when PTP unicast mode of messaging is needed.

```
[edit protocols ptp slave interface interface-name]
user@host# edit unicast-mode
```

7. Configure the **transport** option in unicast mode as IPv4.

The encapsulation type for PTP packet transport is IPv4.

```
[edit protocols ptp slave interface interface-name unicast-mode]
user@host# set transport ipv4
```

8. Configure the IP address of the master.

```
[edit protocols ptp slave interface interface-name unicast-mode]
user@host# edit clock-source ip-address
```

9. Configure the IP address of the interface acting as the local PTP slave port.

```
[edit protocols ptp slave interface interface-name unicast-mode clock-source ip-address]
user@host# set local-ip-address local-ip-address
```



NOTE: You must configure this IP address at the [edit interfaces *interface-name*] hierarchy level.

Configuring Master Clock Options

Configure the following options after the aforementioned PTP options and slave clock options have been set.

1. Configure the master clock.

```
[edit protocols ptp]
user@host# edit master
```

2. Configure the **announce interval** option for the master with values from 0 through 4. The default value is 1.

The announce interval is the logarithmic mean interval between announce messages that is sent by the master. By default, one announce message is sent in every two seconds.

```
[edit protocols ptp master]
user@host# set announce-interval announce-interval-value
```

3. Configure the **clock step** option as either one-step or two-step for the master. The default value is one-step.

The clock step determines whether the timing information is sent along with the sync message only (one-step) or a subsequent follow-up message (two-step) is sent corresponding to the previous sync message.

```
[edit protocols ptp master]
user@host# set clock-step (one-step | two-step)
```

4. Configure the **sync interval** option for the master clock with values from -6 through 6. The default value is -6.

The sync interval is the logarithmic mean interval between synchronous messages that is sent by the master. By default, 64 synchronous interval messages are sent per second.

```
[edit protocols ptp master]
user@host# set sync-interval sync-interval-value
```

5. Configure the interface for the master.

```
[edit protocols ptp master]
user@host# edit interface interface-name
```

6. Configure the unicast mode option for the master. You can set this option when PTP unicast mode of messaging is needed.

```
[edit protocols ptp master interface interface-name]
user@host# edit unicast-mode
```

7. Configure the **transport** option in unicast mode as IPv4.

The encapsulation type for PTP packet transport is IPv4.

```
[edit protocols ptp master interface interface-name unicast-mode]
user@host# set transport ipv4
```

8. Configure the IP address for the slave.

```
[edit protocols ptp master interface interface-name unicast-mode]
user@host# edit clock-client ip-address
```

9. Configure the IP address of the interface acting as the local PTP master port.

```
[edit protocols ptp master interface interface-name unicast-mode clock-client
ip-address]
user@host# set local-ip-address local-ip-address
```

- Related Documentation**
- [\[edit protocols ptp\] Hierarchy Level on page 318](#)
 - [Precision Time Protocol Overview on page 38](#)
 - [Example: Configuring Precision Time Protocol on page 205](#)

Example: Configuring Precision Time Protocol

- [Requirements for PTP Configuration on page 205](#)
- [Overview on page 205](#)
- [Configuration on page 205](#)
- [Verification on page 207](#)

Requirements for PTP Configuration

This example uses the following hardware and software components:

- One MX80, MX240, MX480, or MX960 router
- Junos OS Release 12.2 or later

Overview

This example shows the configuration of Precision Time Protocol (PTP) on all Ethernet Modular Interface Cards (MICs) on the enhanced Module Port Concentrator (MPCE) MX-MPC2E-3D-P on MX240, MX480, and MX960 routers and on the MX80 3D Universal Edge Routers with precision timing support (MX80-P).

PTP synchronizes clocks between nodes in a network, thereby enabling the distribution of an accurate clock over a packet switched network. This synchronization is achieved through packets that are transmitted and received in a session between the master clock and the slave clock. PTP also supports boundary clock.



NOTE: You can set the values for each parameter according to your requirement. The values given in this example are for illustration purposes only.

Configuration

CLI Quick Configuration

To quickly configure PTP on an interface, copy the following commands, paste them in a text file, remove any line breaks, and then copy and paste the commands into the CLI.

[edit]

```
set protocols ptp clock-mode boundary priority1 1 priority2 2 domain 0 unicast-negotiation
set protocols ptp slave announce-timeout 2 delay-request -4 frequency-only
set protocols ptp slave interface ge-1/2/3.0 unicast-mode transport ipv4
set protocols ptp slave interface ge-1/2/3.0 unicast-mode clock-source 2.2.2.2
local-ip-address 3.3.3.3
```

```
set protocols ptp master announce-interval 0 clock-step one-step sync-interval 0
set protocols ptp master interface ge-1/2/0.3 unicast-mode transport ipv4
set protocols ptp master interface ge-1/2/0.3 unicast-mode clock-client 10.10.1.1
local-ip-address 100.1.1.1
```

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

For step-by-step configuration, see [“Configuring Precision Time Protocol” on page 201](#).

To configure PTP, perform the following tasks:

1. Configure the clock mode, priorities, domain, and unicast negotiation options for PTP.

```
[edit protocols ptp]
user@host# set clock-mode boundary priority1 1 priority2 2 domain 0
unicast-negotiation
```

2. Configure the announce timeout, delay request, interface IP address, and encapsulation type for the slave.

```
[edit protocols ptp slave]
user@host# set announce-timeout 2 delay-request 0 interface ge-1/2/3.0 unicast-mode
transport ipv4
```

3. Configure the **clock master** option and the **local-ip-address** option for the slave node.

```
[edit protocols ptp slave interface ge-1/2/3.0 unicast-mode]
user@host# set clock-source 2.2.2.2 local-ip-address 3.3.3.3
```

4. Configure the announce interval, clock step, synchronous interval, interface IP address, and encapsulation type for the master.

```
[edit protocols ptp master]
user@host# set announce-interval 0 clock-step one-step sync-interval 0 interface
ge-1/2/3.0 unicast-mode transport ipv4
```

5. Configure the clock client for the master.

```
[edit protocols ptp master interface ge-1/2/3.0 unicast-mode]
user@host# set clock-client 10.10.1.1 local-ip-address 100.1.1.1
```

Results Display the results of the configuration:

```
[edit protocols ptp]
user@host# show
{
  clock-mode boundary;
  domain 0;
  priority1 1;
  priority2 2;
  unicast-negotiation;
  slave {
    announce-timeout 2;
    delay-request 0
    frequency-only;
    interface ge-1/2/3.0 {
```

```

    unicast-mode {
        transport ipv4;
        clock-source 2.2.2.2 {
            local-ip-address 3.3.3.3;
        }
    }
}
master {
    announce-interval 0;
    clock-step one-step;
    sync-interval 0;
    interface ge-1/2/3.0 {
        unicast-mode {
            transport ipv4;
            clock-client 3.3.3.3 {
                local-ip-address 1.0.1.0;
            }
        }
    }
}
}

```

Verification

Confirm that the configuration is working properly.

- [Verifying the PTP Clock Details on page 207](#)
- [Verifying the Lock Status of the Slave on page 207](#)
- [Verifying the PTP Options on the Slave on page 208](#)
- [Verifying the PTP Options and the Current Status of the Master on page 208](#)
- [Verifying the Number and Status of the PTP Ports on page 208](#)

Verifying the PTP Clock Details

Purpose	Verify that the PTP clock is working as expected.
Action	In operational mode, enter the run show ptp clock command to display the clock details.
Meaning	The output displays the clock details, which include the parameters configured on the node. For more information about the run show ptp clock operational command, see <i>show ptp clock</i> in the <i>Junos OS Operational Mode Commands</i> .

Verifying the Lock Status of the Slave

Purpose	Verify that the slave clock is aligned to the master clock by checking the lock status of the slave.
Action	In operational mode, enter the run show ptp lock-status command to display the lock status of the slave.

Meaning The output displays information about the lock status of the slave. The output shows whether the slave is aligned to the master clock or not. For more information about the **run show ptp lock-status** operational command, see *show ptp lock-status* in the *Junos OS Operational Mode Commands*.

Verifying the PTP Options on the Slave

Purpose Verify the PTP options that are set on the slave and its current status.

Action In operational mode, enter the **run show ptp slave** command to display the configured slave.

Meaning The output displays information about the configured slave and the status of the slave. For more information about the **run show ptp slave** operational command, see *show ptp slave* in the *Junos OS Operational Mode Commands*.

Verifying the PTP Options and the Current Status of the Master

Purpose Verify the PTP options that are set for the master and its current status.

Action In operational mode, enter the **run show ptp master** command to display the configured options for the master.

Meaning The output displays information about the configured master and the current status of the master. For more information about the **run show ptp master** operational command, see *show ptp master* in the *Junos OS Operational Mode Commands*.

Verifying the Number and Status of the PTP Ports

Purpose Verify the number of PTP ports and their current status.

Action In operational mode, enter the **run show ptp port** command to display the configured ports.

Meaning The output displays information about the number of ports created according to the configuration and their current status. For each unique local IP address, one PTP port is created. For more information about the **run show ptp port** operational command, see *show ptp port* in the *Junos OS Operational Mode Commands*.

Related Documentation

- [\[edit protocols ptp\] Hierarchy Level on page 318](#)
- [Configuring Precision Time Protocol on page 201](#)
- [Precision Time Protocol Overview on page 38](#)

Configuring Chassis Setting to Support Hybrid Mode

- [Configuring Hybrid Mode and ESMC Quality Level Mapping on page 209](#)
- [Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 212](#)

Configuring Hybrid Mode and ESMC Quality Level Mapping

You can configure hybrid mode (that is, the combined operation of Synchronous Ethernet and Precision Time Protocol (PTP)) on MX240, MX480, and MX960 3D Universal Edge Routers and on MX80 3D Universal Edge Routers with precision timing support (MX80-P) and with timing support (MX80-T). On the MX240, MX480, and MX960 routers, the combined operation is possible only when the PTP client and the Synchronous Ethernet source are on the same enhanced Modular Port Concentrator (MPC) and are traceable to the same master. When acting as a PTP slave, an MX80-P or MX80-T router can accept any external Synchronous Ethernet clock as reference. Note that when the selected Synchronous Ethernet reference fails, the router continues to work in PTP mode.

In hybrid mode, the synchronous Ethernet equipment clock (EEC) on the MPC derives the frequency from Synchronous Ethernet and the phase and time of day from PTP.

The hybrid mode is configured on the slave. On the slave, one or more interfaces are configured as Synchronous Ethernet source interfaces.

The ESMC quality level value is mapped to the clock class value either by mapping the PTP clock class to the ESMC quality level or by configuring a user-defined mapping of PTP clock class to ESMC quality level. For more information, see [“Understanding ESMC Quality Level Mapping” on page 34](#). The following procedures explain configuring hybrid mode with either of the modes in detail.

- [Configuring the Router in Hybrid Mode on page 210](#)
- [Configuring Hybrid Mode with Mapping of the PTP Clock Class to the ESMC Quality Level on page 210](#)
- [Configuring Hybrid Mode with a User-Defined Mapping of the PTP Clock Class to the ESMC Quality Level on page 211](#)

Configuring the Router in Hybrid Mode

To configure the router in hybrid mode, you must:

1. Configure Synchronous Ethernet options at the **[edit chassis synchronization]** hierarchy level:
 - Configure the **auto-select** mode of operation. You can select the clock source either from a free-run local oscillator or from an external qualified clock.

When the router is configured with the **auto-select** option, the router chooses up to two best upstream clock sources. It then uses the clock recovered from one of the sources to lock the chassis clock. If an upstream clock with acceptable quality is not available or if the router is configured in free-run mode, the router uses the internal oscillator.
 - Configure the **esmc-transmit** and **network-option** options at the **[edit chassis synchronization]** hierarchy level.
 - Configure one or more interfaces at the **[edit chassis synchronization]** hierarchy level as Synchronous Ethernet sources as needed.
2. Configure PTP options at the **[edit protocols ptp]** hierarchy level.
3. Configure hybrid mode options at the **[edit protocols ptp slave]** hierarchy level.

Configuring Hybrid Mode with Mapping of the PTP Clock Class to the ESMC Quality Level

To configure hybrid mode options with mapping of the PTP clock class to the ESMC quality level, perform the following steps:

1. In configuration mode, go to the **[edit protocols ptp slave]** hierarchy level:

```
[edit]
user@host# edit protocols ptp slave
```
2. Configure the **convert-clock-class-to-quality-level** option to set the default mapping between the ESMC SSM quality level and the PTP clock class.

```
[edit protocols ptp slave]
user@host# set convert-clock-class-to-quality-level
```
3. Configure the hybrid mode option on the slave.

```
[edit protocols ptp slave]
user@host# edit hybrid
```
4. Configure the Synchronous Ethernet mapping option in hybrid mode.

```
[edit protocols ptp slave hybrid]
user@host# edit synchronous-ethernet-mapping
```
5. Configure the IP address of the clock source.

```
[edit protocols ptp slave hybrid synchronous-ethernet-mapping]
user@host# edit clock-source ip-address
```
6. Configure one or more Synchronous Ethernet source interfaces for the slave as needed.

```
[edit protocols ptp slave hybrid synchronous-ethernet-mapping clock-source ip-address]
user@host# set interface interface1-name
user@host# set interface interface2-name
```



NOTE: You must first configure these interfaces at the [edit chassis synchronization] hierarchy level as Synchronous Ethernet sources. For information about configuring these interfaces, see [synchronization \(MX Series\)](#).

Configuring Hybrid Mode with a User-Defined Mapping of the PTP Clock Class to the ESMC Quality Level

To configure hybrid mode options with a user-defined mapping of the PTP clock class to the ESMC quality level, perform the following steps:

1. In configuration mode, go to the [edit protocols ptp slave] hierarchy level:

```
[edit]
user@host# edit protocols ptp slave
```

2. To override the default mapping option, perform the following steps:

- a. Configure the **clock-class-to-quality-level-mapping** option with one of the quality level values. The quality level values are prc, prs, sec, smc, ssu-a, ssu-b, st2, st3, st3e, st4, stu, and tnc.

```
[edit protocols ptp slave]
user@host# edit clock-class-to-quality-level-mapping quality-level prc | prs | sec
| smc | ssu-a | ssu-b | st2 | st3 | st3e | st4 | stu | tnc
```

- b. Configure the **clock-class** option for the set quality level. The clock class value ranges from 80 through 109.

```
[edit protocols ptp slave clock-class-to-quality-level-mapping quality-level
quality-level-value]
user@host# set clock-class clock-class
```

3. Configure the hybrid mode option on the slave.

```
[edit protocols ptp slave]
user@host# edit hybrid
```

4. Configure the Synchronous Ethernet mapping option in hybrid mode.

```
[edit protocols ptp slave hybrid]
user@host# edit synchronous-ethernet-mapping
```

5. Configure the IP address of the clock source.

```
[edit protocols ptp slave hybrid synchronous-ethernet-mapping]
user@host# edit clock-source ip-address
```

6. Configure one or more Synchronous Ethernet source interfaces for the slave as needed.

```
[edit protocols ptp slave hybrid synchronous-ethernet-mapping clock-source ip-address]
user@host# set interface interface1-name
user@host# set interface interface2-name
```



NOTE: You must first configure these interfaces at the [edit chassis synchronization] hierarchy level as Synchronous Ethernet sources. For information about configuring these interfaces, see [synchronization \(MX Series\)](#).

For information about verifying the aforementioned procedure, see “[Example: Configuring Hybrid Mode and ESMC Quality Level Mapping](#)” on page 212.

Related Documentation

- [Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 212](#)
- [Understanding Hybrid Mode on page 39](#)
- [Precision Time Protocol Overview on page 38](#)
- [Synchronous Ethernet Overview on page 25](#)

Example: Configuring Hybrid Mode and ESMC Quality Level Mapping

This example shows the configuration of hybrid mode by mapping the PTP clock class to the ESMC quality level and also by configuring a user-defined mapping of the PTP clock class to the ESMC quality level on MX240 3D Universal Edge Routers.

- [Requirements for Hybrid Mode Configuration on page 212](#)
- [Overview on page 212](#)
- [Configuration on page 213](#)
- [Verification on page 216](#)

Requirements for Hybrid Mode Configuration

This example uses the following hardware and software components:

- One MX240 router.
- Junos OS Release 12.2R2 or later.

Overview

The combined operation of Synchronous Ethernet and Precision Time Protocol (PTP) is also known as hybrid mode. In hybrid mode, the synchronous Ethernet equipment clock (EEC) on the Modular Port Concentrator (MPC) derives the frequency from Synchronous Ethernet and the phase and time of day from PTP.

You can configure hybrid mode on MX240, MX480, and MX960 3D Universal Edge Routers and on MX80 3D Universal Edge Routers with precision timing support (MX80-P) and with timing support (MX80-T). On the MX240, MX480, and MX960 routers, the combined operation is possible only when the PTP slave and the Synchronous Ethernet source are on the same enhanced MPC and are traceable to the same master. When acting as a PTP slave, an MX80-P or MX80-T router can accept any external Synchronous Ethernet

clock as reference. Note that when the selected Synchronous Ethernet reference fails, the router continues to work in PTP mode.

Hybrid mode is configured on the slave. On the slave, one or more interfaces are configured as Synchronous Ethernet source interfaces.



NOTE: You can set the values for each parameter according to your requirement. The values given in this example are for illustration purposes only.

The ESMC quality level value is mapped to the clock class value either by mapping the PTP clock class to the ESMC quality level or by configuring a user-defined mapping of the PTP clock class to the ESMC quality level. For more information, see [“Understanding ESMC Quality Level Mapping” on page 34](#). The following examples explain configuring hybrid mode with either of the modes in detail.

To configure the router in hybrid mode, you must:

1. Configure Synchronous Ethernet options at the **[edit chassis synchronization]** hierarchy level:
 - Configure the **auto-select** mode of operation. You can select the clock source either from a free-run local oscillator or from an external qualified clock.

When the router is configured with the **auto-select** option, the router chooses up to two best upstream clock sources. It then uses the clock recovered from one of the sources to lock the chassis clock. If an upstream clock with acceptable quality is not available or if the router is configured in free-run mode, the router uses the internal oscillator.

 - Configure the **esmc-transmit** and **network-option** options at the **[edit chassis synchronization]** hierarchy level.
 - Configure one or more interfaces at the **[edit chassis synchronization]** hierarchy level as Synchronous Ethernet sources as needed.
2. Configure PTP options at the **[edit protocols ptp]** hierarchy level.
3. Configure hybrid mode options at the **[edit protocols ptp slave]** hierarchy level.

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode*. For step-by-step configuration of hybrid mode, see [“Configuring Hybrid Mode and ESMC Quality Level Mapping” on page 209](#).

Configuration

- [Hybrid Mode with Mapping of the PTP Clock Class to the ESMC Quality Level on page 214](#)
- [Hybrid Mode with a User-Defined Mapping of the PTP Clock Class to the ESMC Quality Level on page 215](#)

Hybrid Mode with Mapping of the PTP Clock Class to the ESMC Quality Level

CLI Quick Configuration	<p>To quickly configure hybrid mode on the ge-1/2/3.0 interface with the clock source IP address as 2.2.2.2, copy the following commands, paste them in a text file, remove any line breaks, and then copy and paste the commands into the CLI.</p> <pre>[edit] set protocols ptp slave hybrid set protocols ptp slave hybrid synchronous-ethernet-mapping set protocols ptp slave hybrid synchronous-ethernet-mapping clock-source 2.2.2.2 interface ge-1/2/3.0 set protocols ptp slave convert-clock-class-to-quality-level</pre>
Step-by-Step Procedure	<p>To configure hybrid mode on an MX240 router with mapping of the PTP clock class to the ESMC quality level, perform the following steps:</p> <ol style="list-style-type: none">1. Configure the convert-clock-class-to-quality-level option on the slave at the [edit protocols ptp slave] hierarchy level. <pre>[edit protocols ptp slave] user@host# set convert-clock-class-to-quality-level</pre>2. Configure hybrid mode on the slave. <pre>[edit protocols ptp slave] user@host# edit hybrid</pre>3. Configure the Synchronous Ethernet mapping option, IP address of the master clock as 2.2.2.2, and the interface ge-1/2/3.0 for hybrid mode on the slave. <pre>[edit protocols ptp slave hybrid] user@host# set synchronous-ethernet-mapping clock-source 2.2.2.2 interface ge-1/2/3.0</pre>
Results	<p>Display the results of the configuration of hybrid mode with the mapping of the PTP clock class to the ESMC quality level:</p> <pre>[edit protocols ptp slave] user@host# show convert-clock-class-to-quality-level hybrid { synchronous-ethernet-mapping { clock-source 2.2.2.2 { interface ge-1/2/3.0; } } }</pre>

Hybrid Mode with a User-Defined Mapping of the PTP Clock Class to the ESMC Quality Level

CLI Quick Configuration	<p>To quickly configure hybrid mode on the interface ge-1/2/3.0, copy the following commands, paste them in a text file, remove any line breaks, and then copy and paste the commands into the CLI.</p> <pre>[edit] set protocols ptp slave hybrid set protocols ptp slave hybrid synchronous-ethernet-mapping set protocols ptp slave hybrid synchronous-ethernet-mapping clock-source 2.2.2.2 interface ge-1/2/3.0 set protocols ptp slave clock-class-to-quality-level-mapping quality-level prc clock-class 80</pre>
Step-by-Step Procedure	<p>To configure hybrid mode with a user-defined mapping of the PTP clock class to the ESMC quality level on an MX240 router, perform the following steps:</p> <ol style="list-style-type: none"> 1. Configure the quality-level option for the clock-class-to-quality-level-mapping statement on the slave at the [edit protocols ptp slave] hierarchy level and then configure the clock-class option for the set quality level if you want to manually override the mapping of the ESMC quality level to the clock class. <pre>[edit protocols ptp slave] user@host# set clock-class-to-quality-level-mapping quality-level prc clock-class 80</pre> 2. Configure hybrid mode on the slave. <pre>[edit protocols ptp slave] user@host# edit hybrid</pre> 3. Configure the Synchronous Ethernet mapping option, IP address of the master clock as 2.2.2.2, and the interface ge-1/2/3.0 for hybrid mode on the slave. <pre>[edit protocols ptp slave hybrid] user@host# set synchronous-ethernet-mapping clock-source 2.2.2.2 interface ge-1/2/3.0</pre>
Results	<p>Display the results of the configuration of hybrid mode with a user-defined mapping of the PTP clock class to the ESMC quality level:</p> <pre>[edit protocols ptp slave] user@host# show clock-class-to-quality-level-mapping { quality-level prc { clock-class 80; } } hybrid { synchronous-ethernet-mapping { clock-source 2.2.2.2 { interface ge-1/2/3.0; } } }</pre>

```
    }  
  }  
}
```

Verification

- [Verifying That the Router Is Operating in Hybrid Mode on page 216](#)
- [Verifying the Quality Level Change on the Transmit Side on page 216](#)
- [Verifying Global Information Parameters After Mapping of the PTP Clock Class to the ESMC Quality Level in Hybrid Mode on page 216](#)
- [Verifying Global Information Parameters After Configuring User-Defined Mapping of the PTP Clock Class to the ESMC Quality Level in Hybrid Mode on page 217](#)

Verifying That the Router Is Operating in Hybrid Mode

Purpose	Verify the current mode of operation of the slave.
Action	<p>In operational mode, enter the run show ptp hybrid command to display the current configuration and current mode of operation of the slave.</p> <p>In operational mode, enter the run show ptp hybrid config command to display the PTP source to Synchronous Ethernet interface mappings.</p> <p>In operational mode, enter the run show ptp hybrid status command to display the current hybrid mode operational status.</p>
Meaning	The output displays the current configuration and current mode of operation of the slave. For information about the run show ptp hybrid operational command, see <i>show ptp hybrid</i> .

Verifying the Quality Level Change on the Transmit Side

Purpose	Verify the quality level change on the transmit side of the router.
Action	In operational mode, enter the run show synchronous-ethernet esmc transmit detail command to display the ESMC transmit interface details.
Meaning	The output displays the ESMC SSM quality level transmitted out of various Ethernet interfaces. For information about the run show synchronous-ethernet esmc transmit detail operational command, see <i>show synchronous-ethernet esmc transmit</i> .

Verifying Global Information Parameters After Mapping of the PTP Clock Class to the ESMC Quality Level in Hybrid Mode

Purpose	Verify the global information parameters after mapping of the PTP clock class to the ESMC quality level in hybrid mode by enabling the convert-clock-class-to-quality-level option.
----------------	--

Action In operational mode, enter the **run show ptp global-information** command to display the following output:

```
user@host> run show ptp global-information
PTP Global Configuration:
Domain number          : 0
Transport Encapsulation : IPv4
Clock mode             : Ordinary
Priority Level1         : 128
Priority Level2         : 128
Unicast Negotiation     : Disabled
ESMC QL From Clock Class: Enabled
Clock Class/ESMC QL    : 84 / (QL SSU-A/SSM 0x4)
Slave Parameters:
  Sync Interval         : -
  Delay Request Interval: -6 (64 packets per second)
  Announce Interval     : -
  Announce Timeout      : 3
Master Parameters:
  Sync Interval         : -6 (64 packets per second)
  Delay Request Interval: -
  Announce Interval     : 1 (1 packet every 2 seconds)
  Clock Step            : one-step
Number of Slaves        : 1
Number of Masters       : 0
```

In operational mode, enter the **run show ptp quality-level-mapping** command to display the following output:

```
user@host> run show ptp quality-level-mapping
quality level      ptp clock class
PRC                84
SSU-A              92
SSU-B              96
SEC                104
```

Meaning The output for **run show ptp global-information** displays the parameters set in Synchronous Ethernet mode and the parameters set for the master and the slave.

The output of **run show ptp quality-level-mapping** displays the default mapping of the clock class to the ESMC quality level.

Verifying Global Information Parameters After Configuring User-Defined Mapping of the PTP Clock Class to the ESMC Quality Level in Hybrid Mode

Purpose Verify the global information parameters after configuring a user-defined mapping of the PTP clock class to the ESMC quality level in hybrid mode by disabling the **convert-clock-class-to-quality-level** option.

Action In operational mode, enter the **run show ptp global-information** command to display the following output:

```
user@host> run show ptp global-information
PTP Global Configuration:
Domain number          : 0
Transport Encapsulation : IPv4
Clock mode             : Ordinary
Priority Level1         : 128
```

```
Priority Level2          : 128
Unicast Negotiation      : Disabled
ESMC QL From Clock Class: Disabled
Clock Class/ESMC QL     : -
Slave Parameters:
  Sync Interval          : -
  Delay Request Interval: -6 (64 packets per second)
  Announce Interval      : -
  Announce Timeout       : 3
Master Parameters:
  Sync Interval          : -6 (64 packets per second)
  Delay Request Interval: -
  Announce Interval      : 1 (1 packet every 2 seconds)
  Clock Step             : one-step
```

Meaning The output displays the parameters set in Synchronous Ethernet mode and the parameters set for the master and the slave.

Related Documentation

- [Configuring Hybrid Mode and ESMC Quality Level Mapping on page 209](#)
- [Understanding Hybrid Mode on page 39](#)
- [Precision Time Protocol Overview on page 38](#)
- [Synchronous Ethernet Overview on page 25](#)

Configuring Chassis Settings to Support ATM Devices

- [Configuring the Junos OS to Enable ATM2 Intelligent Queuing Layer 2 Circuit Transport Mode on page 219](#)
- [Configuring the Junos OS to Enable Idle Cell Format and Payload Patterns for ATM Devices on page 220](#)

Configuring the Junos OS to Enable ATM2 Intelligent Queuing Layer 2 Circuit Transport Mode

On ATM2 IQ PICs only, you can configure Layer 2 circuit cell relay, Layer 2 circuit ATM Adaptation Layer 5 (AAL5), or Layer 2 circuit trunk mode.

Layer 2 circuit cell relay and Layer 2 circuit AAL5 are defined in the Internet draft [draft-martini-l2circuit-encap-mpls-04.txt](#), *Encapsulation Methods for Transport of Layer 2 Frames Over IP and MPLS Networks*.

Layer 2 circuit trunk mode allows you to send ATM cells over Multiprotocol Label Switching (MPLS) trunking.

The four transport modes are defined as follows:

- To tunnel IP packets over an ATM backbone, use the default standard AAL5 transport mode.
- To tunnel a stream of AAL5-encoded ATM segmentation-and-reassembly protocol data units (SAR-PDUs) over an MPLS or IP backbone, use Layer 2 circuit AAL5 transport mode.
- To tunnel a stream of ATM cells over an MPLS or IP backbone, use Layer 2 circuit cell-relay transport mode.
- To transport ATM cells over an MPLS core network that is implemented on some other vendor switches, use Layer 2 circuit trunk mode.



NOTE: You can transport AAL5-encoded traffic with Layer 2 circuit cell-relay transport mode, because Layer 2 circuit cell-relay transport mode ignores the encoding of the cell data presented to the ingress interface.

When you configure AAL5 mode Layer 2 circuits, the control word carries cell loss priority (CLP) information by default.

By default, ATM2 IQ PICs are in standard AAL5 transport mode. Standard AAL5 allows multiple applications to tunnel the protocol data units of their Layer 2 protocols over an ATM virtual circuit. To configure the Layer 2 circuit transport modes, include the **atm-l2circuit-mode** statement at the **[edit chassis fpc slot-number pic pic-number]** hierarchy level:

```
[edit chassis fpc slot-number pic pic-number]
  atm-l2circuit-mode (cell | aal5 | trunk trunk);
```

On a TX Matrix or TX Matrix Plus router, include the **atm-l2circuit-mode** statement at the **[edit chassis lcc number fpc slot-number pic pic-number]** hierarchy level:

```
[edit chassis lcc number fpc slot-number pic pic-number]
  atm-l2circuit-mode (cell | aal5 | trunk trunk);
```

aal5 tunnels a stream of AAL5-encoded ATM cells over an IP backbone.

cell tunnels a stream of ATM cells over an IP backbone.

trunk transports ATM cells over an MPLS core network that is implemented on some other vendor switches. Trunk mode can be user-to-network interface (UNI) or network-to-network interface (NNI).



NOTE: To determine which vendors support Layer 2 circuit trunk mode, contact Juniper Networks customer support.

**Related
Documentation**

- [Configuring the Junos OS to Support ILMI for Cell Relay Encapsulation on an ATM2 IQ PIC on page 156](#)
- [Configuring the Junos OS to Enable Idle Cell Format and Payload Patterns for ATM Devices on page 220](#)
- [Configuring the Junos OS to Use ATM Cell-Relay Accumulation Mode on an ATM1 PIC on page 151](#)

Configuring the Junos OS to Enable Idle Cell Format and Payload Patterns for ATM Devices

ATM devices send idle cells to enable the receiving ATM interface to recognize the start of each new cell. The receiving ATM device does not act on the contents of idle cells and does not pass them up to the ATM layer in the ATM protocol stack.

By default, the idle cell format for ATM cells is (4 bytes): 0x00000000. For ATM 2 PICs and ATM MICs, you can configure the format of the idle cell header and payload bytes.

To configure the idle cell header to use the International Telecommunications Union (ITU-T) standard of 0x00000001, include the **itu-t** statement at the **[edit chassis fpc slot-number pic number idle-cell-format]** hierarchy level:

```
[edit chassis fpc slot-number pic pic-number idle-cell-format]
itu-t;
```

On a TX Matrix or TX Matrix Plus router, include the `itu-t` statement at the `[edit chassis lcc number fpc slot-number pic pic-number idle-cell-format]` hierarchy level:

```
[edit chassis lcc number fpc slot-number pic pic-number idle-cell-format]
itu-t;
```

By default, the payload pattern is cell payload (48 bytes). To configure the idle cell payload pattern, include the `payload-pattern` statement at the `[edit chassis fpc slot-number pic pic-number idle-cell-format]` hierarchy level:

```
[edit chassis fpc slot-number pic pic-number idle-cell-format]
payload-pattern payload-pattern-byte;
```

On a TX Matrix router, include the `payload-pattern` statement at the `[edit chassis lcc number fpc slot-number pic pic-number idle-cell-format]` hierarchy level:

```
[edit chassis lcc number fpc slot-number pic pic-number idle-cell-format]
payload-pattern payload-pattern-byte;
```

The payload pattern byte can range from `0x00` through `0xff`.

For information about the TX Matrix router, see “[TX Matrix Router and T640 Router Configuration Overview](#)” on page 47. For information about the TX Matrix Plus router, see “[TX Matrix Plus Router Configuration Overview](#)” on page 52.

Related Documentation

- [Configuring the Junos OS to Use ATM Cell-Relay Accumulation Mode on an ATM1 PIC on page 151](#)
- [Configuring the Junos OS to Enable ATM2 Intelligent Queuing Layer 2 Circuit Transport Mode on page 219](#)
- [Configuring the Junos OS to Support ILMI for Cell Relay Encapsulation on an ATM2 IQ PIC on page 156](#)
- [Configuring Layer 2 Circuit Transport Mode on ATM MICs](#)
- [Example: Configuring Layer 2 Circuit Transport Mode on ATM MICs](#)

CHAPTER 21

Configuring Chassis Settings for Routing Engines and Packet Forwarding Engines

- [Configuring the Junos OS to Support Redundancy on Routers Having Multiple Routing Engines or Switching Boards on page 223](#)
- [Signaling Neighboring Routers of Fabric Down on T640 and T1600 Routers on page 224](#)
- [Traffic Black Hole Caused by Fabric Degradation on page 225](#)
- [Detection and Recovery of Fabric-Related Failures Caused by Traffic Black Holes on MX Series Routers on page 226](#)
- [Corrective Actions for Fabric Failures on MX Series Routers on page 229](#)
- [Detection and Corrective Actions of FPCs with Degraded Fabric on MX Series Routers on page 232](#)
- [Disabling FPC Restart on page 234](#)
- [Disabling an FPC with Degraded Fabric Bandwidth on page 234](#)
- [Configuring Redundancy Fabric Mode for Active Control Boards on MX Series Routers on page 235](#)
- [Configuring the Junos OS to Allocate More Memory for Routing Tables, Firewall Filters, and Layer 3 VPN Labels on page 236](#)
- [Configuring the Junos OS to Enable a Routing Engine to Reboot on Hard Disk Errors on page 238](#)
- [Associating Sampling Instances for Active Flow Monitoring with a Specific FPC, MPC, or DPC on page 239](#)
- [Configuring a Policer Overhead on page 239](#)
- [Configuring Sanity Polling for FPCs on T Series Routers on page 240](#)
- [Configuring Slow Packet Forwarding Engine Alarm on page 242](#)

Configuring the Junos OS to Support Redundancy on Routers Having Multiple Routing Engines or Switching Boards

For routers that have multiple Routing Engines or these multiple switching control boards: Switching and Forwarding Modules (SFMs), System and Switch Boards (SSBs), Forwarding Engine Boards (FEBs), or Compact Forwarding Engine Boards (CFEBs), you can configure redundancy properties.

To configure redundancy, include the following redundancy statements at the **[edit chassis]** hierarchy level:

```
redundancy {
  cfeb slot (always | preferred);
  failover {
    on-disk-failure
    on-loss-of-keepalives;
  }
  feb {
    redundancy-group group-name {
      feb slot-number (backup | primary);
      description description;
      no-auto-failover;
    }
  }
  graceful-switchover;
  keepalive-time seconds;
  routing-engine slot-number (master | backup | disabled);
  sfm slot-number (always | preferred);
  ssb slot-number (always | preferred);
}
```

**Related
Documentation**

- *Understanding Routing Engine Redundancy on Juniper Networks Routers*

Signaling Neighboring Routers of Fabric Down on T640 and T1600 Routers

In JUNOS OS Release 10.4 and later, T640 and T1600 routers signal neighboring routers if they are unable to carry traffic due to all fabric planes being taken offline for one of the following reasons:

- CLI or button press initiated offline state.
- Automatically taken offline by the SPMB due to high temperature.
- PIO errors or voltage errors detected by the SPMB CPU to the SIBs.

The following scenarios are not supported:

- All PFEs get destination errors on all planes to all destinations, even with the Switch Interface Boards (SIBs) staying online.
- Complete fabric loss caused by destination timeouts, with the SIBs still online.

When chassisd detects all fabric planes are down, the router reboots all the FPCs in the system. When the FPCs come back up, the interfaces will not be created again, since all the fabric planes are down.

Once the user diagnoses and fixes the cause of all fabric planes going down, the user must then online the SIBs. The SIB online process brings up the interfaces.

Fabric down signaling to neighboring routers offers the following benefits:

- FPCs reboot when the control plane connection to the RE times out.

- Extends a simple approach to reboot FPCs when the dataplane blacks out.

When the router transitions from a state where SIBs are online or spare to a state where there are no SIBs in online state, then all the FPCs in the system are rebooted.

An ERRMSG indicates if all fabric planes are down and the FPCs will be rebooted if any fabric planes do not come up in 2 minutes.

An ERRMSG indicates the reason for FPC reboot on fabric connectivity loss.

The chassisd daemon traces when an FPC comes online, but PIC attach is not done due to no fabric plane present.

A warning is issued in the CLI when the last fabric plane is taken offline, that FPCs will reboot. You will need to online the SIBs after fixing the cause of the SIBs not being online. When the first SIB goes online, and link training with the FPCs completes, the interfaces will be created.

Fabric down signaling to neighboring routers functionality is available by default, and no user configuration required to enable it.

No CLI commands or alarms are required for this feature. Alarms indicate an SIBs offline system state to the user.

**Related
Documentation**

- *Chassis-Level Feature Guide*

Traffic Black Hole Caused by Fabric Degradation

A traffic black hole occurs when packets are dropped by a device without notification. Other connected devices continue to forward traffic to the affected device, impacting the network performance. A severely degraded fabric plane can be one of the reasons for a traffic black hole.

Devices can limit the black-hole time by detecting unreachable destination Packet Forwarding Engines and signaling connected devices when they cannot carry traffic because of a severely degraded fabric.

Packet Forwarding Engine destinations can become unreachable for the following reasons:

- The fabric Switch Interface Boards (SIBs) go offline as a result of a CLI command or a pressed physical button.
- The fabric SIBs are turned offline by the Switch Processor Mezzanine Board (SPMB) because of high temperature.
- Voltage or polled I/O errors in the SIBs detected by the SPMB.
- On T640 and T1600 routers:
 - All Packet Forwarding Engines receive destination errors on all planes from remote Packet Forwarding Engines, even when the SIBs are online

- Complete fabric loss caused by destination timeouts, even when the SIBs are online.
- On PTX Series routers:
 - Link errors on all connected planes
 - Two Packet Forwarding Engines can reach the fabric but not each other
 - Link errors where two Packet Forwarding Engines have connectivity with the fabric but not through a common plane

When the system detects any unreachable Packet Forwarding Engine destinations, healing from a traffic black hole is attempted. If the healing fails, the system turns off the interfaces, thereby stopping the traffic black hole.

The recovery process consists of the following phases:

1. On T640 and T1600 routers: Fabric plane restart phase: Healing is attempted by restarting the fabric planes one by one. This phase does not start if the fabric plane is functioning properly and a single Flexible PIC Concentrator (FPC) is bad.

On PTX Series routers: SIB restart phase: Healing is attempted by restarting the SIBs one by one. This phase does not start if the SIBs are functioning properly and a single Flexible PIC Concentrator (FPC) is bad.

2. On T640 and T1600 routers: Fabric plane and FPC restart phase: Healing is attempted by restarting both the fabric planes and the FPCs. If there are bad FPCs that are unable to initiate high-speed links to the fabric after reboot, creation of traffic black hole is limited because no interfaces are created for these FPCs.

On PTX Series routers: SIB and FPC restart phase: Healing is attempted by restarting both the SIBs and the FPCs. If there are bad FPCs that are unable to initiate high-speed links to the fabric after reboot, creation of traffic black hole is limited because no interfaces are created for these FPCs.

3. FPC offline phase: Traffic black hole is limited by turning the FPCs offline and by turning off interfaces because previous attempts at recovery have failed.

By default, the system limits black-hole time by detecting severely degraded fabric. No user interaction is necessary.

**Related
Documentation**

- [Disabling FPC Restart on page 234](#)
- [Router Chassis Configuration Statements on page 313](#)
- *degraded*

Detection and Recovery of Fabric-Related Failures Caused by Traffic Black Holes on MX Series Routers

A traffic black hole occurs when a router is unable to transmit data packets to other neighboring routers, although the interfaces on that router continue to be in the active state. As a result, the other neighboring routers continue to forward traffic to the impacted router, which drops the arriving packets without sending a notification to the other routers.

When a Packet Forwarding Engine in a router is unable to send traffic to other Packet Forwarding Engines over the data plane within the same router, the router is unable to transmit any packets to a neighboring router, although the interfaces are advertised as active on the control plane. Fabric failure can be one of the reasons for traffic black holes.

The following fabric failure scenarios can occur:

- Removal of the control board
- High-speed link 2 (HSL2) training failures
- Single link failure on an Flexible PIC Concentrator (FPC)
- Multiple link failures on the same FPC or the same fabric plane
- Multiple link failures randomly on an FPC or a fabric plane
- Intermittent cyclic redundancy check (CRC) errors
- A total traffic black hole for only one destination and not to other destinations

When an FPC does not forward traffic due to a certain reason to other FPCs within the device, the control protocol on the Routing Engine is unable to detect this condition. The traffic transmission is not diverted to the functional, active FPCs and, instead, the packets are continued to be sent to the affected FPC and are dropped at that point. The following might be the causes for an FPC being unable to forward traffic:

- All the planes in the system are in the **Offline** or **Fault** state.
- All the Packet Forwarding Engines on the DPC might have disabled the fabric streams due to destination errors.

If all the Switch Control Boards (SCBs) lose connectivity to the DPCs, then all the interfaces are brought down. If a Packet Forwarding Engine of a DPC loses complete connectivity to or from the fabric, then that DPC is brought down.

System hardware failures can be of the following types:

- A single occurrence or a rare failure for a brief period (such as environmental spikes). This failure is effectively healed without manual intervention by restarting the fabric plane and restarting the FPCs and the fabric plane, if necessary.
- Repeated failures that occur frequently.
- A permanent failure.

A recovery from any case of reduced throughput, such as multiple Packet Forwarding Engine destination timeouts on multiple planes is not attempted. Recovery from traffic black hole is attempted only when all the planes are in the **Offline** or **Fault** state or when the destinations are unreachable on all active planes.

If a black hole occurs because of a single bad FPC, which is either a common source or common destination of the destination timeout, if you the configured the **action-fpc-restart-disable** statement at the **[edit chassis fabric degraded]** hierarchy level, no recovery action is taken. The **show chassis fabric reachability** command output can

be used to verify the status of the fabric and the FPC. An alarm is triggered to indicate that the particular FPC is causing a traffic black hole.

Fabric-Failure Detection Methods on MX Series Routers

The chassis daemon (chassisd) process detects the removal of a control board. The removal of the control board causes all the active planes that reside on that board to be disabled and a switchover is performed. If the active Routing Engine is also unplugged along with the control board, the detection of the control board removal is delayed until the switchover of the Routing Engine occurs and the reconnection in the primary, backup Routing Engine pair occurs. If the control board is turned offline by specifying the **request chassis cb slot slot-number offline** or a pressed physical button to cause a graceful shutdown, a fabric failure does not occur, even if the control board is moved to the offline state.

If active fabric planes are removed because of removal of the control board on the master RE, the DPC takes the local action of disabling removed planes. If spare planes are available, DPC initiates switchover to spare planes. If an active control board on a backup RE is removed, the master RE performs the switchover. The software attempts to optimize the duration of traffic black hole by disabling all removed planes. The spare planes are transitioned to the online state one by one.

Fabric self-ping is a mechanism to detect any issues in the fabric data path. Each Packet Forwarding Engine forwards fabric data cells that are destined to itself over all active fabric planes. To transmit the data cell, the Packet Forwarding Engine fabric sends the request cells over an active plane and waits for a grant packet. The destination Packet Forwarding Engine sends a grant packet over the same plane on which the request cell is received. When the grant cell is received, the source Packet Forwarding Engine sends the data cell.

The Packet Forwarding Engine fabric contains the capability to detect grant delays. If grants are not received within a certain period of time, a destination timeout is declared. Destination timeout on a certain plane by a Packet Forwarding Engine on two or more FPCs is considered as an indication for plane failures. Even if one Packet Forwarding Engine on an FPC flashes an error, the FPC is considered to be in error. Destination timeouts are noticed when the Packet Forwarding Engine sends traffic actively because requests are sent only for valid data cells. The software takes an appropriate action based on the destination timeout. For self-ping, a data cell is destined to the source Packet Forwarding Engine only.

Fabric ping failure messages are sent to the fabric manager on the Routing Engine, which collates all of the errors reported by all the Dense Port Concentrators (DPCs) and takes a corrective action. For example, a ping failure for all links of the same DPC might indicate a problem on the DPC. Ping failure for multiple DPCs for the same fabric plane might denote a problem with the fabric.

If the Routing Engine determines that a fabric plane is down, based on the information on errors it receives from the DPCs or the Packet Forwarding Engines, over a period of 5 seconds, it indicates a fabric failure. The duration of 5 seconds is the period for which the Routing Engine collates the errors from all of the DPCs.

Fabric self-ping packets are periodically sent to check the sanity of the fabric links. Self pings are sent at interval of 500 ms. The destination timeout is also checked in intervals of 500 ms. If two timeouts occur successively, self ping failure is detected. When a destination timeout is received, the Packet Forwarding Engine fabric stops the sending of packets to the fabric. To examine the link condition again, the software resets the credits to ensure that new requests are sent again. When a self-ping failure occurs, the DPC removes the affected plane from sending data to all destinations. This method ensures that self-ping is not attempted to be sent again on the defective plane.

The following guidelines apply to the self-ping capability:

- By default, self pings are not sent on spare fabric planes because spare planes do not carry traffic.
- The size of self-ping packets is large enough to enable the cells to be loaded over all the active fabric planes (maximum of 8 for MX Series routers).
- A detection of received self-ping packets is not performed.
- High priority queue is used to enable self-ping to be sent for oversubscription cases.

**Related
Documentation**

- [Detection and Corrective Actions of FPCs with Degraded Fabric on MX Series Routers on page 232](#)
- [Corrective Actions for Fabric Failures on MX Series Routers on page 229](#)
- [redundancy-mode on page 396](#)
- [show chassis fabric redundancy-mode on page 926](#)
- [Configuring Redundancy Fabric Mode for Active Control Boards on MX Series Routers on page 235](#)

Corrective Actions for Fabric Failures on MX Series Routers

This topic contains the following sections that describe different fabric failure scenarios, the detection methods used, and the corrective actions for the faults:

- [Traffic Black Hole Healing on page 229](#)
- [FPCs with Degraded Fabric on page 231](#)
- [Complete Black Hole Towards a Single Destination Only on page 231](#)
- [Redundancy Fabric Mode on Active Control Boards on page 231](#)

Traffic Black Hole Healing

Packet Forwarding Engine destinations can become unreachable for the following reasons:

- The control boards go offline as a result of a CLI command or a pressed physical button.
- The fabric control boards are turned offline because of high temperature.
- Voltage or polled I/O errors in the SIBs detected by the SPMB.

- All Packet Forwarding Engines receive destination errors on all planes from remote Packet Forwarding Engines, even when the SIBs are online.
- Complete fabric loss caused by destination timeouts, even when the SIBs are online.

When the system detects any unreachable Packet Forwarding Engine destinations, healing from a traffic black hole is attempted. If the healing fails, the system turns off the interfaces, thereby stopping the traffic black hole.

The recovery process consists of the following phases:

1. Fabric plane restart phase: Healing is attempted by restarting the fabric planes one by one. This phase does not start if the fabric plane is functioning properly and a single Flexible PIC Concentrator (FPC) is bad. An error message is generated to specify that a black hole is the reason for the fabric plane being turned offline. This phase is performed for fabric plane errors only.
2. Fabric plane and FPC restart phase: The system waits for the first phase to be completed before examining the system state again. If the black hole condition still persists after the first phase is performed or if the problem occurs again within a duration of 10 minutes, healing is attempted by restarting both the fabric planes and the FPCs. If you have configured the **action-fpc-restart-disable** statement at the **[edit chassis fabric degraded]** hierarchy level to disable restart of the FPCs when a recovery is attempted, an alarm is triggered to indicate that a traffic black hole has occurred. In this second phase, three steps are taken:
 1. All the FPCs that have destination errors on a PFE are turned offline
 2. The fabric planes are turned offline and brought back online, one by one, starting with the spare plane.
 3. The FPCs that were turned offline are brought back online.
3. FPC offline phase: The system waits for the second phase to be completed before examining the system state again. Traffic black hole is limited by turning the FPCs offline and by turning off interfaces because previous attempts at recovery have failed. If the problem is not resolved by restarting the FPCs or if the problem recurs within 10 minutes after restarting the FPCs, this phase is performed.

The three phases are controlled by timers. During these phases, if an event (such as offlining/onlining FPCs or fabric planes) times out, then the phase skips that event and proceeds to the next event. The timer control has a timeout value of 10 minutes. If the first fabric error occurs in a system with two or more FPCs, the fabric planes are restarted. If another fabric error occurs within the next 10 minutes, the fabric planes and FPCs are restarted. However, if the second fabric error occurs outside of the timeout period of 10 minutes, then the first phase is performed, which is the restart of only the fabric planes.

In cases where all the destination timeouts are traced to a bad FPC, for example, one source FPC or one destination FPC, only that FPC is turned offline and online. The fabric planes are not turned offline and online. If another fabric fault occurs within the period of 10 minutes, the FPC is turned offline.

By default, the system limits black-hole time by detecting severely degraded fabric. No user interaction is necessary.

FPCs with Degraded Fabric

You can configure an FPC with degraded fabric to be moved to the offline state. On an MX960, MX480, or MX240 router, you can configure link errors or bad fabric planes. This configuration is particularly useful in partial black hole scenarios where bringing the FPC offline results in faster re-routing. To configure this option on an FPC, use the **offline-on-fabric-bandwidth-reduction** statement at the **[edit chassis fpc slot-number]** hierarchy level. For more information, see [“Detection and Corrective Actions of FPCs with Degraded Fabric on MX Series Routers” on page 232.](#)

Complete Black Hole Towards a Single Destination Only

In certain deployments, an FPC indicates a complete black hole towards a single destination only, but it functions properly for other destinations. Such cases are identified and the affected FPC is recovered. Consider a sample scenario in which the active planes are 0,1,2,3 and the spare planes are 4,5,6,7 in the connection between FPC 0 and FPC1. If FPC 0 has single link failures for planes 0 and 1 and if FPC 1 has single link failures for planes 2 and 3, a complete black hole occurs between the two FPCs. Both FPC 0 and FPC 1 undergo a phased mode of recovery and fabric healing takes place.

Redundancy Fabric Mode on Active Control Boards

You can configure the active control board to be in redundancy mode or in increased fabric bandwidth mode. To configure redundancy mode for the active control board, use the **redundancy-mode redundant** statement at the **[edit chassis fabric]** hierarchy level. In redundancy mode, all the FPCs use 4 fabric planes as active planes, regardless of the type of the FPC. You can enable increased fabric bandwidth of active control boards for optimal and efficient performance and traffic handling. On an MX960, MX480, or MX240 router, you can use the **redundancy-mode increased-bandwidth** statement at the **[edit chassis fabric]** hierarchy level to enable increased fabric bandwidth mode for the active control board to cause all the available fabric planes to be used. In this mode, the maximum number of available fabric planes are used for MX routers with Trio chips and the MPC3E. On MX960 routers with active control boards, 6 active planes are used, and on MX240 and MX480 routers with active control boards, 8 active planes are used.

Increased fabric bandwidth mode is enabled by default on MX routers with Switch Control Board (SCB). On MX routers that contain the enhanced SCB with Trio chips and the MPC3E, redundancy mode is enabled by default. For more information, see [“Configuring Redundancy Fabric Mode for Active Control Boards on MX Series Routers” on page 235.](#)

Related Documentation

- [Detection and Corrective Actions of FPCs with Degraded Fabric on MX Series Routers on page 232](#)
- [Detection and Recovery of Fabric-Related Failures Caused by Traffic Black Holes on MX Series Routers on page 226](#)
- [redundancy-mode on page 396](#)
- [show chassis fabric redundancy-mode on page 926](#)

- [Configuring Redundancy Fabric Mode for Active Control Boards on MX Series Routers on page 235](#)

Detection and Corrective Actions of FPCs with Degraded Fabric on MX Series Routers

You can configure an FPC with degraded fabric to be moved to the offline state on an MX960, MX480, or MX240 router. Configuring this feature does not affect the system. You can configure this feature without restarting the FPC or restarting the system.

The following scenarios can occur when you configure the feature to disable FPCs with degraded fabric:

- If an FPC has degraded fabric bandwidth and if you configure this capability to turn off such an FPC after it has been operating with degraded fabric for some time, the corrective action is still taken.
- If an FPC has been brought offline because of fabric errors and this functionality to move the FPC to offline state is disabled, the FPC is transitioned to the online state automatically.
- If an FPC has been brought offline because of fabric errors and this functionality to move the FPC to offline state is disabled or configured for some other FPC, the FPC that was turned offline is transitioned to the online state automatically.
- All the FPCs that were brought offline because of degraded fabric, when you configured this setting, are brought back online when you commit any configuration under the **[edit chassis]** hierarchy level. Similarly, a restart of the chassis daemon or the Graceful Routing Engine switchover (GRES) operation also causes the FPC that is disabled because of degraded fabric to be moved to the online state.

Degraded fabric indicates that an FPC is operating with less than the required number of active fabric planes. If an FPC is operating with less than four planes, it is considered to be degraded. This rule applies to all types of FPCs and fabric. Degraded condition denotes that good fabric traffic exists at a reduced bandwidth.

The following conditions can result in degradation of fabric:

- The fabric control boards go offline as a result of an unintentional, abrupt power shutdown.
- An application-specific integrated circuit (ASIC) error, which causes a plane of a control board to be automatically turned offline.
- Manually bringing the fabric plane or the control board to the offline state.
- Removal of the control board
- Self-ping failure on any plane.
- HSL2 training failure for active plane.

- If a spare fabric plane has CRC errors, and this spare plane is made online, the link with the CRC error is disabled. This mechanism might cause a degradation in fabric in one direction and might cause a traffic black hole in the other direction.
- When a self-ping or HSL2 training failure occurs, the fabric plane is disabled for a particular FPC and it is online for other FPCs. This condition can also cause a traffic black hole.

If you need to remove the control board or move a fabric plane to the offline state during a system maintenance, you must enable the functionality to turn the FPCs with degraded bandwidth to the offline state (by using the **offline-on-fabric-bandwidth-reduction** statement at the **[edit chassis fpc slot-number]** hierarchy level).

The following corrective actions are performed when a traffic black hole or fabric degradation occurs:

- Regardless of whether a spare control board is available or not, self-ping state for each FPC is monitored at intervals of 5 seconds at the Routing Engine. Fabric manager uses the following rule to determine the presence of a spare control board:
 - MX960 routers with I-chip or I-chip and Trio-chip-based FPCs that contain three control boards
 - MX240 or MX480 routers with I-chip or I-chip and Trio-chip-based FPCs that contain two control boards
 - MX960, MX480, or MX240 routers that contain only Trio-based FPCs are not considered to contain a spare control board

If during any such interval of 5 seconds, two FPCs indicate a failure for the same plane, a switchover to the spare control board. In this case, the control board that reported errors is turned offline and the spare control board is turned online.

- If a spare control board is available, and if you configure the functionality to disable FPCs with degraded fabric, self-ping state for each FPC is monitored at intervals of 5 seconds at the Routing Engine. The following conditions can occur:
 - During any 5-second interval, if only one FPC indicates a failure for a plane, the fabric Manager waits for the next interval. During the subsequent interval, if no other FPC indicates a failure for the same plane, switchover of the control board is performed.
 - During any 5-second interval, if multiple FPCs show failures for multiple control boards, the fabric manager waits for the next interval. During the subsequent interval, if the same condition remains, all the failing FPCs are turned offline even if the spare control board is present.
 - During any 5-second interval, if any FPC shows a failure for multiple planes on multiple control boards, the fabric manager waits for the next interval. During the subsequent interval, if the same condition persists, the FPC is turned offline even if the spare control board is present.
- If spare planes are not available, the FPC is turned offline when it displays a failure for a single plane or multiple planes. The FPC is brought offline only if you previously

configured the **offline-on-fabric-bandwidth-reduction** statement at the **[edit chassis fpc slot-number]** hierarchy level.

- Related Documentation**
- [Detection and Recovery of Fabric-Related Failures Caused by Traffic Black Holes on MX Series Routers on page 226](#)
 - [Corrective Actions for Fabric Failures on MX Series Routers on page 229](#)
 - [redundancy-mode on page 396](#)
 - [show chassis fabric redundancy-mode on page 926](#)

Disabling FPC Restart

You can disable FPC restart to limit recovery actions from a degraded fabric condition. On T640 and T1600 routers, only the fabric plane is restarted. On PTX Series routers, only the Switch Interface Boards (SIBs) are restarted. To disable the restarting of FPCs, use the **action-fpc-restart-disable** statement at the **[edit chassis fabric degraded]** hierarchy level:

```
[edit chassis fabric]
degraded {
  action-fpc-restart-disable;
}
```

Whenever FPC restart is disabled, an alarm is raised when there are unreachable destinations present in the router, and you must restart the FPCs manually.

To ensure that both the fabric planes (T640 and T1600 routers) or the SIBs (PTX Series routers) and the FPCs are restarted during the recovery process, do not configure the **action-fpc-restart-disable** statement at the **[edit chassis fabric degraded]** hierarchy level.

- Related Documentation**
- [Traffic Black Hole Caused by Fabric Degradation on page 225](#)
 - [Router Chassis Configuration Statements on page 313](#)

Disabling an FPC with Degraded Fabric Bandwidth

You can bring an FPC with degraded fabric bandwidth offline to avoid causing a traffic black hole in the chassis for an extended time. To configure the option to disable an FPC with degraded bandwidth, use the **offline-on-fabric-bandwidth-reduction** statement at the **[edit chassis fpc slot-number]** hierarchy level:

```
[edit chassis]
fpc slot-number {
  offline-on-fabric-bandwidth-reduction;
}
```

The fabric manager checks the number of current active planes periodically. If the number of active planes is lower than the required number of active planes for a particular router, the system waits 10 seconds before it takes any corrective action. If the reduced bandwidth condition persists for an FPC and if this feature has been configured for the FPC, the system brings the FPC offline.

- Related Documentation**
- [offline-on-fabric-bandwidth-reduction on page 379](#)
 - [Traffic Black Hole Caused by Fabric Degradation on page 225](#)
 - [Router Chassis Configuration Statements on page 313](#)

Configuring Redundancy Fabric Mode for Active Control Boards on MX Series Routers

You can configure the active control board to be in redundancy mode or in increased fabric bandwidth mode. You can enable increased fabric bandwidth of active control boards for optimal and efficient performance and traffic handling by configuring the active control boards to be in redundancy mode. To configure redundancy mode for the active control board, use the **redundancy-mode redundant** statement at the **[edit chassis fabric]** hierarchy level:

```
[edit chassis fabric]
redundancy-mode {
  redundant;
}
```

When you configure this option, all the FPCs use 4 fabric planes as active planes, regardless of the type of the FPC. If you do not configure this option, increased fabric bandwidth mode is enabled by default on MX routers.

To configure increased bandwidth mode for the active control board, use the **redundancy-mode increased-bandwidth** statement at the **[edit chassis fabric]** hierarchy level:

```
[edit chassis fabric]
redundancy-mode {
  increased-bandwidth;
}
```

In increased fabric bandwidth mode, the maximum number of available fabric planes are used for MX routers with Trio chips and the MPC3E. On MX960 routers with active control boards, 6 active planes are used, and on MX240 and MX480 routers with active control boards, 8 active planes are used.

Increased fabric bandwidth mode is enabled by default on MX routers with Switch Control Board (SCB). On MX routers that contain the enhanced SCB with Trio chips and the MPC3E, redundancy mode is enabled by default.

Configuring this feature does not affect the system. You can configure this feature without restarting the FPC or restarting the system.

- Related Documentation**
- [redundancy-mode on page 396](#)
 - [show chassis fabric redundancy-mode on page 926](#)
 - [Router Chassis Configuration Statements on page 313](#)

Configuring the Junos OS to Allocate More Memory for Routing Tables, Firewall Filters, and Layer 3 VPN Labels

The jtree memory on all MX Series, all M120, and some M320, M10i, M7i, T640, T1600, TX Matrix, TX Matrix Plus router Packet Forwarding Engines has two segments: one segment primarily stores routing tables and related information, and the other segment primarily stores firewall-filter-related information.

The Junos OS provides the **memory-enhanced** statement to reallocate the jtree memory for routes, firewall filters, and Layer 3 VPNs. The statement has the following options:

- **filter**—Include this statement when you want to support larger firewall filters over routing tables. However, we recommend enabling this option only if you do not have a very large routing table configuration.

To allocate more memory for firewall filters, include the **filter** statement at the **[edit chassis memory-enhanced]** hierarchy level:

```
[edit chassis memory-enhanced]
filter;
```

- **route**—Include this statement when you want to support larger routing tables (with more routes) over firewall filters. For example, you can enable this option, when you want to support a large number of routes for Layer 3 VPNs implemented using MPLS. However, we recommend enabling this option only if you do not have a very large firewall configuration.

To allocate more memory for routing tables, include the **route** statement at the **[edit chassis memory-enhanced]** hierarchy level:

```
[edit chassis memory-enhanced]
route;
```

- **vpn-label**—(T Series platforms only) Include this statement when you want to enhance memory to support a larger number of Layer 3 VPN labels.

Layer 3 VPN composite next hops can be enabled by including the **l3vpn-composite-nexthop** statement at the **[edit routing-options]** and **[edit logical-systems logical-system-name routing-options]** hierarchy levels. This statement enables BGP to accept larger numbers of Layer 3 VPN BGP updates with unique inner VPN labels. Including the **l3vpn-composite-nexthop** in the configuration enhances scaling and convergence performance of PE routers participating in a Layer 3 VPN in a multivendor environment. For more information on configuring the **l3vpn-composite-nexthop** statement, see the *Junos OS VPNs Library for Routing Devices*.

To allocate more memory to support a larger number of Layer 3 VPN labels accepted by the **l3vpn-composite-nexthop** statement, include the **vpn-label** statement at the **[edit chassis memory-enhanced]** hierarchy level:

```
[edit chassis memory-enhanced]
vpn-label;
```

The **memory-enhanced vpn-label** statement increases the size of the fabric next-hop table, which is held on the egress FPC in the jtree, from the default value of 128,000

entries to 1,000,000 entries. This improves token fabric scaling, at the expense of additional segment 1 usage. This functionality is not applicable to MX Series, or M320 platforms, as these platforms provide for flexibly sized fabric token tables by default. This means that the **memory-enhanced route** statement is applicable to T Series platforms and that you can configure both **memory-enhanced vpn-label** and **memory-enhanced route** on T Series platforms when their combined functionality is desired.

You can configure the **memory-enhanced** statement on the following routers:

- M10i and M7i routers with Enhanced CFEB
- M320 routers with Enhanced III FPC1, Enhanced III FPC2, and Enhanced III FPC3
- M120 routers
- MX Series routers
- T Series (T640, T1600, TX Matrix, and TX Matrix Plus) routers with Enhanced Scaling FPC1, Enhanced Scaling FPC2, Enhanced Scaling FPC3, and Enhanced Scaling FPC4.



NOTE:

- The following hardware is not supported for the TXP-T1600 configuration for Junos OS Release 10.0 and earlier releases. If you plan to run a release prior to Junos OS Release 10.0, you must remove the following FPCs and any PICs that require these FPCs prior to integrating the LCC into the routing matrix:
 - All type 1 FPCs
 - All type 2 FPCs
 - T640 Enhanced Scaling FPC4-IP FPCs
- The following hardware is not supported for the TXP-T1600-3D or TXP-Mixed-LCC-3D configuration:
 - T640-FPC1-E and T640-FPC1-E2
 - T640-FPC2, T640-FPC2-E, and T640-FPC2-E2
 - T640-FPC3, T640-FPC3-E, and T640-FPC3-E2

As the allocation of more memory for routing tables or firewall filters might disrupt the forwarding operations of a Packet Forwarding Engine, the Junos OS CLI displays a warning to restart all affected FPCs when you commit a configuration that includes the **memory-enhanced route** statement. The configuration does not become effective until you restart the FPC or DPC (on MX Series routers).

To restart a single FPC or DPC without rebooting the entire router, issue the **request chassis fpc slot slot-number restart** command. On an M120 router, issue the **request chassis feb slot slot-number restart** command.

To view if the configuration is active on an FPC or DPC, issue the **show pfe fpc slot-number** command.



NOTE:

- For T Series routers only. With Junos OS Release 10.2, enhanced jtree memory allocation is disabled by default. For Junos OS Releases 9.3 through 10.1, the default routing tables (inet.0 and inet6.0) use both memory segments by default.
- In Junos OS Release 11.2 and later, the memory-enhanced route statement at the [edit chassis] hierarchy level replaces the route-memory-enhanced statement at the [edit chassis] hierarchy level.
- The filter and vpn-label statements are supported only on T Series routers.

Related Documentation

- [memory-enhanced on page 373](#)
- [filter on page 350](#)
- [route \(chassis\) on page 397](#)
- [vpn-label on page 428](#)
- *Overview of a Routing Matrix with a TX Matrix Plus Router*

Configuring the Junos OS to Enable a Routing Engine to Reboot on Hard Disk Errors

When a hard disk error occurs, a Routing Engine might enter a state in which it responds to local pings and interfaces remain up, but no other processes are responding.

To recover from this situation, you can configure a single Routing Engine to reboot automatically when a hard disk error occurs. To enable this feature, include the **on-disk-failure reboot** statement at the [edit chassis routing-engine] hierarchy level.

```
[edit chassis routing-engine]
on-disk-failure {
  disk-failure-action (halt | reboot);
}
```

For dual Routing Engine environments, you can configure a backup Routing Engine to assume mastership automatically, if it detects a hard disk error on the master Routing Engine. To enable this feature, include the **on-disk-failure** statement at the [edit chassis redundancy failover] hierarchy level. For information about this statement, see the *Junos OS High Availability Library for Routing Devices*.

You can configure the Routing Engine to halt (instead of rebooting) when the hard disk fails on the Routing Engine. To configure this feature, include the **disk-failure-action (halt | reboot)** statement at the [edit chassis routing-engine on-disk-failure] hierarchy level:

```
[edit chassis routing-engine]
on-disk-failure {
  disk-failure-action (halt | reboot);
}
```

```
}
```

Use the **halt** option to configure the Routing Engine to halt when the hard disk fails. Use the **reboot** option to configure the Routing Engine to reboot when the hard disk fails.

Related Documentation

- [Configuring Automatic Mirroring of the CompactFlash Card on the Hard Disk Drive](#)

Associating Sampling Instances for Active Flow Monitoring with a Specific FPC, MPC, or DPC

The Junos OS enables you to configure sampling instances for active flow monitoring, by specifying a name for the sampling parameters and associating the instance name with a specific FPC, MPC, or DPC.

To configure active sampling instances, include the **instance** statement at the **[edit forwarding-options sampling]** hierarchy level. For more information about configuring sampling instances, see the *Junos OS Services Interfaces Library for Routing Devices*.

To associate a configured active sampling instance with a specific FPC, MPC, or DPC, include the sampling instance name at the **[edit chassis fpc slot-number]** hierarchy level:

```
[edit chassis fpc slot-number]
sampling-instance instance-name;
```

On a TX Matrix, TX Matrix Plus router, include the **sampling-instance** statement at the **[edit chassis lcc number fpc slot-number]** hierarchy level:

```
[edit chassis lcc number fpc slot-number]
sampling-instance instance-name;
```

Related Documentation

- [Junos Services Interfaces Configuration Guide](#)
- [Example: Sampling Instance Configuration](#)
- [sampling-instance on page 400](#)

Configuring a Policer Overhead

Configuring a policer overhead allows you to control the rate of traffic sent or received on an interface. When you configure a policer overhead, the configured policer overhead value (bytes) is added to the length of the final Ethernet frame. This calculated length of frame is used to determine the policer or the rate limit action. Therefore, the policer overhead enables you to control the rate of traffic sent or received on an interface. You can configure the policer overhead to rate-limit queues and Layer 2 and MAC policers. The policer overhead and the shaping overhead can be configured simultaneously on an interface.

This feature is supported on M Series and T Series routers with IQ2 PICs or IQ2E PICs, and on MX Series DPCs.

To configure a policer overhead for controlling the rate of traffic sent or received on an interface:

1. In the **[edit chassis]** hierarchy level in configuration mode, create the interface on which to add the policer overhead to input or output traffic.

```
[edit chassis]
user@host# edit fpc fpc pic pic
```

For example:

```
[edit chassis]
user@host# edit fpc 0 pic 1
```

2. Configure the policer overhead to control the input or output traffic on the interface. You could use either statement or both the statements for this configuration.

```
[edit chassis fpc fpc pic pic]
user@host# set ingress-policer-overhead bytes;
user@host# set egress-policer-overhead bytes;
```

For example:

```
[edit chassis fpc 0 pic 1]
user@host# set ingress-policer-overhead 10;
user@host# set egress-policer-overhead 20;
```

3. Verify the configuration:

```
[edit chassis]
user@host# show
fpc 0 {
  pic 1 {
    ingress-policer-overhead 10;
    egress-policer-overhead 20;
  }
}
```



NOTE: When the configuration for the policer overhead bytes on a PIC is changed, the PIC goes offline and then comes back online. In addition, the configuration in the CLI is on a per-PIC basis and, therefore, applies to all the ports on the PIC.

- Related Documentation**
- [egress-policer-overhead on page 343](#)
 - [ingress-policer-overhead on page 362](#)

Configuring Sanity Polling for FPCs on T Series Routers

T Series routers running Junos OS Release 11.4 and later support the sanity polling feature. You can configure the **sanity-poll** statement for a particular FPC to start a periodic sanity check for that FPC. The periodic sanity check includes checking for FPC error conditions

such as “register sanity issues,” “high temperature,” “hardware failure,” and so on. If you do not configure the **sanity-poll** statement, then sanity polling is disabled.



NOTE: Currently, periodic sanity check is performed only on the routing chip register.

Sanity polling periodically checks for an error condition in an FPC and performs the appropriate actions in case of an error.

To configure sanity polling for an FPC, include the **sanity-poll** statement and its substatements at the **[edit chassis fpc slot-number]** hierarchy level:

```
[edit chassis]
fpc slot-number {
  sanity-poll {
    retry-count number;
    on-error {
      raise-alarm;
      power (cycle | off);
      write-coredump;
    }
  }
}
```



NOTE: On a TX Matrix or TX Matrix Plus router, you can configure the **sanity-poll** statement at the **[edit chassis lcc number fpc number]** hierarchy level.

The **sanity-poll** statement comprises the following substatements:

- The **retry-count** statement specifies the number of rechecks to be performed after the occurrence of a particular error condition. If an error exists in all the periodic checks, then sanity polling reports an error and proceeds to perform the appropriate actions (described as options of the **on-error** statement).

For example, if the periodic sanity check detects an error in the FPC and if you configure the **retry count number** to 15, sanity polling does not report the error immediately. Sanity polling checks 15 times for the same error condition. If an error persists in all 15 rechecks, then it reports an error and takes the appropriate actions.

If you do not configure the **retry-count** statement, then by default, the **sanity-poll** statement rechecks the detected error 10 times before reporting an error condition.

- If sanity polling detects an error condition, the **on-error** statement performs the appropriate actions to eliminate the error.

The following actions are common to all kinds of error conditions:

- To generate a chassis alarm, configure the **raise-alarm** statement. The chassis alarm is displayed in the front panel of the chassis.
- To reboot the FPC after generating a core file, configure the **power cycle** statement. This statement is useful for temporary software errors that are eliminated after reboot.
- To halt the FPC, configure the **power off** statement. This statement is useful in case of permanent hardware failure.



CAUTION: The **power off** statement halts the FPC. Ensure that you have backup paths through a different FPC to avoid service outage.



NOTE: The **power cycle** and **power off** statements are mutually exclusive: You can configure either the **power cycle** or the **power off** action for an error.

- To trigger the core file, configure the **write-coredump** statement.

You can configure multiple actions for a given FPC. If you do not configure any actions, the **sanity-poll** statement generates only FPC system log messages.

**Related
Documentation**

- [sanity-poll on page 401](#)
- [retry-count on page 397](#)
- [on-error on page 380](#)

Configuring Slow Packet Forwarding Engine Alarm

On an MX240 router or a TX Matrix router, the Packet Forwarding Engine might not send a resource acknowledgment message to the Routing Engine within a predetermined time of 360 seconds. This delay in receiving resource acknowledgment could be due to a slow or stuck Packet Forwarding Engine on the MX240 router or on one of the LCCs connected to a TX Matrix router.

Starting with Junos OS Release 13.2R1 (also applicable in Junos OS Releases 12.1R6, 12.2R5, 12.3R3, 13.1R2 and later), to display this issue as an alarm in the **show chassis alarms** command output and to append this alarm into the system log messages file, you must enable the slow Packet Forwarding Engine alarm on the MX240 router or on the TX Matrix router.

The following sections provide more information about the slow Packet Forwarding Engine alarm:

- [Enabling Slow Packet Forwarding Engine Alarm on page 243](#)
- [Disabling Slow Packet Forwarding Engine Alarm on page 243](#)
- [Verifying That the Alarm Output and System Log Messages Are Updated on page 243](#)

Enabling Slow Packet Forwarding Engine Alarm

To enable the slow Packet Forwarding Engine alarm, perform the following steps:



NOTE: By default, the slow Packet Forwarding Engine alarm is disabled.

1. In configuration mode, go to the **[edit chassis]** hierarchy level:

```
[edit]
user@host# edit chassis
```

2. Enable the slow Packet Forwarding Engine alarm by configuring the **slow-pfe-alarm** statement.

```
[edit chassis]
user@host# set slow-pfe-alarm
```

Disabling Slow Packet Forwarding Engine Alarm

To disable the slow Packet Forwarding Engine alarm, perform the following steps:

1. In configuration mode, go to the **[edit chassis]** hierarchy level:

```
[edit]
user@host# edit chassis
```

2. Disable the slow Packet Forwarding Engine alarm by deleting the **slow-pfe-alarm** statement.

```
[edit chassis]
user@host# delete slow-pfe-alarm
```

Verifying That the Alarm Output and System Log Messages Are Updated

Purpose To verify that the output of the **show chassis alarms** operational mode command and the system log messages file are updated with the slow Packet Forwarding Engine alarm on an MX240 router or a TX Matrix router when:

- The **slow-pfe-alarm** statement is enabled in the **[edit chassis]** hierarchy.
- The Packet Forwarding Engine resource acknowledgment is not received by the Routing Engine within a predetermined time of 360 seconds.

Action To check the output on an MX240 router:

1. Verify that the alarm is displayed in the output of the **show chassis alarms** operational mode command.

```
user@host> show chassis alarms
1 alarms currently active
Alarm time          Class  Description
2013-02-05 01:12:33 PST  Minor  Potential slow peers are: XDPC2
```

For field descriptions, see [show chassis alarms](#).

2. Verify that the alarm is appended to the system log messages file.

```
/var/log/messages -
... Alarm set: RE color=YELLOW, class=CHASSIS, reason=Potential slow peers
are: XDPC2
... Minor alarm set, Potential slow peers are: XDPC2
```

To check the output on a TX Matrix router:

1. Verify that the alarm is displayed in the output of the **show chassis alarms** operational mode command.

```
user@scc> show chassis alarms
scc-re0:
-----
9 alarms currently active
Alarm time          Class  Description
2013-02-06 00:45:46 PST  Minor  Potential slow peers are: LCC1 LCC0
...
lcc0-re0:
-----
4 alarms currently active
Alarm time          Class  Description
2013-02-06 00:44:51 PST  Minor  Potential slow peers are: GFPC4 GFPC3
...
lcc1-re0:
-----
4 alarms currently active
Alarm time          Class  Description
2013-02-06 00:45:44 PST  Minor  Potential slow peers are: GFPC10
...
lcc2-re0:
-----
No alarms currently active
lcc3-re0:
-----
No alarms currently active
```

For field descriptions, see [show chassis alarms](#).

2. Verify that the alarm is appended to the system log messages file.

```
... Alarm set: RE color=YELLOW, class=CHASSIS, reason=Potential slow peers
are: LCC0 LCC1
... Minor alarm set, Potential slow peers are: LCC0
... Alarm set: RE color=YELLOW, class=CHASSIS, reason=Potential slow peers
are: GFPC4 GFPC3
... Minor alarm set, Potential slow peers are: GFPC4 GFPC3
... Alarm set: RE color=YELLOW, class=CHASSIS, reason=Potential slow peers
are: GFPC10
... Minor alarm set, Potential slow peers are: GFPC10
```

Meaning The output of **show chassis alarms** operational mode command and the system log messages file are updated as expected when the slow Packet Forwarding Engine alarm is enabled and when the Packet Forwarding Engine resource acknowledgment is not received by the Routing engine within a predetermined time of 360 seconds.

Related Documentation

- [slow-pfe-alarm on page 404](#)

CHAPTER 22

Configuring Chassis Settings for the Craft Interface

- [Configuring the Junos OS to Disable the Physical Operation of the Craft Interface on page 245](#)

Configuring the Junos OS to Disable the Physical Operation of the Craft Interface

You can disable the physical operation of the craft interface front panel on the router. When you disable the operation of the craft interface, the buttons on the front panel, such as the alarm cutoff button, no longer function. To disable the craft interface operation, include the **craft-lockout** statement at the **[edit chassis]** hierarchy level:

```
[edit chassis]  
craft-lockout;
```

Related Documentation

- [Configuring the Junos OS to Determine Conditions That Trigger Alarms on Different Interface Types on page 251](#)
- [Silencing External Devices Connected to Alarm Relay Contacts on page 292](#)

Configuring Chassis Settings for PEMs

- [Configuring the Six-Input DC Power Supply on page 247](#)

Configuring the Six-Input DC Power Supply

By default, the six-input DC power supply is configured to have all the six input feeds connected. You can also choose to provide four or five input feeds to the six-input DC power supply. When providing four or five input feeds on standalone routers, you need to configure the **feeds** statement at the **[edit chassis pem]** hierarchy level. When providing four or five input feeds to an LCC router in a routing matrix, you need to configure the **feeds** statement at the **[edit chassis lcc lcc-number pem]** hierarchy level.

Starting with Junos OS Release 12.3, the power management feature is enabled on T4000 routers with six-input DC power supply. The power management feature is enabled only when six input feeds with 40 amperes (A) each or four input feeds with 60 A each is configured on the router. To do this, you need to configure the **feeds** and **input-current** statements at the **[edit chassis pem]** hierarchy level.



NOTE:

- Before configuring input feeds for your router, see the *T640 Core Router Hardware Guide*, *T1600 Core Router Hardware Guide*, or *T4000 Core Router Hardware Guide* for special considerations and for the number of input feeds supported by the router.
- The value assigned to the **feeds** statement must be equal to the number of input feeds provided to the power supply. Else, an alarm message is generated to indicate the mismatch.

The following procedures describe how to configure the six-input DC power supply on different routers:

- [Configuring the Six-Input DC Power Supply on an LCC Router in a Routing Matrix on page 248](#)
- [Configuring the Six-Input DC Power Supply on T640 and T1600 Routers on page 248](#)
- [Configuring the Six-Input DC Power Supply on T4000 Routers on page 249](#)

Configuring the Six-Input DC Power Supply on an LCC Router in a Routing Matrix

To configure the six-input DC power supply on an LCC router in a routing matrix:

1. At the **[edit chassis lcc lcc-number pem]** hierarchy level, configure the **feeds** statement with the number of input feeds provided to the power supply.

```
[edit chassis lcc lcc-number pem]
user@host# set feeds number-of-input-feeds
```

For example:

```
[edit chassis lcc 1 pem]
user@host# set feeds 5
```



NOTE: All power supplies in the router must use the same number of inputs feeds.

2. Verify the configuration by using the **show** command at the **[edit chassis]** hierarchy level:

```
[edit chassis lcc 1 pem]
user@host# show
pem {
    feeds 5;
}
```

Configuring the Six-Input DC Power Supply on T640 and T1600 Routers

To configure the six-input DC power supply on a standalone T640 or T1600 router:

1. At the **[edit chassis pem]** hierarchy level, configure the **feeds** statement with the number of input feeds provided to the power supply.

```
[edit chassis pem]
user@host# set feeds number-of-input-feeds
```

For example:

```
[edit chassis pem]
user@host# set feeds 5
```



NOTE: All power supplies in the router must use the same number of inputs feeds.

2. Verify the configuration by using the **show** command at the **[edit chassis]** hierarchy level:

```
[edit chassis]
user@host# show
pem {
```



```
    feeds 5;
}
```

Configuring the Six-Input DC Power Supply on T4000 Routers

To configure the six-input DC power supply on a T4000 router:

1. At the **[edit chassis pem]** hierarchy level, configure the **feeds** statement with the number of input feeds provided to the power supply.

```
[edit chassis pem]
user@host# set feeds number-of-input-feeds
```

For example:

```
[edit chassis pem]
user@host# set feeds 4
```



NOTE: All power supplies in the router must use the same number of inputs feeds.

2. Configure the input current received by the router.

```
[edit chassis pem]
user@host# set input-current amps-in-each-feed
```

For example, if the router receives 60 A of input current:

```
[edit chassis pem]
user@host# set input-current 60
```



NOTE: You can connect three 80 A DC power cables to six-input DC power supply by using terminal jumpers. When you do this, ensure that you set the value of the feeds statement to 6 and that of the input current statement to 40. If these configurations are not set, the power management feature is *not* enabled. For more information about the power management feature, see [“T4000 Power Management Overview” on page 17](#).

3. Verify the configuration by using the **show** command at the **[edit chassis]** hierarchy level:

```
[edit chassis]
user@host# show
pem {
    feeds 4;
    input-current 60;
}
```

Related Documentation

- [T4000 Power Management Overview on page 17](#)
- [Configuring the Power-On Sequence for FPCs on T640, T1600, and T4000 Routers on page 137](#)

- [pem on page 386](#)
- [feeds on page 348](#)
- [input-current on page 363](#)
- [fru-poweron-sequence on page 356](#)
- *Chassis Traps*

Configuring Chassis Settings for Alarms

- [Configuring the Junos OS to Determine Conditions That Trigger Alarms on Different Interface Types on page 251](#)
- [System-Wide Alarms and Alarms for Each Interface Type on page 252](#)
- [Chassis Conditions That Trigger Alarms on page 253](#)
- [Silencing External Devices Connected to Alarm Relay Contacts on page 292](#)

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 on page 252](#)
- [Chassis Conditions That Trigger Alarms on page 253](#)
- [Silencing External Devices Connected to Alarm Relay Contacts on page 292](#)

System-Wide Alarms and Alarms for Each Interface Type

Table 19 on page 252 lists the system-wide alarms and the alarms for each interface type.

Table 19: Configurable PIC Alarm Conditions

Interface/System	Alarm Condition	Configuration Option
SONET/SDH and ATM	Link alarm indication signal	ais-l
	Path alarm indication signal	ais-p
	Signal degrade (SD)	ber-sd
	Signal fail (SF)	ber-sf
	Loss of cell delineation (ATM only)	locd
	Loss of framing	lof
	Loss of light	lol
	Loss of pointer	lop-p
	Loss of signal	los
	Phase-locked loop out of lock	pll
	Synchronous transport signal (STS) payload label (C2) mismatch	plm-p
	Line remote failure indication	rfi-l
	Path remote failure indication	rfi-p
	STS path (C2) unequipped	uneq-p

Table 19: Configurable PIC Alarm Conditions (*continued*)

Interface/System	Alarm Condition	Configuration Option
E3/T3	Alarm indicator signal	ais
	Excessive numbers of zeros	exz
	Failure of the far end	ferf
	Idle alarm	idle
	Line code violation	lcv
	Loss of frame	lof
	Loss of signal	los
	Phase-locked loop out of lock	pll
	Yellow alarm	ylw
Ethernet	Link has gone down	link-down
DS1	Alarm indicator signal	ais
	Yellow alarm	ylw
Integrated services	Hardware or software failure	failure
Management Ethernet	Link has gone down	link-down

Related Documentation

- [Configuring the Junos OS to Determine Conditions That Trigger Alarms on Different Interface Types on page 251](#)

Chassis Conditions That Trigger Alarms

Various conditions related to the chassis components trigger yellow and red alarms. You cannot configure these conditions.

- [Backup Routing Engine Alarms on page 290](#)
- For J Series Services Routers chassis component alarm conditions, see the *J Series Services Routers Hardware Guide*
- [Chassis Component Alarm Conditions on M5 and M10 Routers on page 254](#)
- [Chassis Component Alarm Conditions on M7i and M10i Routers on page 257](#)
- [Chassis Component Alarm Conditions on M20 Routers on page 262](#)

- [Chassis Component Alarm Conditions on M40 Routers on page 265](#)
- [Chassis Component Alarm Conditions on M40e and M160 Routers on page 270](#)
- [Chassis Component Alarm Conditions on M120 Routers on page 275](#)
- [Chassis Component Alarm Conditions on M320 Routers on page 280](#)
- [Chassis Component Alarm Conditions on MX Series 3D Universal Edge Routers on page 285](#)
- For PTX5000 Packet Transport Router chassis component alarm conditions, see the [PTX5000 Packet Transport Router Hardware Guide](#)
- For T320 Core Router chassis component alarm conditions, see the [T320 Core Router Hardware Guide](#)
- For T640 Core Router chassis component alarm conditions, see the [T640 Core Router Hardware Guide](#)
- For T1600 Core Router chassis component alarm conditions, see the [T1600 Core Router Hardware Guide](#)
- For T4000 Core Router chassis component alarm conditions, see the [T4000 Core Router Hardware Guide](#)
- For TX Matrix chassis component alarm conditions, see the [TX Matrix Router Hardware Guide](#)
- For TX Matrix Plus chassis component alarm conditions, see the [TX Matrix Plus Router Hardware Guide](#)

Chassis Component Alarm Conditions on M5 and M10 Routers

Table 20 on page 254 lists the alarms that the chassis components can generate on M5 and M10 routers.

Table 20: Chassis Component Alarm Conditions on M5 and M10 Routers

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Alternative media	The router boots from an alternate boot device, the hard disk. The CompactFlash card is typically the primary boot device. The Routing Engine boots from the hard disk when the primary boot device fails.	Open a support case using the Case Manager link at www.juniper.net/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Yellow
Craft interface	The craft interface has failed.	Replace failed craft interface.	Red

Table 20: Chassis Component Alarm Conditions on M5 and M10 Routers (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Fan trays	One fan tray has been removed from the chassis.	Install missing fan tray.	Yellow
	Two or more fan trays have been removed from the chassis.	Install missing fan trays.	Red
	One fan in the chassis is not spinning or is spinning below required speed.	Replace failed fan tray.	Red
Forwarding Engine Board (FEB)	The control board has failed. If this occurs, the board attempts to reboot.	Replace failed FEB.	Red
Flexible PIC Concentrator (FPC)	An FPC has failed. If this occurs, the FPC attempts to reboot. If the FEB sees that an FPC is rebooting too often, it shuts down the FPC.	Replace failed FPC.	Red
Hot swapping	Too many hot-swap interrupts are occurring. This message generally indicates that a hardware component that plugs into the router's backplane from the front (generally, an FPC) is broken.	Replace failed component.	Red

Table 20: Chassis Component Alarm Conditions on M5 and M10 Routers (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Routing Engine	Error in reading or writing CompactFlash card.	Reformat CompactFlash card and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	System booted from hard disk.	Install bootable image on CompactFlash card. If this fails, replace failed Routing Engine.	Yellow
	CompactFlash card missing in boot list.	Replace failed Routing Engine.	Red
	Hard disk missing in boot list.	Replace failed Routing Engine.	Red
	The Ethernet management interface (fxp0 or em0) on the Routing Engine is down.	<ul style="list-style-type: none"> Check the interface cable connection. Reboot the system. If the alarm recurs, open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States) 	Red
Power supplies	A power supply has been removed from the chassis.	Install missing power supply.	Yellow
	A power supply has failed.	Replace failed power supply.	Red

Table 20: Chassis Component Alarm Conditions on M5 and M10 Routers (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Temperature	The chassis temperature has exceeded 55 degrees C (131 degrees F), the fans have been turned on to full speed, and one or more fans have failed.	<ul style="list-style-type: none"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and the fans have been turned on to full speed.	<ul style="list-style-type: none"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and a fan has failed. If this condition persists for more than 4 minutes, the router shuts down.	<ul style="list-style-type: none"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Red
	The chassis temperature has exceeded 75 degrees C (167 degrees F). If this condition persists for more than 4 minutes, the router shuts down.	<ul style="list-style-type: none"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Red
	The temperature sensor has failed.	<p>Open a support case using the Case Manager link at</p> <p>www.juniper.net/</p> <p>or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).</p>	Red

Chassis Component Alarm Conditions on M7i and M10i Routers

Table 21 on page 258 lists the alarms that the chassis components can generate on M7i and M10i routers.

Table 21: Chassis Component Alarm Conditions on M7i and M10i Routers

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Alternative media	The router boots from an alternate boot device, the hard disk. The CompactFlash card is typically the primary boot device. The Routing Engine boots from the hard disk when the primary boot device fails.	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Yellow
Compact FEB (CFEB)	For an M7i router, CFEB has failed. If this occurs, the board attempts to reboot.	Replace failed CFEB.	Red
	For an M10i router, both control boards have been removed or have failed.	Replace failed or missing CFEB.	Red
	Too many hard errors in CFEB memory.	Replace failed CFEB.	Red
	Too many soft errors in CFEB memory.	Replace failed CFEB.	Red
	A CFEB microcode download has failed.	Replace failed CFEB.	Red
Fan trays	A fan has failed.	Replace failed fan tray.	Red
	For an M7i router, a fan tray has been removed from the chassis.	Install missing fan tray.	Red
	For an M10i router, both fan trays are absent from the chassis.	Install missing fan tray.	Red
	For a TX Matrix Plus router, fan tray is not matching the ST-SIB-Ls SIB.	Install a Rev.3 fan tray.	Red
Hot swapping	Too many hot-swap interrupts are occurring. This message generally indicates that a hardware component that plugs into the router's midplane from the front is broken.	Replace failed component.	Red

Table 21: Chassis Component Alarm Conditions on M7i and M10i Routers (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Power supplies	A power supply has been removed.	Insert missing power supply.	Yellow
	A power supply has failed.	Replace failed power supply.	Red
	For an M10i router, only one power supply is operating.	Insert or replace secondary power supply.	Red

Table 21: Chassis Component Alarm Conditions on M7i and M10i Routers (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Routing Engine	Excessive framing errors on console port.	Replace the serial cable connected to the device.	Yellow
	An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded.	If the cable is replaced and no excessive framing errors are detected within 5 minutes from the last detected framing error, the alarm is cleared automatically.	
	This might be caused by a faulty serial console port cable connected to the device.		
	Error in reading or writing hard disk.	Reformat hard disk and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	Error in reading or writing CompactFlash card.	Reformat CompactFlash card and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	System booted from hard disk. This alarm only applies, if you have an optional CompactFlash card.	Install bootable image on CompactFlash card. If this fails, replace failed Routing Engine.	Yellow
	CompactFlash card missing in boot list.	Replace failed Routing Engine.	Red
	Hard disk missing in boot list.	Replace failed Routing Engine.	Red
	Routing Engine failed to boot.	Replace failed Routing Engine.	Red
	The Ethernet management interface (fxp0 or em0) on the Routing Engine is down.		Red

Table 21: Chassis Component Alarm Conditions on M7i and M10i Routers (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		<ul style="list-style-type: none"> • Check the interface cable connection. • Reboot the system. • If the alarm recurs, open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States) 	
Temperature	The chassis temperature has exceeded 55 degrees C (131 degrees F), the fans have been turned on to full speed, and one or more fans have failed.	<ul style="list-style-type: none"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and the fans have been turned on to full speed.	<ul style="list-style-type: none"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and a fan has failed. If this condition persists for more than 4 minutes, the router shuts down.	<ul style="list-style-type: none"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Red
	The chassis temperature has exceeded 75 degrees C (167 degrees F). If this condition persists for more than 4 minutes, the router shuts down.	<ul style="list-style-type: none"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Red
	The temperature sensor has failed.	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Red

Chassis Component Alarm Conditions on M20 Routers

Table 22 on page 262 lists the alarms that the chassis components can generate on M20 routers.

Table 22: Chassis Component Alarm Conditions on M20 Routers

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Alternative media	The router boots from an alternate boot device, the hard disk. The CompactFlash card is typically the primary boot device. The Routing Engine boots from the hard disk when the primary boot device fails.	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Yellow
Craft interface	The craft interface has failed.	Replace failed craft interface.	Red
Fan trays	One fan tray has been removed from the chassis.	Install missing fan tray.	Yellow
	Two or more fan trays have been removed from the chassis.	Install missing fan trays.	Red
	One fan in the chassis is not spinning or is spinning below requires speed.	Replace fan tray.	Red
FPC	An FPC has failed. If this occurs, the FPC attempts to reboot. If the System and Switch Board (SSB) sees that an FPC is rebooting too often, it shuts down the FPC.	Replace failed FPC.	Red
Hot swapping	Too many hot-swap interrupts are occurring. This message generally indicates that a hardware component that plugs in to the router's backplane from the front (generally, an FPC) is broken.	Replace failed component.	Red

Table 22: Chassis Component Alarm Conditions on M20 Routers (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Routing Engine	Excessive framing errors on console port.	Replace the serial cable connected to the device.	Yellow
	An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded.	If the cable is replaced and no excessive framing errors are detected within 5 minutes from the last detected framing error, the alarm is cleared automatically.	
	This might be caused by a faulty serial console port cable connected to the device.		
	Error in reading or writing hard disk.	Reformat hard disk and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	Error in reading or writing CompactFlash card.	Reformat CompactFlash card and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	System booted from default backup Routing Engine. If you manually switched mastership, ignore this alarm condition.	Install bootable image on default master Routing Engine. If this fails, replace failed Routing Engine.	Yellow
	System booted from hard disk.	Install bootable image on CompactFlash card. If this fails, replace failed Routing Engine.	Yellow
	CompactFlash card missing in boot list.	Replace failed Routing Engine.	Red
	Hard disk missing in boot list.	Replace failed Routing Engine.	Red
	The Ethernet management interface (fxp0 or em0) on the Routing Engine is down.		Red

Table 22: Chassis Component Alarm Conditions on M20 Routers (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		<ul style="list-style-type: none"> • Check the interface cable connection. • Reboot the system. • If the alarm recurs, open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States) 	
	Routing Engine failed to boot.	Replace failed Routing Engine.	Red
Power supplies	A power supply has been removed from the chassis.	Insert power supply into empty slot.	Yellow
	A power supply has failed.	Replace failed power supply.	Red
SSB	The control board has failed. If this occurs, the board attempts to reboot.	Replace failed control board.	Red

Table 22: Chassis Component Alarm Conditions on M20 Routers (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Temperature	The chassis temperature has exceeded 55 degrees C (131 degrees F), the fans have been turned on to full speed, and one or more fans have failed.	<ul style="list-style-type: none"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and the fans have been turned on to full speed.	<ul style="list-style-type: none"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and a fan has failed. If this condition persists for more than 4 minutes, the router shuts down.	<ul style="list-style-type: none"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Red
	The chassis temperature has exceeded 75 degrees C (167 degrees F). If this condition persists for more than 4 minutes, the router shuts down.	<ul style="list-style-type: none"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Red
	The temperature sensor has failed.	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Red

Chassis Component Alarm Conditions on M40 Routers

Table 23 on page 265 lists the alarms that the chassis components can generate on M40 routers.

Table 23: Chassis Component Alarm Conditions on M40 Routers

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Air filter	Change air filter.	Change air filter.	Yellow

Table 23: Chassis Component Alarm Conditions on M40 Routers (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Alternative media	The router boots from an alternate boot device, the hard disk. The CompactFlash card is typically the primary boot device. The Routing Engine boots from the hard disk when the primary boot device fails.	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Yellow
Craft interface	The craft interface has failed.	Replace failed craft interface.	Red
Fan trays	One fan tray has been removed from the chassis.	Install missing fan tray.	Yellow
	Two or more fan trays have been removed from the chassis.	Install missing fan trays.	Red
	One fan in the chassis is not spinning or is spinning below required speed.	Replace fan tray.	Red
FPC	An FPC has an out of range or invalid temperature reading.	Replace failed FPC.	Yellow
	An FPC microcode download has failed.	Replace failed FPC.	Red
	An FPC has failed. If this occurs, the FPC attempts to reboot. If the SCB sees that an FPC is rebooting too often, it shuts down the FPC.	Replace failed FPC.	Red
	Too many hard errors in FPC memory.	Replace failed FPC.	Red
	Too many soft errors in FPC memory.	Replace failed FPC.	Red
Hot swapping	Too many hot-swap interrupts are occurring. This message generally indicates that a hardware component that plugs into the router's backplane from the front (generally, an FPC) is broken.	Replace failed component.	Red

Table 23: Chassis Component Alarm Conditions on M40 Routers (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Power supplies	A power supply has been removed from the chassis.	Insert power supply into empty slot.	Yellow
	A power supply temperature sensor has failed.	Replace failed power supply or power entry module.	Yellow
	A power supply fan has failed.	Replace failed power supply fan.	Yellow
	A power supply has high temperature.	Replace failed power supply or power entry module.	Red
	A 5-V power supply has failed.	Replace failed power supply or power entry module.	Red
	A 3.3-V power supply has failed.	Replace failed power supply or power entry module.	Red
	A 2.5-V power supply has failed.	Replace failed power supply or power entry module.	Red
	A power supply input has failed.	Check power supply input connection.	Red
	A power supply has failed.	Replace failed power supply or power entry module.	Red

Table 23: Chassis Component Alarm Conditions on M40 Routers (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Routing Engine	Excessive framing errors on console port.	Replace the serial cable connected to the device.	Yellow
	An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded.	If the cable is replaced and no excessive framing errors are detected within 5 minutes from the last detected framing error, the alarm is cleared automatically.	
	This might be caused by a faulty serial console port cable connected to the device.		
	Error in reading or writing hard disk.	Reformat hard disk and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	Error in reading or writing CompactFlash card.	Reformat CompactFlash card and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	System booted from default backup Routing Engine. If you manually switched mastership, ignore this alarm condition.	Install bootable image on default master Routing Engine. If this fails, replace failed Routing Engine.	Yellow
	System booted from hard disk.	Install bootable image on CompactFlash card. If this fails, replace failed Routing Engine.	Yellow
	CompactFlash card missing in boot list.	Replace failed Routing Engine.	Red
	Hard disk missing in boot list.	Replace failed Routing Engine.	Red
	Routing Engine failed to boot.	Replace failed Routing Engine.	Red
	The Ethernet management interface (fxp0 or em0) on the Routing Engine is down.		Red

Table 23: Chassis Component Alarm Conditions on M40 Routers (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		<ul style="list-style-type: none"> • Check the interface cable connection. • Reboot the system. • If the alarm recurs, open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States) 	
SCB	The System Control Board (SCB) has failed. If this occurs, the board attempts to reboot.	Replace failed SCB.	Red

Table 23: Chassis Component Alarm Conditions on M40 Routers (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Temperature	The chassis temperature has exceeded 55 degrees C (131 degrees F), the fans have been turned on to full speed, and one or more fans have failed.	<ul style="list-style-type: none"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and the fans have been turned on to full speed.	<ul style="list-style-type: none"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and a fan has failed. If this condition persists for more than 4 minutes, the router shuts down.	<ul style="list-style-type: none"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Red
	The chassis temperature has exceeded 75 degrees C (167 degrees F). If this condition persists for more than 4 minutes, the router shuts down.	<ul style="list-style-type: none"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Red
	The temperature sensor has failed.	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Red

Chassis Component Alarm Conditions on M40e and M160 Routers

Table 24 on page 271 lists the alarms that the chassis components can generate on M40e and M160 routers.

Table 24: Chassis Component Alarm Conditions on M40e and M160 Routers

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Air filter	Change air filter.	Change air filter.	Yellow
Alternative media	The router boots from an alternate boot device, the hard disk. The CompactFlash card is typically the primary boot device. The Routing Engine boots from the hard disk when the primary boot device fails.	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Yellow
Connector Interface Panel (CIP)	A CIP is missing.	Insert CIP into empty slot.	Red
Craft interface	The craft interface has failed.	Replace failed craft interface.	Red
Fan trays	One fan tray has been removed from the chassis.	Install missing fan tray.	Yellow
	Two or more fan trays have been removed from the chassis.	Install missing fan trays.	Red
	One fan in the chassis is not spinning or spinning below required speed.	Replace fan tray.	Red
FPC	An FPC has an out of range or invalid temperature reading.	Replace failed FPC.	Yellow
	An FPC microcode download has failed.	Replace failed FPC.	Red
	An FPC has failed. If this occurs, the FPC attempts to reboot. If the MCS sees that an FPC is rebooting too often, it shuts down the FPC.	Replace failed FPC.	Red
	Too many hard errors in FPC memory.	Replace failed FPC.	Red
	Too many soft errors in FPC memory.	Replace failed FPC.	Red

Table 24: Chassis Component Alarm Conditions on M40e and M160 Routers (continued)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Hot swapping	Too many hot-swap interrupts are occurring. This message generally indicates that a hardware component that plugs into the router's backplane from the front (generally, an FPC) is broken.	Replace failed component.	Red
Miscellaneous Control Subsystem (MCS)	An MCS has an out of range or invalid temperature reading.	Replace failed MCS.	Yellow
	MCS0 has been removed.	Reinstall MCS0.	Yellow
	An MCS has failed.	Replace failed MCS.	Red
Packet Forwarding Engine Clock Generator (PCG)	A backup PCG is offline.	Set backup PCG online.	Yellow
	A PCG has an out of range or invalid temperature reading.	Replace failed PCG.	Yellow
	A PCG has been removed.	Insert PCG into empty slot.	Yellow
	A PCG has failed to come online.	Replace failed PCG.	Red

Table 24: Chassis Component Alarm Conditions on M40e and M160 Routers (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Routing Engine	Excessive framing errors on console port.	Replace the serial cable connected to the device.	Yellow
	An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded.	If the cable is replaced and no excessive framing errors are detected within 5 minutes from the last detected framing error, the alarm is cleared automatically.	
	This might be caused by a faulty serial console port cable connected to the device.		
	Error in reading or writing hard disk.	Reformat hard disk and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	Error in reading or writing CompactFlash card.	Reformat CompactFlash card and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	System booted from default backup Routing Engine. If you manually switched mastership, ignore this alarm condition.	Install bootable image on default master Routing Engine. If this fails, replace failed Routing Engine.	Yellow
	System booted from hard disk.	Install bootable image on CompactFlash card. If this fails, replace failed Routing Engine.	Yellow
	CompactFlash card missing in boot list.	Replace failed Routing Engine.	Red
	Hard disk missing in boot list.	Replace failed Routing Engine.	Red
	Routing Engine failed to boot.	Replace failed Routing Engine.	Red
	The Ethernet management interface (fxp0 or em0) on the Routing Engine is down.		Red

Table 24: Chassis Component Alarm Conditions on M40e and M160 Routers (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		<ul style="list-style-type: none"> • Check the interface cable connection. • Reboot the system. • If the alarm recurs, open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States) 	
Power supplies	A power supply has been removed from the chassis.	Insert power supply into empty slot.	Yellow
	A power supply has failed.	Replace failed power supply.	Red
Switching and Forwarding Module (SFM)	An SFM has an out of range or invalid temperature reading on SPP.	Replace failed SFM.	Yellow
	An SFM has an out of range or invalid temperature reading on SPR.	Replace failed SFM.	Yellow
	An SFM is offline.	Set SFM online.	Yellow
	An SFM has failed.	Replace failed SFM.	Red
	An SFM has been removed from the chassis.	Insert SFM into empty slot.	Red
	All SFMs are offline or missing from the chassis.	Insert SFMs into empty slots or set all SFMs online.	Red

Table 24: Chassis Component Alarm Conditions on M40e and M160 Routers (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Temperature	The chassis temperature has exceeded 55 degrees C (131 degrees F), the fans have been turned on to full speed, and one or more fans have failed.	<ul style="list-style-type: none"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and the fans have been turned on to full speed.	<ul style="list-style-type: none"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and a fan has failed. If this condition persists for more than 4 minutes, the router shuts down.	<ul style="list-style-type: none"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Red
	The chassis temperature has exceeded 75 degrees C (167 degrees F). If this condition persists for more than 4 minutes, the router shuts down.	<ul style="list-style-type: none"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Red
	The temperature sensor has failed.	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Red

Chassis Component Alarm Conditions on M120 Routers

Table 25 on page 275 lists the alarms that the chassis components can generate on M120 routers.

Table 25: Chassis Component Alarm Conditions on M120 Routers

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Air filters	Change air filter.	Change air filter.	Yellow

Table 25: Chassis Component Alarm Conditions on M120 Routers (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Alternative media	The router boots from an alternate boot device, the hard disk. The CompactFlash card is typically the primary boot device. The Routing Engine boots from the hard disk when the primary boot device fails.	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Yellow
Control Board (CB)	A CB Ethernet switch has failed.	Replace failed CB.	Yellow
	A CB has been removed.	Insert CB into empty slot.	Red
	A CB has failed.	Replace failed CB.	Red
Craft interface	The craft interface has failed.	Replace failed craft interface.	Red
Fan trays	One fan tray has been removed from the chassis.	Install missing fan tray.	Yellow
	Two or more fan trays have been removed from the chassis.	Install missing fan trays.	Red
	One fan in the chassis is not spinning or is spinning below required speed.	Replace fan tray.	Red
Forwarding Engine Boards (FEBs)	A spare FEB has failed.	Replace failed FEB.	Yellow
	A spare FEB has been removed.	Insert FEB into empty slot.	Yellow
	A FEB is offline.	Check FEB. Remove and reinsert the FEB. If this fails, replace failed FEB.	Yellow
	A FEB has failed.	Replace failed FEB.	Red
	A FEB has been removed.	Insert FEB into empty slot.	Red

Table 25: Chassis Component Alarm Conditions on M120 Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Host subsystem	A host subsystem has failed.	Replace the host subsystem.	Yellow
	A host subsystem has been removed.	Insert host subsystem into empty slot.	Red
Hot swapping	Too many hot-swap interrupts are occurring. This message generally indicates that a hardware component that plugs into the router's backplane from the front (generally, an FPC) is broken.	Replace failed component.	Red
Power supplies	A power supply has been removed from the chassis.	Insert power supply into empty slot.	Yellow
	A power supply has a high temperature.	Replace failed power supply or power entry module.	Red
	A power supply input has failed.	Check power supply input connection.	Red
	A power supply output has failed.	Check power supply output connection.	Red
	A power supply has failed.	Replace failed power supply.	Red

Table 25: Chassis Component Alarm Conditions on M120 Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Routing Engine	Excessive framing errors on console port.	Replace the serial cable connected to the device.	Yellow
	An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded.	If the cable is replaced and no excessive framing errors are detected within 5 minutes from the last detected framing error, the alarm is cleared automatically.	
	This might be caused by a faulty serial console port cable connected to the device.		
	Error in reading or writing hard disk.	Reformat hard disk and install bootable image. If this fails, replace failed Routing Engine.	
	Error in reading or writing CompactFlash card.	Reformat CompactFlash card and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	System booted from default backup Routing Engine. If you manually switched mastership, ignore this alarm condition.	Install bootable image on default master Routing Engine. If this fails, replace failed Routing Engine.	Yellow
	System booted from hard disk.	Install bootable image on CompactFlash card. If this fails, replace failed Routing Engine.	Yellow
	CompactFlash card missing in boot list.	Replace failed Routing Engine.	Red
	Hard disk missing in boot list.	Replace failed Routing Engine.	Red
	Routing Engine failed to boot.	Replace failed Routing Engine.	Red
	The Ethernet management interface (fxp0 or em0) on the Routing Engine is down.		Red

Table 25: Chassis Component Alarm Conditions on M120 Routers (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		<ul style="list-style-type: none">• Check the interface cable connection.• Reboot the system.• If the alarm recurs, open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States)	

Table 25: Chassis Component Alarm Conditions on M120 Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Temperature	The chassis temperature has exceeded 55 degrees C (131 degrees F), the fans have been turned on to full speed, and one or more fans have failed.	<ul style="list-style-type: none"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and the fans have been turned on to full speed.	<ul style="list-style-type: none"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and a fan has failed. If this condition persists for more than 4 minutes, the router shuts down.	<ul style="list-style-type: none"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Red
	Chassis temperature has exceeded 75 degrees C (167 degrees F). If this condition persists for more than 4 minutes, the router shuts down.	<ul style="list-style-type: none"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Red
	The temperature sensor has failed.	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Red

Chassis Component Alarm Conditions on M320 Routers

Table 26 on page 281 lists the alarms that the chassis components can generate on M320 routers.

Table 26: Chassis Component Alarm Conditions on M320 Routers

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Air filters	Change air filter.	Change air filter.	Yellow
Alternative media	The router boots from an alternate boot device, the hard disk. The CompactFlash card is typically the primary boot device. The Routing Engine boots from the hard disk when the primary boot device fails.	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Yellow
Control Board (CB)	A CB has been removed.	Insert CB into empty slot.	Yellow
	A CB temperature sensor alarm has failed.	Replace failed CB.	Yellow
	A CB has failed.	Replace failed CB.	Red
CIP	A CIP is missing.	Insert CIP into empty slot.	Red
Craft interface	The craft interface has failed.	Replace failed craft interface.	Red
Fan trays	One fan tray has been removed from the chassis.	Install missing fan tray.	Yellow
	Two or more fan trays have been removed from the chassis.	Install missing fan trays.	Red
	One fan in the chassis is not spinning or is spinning below required speed.	Replace fan tray.	Red

Table 26: Chassis Component Alarm Conditions on M320 Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
FPC	An FPC has an out of range or invalid temperature reading.	Replace failed FPC.	Yellow
	An FPC microcode download has failed.	Replace failed FPC.	Red
	An FPC has failed. If this occurs, the FPC attempts to reboot. If the CB sees that an FPC is rebooting too often, it shuts down the FPC.	Replace failed FPC.	Red
	Too many hard errors in FPC memory.	Replace failed FPC.	Red
	Too many soft errors in FPC memory.	Replace failed FPC.	Red
Hot swapping	Too many hot-swap interrupts are occurring. This message generally indicates that a hardware component that plugs into the router's backplane from the front (generally, an FPC) is broken.	Replace failed component.	Red
Power supplies	A power supply has been removed from the chassis.	Insert power supply into empty slot.	Yellow
	A power supply has failed.	Replace failed power supply.	Red

Table 26: Chassis Component Alarm Conditions on M320 Routers (continued)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Routing Engine	Excessive framing errors on console port.	Replace the serial cable connected to the device.	Yellow
	An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded.	If the cable is replaced and no excessive framing errors are detected within 5 minutes from the last detected framing error, the alarm is cleared automatically.	
	This might be caused by a faulty serial console port cable connected to the device.		
	Error in reading or writing hard disk.	Reformat hard disk and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	Error in reading or writing CompactFlash card.	Reformat CompactFlash card and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	System booted from default backup Routing Engine. If you manually switched mastership, ignore this alarm condition.	Install bootable image on default master Routing Engine. If this fails, replace failed Routing Engine.	Yellow
	System booted from hard disk.	Install bootable image on CompactFlash card. If this fails, replace failed Routing Engine.	Yellow
	CompactFlash card missing in boot list.	Replace failed Routing Engine.	Red
	Hard disk missing in boot list.	Replace failed Routing Engine.	Red
Routing Engine	Routing Engine failed to boot.	Replace failed Routing Engine.	Red
	A spare SIB is missing.	Insert spare SIB in to empty slot.	Yellow
	The Ethernet management interface (fxp0 or em0) on the Routing Engine is down.		Red

Table 26: Chassis Component Alarm Conditions on M320 Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		<ul style="list-style-type: none"> • Check the interface cable connection. • Reboot the system. • If the alarm recurs, open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States) 	
Switch Interface Board (SIB)	A SIB has failed.	Replace failed SIB.	Yellow
	A spare SIB has failed.	Replace failed SIB.	Yellow
	A SIB has an out of range or invalid temperature reading.	Replace failed SIB.	Yellow
	A SIB is missing.	Insert SIB into empty slot.	Red
	A SIB has failed.	Replace failed SIB.	Red
	The chassis temperature has exceeded 55 degrees C (131 degrees F), the fans have been turned on to full speed, and one or more fans have failed.	<ul style="list-style-type: none"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Yellow

Table 26: Chassis Component Alarm Conditions on M320 Routers (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Temperature	The chassis temperature has exceeded 65 degrees C (149 degrees F), and the fans have been turned on to full speed.	<ul style="list-style-type: none"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and a fan has failed. If this condition persists for more than 4 minutes, the router shuts down.	<ul style="list-style-type: none"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Red
	Chassis temperature has exceeded 75 degrees C (167 degrees F). If this condition persists for more than 4 minutes, the router shuts down.	<ul style="list-style-type: none"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Red
	The temperature sensor has failed.	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Red

Chassis Component Alarm Conditions on MX Series 3D Universal Edge Routers

Table 27 on page 285 lists the alarms that the chassis components can generate on MX Series 3D Universal Edge routers.

Table 27: Chassis Component Alarm Conditions on MX Series 3D Universal Edge Routers

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Air filters	Change air filter.	Change air filter.	Yellow

Table 27: Chassis Component Alarm Conditions on MX Series 3D Universal Edge Routers (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Alternative media	The router boots from an alternate boot device, the hard disk. The CompactFlash card is typically the primary boot device. The Routing Engine boots from the hard disk when the primary boot device fails.	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Yellow
Craft interface	The craft interface has failed.	Replace failed craft interface.	Red
Dense Port Concentrators (DPC)s	A DPC is offline.	Check DPC. Remove and reinsert the DPC. If this fails, replace failed DPC.	Yellow
	A DPC has failed.	Replace failed DPC.	Red
	A DPC has been removed.	Insert DPC into empty slot.	Red
Fan trays	A fan tray has been removed from the chassis.	Install missing fan tray.	Red
	One fan in the chassis is not spinning or is spinning below required speed.	Replace fan tray.	Red
	A higher-cooling capacity fan tray is required when an MPC is installed on the chassis.	Upgrade to a high-capacity fan tray.	Yellow
Host subsystem	A host subsystem has been removed.	Insert host subsystem into empty slot.	Yellow
	A host subsystem has failed.	Replace failed host subsystem.	Red
Hot swapping	Too many hot-swap interrupts are occurring. This message generally indicates that a hardware component that plugs into the router's backplane from the front (generally, an FPC) is broken.	Replace failed component.	Red

Table 27: Chassis Component Alarm Conditions on MX Series 3D Universal Edge Routers (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Power supplies	A power supply has been removed from the chassis.	Insert power supply into empty slot.	Yellow
	A power supply has a high temperature.	Replace failed power supply or power entry module.	Red
	A power supply input has failed.	Check power supply input connection.	Red
	A power supply output has failed.	Check power supply output connection.	Red
	A power supply has failed.	Replace failed power supply.	Red
	Invalid AC power supply configuration.	When two AC power supplies are installed, insert one power supply into an odd-numbered slot and the other power supply into an even-numbered slot.	Red
	Invalid DC power supply configuration.	When two DC power supplies are installed, insert one power supply into an odd-numbered slot and the other power supply into an even-numbered slot.	Red
	Mix of AC and DC power supplies.	Do not mix AC and DC power supplies. For DC power, remove the AC power supply. For AC power, remove the DC power supply.	Red
	Not enough power supplies.	Install an additional power supply.	Red

Table 27: Chassis Component Alarm Conditions on MX Series 3D Universal Edge Routers (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Routing Engine	Excessive framing errors on console port.	Replace the serial cable connected to the device.	Yellow
	An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded.	If the cable is replaced and no excessive framing errors are detected within 5 minutes from the last detected framing error, the alarm is cleared automatically.	
	This might be caused by a faulty serial console port cable connected to the device.		
	Error in reading or writing hard disk.	Reformat hard disk and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	Error in reading or writing CompactFlash card.	Reformat CompactFlash card and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	System booted from default backup Routing Engine. If you manually switched mastership, ignore this alarm condition.	Install bootable image on default master Routing Engine. If this fails, replace failed Routing Engine.	Yellow
	System booted from hard disk.	Install bootable image on CompactFlash card. If this fails, replace failed Routing Engine.	Yellow
	CompactFlash card missing in boot list.	Replace failed Routing Engine.	Red
	Hard disk missing in boot list.	Replace failed Routing Engine.	Red
	Routing Engine failed to boot.	Replace failed Routing Engine.	Red
	The Ethernet management interface (fxp0 or em0) on the Routing Engine is down.		Red

Table 27: Chassis Component Alarm Conditions on MX Series 3D Universal Edge Routers (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		<ul style="list-style-type: none"> • Check the interface cable connection. • Reboot the system. • If the alarm recurs, open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States) 	
System Control Board (SCB)	An SCB has been removed.	Insert SCB into empty slot.	Yellow
	An SCB temperature sensor alarm has failed.	Replace failed SCB.	Yellow
	An SCB has failed.	Replace failed SCB.	Red

Table 27: Chassis Component Alarm Conditions on MX Series 3D Universal Edge Routers (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Temperature	The chassis temperature has exceeded 55 degrees C (131 degrees F), the fans have been turned on to full speed, and one or more fans have failed.	<ul style="list-style-type: none"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and the fans have been turned on to full speed.	<ul style="list-style-type: none"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and a fan has failed. If this condition persists for more than 4 minutes, the router shuts down.	<ul style="list-style-type: none"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Red
	Chassis temperature has exceeded 75 degrees C (167 degrees F). If this condition persists for more than 4 minutes, the router shuts down.	<ul style="list-style-type: none"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Red
	The temperature sensor has failed.	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Red

Backup Routing Engine Alarms

For routers with master and backup Routing Engines, a master Routing Engine can generate alarms for events that occur on a backup Routing Engine. [Table 28 on page 291](#) lists chassis alarms generated for a backup Routing Engine.



NOTE: Because the failure occurs on the backup Routing Engine, alarm severity for some events (such as Ethernet interface failures) is yellow instead of red.



NOTE: For information about configuring redundant Routing Engines, see the *Junos High Availability Configuration Guide*.

Table 28: Backup Routing Engine Alarms

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Alternative media	The backup Routing Engine boots from an alternate boot device, the hard disk. The CompactFlash card is typically the primary boot device. The Routing Engine boots from the hard disk when the primary boot device fails.	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Yellow
Boot Device	The boot device (CompactFlash or hard disk) is missing in boot list on the backup Routing Engine.	Replace failed backup Routing Engine.	Red
Ethernet	The Ethernet management interface (fxp0 or em0) on the backup Routing Engine is down.	<ul style="list-style-type: none"> Check the interface cable connection. Reboot the system. If the alarm recurs, open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States) 	Yellow
FRU Offline	The backup Routing Engine has stopped communicating with the master Routing Engine.	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Yellow
Hard Disk	Error in reading or writing hard disk on the backup Routing Engine.	Reformat hard disk and install bootable image. If this fails, replace failed backup Routing Engine.	Yellow

Table 28: Backup Routing Engine Alarms (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Multibit Memory ECC	The backup Routing Engine reports a multibit ECC error.	<ul style="list-style-type: none"> Reboot the system with the board reset button on the backup Routing Engine. If the alarm recurs, open a support case using the Case Manager link at www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States) 	Yellow

- Related Documentation**
- [Silencing External Devices Connected to Alarm Relay Contacts on page 292](#)

Silencing External Devices Connected to Alarm Relay Contacts

You can manually silence external devices connected to alarm relay contacts. To silence an external devices, press the alarm cutoff button located on the craft interface front panel of the device.

Silencing the device does not remove the alarm messages from the display (if present on the router or switch) or extinguish the alarm LEDs. In addition, new alarms that occur after an external device is silenced reactivate the external device.

- Related Documentation**
- [Configuring the Junos OS to Determine Conditions That Trigger Alarms on Different Interface Types on page 251](#)
 - [Configuring the Junos OS to Disable the Physical Operation of the Craft Interface on page 245](#)

CHAPTER 25

Examples

- [Examples: Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs on MX Series Routers on page 293](#)
- [Example: Configuring Tunnel Interfaces on a Gigabit Ethernet 40-Port DPC on page 295](#)
- [Example: Configuring J Series Services Router Switching Interfaces on page 296](#)
- [Example: Configuring Tunnel Interfaces on a 10-Gigabit Ethernet 4-Port DPC on page 296](#)
- [Example: Configuring Tunnel Interfaces on the MPC3E on page 296](#)
- [Example: Configuring Fabric Redundancy Mode on MPC4E on page 298](#)
- [Example: Configuring Centralized Clocking on the Enhanced MX Switch Control Board on page 300](#)
- [Example: Configuring a T4000 Chassis to Represent a T640 Chassis on page 309](#)

Examples: Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs on MX Series Routers

The following examples show how to configure symmetrical hashing at the PIC level for load balancing on MX Series routers:

- [Configuring Symmetrical Hashing for family multiservice on Both Routers on page 293](#)
- [Configuring Symmetrical Hashing for family inet on Both Routers on page 294](#)
- [Configuring Symmetrical Hashing for family inet and family multiservice on the Two Routers on page 294](#)

Configuring Symmetrical Hashing for family multiservice on Both Routers

On the inbound traffic interface where traffic enters Router A, include the **symmetric-hash** statement at the **[edit chassis fpc slot-number pic pic-number hash-key family multiservice]** hierarchy level:

```
[edit chassis fpc 2 pic 2 hash-key]
family multiservice {
  source-mac;
  destination-mac;
  payload {
    ip {
      layer-3;
      layer-4;
```

```
    }  
  }  
  symmetric-hash;  
}
```

On the inbound traffic interface where traffic enters Router B, include the **symmetric-hash complement** statement at the **[edit chassis fpc slot-number pic pic-number hash-key family multiservice]** hierarchy level:

```
[edit chassis fpc 0 pic 3 hash-key]  
family multiservice {  
  source-mac;  
  destination-mac;  
  payload {  
    ip {  
      layer-3;  
      layer-4;  
    }  
  }  
  symmetric-hash {  
    complement;  
  }  
}
```

Configuring Symmetrical Hashing for family inet on Both Routers

On the inbound traffic interface where traffic enters Router A, include the **symmetric-hash** statement at the **[edit chassis fpc slot-number pic pic-number hash-key family inet]** hierarchy level:

```
[edit chassis fpc 0 pic 1 hash-key]  
family inet {  
  layer-3;  
  layer-4;  
  symmetric-hash;  
}
```

On the inbound traffic interface where traffic enters Router B, include the **symmetric-hash complement** statement at the **[edit chassis fpc slot-number pic pic-number hash-key family inet]** hierarchy level:

```
[edit chassis fpc 1 pic 2 hash-key]  
family inet {  
  layer-3;  
  layer-4;  
  symmetric-hash {  
    complement;  
  }  
}
```

Configuring Symmetrical Hashing for family inet and family multiservice on the Two Routers

On the inbound traffic interface where traffic enters Router A, include the **symmetric-hash** statement at the **[edit chassis fpc slot-number pic pic-number hash-key family multiservice]** hierarchy level:

```
[edit chassis fpc 1 pic 0 hash-key]
family multiservice {
  payload {
    ip {
      layer-3;
      layer-4;
    }
  }
  symmetric-hash;
}
```

On the inbound traffic interface where traffic enters Router B, include the **symmetric-hash complement** statement at the `[edit chassis fpc slot-number pic pic-number hash-key family inet]` hierarchy level:

```
[edit chassis fpc 0 pic 3 hash-key]
family inet {
  layer-3;
  layer-4;
  symmetric-hash {
    complement;
  }
}
```

**Related
Documentation**

- [Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs for MX Series Routers on page 111](#)

Example: Configuring Tunnel Interfaces on a Gigabit Ethernet 40-Port DPC

The following example shows how to create tunnel interfaces on Packet Forwarding Engine 1 of DPC 4 with 1 Gbps of bandwidth reserved for tunnel services. On a Gigabit Ethernet 40-port DPC, tunnel interfaces coexist with Ethernet interfaces. With this configuration, the Gigabit Ethernet interfaces are **ge-4/1/0** through **ge-4/1/9**. The tunnel interfaces created are **gr-4/1/10**, **pe-4/1/10**, **pd-4/1/10**, **vt-4/1/10** and so on.

```
[edit chassis]
fpc 4 pic 1 {
  tunnel-services {
    bandwidth 1g;
  }
}
```

**Related
Documentation**

- [Configuring the Junos OS to Support ILMI for Cell Relay Encapsulation on an ATM2 IQ PIC on page 156](#)
- [Example: Configuring Tunnel Interfaces on a 10-Gigabit Ethernet 4-Port DPC on page 296](#)
- [Example: Configuring Tunnel Interfaces on the MPC3E on page 296](#)
- [bandwidth \(Tunnel Services\) on page 327](#)
- [tunnel-services \(Chassis\) on page 424](#)
- [\[edit chassis\] Hierarchy Level](#)

Example: Configuring J Series Services Router Switching Interfaces

Configure a single physical interface for the uPIM and set the port parameters for port 0 and port 1:

```
[edit interfaces]
ge-2/0/0 {
  {
    switch-port 0 {
      no-auto-negotiation;
      1g;
      link-mode full-duplex;
    }
    port 1 {
      no-auto-negotiation;
      10m;
      link-mode half-duplex;
    }
  }
}
```

Related Documentation

- [Configuring J Series Services Router Switching Interfaces on page 143](#)

Example: Configuring Tunnel Interfaces on a 10-Gigabit Ethernet 4-Port DPC

In this example, you create tunnel interfaces on Packet Forwarding Engine 0 of DPC 4 with 10 Gbps of bandwidth reserved for tunnel traffic. Ethernet and tunnel interfaces cannot coexist on the same Packet Forwarding Engine of a 10-Gigabit Ethernet 4-port DPC. With this configuration, the tunnel interfaces created are **gr-4/0/0**, **pe-4/0/0**, **pd-4/0/0**, **vt-4/0/0** and so on.

```
[edit chassis]
fpc 4 pic 0 {
  tunnel-services {
    bandwidth 10g;
  }
}
```

Related Documentation

- [Example: Configuring Tunnel Interfaces on a Gigabit Ethernet 40-Port DPC on page 295](#)
- [Example: Configuring Tunnel Interfaces on the MPC3E on page 296](#)
- [bandwidth \(Tunnel Services\) on page 327](#)
- [tunnel-services \(Chassis\) on page 424](#)
- [\[edit chassis\] Hierarchy Level](#)

Example: Configuring Tunnel Interfaces on the MPC3E

- [Requirements for Configuration of Tunnel Interfaces on the MPC3E on page 297](#)
- [Ethernet Tunnel Configuration Overview on page 297](#)

- [Configuring a 20-Gigabit Ethernet Tunnel on page 297](#)
- [Configuring a Tunnel With Unspecified Bandwidth on page 297](#)

Requirements for Configuration of Tunnel Interfaces on the MPC3E

This example requires MX Series routers with the MPC3E.

Ethernet Tunnel Configuration Overview

MX Series routers do not support Tunnel Services PICs. However, you can create one set of tunnel interfaces per pic slot up to a maximum of 4 slots from 0-3 on MX Series routers with the MPC3E.

To configure the tunnels, include the **tunnel-services** statement and an optional bandwidth of (1g | 10g | 20g | 30g | 40g) at the **[edit chassis]** hierarchy level.



NOTE: When no tunnel bandwidth is specified, the tunnel interface can have a maximum bandwidth of up to 60Gbps.



NOTE: A MIC need not be plugged in to the MPC3E to configure a tunnel interface.

Configuring a 20-Gigabit Ethernet Tunnel

Step-by-Step Procedure

In the following example, you create tunnel interfaces on PIC-slot 1 of MPC 0 with 20 gigabit per second of bandwidth reserved for tunnel traffic. With this configuration, the tunnel interfaces created are **gr-0/1/0**, **pe-0/1/0**, **pd-0/1/0**, **vt-0/1/0**, and so on.

1. To create a 20 gigabit per second tunnel interface, use the following configuration:

```
[edit chassis]
fpc 0 pic 1 {
  tunnel-services {
    bandwidth 20g;
  }
}
```

Configuring a Tunnel With Unspecified Bandwidth

Step-by-Step Procedure

In the following example, you create a tunnel interface on PIC-slot 3 of MPC 0 with no bandwidth specified. The tunnel traffic can carry up to a maximum of 60Gbps depending on other traffic through the packet forwarding engine. With this configuration, the tunnel interfaces created are **gr-0/3/0**, **pe-0/3/0**, **pd-0/3/0**, **vt-0/3/0**, and so on.

1. To create a tunnel interface with no bandwidth specification, use the following configuration:

```
[edit chassis]
fpc 0 pic 3 {
  tunnel-services;
```

```
}
```

Related Documentation

- [Example: Configuring Tunnel Interfaces on a Gigabit Ethernet 40-Port DPC on page 295](#)
- [Example: Configuring Tunnel Interfaces on a 10-Gigabit Ethernet 4-Port DPC on page 296](#)
- [bandwidth \(Tunnel Services\) on page 327](#)
- [tunnel-services \(Chassis\) on page 424](#)
- [\[edit chassis\] Hierarchy Level](#)
- [Configuring Tunnel Interfaces on MX Series Routers](#)

Example: Configuring Fabric Redundancy Mode on MPC4E

- [Requirements for Configuration of the Fabric Redundancy Mode on MPC4E on page 298](#)
- [Overview on page 298](#)
- [Configuring Increased Bandwidth Mode on page 298](#)
- [Verification on page 299](#)

Requirements for Configuration of the Fabric Redundancy Mode on MPC4E

This example uses the following hardware and software components:

- Junos OS Release 12.3 R2 or later for MX Series routers
- A single MX480 router with MPC4E

Overview

This example provides information about configuring the fabric redundancy mode on an MX480 router with MPC4E. You can configure the MPC4E to function in redundant fabric mode or increased bandwidth mode. If you do not configure the mode, the MPC4E, by default, functions in redundant fabric mode. In redundant fabric mode, the number of active fabric planes is 4. If you configure the MPC4E to function in increased bandwidth mode, the number of active fabric planes increases to 6.

Configuring Increased Bandwidth Mode

Step-by-Step Procedure

In this example, you configure increased bandwidth mode on an MX480 router with MPC4E. The existing fabric mode on the MX480 router is redundant fabric mode. To configure the fabric mode, perform the following tasks:

1. Verify the existing fabric mode of the router by using the **show chassis fabric mode** command.

```
user@host > show chassis fabric mode
Fabric Operating Mode :
    Redundant Fabric
```
2. View the number of active fabric planes by using the **show chassis fabric summary** command.

```

user@host > show chassis fabric summary
Plane  State      Uptime
0       Online    2 hours, 58 minutes, 22 seconds
1       Online    6 seconds
2       Online    32 seconds
3       Online    2 hours, 58 minutes, 23 seconds
4       Spare     31 seconds
5       Spare     21 seconds
6       Spare     18 seconds
7       Spare     9 seconds
Note:
For FPC slots with MPC Type 4 or MCC:
Fabric planes 1 and 5, 3 and 7 use shared physical links.
Those slots may run in a reduced bandwidth in case both
plane 1 and 5, or both 3 and 7 are active.

```

3. In configuration mode, go to the **[edit chassis]** hierarchy level and set the fabric mode to **increased-bandwidth** as follows:

```

[edit chassis]
user@ host #set fabric redundancy-mode increased-bandwidth

```

Results In **redundant fabric** mode, the number of active fabric planes is 4 while the number of spare planes is also 4. In **increased-bandwidth** mode, the number of active planes is 6 while the number of spare planes is 2.



NOTE: Fabric planes 1 and 5 and fabric planes 3 and 7 use shared physical links. So, among fabric planes 1 and 5, only one plane can be active. Similarly, among fabric planes 3 and 7, only one plane can be active.

Verification

To verify that the fabric mode of the MX480 router with MPC4E, perform the following tasks:

- [Verifying the Fabric Redundancy Mode of the Router on page 299](#)
- [Verifying the Number of Active Fabric Planes on page 300](#)

Verifying the Fabric Redundancy Mode of the Router

Purpose To verify that the fabric redundancy mode of the MX480 router with MPC4E has been modified to **increased-bandwidth**.

Action To view the fabric mode of the router, use the **show chassis fabric mode** command.

```

user@host > show chassis fabric mode
Fabric redundancy mode: Increased Bandwidth

```

Meaning The MX480 router with MPC4E is functioning in increased bandwidth mode.

Verifying the Number of Active Fabric Planes

Purpose To verify that the number of active fabric planes is 6.

Action To view the number of active fabric planes, use the **show chassis fabric summary** command.

```
user@host > show chassis fabric summary
Plane  State      Uptime
0       Online    2 hours, 55 minutes, 49 seconds
1       Online    2 hours, 55 minutes, 25 seconds
2       Online    2 hours, 58 minutes, 48 seconds
3       Online    2 hours, 55 minutes, 50 seconds
4       Online    2 hours, 55 minutes, 48 seconds
5       Spare     2 hours, 55 minutes, 40 seconds
6       Online    2 hours, 55 minutes, 37 seconds
7       Spare     2 hours, 55 minutes, 29 seconds
Note:
For FPC slots with MPC Type 4 or MCC:
Fabric planes 1 and 5, 3 and 7 use shared physical links.
Those slots may run in a reduced bandwidth in case both
plane 1 and 5, or both 3 and 7 are active.
```

Meaning Number of active planes on the MX480 router with MPC4E is 6 (0, 1, 2, 3, 4, and 6) while the number of spare planes is 2.

Related Documentation

- [Fabric Management on MPC4E Overview on page 16](#)
- [show chassis fabric destinations on page 801](#)
- [show chassis fabric fpcs on page 819](#)
- [show chassis fabric plane on page 876](#)
- [show chassis fabric summary](#)

Example: Configuring Centralized Clocking on the Enhanced MX Switch Control Board

These examples show how to configure the following clock sources and features on an Enhanced MX Switch Control Board (SCB): Synchronous Ethernet, ordinary Precision Time Protocol (PTP) slave, hybrid PTP slave, and retiming through the building-integrated timing supply (BITS) external interface.

- [Requirements on page 301](#)
- [Overview on page 301](#)
- [Configuration on page 302](#)
- [Verification on page 306](#)

Requirements

These examples use the following hardware and software components:

- One MX240, MX480, or MX960 router with MPC 16x10GE or MPC2Es (see *MPCs Supported by MX240, MX480, MX960, MX2010, and MX2020 Routers*) for Synchronous Ethernet clock sources, or MPC2E-P for PTP clock sources
- One Synchronous Ethernet clock source device (may be an MX240, MX480, or MX960 router)
- One PTP grandmaster device
- One BITS device (may be the same as the PTP grandmaster device)
- Junos OS Release 12.2 or later for MX240, MX480, or MX960 routers
- Junos OS Release 12.3 or later to configure a BITS interface as an input, output, or I/O clock source for MX240, MX480, or MX960 routers

Before you begin configuring centralized clocking on an interface that uses Synchronous Ethernet, ensure that you have configured the MX Series interface as a chassis synchronization source to the device that provides a Synchronous Ethernet clock source.

- Configure the MX Series interface as a chassis synchronization source to the device that provides a Synchronous Ethernet clock source.

Overview

With the addition of a Stratum 3 (ST3) clock module to the Enhanced MX SCB, an MX240, MX480, or MX960 chassis can perform clock monitoring, filtering, and holdover in a centralized chassis location. Chassis line cards can be configured to recover network timing clocks at the physical layer via Synchronous Ethernet or by a packet-based PTP implementation. These recovered clocks are routed to the Enhanced MX SCB ST3 clock module via the chassis backplane. A clock selection algorithm is run that selects the best quality recovered clock from the list of configured clock sources. The ST3 clock module locks to the selected clock source and fans it out to the chassis line cards. 16x10GE 3D and MPC2Es (see *MPCs Supported by MX240, MX480, MX960, MX2010, and MX2020 Routers*) can distribute this clock to downstream network elements via Synchronous Ethernet.

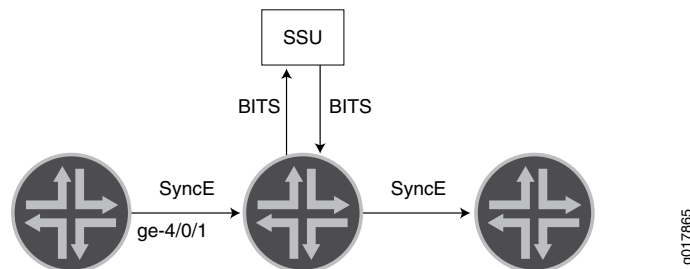
The ST3 clock module acquires holdover data while locked to the selected clock source. If the clock fails, the ST3 clock module enters holdover mode and replays collected holdover data to maintain its output clock. The ST3 holdover performance depends on the drift of the Enhanced MX SCB OCXO device.

In Junos 12.3, support was added for synchronizing an MX240, MX480, or MX960 chassis with an Enhanced MX SCB to a BITS timing source through an RJ-48 port on the Enhanced MX SCB. The BITS external clock interface (ECI) supports the sending and receiving of Synchronization Status Message (SSM) quality levels. The quality level is used by the chassis clock-selection algorithm. When BITS output is configured, the source-mode default is the selected line clock source.

The BITS external interface can be connected to a retiming device, which cleans up the clock and sends it back in the external BITS interface. The conditioned input BITS clock is selected as the chassis clock and distributed downstream via Synchronous Ethernet interfaces. The **tx-dnu-to-line-source-enable** option is used to prevent a timing loop.

[Figure 4 on page 302](#) shows the BITS retiming functionality using a Synchronization Supply Unit (SSU). For instructions on how to configure retiming through the BITS external interface, see [“Configuring Retiming through the BITS External Interface” on page 304](#).

Figure 4: BITS Retiming with Synchronization Supply Unit (SSU)



Prior to the Enhanced MX SCB, clock monitoring, filtering, and holdover functions were distributed throughout the chassis and performed on MPC2E line cards. This distributed clocking mode limits the distribution of timing to downstream network elements on MPC2E interfaces only. Centralized clocking mode removes this limitation by supporting the distribution of timing on MPC 16x 10GE line interfaces as well.

Configuration

To configure centralized clocking, perform one or more of these tasks:

- [Configuring Centralized Clocking from a Synchronous Ethernet Clock Source on page 302](#)
- [Configuring Centralized Clocking from an Ordinary PTP Clock Source on page 303](#)
- [Configuring Centralized Clocking from a Hybrid PTP Clock Source on page 303](#)
- [Configuring Retiming through the BITS External Interface on page 304](#)

Configuring Centralized Clocking from a Synchronous Ethernet Clock Source

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 chassis synchronization network-option option-2
set chassis synchronization source interfaces ge-4/1/0 priority 1
set chassis synchronization source interfaces ge-4/1/0 quality-level st3
```

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure a Synchronous Ethernet clock source:

1. Configure the network option:

```
[edit chassis synchronization]
user@host# set network-option option-2
```

2. Configure the priority and quality level of the clock source on this interface:

```
[edit chassis synchronization source interfaces ge-4/1/0]
user@host# set priority 1
user@host# set quality-level st3
```

Results From configuration mode, confirm your configuration by entering the **show chassis synchronization** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
[edit]
user@host# show chassis synchronization
network-option option-2;
source {
    interfaces ge-4/1/0 {
        priority 1;
        quality-level st3;
    }
}
```

After you configure the device, enter **commit** from configuration mode.

Configuring Centralized Clocking from an Ordinary PTP Clock Source

Step-by-Step Procedure

To configure a PTP clock source:

1. Configure ordinary mode PTP on the ge-4/1/9 interface to the PTP grandmaster device. See [“Example: Configuring Precision Time Protocol” on page 205](#).

Configuring Centralized Clocking from a Hybrid PTP Clock Source

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 chassis synchronization network-option option-2
set chassis synchronization source interfaces ge-4/1/0 priority 1
set chassis synchronization source interfaces ge-4/1/0 quality-level st3
```

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure a hybrid PTP clock source:

1. Configure the network option:


```
[edit chassis synchronization]
user@host# set network-option option-2
```
2. Configure the priority and quality level of the clock source on this interface:

```
[edit chassis synchronization source interfaces ge-4/1/0]
user@host# set priority 1
user@host# set quality-level st3
```

3. Configure hybrid mode PTP on the ge-4/1/9 interface to the PTP grandmaster device. For the **synchronous-ethernet-mapping** interface, specify the Synchronous Ethernet interface used in Step 2.

Results From configuration mode, confirm your configuration by entering the **show chassis synchronization** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
[edit]
user@host# show chassis synchronization
network-option option-2;
source {
    interfaces ge-4/1/0 {
        priority 1;
        quality-level st3;
    }
}
```

After you configure the device, enter **commit** from configuration mode.

Configuring Retiming through the BITS External Interface

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 chassis synchronization network-option option-2
set chassis synchronization interfaces external signal-type t1
set chassis synchronization interfaces external t1-options line-encoding b8zs
set chassis synchronization interfaces external t1-options framing sf
set chassis synchronization output interfaces external wander-filter-disable
set chassis synchronization output interfaces external holdover-mode-disable
set chassis synchronization output interfaces external source-mode line
set chassis synchronization output interfaces external tx-dnu-to-line-source-enable
set chassis synchronization output interfaces external minimum-quality st3
set chassis synchronization source interfaces ge-4/0/1 quality-level st3
set chassis synchronization source interfaces external quality-level prs
```

Step-by-Step Procedure The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure retiming through the BITS external interface using an SSU:

1. Configure the network option (G.812 type IV clock):

```
[edit chassis synchronization]
user@host# set network-option option-2
```
2. Configure the external BITS signal type (T1-coded 1.544-MHz signal on 100-ohm balanced line):


```
[edit chassis synchronization interfaces external]
set signal-type t1
```

3. Configure the external BITS signal line-encoding (B8ZS) and framing (superframe) options:

```
[edit chassis synchronization interfaces external]
user@host# set t1-options line-encoding b8zs
user@host# set t1-options framing sf
```

4. Configure the output external BITS signal properties:

- Disable wander filtering:

```
[edit chassis synchronization output interfaces external]
user@host# set wander-filter-disable
```

- Disable holdover:

```
[edit chassis synchronization output interfaces external]
user@host# set holdover-mode-disable
```

- Select the best line clock source for output:

```
[edit chassis synchronization output interfaces external]
user@host# set source-mode line
```

- Set Tx QL to DNU/DUS on the line source interface to prevent a timing loop:

```
[edit chassis synchronization output interfaces external]
user@host# set tx-dnu-to-line-source-enable
```

- Set minimum quality level:

```
[edit chassis synchronization output interfaces external]
user@host# set minimum-quality st3
```

5. Configure the incoming clock source and quality level:

```
[edit chassis synchronization source interfaces ge-4/0/1]
user@host# set quality-level st3
```

6. Configure the external clock source and quality level:

```
[edit chassis synchronization source interfaces external]
user@host# set quality-level prs
```

Results From configuration mode, confirm your configuration by entering the **show chassis synchronization** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
[edit]
user@host# show chassis synchronization
network-option option-2;
interfaces external {
  signal-type t1;
  t1-options {
    line-encoding b8zs;
    framing sf;
  }
}
output {
  interfaces external {
```

```

        wander-filter-disable;
        holdover-mode-disable;
        source-mode line;
        tx-dnu-to-line-source-enable;
        minimum-quality st3;
    }
}
source {
    interfaces ge-4/0/1 {
        quality-level st3;
    }
    interfaces external {
        quality-level prs;
    }
}

```

After you configure the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

- [Verifying the Synchronous Ethernet Clock Source on page 306](#)
- [Verifying the Ordinary PTP Clock Source on page 306](#)
- [Verifying the Hybrid PTP Clock Source on page 307](#)
- [Verifying the Retiming through the BITS External Interface on page 307](#)

Verifying the Synchronous Ethernet Clock Source

Purpose	Verify that the MX Series router recovers, selects, qualifies, and locks to the configured Synchronous Ethernet clock source.
Action	<p>From operational mode, enter the show chassis synchronization clock-module command.</p> <pre>user@host> show chassis synchronization clock-module</pre> <pre> Clock module on SCB0 Current role : master Current state : locked to ge-4/1/0 State for : 0 days, 00 hrs, 00 mins, 15 secs State since : Mon Jun 6 07:28:47 2011 Monitored clock sources Interface Type Status ge-4/1/0 syncE qualified-selected </pre>
Meaning	The Monitored clock sources field shows that the ge-4/1/0 interface has the Synchronous Ethernet type and is the qualified and selected centralized clock source.

Verifying the Ordinary PTP Clock Source

Purpose	Verify that the MX Series router recovers, selects, qualifies, and locks to the configured PTP clock source.
----------------	--

Action From operational mode, enter the **show chassis synchronization clock-module** command.

```
user@host> show chassis synchronization clock-module

Clock module on SCB0
  Current role      : master
  Current state     : locked to ge-4/1/9
    State for       : 0 days, 00 hrs, 00 mins, 45 secs
    State since     : Wed Jun 29 10:52:05 2011
  Monitored clock sources
    Interface      Type      Status
    ge-4/1/9       ptp       qualified-selected
```

Meaning The Monitored clock sources field shows that the ge-4/1/9 interface has the ptp type and is the qualified and selected centralized clock source.

Verifying the Hybrid PTP Clock Source

Purpose Verify that the MX Series router recovers, selects, qualifies, and locks to the configured hybrid PTP clock source.

Action From operational mode, enter the **show chassis synchronization clock-module** command.

```
user@host> show chassis synchronization clock-module

Clock module on SCB0
  Current role      : master
  Current state     : locked to ge-4/1/9
    State for       : 0 days, 00 hrs, 00 mins, 15 secs
    State since     : Wed Jun 29 11:19:25 2011
  Monitored clock sources
    Interface      Type      Status
    ge-4/1/9       ptp-hybrid qualified-selected

Configured sources:

Interface      : ge-4/1/0
Status         : Primary      Index      : 218
Clock source state : Clk qualified Priority    : 1
Configured QL    : ST3        ESMC QL    : DUS
Clock source type : ifd        Clock Event : Clock locked
Kernel flags    : Up,sec,
```

Meaning The Monitored clock sources field shows that the ge-4/1/9 interface has the ptp-hybrid type and is the qualified and selected centralized clock source. The Configured sources field shows that the ge-4/1/0 interface has the Clock locked Clock Event .

Verifying the Retiming through the BITS External Interface

Purpose Verify that the MX Series router recovers, selects, qualifies, and locks to the configured clock source, and that the external clock is locked to the configured clock source.

Action From operational mode, enter the **show chassis synchronization extensive** command.

```
user@host> show chassis synchronization extensive
```

Current clock status : Locked
Clock locked to : Primary

Configured interfaces:

Name : external
Signal type : t1 (sf b8zs)
Rx status : active
Tx status : active
LED color : green

Configured outputs:

Interface : external
Tx status : active
Minimum QL : ST3 Tx QL : ST3
Holdover mode : disabled Wander filter : disabled
Source mode : line Source Tx DNU : enabled
Holdover data : valid
Current state : locked to ge-4/0/1
State for : 0 days, 00 hrs, 24 mins, 47 secs
State since : Thu Sep 6 13:01:07 2012

Configured sources:

Interface : external
Status : Primary Index : 0
Clock source state : Clk qualified Priority : Default(6)
Configured QL : PRS ESMC QL : PRS
Clock source type : extern Clock Event : Clock locked
Interface State : Up,pri,

Interface : ge-4/0/1
Status : Secondary Index : 152
Clock source state : Clk qualified Priority : Default(8)
Configured QL : ST3 ESMC QL : DUS
Clock source type : ifd Clock Event : Clock qualified
Interface State : Up,sec,ESMC TX(QL DUS/SSM 0xf),

Meaning The Configured interfaces field shows that the external interface receive and transmit statuses are active. The Configured outputs field shows that the current state is locked to ge-4/0/1. The Configured sources field shows that the external interface is the qualified and selected centralized clock source, and has the Clock locked Clock Event. The Configured sources field shows that the ge-4/0/1 interface is the secondary clock source, and has the Clock qualified Clock Event.

- Related Documentation**
- [synchronization on page 411](#)
 - [show chassis synchronization \(MX Series Routers\) on page 1260](#)
 - [Example: Configuring Precision Time Protocol on page 205](#)
 - [Configuring Hybrid Mode and ESMC Quality Level Mapping on page 209](#)
 - [Precision Time Protocol Overview on page 38](#)

Example: Configuring a T4000 Chassis to Represent a T640 Chassis

This example shows how to configure OSS mapping feature to represent a T4000 chassis as a T640 chassis. You can extend this concept to configure a T4000 chassis to represent as a T1600 chassis as well.

- [Requirements on page 309](#)
- [Overview on page 309](#)
- [Configuring the T4000 Chassis to Represent a T640 Chassis on page 310](#)
- [Verification on page 310](#)

Requirements

This example uses the following hardware and software components:

- One T4000 router
- Junos OS Release 12.3R3, 13.1R2, 13.2R1, or later

Overview

Operations support systems (OSS) is used by service providers to maintain their networks. When a new router is added or removed from the network, the OSS must be updated to reflect the changes. This process is tedious and time-consuming.

When a T1600 chassis or a T640 chassis is upgraded to a T4000 chassis, the OSS identifies the new chassis as a new networking element and follows a tedious process of qualifying it for the customer's network. The *OSS mapping feature* helps avoid this scenario.

Using the OSS mapping feature, you can map a T4000 chassis to a T1600 chassis or to a T640 chassis with the **set chassis oss-map model-name t640|t1600** configuration command. This configuration command overrides the chassis model name, so that the OSS recognizes the chassis as a known chassis and proceeds without any requalification.



NOTE:

- The **set chassis oss-map model-name t640 | t1600** command is applicable only on T4000 routers. You must explicitly set this command when a T1600 chassis or a T640 chassis is upgraded to a T4000 chassis.
 - You can execute the **set chassis oss-map model-name t640** command or the **set chassis oss-map model-name t1600** command, if the OSS is compatible with either the T640 chassis or the T1600 chassis, respectively.
-

Configuring the T4000 Chassis to Represent a T640 Chassis

Step-by-Step Procedure To configure the T4000 chassis to represent a T640 chassis by using the OSS mapping feature:

1. In configuration mode, go to the **[edit chassis]** hierarchy level.

```
[edit]
user@T4000# edit chassis
```
2. Configure the OSS mapping feature to map the T4000 chassis to a T640 chassis.

```
[edit chassis]
user@T4000# set oss-map model-name t640
```

Verification

Verifying the OSS Mapping Feature

Purpose To verify that the OSS mapping feature is working on a T4000 router.

Action Run the **show chassis operational** command and verify that the configured known chassis name is displayed when the T4000 chassis is mapped to a T640 chassis.

- Run the **show chassis hardware** operational command:

```
user@T4000> show chassis hardware
Hardware inventory:
Item          Version  Part number  Serial number  Description
Chassis                               JN11B3892AHA  T640
Midplane      REV 01   710-027486   RC9848         T-series Backplane
FPM GBUS      REV 13   710-002901   BBAG5143       T640 FPM Board
FPM Display   REV 04   710-021387   BBAL2705       T1600 FPM Display
CIP           REV 06   710-002895   BBAL3705       T-series CIP
PEM 1         REV 03   740-036442   VJ00054        Power Entry Module
6x60
SCG 0         REV 18   710-003423   BBAJ0727       T640 Sonet Clock Gen.
SCG 1         REV 18   710-003423   BBAE3887       T640 Sonet Clock Gen.
Routing Engine 0 REV 06   740-026941   P737F-002705   RE-DUO-1800
Routing Engine 1 REV 06   740-026941   P737F-002675   RE-DUO-1800
CB 0          REV 09   710-022597   EF7371         LCC Control Board
....
```

- Run the **show chassis hardware detail** operational command:

```
user@T4000> show chassis hardware detail
Hardware inventory:
Item          Version  Part number  Serial number  Description
Chassis                               JN11B3892AHA  T640
Midplane      REV 01   710-027486   RC9848         T-series Backplane
FPM GBUS      REV 13   710-002901   BBAG5143       T640 FPM Board
FPM Display   REV 04   710-021387   BBAL2705       T1600 FPM Display
CIP           REV 06   710-002895   BBAL3705       T-series CIP
PEM 1         REV 03   740-036442   VJ00054        Power Entry Module
6x60
SCG 0         REV 18   710-003423   BBAJ0727       T640 Sonet Clock Gen.
SCG 1         REV 18   710-003423   BBAE3887       T640 Sonet Clock Gen.
Routing Engine 0 REV 06   740-026941   P737F-002705   RE-DUO-1800
ad0          3823 MB SMART CF 201101050335CCFACCFA Compact Flash
```

```

ad1 62720 MB SMART Lite SATA Drive 2011021700D8789F789F Disk 1
Routing Engine 1 REV 06 740-026941 P737F-002675 RE-DUO-1800
ad0 3823 MB SMART CF 201011150208AF59AF59 Compact Flash
ad1 62720 MB SMART Lite SATA Drive 2010122700A160026002 Disk 1
CB 0 REV 09 710-022597 EF7371 LCC Control Board
....

```

- Run the **show chassis hardware extensive** operational command:

```

user@T4000> show chassis hardware extensive
Hardware inventory:
Item          Version  Part number  Serial number  Description
Chassis                               JN11B3892AHA  T640
Jedec Code:   0x7fb0                  EEPROM Version: 0x02
                                           S/N:          JN11B3892AHA
Assembly ID:  0x0507                  Assembly Version: 00.00
Date:         00-00-0000              Assembly Flags:  0x00
....

```

Verifying the OSS Mapping Feature on SNMP MIBs

Purpose To verify that the SNMP MIBs are updated with the configured known chassis name.

Action Run the **show snmp mib** operational commands and verify that the configured known chassis name is displayed in SNMP MIBs when the T4000 chassis is mapped to a T640 chassis:

- Run the **show snmp mib walk system** operational command:

```

user@T4000> show snmp mib walk system
sysDescr.0 = Juniper Networks, Inc. t640 internet router, kernel JUNOS
12.3-...Juniper Networks, Inc.
sysObjectID.0 = jnxProductNameT640
...

```

- Run the **show snmp mib walk jnxBoxAnatomy** operational command:

```

user@T4000> show snmp mib walk jnxBoxAnatomy
jnxBoxClass.0 = jnxProductLineT640.0
jnxBoxDescr.0 = Juniper t640 Internet Backbone Router
jnxBoxSerialNo.0 = JN11B3892AHA
jnxBoxRevision.0
....

```

Meaning On configuring the OSS mapping feature, the OSS maps the T4000 chassis to a T640 chassis, thereby preventing requalification of the new chassis.

- Related Documentation**
- [Configuring OSS Mapping to Represent a T4000 Chassis as a T1600 or a T640 Chassis on page 138](#)
 - [oss-map on page 382](#)
 - [show chassis oss-map on page 1165](#)
 - [Understanding Operations Support Systems Mapping on page 19](#)

Configuration Statements

- Router Chassis Configuration Statements on page 313
- [edit protocols ptp] Hierarchy Level on page 318

Router Chassis Configuration Statements

You can configure properties of the router chassis, including conditions that activate the red and yellow alarm LEDs and SONET/SDH framing and concatenation properties for individual Physical Interface Cards (PICs).

To configure router chassis properties, include the following statements at the **[edit chassis]** hierarchy level:



NOTE: Statements at the **[edit chassis redundancy]** hierarchy level are described in the *Junos OS High Availability Library for Routing Devices*.

```
chassis {
  aggregated-devices {
    ethernet {
      device-count number;
      lacp {
        system-priority;
        link-protection;
      }
    }
    sonet {
      device-count number;
    }
  }
  alarm {
    interface-type {
      alarm-name (red | yellow | ignore);
    }
  }
  config-button {
    no-clear;
    no-rescue;
    craft-lockout;
  }
}
```

```

fabric {
    degraded {
        action-fpc-restart-disable;
        degraded-fabric-detection-enable
        degraded-fpc-bad-plane-threshold number-bad-planes;
    }
    redundancy-mode (increased-bandwidth | redundant);
}
feb
slot number
    ucode-imem-remap
    {
    }
fpc slot-number {
    allow-sram-parity-errors;
    offline-on-fabric-bandwidth-reduction
    port-mirror-instance port-mirroring-instance-name;
    sampling-instance;
    route-localization {
        fib-local;
        fib-remote;
    }
    power (off | on);
    pic pic-number {
        port-mirror-instance port-mirroring-instance-name;
        framing (t1 | e1);
        port port-number {
            forwarding-mode {
                sa-multicast;
            }
            speed (oc3-stm1 | oc12-stm4 | oc48-stm16);
        }
        adaptive-services {
            service-package (layer-2 | layer-3);
        }
        aggregate-ports;
        atm-cell-relay-accumulation;
        atm-l2circuit-mode (cell | aal5 | trunk trunk);
        vtmapping number;
        cel {
            e1 port-number {
                channel-group channel-number timeslots slot-number;
            }
        }
        channelization;
        ct3 {
            port port-number {
                t1 link-number {
                    channel-group channel-number timeslots slot-number;
                }
            }
        }
        egress-policer-overhead bytes;
        forwarding-mode {
            sa-multicast;
            vlan-steering {

```

```

        vlan-rule (high-low | odd-even);
    }
}
framing (sdh | sonet);
fru-poweron-sequence;
idle-cell-format {
    itu-t;
    payload-pattern payload-pattern-byte;
}
ingress-policer-overhead bytes;
linerate-mode;
max-queues-per-interface (8 | 4);
mlfr-uni-nni-bundles number;
number-of-ports;
no-concatenate;
no-multi-rate;
q-pic-large-buffer {
    large-scale;
    small-scale;
}
red-buffer-occupancy {
    weighted-averaged [ instant-usage-weight-exponent weight-value ];
}
}
sparse-dlcis;
traffic-manager {
    egress-shaping-overhead number;
    ingress-shaping-overhead number;
    mode {
        egress-only;
        ingress-and-egress;
        session-shaping;
    }
}
tunnel-services {
    bandwidth (1g | 10g);
    vtmapping (itu-t | klm);
}
}
fpc-resync;
fpc-feb-connectivity {
    fpc slot-number feb (slot-number | none);
}
lcc number {
    fpc number {
        pic number {
            atm-cell-relay-accumulation;
            atm-l2circuit-mode (cell | aal5 | trunk trunk);
            framing (sdh | sonet);
            idle-cell-format {
                itu-t;
                payload-pattern payload-pattern-byte;
            }
            linerate-mode;
            max-queues-per-interface (8 | 4);
            no-concatenate;
            no-mcast-replication;

```

```
hash-key {
  family {
    inet {
      layer-3;
      layer-4;
      symmetric-hash {
        complement;
      }
    }
    multiservice {
      source-mac;
      destination-mac;
      payload {
        ip {
          layer-3;
          layer-4;
        }
      }
      symmetric-hash {
        complement;
      }
    }
  }
}

pem {
  feeds number-of-input-feeds;
}

maximum-ecmp;
offline;
online-expected;
sampling-instance;
}

lcc-mode {
  lcc number {
    mode mode;
  }
}

memory-enhanced{
  filter;
  route;
  vpn-label;
}

(packet-scheduling | no-packet-scheduling);
pem {
  minimum number;
  feeds number-of-input-feeds;
  input-current amps-in-each-feed;
}

no-concatenate;
redundancy {
  cfeb slot (always | preferred);
  failover {
    on-disk-failure
    on-loss-of-keepalives;
  }
}
```

```

}
feb {
  redundancy-group group-name {
    feb slot-number (backup | primary);
    description description;
    no-auto-failover;
  }
}
port-mirror-instance port-mirroring-instance-name;
graceful-switchover;
keepalive-time seconds;
routing-engine slot-number (master | backup | disabled);
sfm slot-number (always | preferred);
ssb slot-number (always | preferred);
}
network-services (ethernet | enhanced-ethernet | ip | enhanced-ip);
route-localization {
  inet;
  inet6;
}
routing-engine {
  on-disk-failure {
    disk-failure-action (halt | reboot);
  }
}
sfm slot-number {
  power off;
}
sib {
  minimum number;
}
vrf-mtu-check;
vtmapping (itu-t | klm);
synchronization {
  signal-type (e1 | t1);
  switching-mode (revertive | non-revertive);
  y-cable-line-termination;
  transmitter-enable;
  validation-interval seconds;
  primary (external-a | external-b);
  secondary (external-a | external-b);
}
}

```



NOTE: The configuration statements at the [edit chassis lcc] hierarchy level apply only to a routing matrix based on a TX Matrix router or a TX Matrix Plus router. For information about a routing matrix composed of a TX Matrix router and T640 routers, see [“TX Matrix Router and T640 Router Configuration Overview” on page 47](#) and the *TX Matrix Router Hardware Guide*. For information about a routing matrix composed of a TX Matrix Plus router and T1600 routers, see [“TX Matrix Plus Router Configuration Overview” on page 52](#) and the *TX Matrix Plus Router Hardware Guide*.

[edit protocols ptp] Hierarchy Level

```

protocols {
  ptp {
    clock-mode (boundary | ordinary);
    domain domain-value;
    master {
      announce-interval announce-interval-value;
      clock-step (one-step | two-step);
      interface interface-name {
        unicast-mode {
          clock-client ip-address {
            local-ip-address local-ip-address;
          }
          transport ipv4;
        }
      }
      sync-interval sync-interval-value;
    }
    priority1 priority1-value;
    priority2 priority2-value;
    slave {
      announce-timeout announce-timeout-value;
      delay-request delay-request-value;
      frequency-only;
      interface interface-name {
        unicast-mode {
          clock-source ip-address {
            local-ip-address local-ip-address;
          }
          transport ipv4;
        }
      }
    }
    unicast-negotiation;
  }
}

```

Related Documentation

- [\[edit protocols\] Hierarchy Level](#)
- [Configuring Precision Time Protocol on page 201](#)
- [Example: Configuring Precision Time Protocol on page 205](#)
- [Notational Conventions Used in Junos OS Configuration Hierarchies](#)
- [Precision Time Protocol Overview on page 38](#)
- [IEEE 1588v2 Precision Timing Protocol \(PTP\) on ACX Series Universal Access Routers](#)

account-layer2-overhead (Interface Level)

Syntax	<pre> account-layer2-overhead { value; egress bytes; ingress bytes; } </pre>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced in Junos OS Release 13.2.
Description	Add the configured number of bytes, which is the octet adjustment per packet, to the total octet count for both the ingress and egress traffic on the logical interface, or separately for ingress and egress traffic on the logical interface.
Options	<p>bytes—Number of bytes added to a packet entering and exiting an interface.</p> <p>Range: –128–+127 bytes</p> <p>Default: 0</p> <p>egress—Include the Layer 2 overhead value in bytes that is the octet adjustment per packet in the total octet count for egress traffic only on the logical interface</p> <p>ingress—Include the Layer 2 overhead value in bytes that is the octet adjustment per packet in the total octet count for ingress traffic only on the logical interface</p> <p>value—Layer 2 overhead value in bytes that is the octet adjustment per packet in the total octet count for both ingress and egress traffic on the logical interface</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Accounting of the Layer 2 Overhead Attribute in Interface Statistics on page 128 • Configuring Layer 2 Overhead Accounting in Interface Statistics on page 130 • Verifying the Accounting of Layer 2 Overhead in Interface Statistics on page 133 • account-layer2-overhead (PIC Level) on page 320 • [edit interfaces] Hierarchy Level

account-layer2-overhead (PIC Level)

Syntax	account-layer2-overhead;
Hierarchy Level	[edit chassis fpc slot-number pic pic-number]
Release Information	Statement introduced in Junos OS Release 13.2.
Description	Enable the automatic adjustment of Layer 2 overhead in bytes, which is the octet adjustment per packet, based on the encapsulation on the logical interface for the total octet count for ingress and egress traffic on all the interfaces in the PIC.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Accounting of the Layer 2 Overhead Attribute in Interface Statistics on page 128• Configuring Layer 2 Overhead Accounting in Interface Statistics on page 130• Verifying the Accounting of Layer 2 Overhead in Interface Statistics on page 133• account-layer2-overhead (Interface Level) on page 319• [edit chassis] Hierarchy Level

action-fpc-restart-disable

Syntax	action-fpc-restart-disable;
Hierarchy Level	[edit chassis fabric degraded]
Release Information	Statement added in Junos OS Release 11.4. Statement introduced in Junos OS Release 12.1X48R4 for PTX Series Packet Transport Routers.
Description	Allow the user to disable restarting of the FPCs during healing from a degraded fabric condition. The device can automatically recover from degraded fabric conditions by restarting both the fabric planes and the FPCs. If the action-fpc-restart-disable statement is configured, the healing attempt is limited to restarting the fabric planes only.
Default	The system will detect a blackholing condition and try to heal the system.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Disabling FPC Restart on page 234• Traffic Black Hole Caused by Fabric Degradation on page 225

adaptive-services

Syntax	<code>adaptive-services { (layer-2 | layer-3); }</code>
Hierarchy Level	<code>[edit chassis fpc slot-number pic pic-number]</code>
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Enable a service package on adaptive services interfaces.
Options	The remaining statements are explained separately.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring the Junos OS to Enable Service Packages on Adaptive Services Interfaces on page 181 • Configuring the Junos OS to Support Layer 2 Services on MX Series 3D Universal Edge Routers with MS-DPCs on page 126 • Junos Services Interfaces Configuration Guide • Junos OS Feature Guides

aggregate-ports

Syntax	<code>aggregate-ports;</code>
Hierarchy Level	<code>[edit chassis fpc slot-number pic pic-number]</code>
Release Information	Statement introduced in Junos OS Release 8.1.
Description	For T Series routers only, specify OC768-over-OC192 mode on the 4-port OC192C PIC. Four OC192 links are aggregated into one OC768 link with one logical interface.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring 4-Port OC192 PIC to Operate in OC768-over-OC192 Mode

aggregated-devices

Syntax	<pre>aggregated-devices { ethernet { device-count <i>number</i>; lacp { link-protection { non-revertive; } system-priority; } } sonet { device-count <i>number</i>; } maximum-links <i>maximum-links-limit</i>; }</pre>
Hierarchy Level	[edit chassis]
Release Information	Statement introduced before Junos OS Release 7.4. Support for LACP link protection and system priority introduced in Junos OS Release 9.3.
Description	Configure properties for aggregated devices on the router.
Options	The remaining statements are explained separately.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Junos OS for Supporting Aggregated Devices on page 167

alarm (chassis)

Syntax	<pre>alarm { interface-type { alarm-name (ignore | red | yellow); } }</pre>
Hierarchy Level	[edit chassis], [edit chassis interconnect-device <i>name</i>], [edit chassis node-group <i>name</i>]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 11.1 for the QFX Series. Statement introduced in Junos OS Release 12.2 for the ACX Series.
Description	<p>Configure the chassis alarms and whether they trigger a red or yellow alarm, or whether they are ignored. Red alarm conditions light the RED ALARM LED on either the router's craft interface or the switch's LCD screen and trigger an audible alarm if one is connected to the contact on the craft interface or LCD screen. Yellow alarm conditions light the YELLOW ALARM LED on either the router's craft interface or the switch's LCD screen and trigger an audible alarm if one is connected to the craft interface or LCD screen.</p> <p>To configure more than one alarm, include multiple <i>alarm-name</i> lines.</p>
Options	<p><i>alarm-name</i>—Alarm condition. For a list of conditions, see Table 19 on page 252.</p> <p><i>ignore</i>—The specified alarm condition does not set off any alarm.</p> <p><i>interface-type</i>—Type of interface on which you are configuring the alarm: atm, ethernet, sonet, or t3.</p> <p>red—The specified alarm condition sets off a red alarm.</p> <p>yellow—The specified alarm condition sets off a yellow alarm.</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Understanding Alarms</i> • Chassis Conditions That Trigger Alarms on page 253 • <i>Chassis Alarm Messages on a QFX3500 Device</i> • <i>Interface Alarm Messages</i>

allow-sram-parity-errors

Syntax	allow-sram-parity-errors;
Hierarchy Level	[edit chassis fpc <i>slot-number</i>]
Release Information	Statement introduced in Junos OS Release 8.0.
Description	(T Series routers only) Allow SRAM parity errors to occur without restarting the FPC.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.

announce-timeout

Syntax	announce-timeout <i>announce-timeout-value</i> ;
Hierarchy Level	[edit protocols ptp slave]
Release Information	Statement introduced in Junos OS Release 12.2.
Description	Specify the number of announce messages a slave—configured on an ACX Series router—must miss before an announce-timeout is declared. Announce messages are sent by the master to the slave.
Options	<i>announce-timeout-value</i> —The announce timeout value for announce interval messages. Range: 2 through 10 Default: 3
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Precision Time Protocol on page 201• Example: Configuring Precision Time Protocol on page 205• Precision Time Protocol Overview on page 38

announce-interval

Syntax	<code>announce-interval <i>announce-interval-value</i>;</code>
Hierarchy Level	<code>[edit protocols ptp master]</code>
Release Information	Statement introduced in Junos OS Release 12.2.
Description	Configure the logarithmic mean interval for the announce messages to be sent by the master. By default, one announce message is sent in every two seconds.
Options	<p><i>announce-interval-value</i>—The announce interval value for the announce messages.</p> <p>Range: 0 through 4</p> <p>Default: 1</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Precision Time Protocol on page 201 • Example: Configuring Precision Time Protocol on page 205 • Precision Time Protocol Overview on page 38

atm-cell-relay-accumulation

Syntax	<code>atm-cell-relay-accumulation;</code>
Hierarchy Level	<p><code>[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i>],</code></p> <p><code>[edit chassis lcc <i>number</i> fpc <i>slot-number</i> pic <i>pic-number</i>] (Routing Matrix)</code></p>
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure an Asynchronous Transfer Mode (ATM) Physical Interface Card (PIC) in cell-relay accumulation mode.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring the Junos OS to Use ATM Cell-Relay Accumulation Mode on an ATM1 PIC on page 151

atm-l2circuit-mode

Syntax	atm-l2circuit-mode (cell | aal5 | trunk <i>trunk</i>);
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i>], [edit chassis lcc <i>number</i> fpc <i>slot-number</i> pic <i>pic-number</i>] (Routing Matrix)
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure the ATM2 intelligent queuing (IQ) Layer 2 circuit transport mode.
Default	aal5
Options	aal5 —Tunnel a stream of ATM cells encoded with ATM Adaptation Layer (AAL5) over an IP Multiprotocol Label Switching (MPLS) backbone. cell —Tunnel a stream of ATM cells over an IP MPLS backbone. trunk <i>trunk</i> —Transport ATM cells over an MPLS core network that is implemented on some other vendor switches. Trunk mode can be UNI or NNI .



.....

NOTE: To determine which vendors support Layer 2 circuit trunk mode, contact Juniper Networks Customer Support.

.....

Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the Junos OS to Enable ATM2 Intelligent Queuing Layer 2 Circuit Transport Mode on page 219

bandwidth (Tunnel Services)

Syntax	<code>bandwidth <i>bandwidth-value</i>;</code>
Hierarchy Level	<code>[edit chassis fpc <i>slot-number</i> pic <i>number</i> tunnel-services]</code>
Release Information	Statement introduced in Junos OS Release 8.2.
Description	(MX Series 3D Universal Edge Routers and T4000 Core Routers only) Specify the amount of bandwidth in gigabits per second to reserve for tunnel services.
Options	<i>bandwidth-value</i> —Define the amount of bandwidth in gigabits per second to reserve for tunnel services. On MX Series routers, the bandwidth values can be 1g , 10g , 20g , or 40g . On T4000 routers, the bandwidth values are multiples of 10g up to 100g .



NOTE: If you specify a bandwidth that is not compatible with the type of DPCs or MPCs and their respective Packet Forwarding Engine, tunnel services are not activated. For example, you cannot specify 1 gigabit per second bandwidth for a Packet Forwarding Engine on a 10-Gigabit Ethernet 4-port DPC or 16x10GE 3D MPC.



NOTE: Bandwidth rates of 20 gigabits per second and 40 gigabits per second require use of an MX Series router with the MPC3E and the 100-Gigabit CFP MIC.

Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Example: Configuring Tunnel Interfaces on a Gigabit Ethernet 40-Port DPC on page 295 • Configuring Tunnel Interfaces on MX Series Routers • Configuring Tunnel Interfaces on T4000 Routers • Example: Configuring Tunnel Interfaces on a 10-Gigabit Ethernet 4-Port DPC on page 296 • Example: Configuring Tunnel Interfaces on the MPC3E on page 296 • Configuring Layer 3 Tunnel Services Interfaces on an MX Series Router with a DPC • tunnel-services (Chassis) on page 424 • [edit chassis] Hierarchy Level

cel

Syntax	<pre>cel { e1 <i>port-number</i> { channel-group <i>channel-number</i> timeslots <i>slot-number</i>; } }</pre>
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure channelized E1 port and channel specifications.
Options	<p>e1 <i>port-number</i>—Any valid E1 port number on the host system.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 154

channel-group

Syntax	<code>channel-group <i>channel-number</i> timeslots <i>slot-number</i>;</code>
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> ce1 e1 <i>link-number</i>], [edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> ct3 port <i>port-number</i> t1 <i>link-number</i>], [edit chassis lcc <i>lcc-index</i> fpc <i>slot-number</i> pic <i>pic-number</i> ce1 e1 <i>link-number</i>], [edit chassis lcc <i>lcc-index</i> fpc <i>slot-number</i> pic <i>pic-number</i> ct3 port <i>port-number</i> t1 <i>link-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure the DS0 channel number.
Options	<p><i>channel-number</i>—DS0 channel group.</p> <p>Range: 0 through 7 for DS0 naming, and 0 through 23 for E1 naming.</p> <p><i>timeslots slot-number</i>—One or more actual time slot numbers allocated.</p> <p>Range: 1 through 24 for T1 and 1 through 32 for E1</p> <p>Default: All time slots for T1 and all time slots for E1</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 175 • Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 154

channelization

Syntax	<code>channelization;</code>
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i>]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Enable the DS3/E3 MIC on MX Series routers with Queuing and Enhanced Queuing MPCs (MX-MPC1-3D-Q, MX-MPC2-3D-Q, and MX-MPC2-3D-EQ) or on MX80 routers to function in channelized mode.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring the Junos OS to Enable Channelization on DS3/E3 MIC on page 177

chassis

Syntax	<code>chassis { ... }</code>
Hierarchy Level	[edit]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure router chassis properties.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Router Chassis Configuration Statements on page 313

clock-class

Syntax	<code>clock-class <i>clock-class-value</i>;</code>
Hierarchy Level	[edit protocols ptp slave clock-class-to-quality-level-mapping]
Release Information	Statement introduced in Junos OS Release 12.2R2.
Description	Configure the clock class to the set ESMC quality level.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Hybrid Mode and ESMC Quality Level Mapping on page 209• Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 212• Understanding Hybrid Mode on page 39• Precision Time Protocol Overview on page 38• Synchronous Ethernet Overview on page 25


clock-class-to-quality-level-mapping

Syntax	<pre>clock-class-to-quality-level-mapping { clock-class clock-class-value; { quality-level ql-value; } }</pre>
Hierarchy Level	[edit protocols ptp slave]
Release Information	Statement introduced in Junos OS Release 12.2R2.
Description	<p>Configure the slave to override the default Precision Time Protocol (PTP) clock class to Ethernet Synchronization Message Channel (ESMC) mapping.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Hybrid Mode and ESMC Quality Level Mapping on page 209 • Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 212 • Understanding Hybrid Mode on page 39 • Precision Time Protocol Overview on page 38 • Synchronous Ethernet Overview on page 25


clock-source (slave)

Syntax	<code>clock-source <i>ip-address</i> { <i>local-ip-address</i> <i>local-ip-address</i>; }</code>
Hierarchy Level	[edit protocols ptp <i>slave</i> interface <i>interface-name</i> <i>unicast-mode</i> transport]
Release Information	Statement introduced in Junos OS Release 12.2.
Description	Configure the IP address of the master.
Options	<i>ip-address</i> —IP address for the master. The remaining statements are explained separately.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Precision Time Protocol on page 201• Example: Configuring Precision Time Protocol on page 205• Precision Time Protocol Overview on page 38

clock-source (hybrid)

Syntax	clock-source <i>ip-address</i> { interface <i>interface1-name</i> ; interface <i>interface2-name</i> ; }
Hierarchy Level	[edit protocols ptp slave hybrid synchronous-ethernet-mapping]
Release Information	Statement introduced in Junos OS Release 12.2R2.
Description	Configure the IP address of the PTP master and its possible Synchronous Ethernet source interfaces.
Options	<p>interface <i>interface1-name</i>—Synchronous Ethernet interface traceable to the same PTP master clock.</p> <p>interface <i>interface2-name</i>—Synchronous Ethernet interface traceable to the same PTP master clock.</p>
<div>  <p>NOTE: You must first configure these interfaces at the [edit chassis synchronization] hierarchy level as Synchronous Ethernet sources. For information about configuring the interfaces, see synchronization (MX Series).</p> </div>	
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Hybrid Mode and ESMC Quality Level Mapping on page 209 • Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 212 • Understanding Hybrid Mode on page 39 • Precision Time Protocol Overview on page 38 • Synchronous Ethernet Overview on page 25

clock-mode

Syntax	clock-mode (boundary | ordinary);
Hierarchy Level	[edit protocols ptp]
Release Information	Statement introduced in Junos OS Release 12.2. Statement introduced in Junos OS Release 12.2 for the ACX Series Universal Access Routers.
Description	Configure the clock mode as either boundary clock or ordinary clock. The clock mode determines whether the node is going to act as a slave, master, or both. This attribute is mandatory and has no default value.
Options	boundary —The clock mode of the node is a boundary clock where the clock acts as both master and slave. <div> NOTE: A boundary clock is not supported on the ACX Series routers for 12.2.</div> ordinary —The clock mode of the node is a system clock where the clock acts either as a master or as a slave.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Precision Time Protocol on page 201• Example: Configuring Precision Time Protocol on page 205• Precision Time Protocol Overview on page 38• <i>IEEE 1588v2 Precision Timing Protocol (PTP) on ACX Series Universal Access Routers</i>

clock-client

Syntax	<code>clock-client <i>ip-address</i>;</code>
Hierarchy Level	[edit protocols ptp master interface <i>interface-name</i> unicast-mode transport ipv4]
Release Information	Statement introduced in Junos OS Release 12.2.
Description	Configure the IP address of the slave.
Options	<i>ip-address</i> —The IP address for the slave.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Precision Time Protocol on page 201 • Example: Configuring Precision Time Protocol on page 205 • Precision Time Protocol Overview on page 38

clock-step

Syntax	<code>clock-step (one-step | two-step);</code>
Hierarchy Level	[edit protocols ptp master]
Release Information	Statement introduced in Junos OS Release 12.2.
Description	Configure the clock step that determines whether the timing information is sent along with the synchronous message (one-step) only or a subsequent follow-up message (two-step) is received for the sent synchronous message.
Options	<p>one-step—One clock step to send timing information along with the synchronous message.</p> <p>two-step—Two clock steps to send timing information and receive a subsequent follow-up message.</p> <p>Default: one-step</p>
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Precision Time Protocol on page 201 • Example: Configuring Precision Time Protocol on page 205 • Precision Time Protocol Overview on page 38

config-button

Syntax	<pre>config-button { no-clear; no-rescue; }</pre>
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 7.4.
Description	(J Series Services Routers only) Configure the CONFIG button on the router to prevent resetting the router to the factory default or rescue configuration.
Options	<p>no-clear—Prevent resetting the router to the factory default configuration. You can still press and quickly release the button to reset to the rescue configuration (if one was set previously).</p> <p>no-rescue—Prevent resetting the router to the rescue configuration. You can still press and hold the button for more than 15 seconds to reset to the factory default configuration.</p> <p>When both the no-clear and no-rescue statements are present, the CONFIG button is deactivated for all types of reset.</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the Junos OS to Prevent the Resetting of the Factory Default or Rescue Configuration During Current Configuration Failure on J Series Routers on page 141

convert-clock-class-to-quality-level

Syntax	convert-clock-class-to-quality-level;
Hierarchy Level	[edit protocols ptp slave]
Release Information	Statement introduced in Junos OS Release 12.2 for ACX Series Universal Access Routers. Statement introduced in Junos OS Release 12.2R2 for MX Series 3D Universal Edge Routers.
Description	<p>Configure the slave to enable it to retrieve Ethernet Synchronization Message Channel (ESMC) information from the Precision Time Protocol (PTP) clock class.</p> <p>When this option is set, the outgoing quality level depends on the PTP clock class mapping, irrespective of the clock being configured in hybrid mode or pure PTP mode. This is the default mapping mode of the ESMC quality level value to the clock class.</p>
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Hybrid Mode and ESMC Quality Level Mapping on page 209 • Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 212 • Precision Time Protocol Overview on page 38 • Synchronous Ethernet Overview on page 25 • Understanding ESMC Quality Level Mapping on page 34 • Understanding Hybrid Mode on page 39

craft-lockout

Syntax	craft-lockout;
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 8.1.
Description	Disable the physical operation of the craft interface front panel.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring the Junos OS to Disable the Physical Operation of the Craft Interface on page 245

ct3

Syntax	<pre>ct3 { port <i>port-number</i> { t1 <i>link-number</i> { channel-group <i>channel-number</i> timeslots <i>slot-number</i>; } } }</pre>
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure channelized T3 port and channel specifications.
Options	<p>port <i>port-number</i>—Any valid T3 port number on the host system.</p> <p>t1 <i>link-number</i>—T1 link.</p> <p>Range: 0 through 27</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 175

degraded-fabric-detection-enable

Syntax	degraded-fabric-detection-enable;
Hierarchy Level	[edit chassis fabric degraded]
Release Information	Statement introduced in Junos OS Release 12.1X48R4 for PTX Series Packet Transport Routers.
Description	Enable detection of an FPC with degraded fabric.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Traffic Black Hole Caused by Fabric Degradation on page 225• Disabling FPC Restart on page 234

degraded-fpc-bad-plane-threshold

Syntax	<code>degraded-fpc-bad-plane-threshold <i>number-bad-planes</i>;</code>
Hierarchy Level	[edit chassis fabric degraded]
Release Information	Statement introduced in Junos OS Release 12.1X48R4 for PTX Series Packet Transport Routers.
Description	Configure the number of bad planes that indicate an FPC is degraded.
Options	number-bad-planes —Number of bad planes. Range: 4 through 18 Default: 4
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Traffic Black Hole Caused by Fabric Degradation on page 225 • Disabling FPC Restart on page 234

delay-request

Syntax	<code>delay-request <i>delay-request-value</i>;</code>
Hierarchy Level	[edit protocols ptp slave] [edit protocols ptp slave (ACX Series)]
Release Information	Statement introduced in Junos OS Release 12.2. Statement introduced in Junos OS Release 12.2 for the ACX Series Universal Access Routers.
Description	Configure the logarithmic mean interval in seconds between the delay request messages sent by the slave to the master.
Options	<i>delay-request-value</i> —The delay request value for the delay request messages. Range: -6 through +6 Default: 0
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Precision Time Protocol on page 201 • Example: Configuring Precision Time Protocol on page 205 • Precision Time Protocol Overview on page 38

device-count

Syntax	device-count <i>number</i> ;
Hierarchy Level	[edit chassis aggregated-devices ethernet]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure the number of aggregated logical devices available to the router.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Junos OS for Supporting Aggregated Devices on page 167

disk-failure-action

Syntax	disk-failure-action (halt | reboot);
Hierarchy Level	[edit chassis routing-engine on-disk-failure]
Release Information	Statement introduced in Junos OS Release 9.0.
Description	Configure the Routing Engine to halt or reboot when the Routing Engine hard disk fails.
Options	halt —Specify the Routing Engine to halt. reboot —Specify the Routing Engine to reboot.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the Junos OS to Enable a Routing Engine to Reboot on Hard Disk Errors on page 238

domain

Syntax	domain <i>domain-value</i> ;
Hierarchy Level	[edit protocols ptp]
Release Information	Statement introduced in Junos OS Release 12.2. Statement introduced in Junos OS Release 12.2 for the ACX Series Universal Access Routers.
Description	Configure multiple independent Precision Time Protocol (PTP) domains.



NOTE: Only one PTP domain is supported at any given point in time.

Options	<i>domain-value</i> —The PTP domain value. Range: 0 through 127 Default: 0
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Precision Time Protocol on page 201 • Example: Configuring Precision Time Protocol on page 205 • Precision Time Protocol Overview on page 38


dynamic-profile-options

Syntax	dynamic-profile-options { versioning; }
Hierarchy Level	[edit system]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Configure global dynamic profile options. The remaining statement is explained separately.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Enabling Dynamic Profiles to use Multiple Versions

e1

Syntax	<code>e1 <i>port-number</i> { <i>channel-group channel-number</i> timeslots <i>slot-number</i>; }</code>
Hierarchy Level	<code>[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> ce1]</code>
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure the channelized E1 port number on the PIC. The range is from 0 through 9.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 154

egress-policer-overhead

Syntax	<code>egress-policer-overhead bytes;</code>
Hierarchy Level	<code>[edit chassis fpc slot-number pic pic-number]</code>
Release Information	Statement introduced before Junos OS Release 11.1.
Description	<p>Add the specified number of bytes to the actual length of an Ethernet frame when determining the actions of Layer 2 policers, MAC policers, or queue rate limits applied to output traffic on the line card. You can configure egress policer overhead to account for egress <i>shaping</i> overhead bytes added to output traffic on the line card.</p> <p>On M Series and T Series routers, this statement is supported on Gigabit Ethernet Intelligent Queuing 2 (IQ2) PICs and Enhanced IQ2 (IQ2E) PICs. On MX Series routers, this statement is supported for interfaces configured on Dense Port Concentrators (DPCs).</p>
	<div>  <p>NOTE: This statement is not supported on Modular Interface Cards (MICs) or Modular Port Concentrators (MPCs) in MX Series routers.</p> </div>
Options	<p>bytes—Number of bytes added to a packet exiting an interface.</p> <p>Range: 0–255 bytes</p> <p>Default: 0</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • egress-shaping-overhead • Policer Overhead to Account for Rate Shaping Overview • Example: Configuring Policer Overhead to Account for Rate Shaping • Configuring a Policer Overhead on page 160 • CoS on Enhanced IQ2 PICs Overview

enhanced-mode (network-services)

Syntax	enhanced-mode;
Hierarchy Level	[edit chassis network-services]
Release Information	Statement introduced in Junos OS Release 12.3 for T4000 Core Routers with Type 5 FPCs.
Description	Enable improved virtual private LAN service (VPLS) MAC address learning by supporting up to 262,143 MAC addresses per VPLS routing instance.



NOTE:

- The enhanced-mode statement supports up to 262,143 MAC addresses per VPLS routing instance. However, the MAC address learning limit for each interface remains the same (that is, 65,535 MAC addresses).
 - After you configure the enhanced-mode statement and commit your configuration, a warning message prompts you to reboot the router. You must reboot the router and then modify the size of the VPLS MAC address table, otherwise the improved VPLS MAC address learning does not take effect.
 - When the T4000 router reboots after the enhanced-mode statement is configured, only the T4000 Type 5 FPCs are online while the remaining FPCs are offline.
-

Default	By default, the improved VPLS MAC address learning feature is disabled.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Network Services Mode Overview on page 43• show chassis fpc on page 988• <i>mac-table-size</i>

ethernet (Chassis)

Syntax	<pre>ethernet { device-count number; lacp { link-protection { non-revertive; } system-priority; } }</pre>
Hierarchy Level	[edit chassis aggregated-devices]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 11.4 for EX Series switches.
Description	Configure properties for Ethernet aggregated devices on the router.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Junos OS for Supporting Aggregated Devices on page 167 • Configuring LACP Link Protection of Aggregated Ethernet Interfaces (CLI Procedure)

fabric upgrade-mode

Syntax	<pre>fabric { upgrade-mode; }</pre>
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 7.5.
Description	Configure upgrade mode for SIBs and forces them to operate in the same mode until the upgrade is complete.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • TX Matrix Router and T640 Router Configuration Overview on page 47


fabric upgrade-mode 3d-fabric

Syntax (TX Matrix Plus Router)	<code>fabric upgrade-mode 3d-fabric;</code>
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 13.2.
Description	<ul style="list-style-type: none">• Enable the TX Matrix Plus router to upgrade to a TX Matrix Plus router with 3D SIBs. On the SFC, enable setting proper support for mixed SIBs (TXP-F13 SIB and TXP-F13-3D SIB).• Enable the T640 or T1600 or T4000 routers in a routing matrix to support mixed SIBs (TXP-T1600 SIB and TXP-3D-LCC SIBs on the T1600 router and SIB-I-T4000 and TXP-3D-LCC SIBs on the T4000 router).
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Junos OS to Upgrade a T4000 Router to LCC 0 of a TX Matrix Plus Router with 3D SIBs on page 92• Configuring Junos OS to Upgrade the T1600 Router Chassis to LCC 0 of a TX Matrix Plus Router with 3D SIBs on page 86• <i>Upgrading an Operational Standalone Router and Integrating It into a TX Matrix Plus Routing Matrix with 3D SIBs</i>

family

Syntax	<pre> family { inet { layer-3; layer-4; symmetric-hash { complement; } } multiservice { source-mac; destination-mac; payload { ip { layer-3; layer-4; } } symmetric-hash { complement; } } } </pre>
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> hash-key]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	(MX Series 3D Universal Edge Routers only) Configure data used in a hash key for a specific protocol family when configuring PIC-level symmetrical load balancing on an 802.3ad Link Aggregation Group.
Options	<p>inet—Configure data used in a hash key for the inet protocol family.</p> <p>multiservice—Configure data used in a hash key for the multiservice protocol family.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs for MX Series Routers on page 111

feeds (T640, T1600, and T4000 Routers with Six-Input DC Power Supply)

Syntax	<code>feeds number-of-input-feeds;</code>
Hierarchy Level	<code>[edit chassis pem]</code> <code>[edit chassis lcc lcc-number pem]</code> (Routing Matrix)
Release Information	Statement introduced in Junos OS Release 12.1.
Description	<p>Configure the number of input feeds connected to the six-input DC power supply on T640, T1600, or T4000 routers. The value assigned to the feeds statement must be equal to the number of input feeds provided to the power supply.</p> <p>When providing four or five input feeds on standalone routers, you must configure the feeds statement at the <code>[edit chassis pem]</code> hierarchy level. When providing four or five input feeds to an LCC router in a routing matrix, you must configure the feeds statement at the <code>[edit chassis lcc lcc-number pem]</code> hierarchy level.</p> <div><p>NOTE:</p><ul style="list-style-type: none">• Before configuring input feeds for your router, see the <i>T640 Core Router Hardware Guide</i>, <i>T1600 Core Router Hardware Guide</i>, or <i>T4000 Core Router Hardware Guide</i> for special considerations and for the number of input feeds supported by the router.• All power supplies in the router must use the same number of inputs feeds.</div>
Options	Range: 4 through 6 Default: 6
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the Six-Input DC Power Supply on page 247

fib-local

Syntax	fib-local;
Hierarchy Level	[edit chassis fpc <i>fpc-number</i> route-localization]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Configure the Packet Forwarding Engine on an FPC as FIB-local.



NOTE: At least, one Packet Forwarding Engine must be configured as **fib-local** for the commit operation to be successful. If you do not configure **fib-local** for the Packet Forwarding Engine, the CLI displays an appropriate error message and the commit fails.

Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Example: Configuring Packet Forwarding Engine FIB Localization on page 68

fib-remote

Syntax	fib-remote;
Hierarchy Level	[edit chassis fpc <i>fpc-number</i> route-localization]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Configure the Packet Forwarding Engine on an FPC as FIB-remote.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Example: Configuring Packet Forwarding Engine FIB Localization on page 68

filter

Syntax	filter;
Hierarchy Level	[edit chassis memory-enhanced]
Release Information	Statement added in Junos OS Release 11.1.
Description	Enables storing of firewall filters across multiple static RAM (SRAM) segments, resulting in proper utilization of SRAM segments. This feature is useful in routers with small routing tables and large firewall filters. This statement is supported on T Series routers.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the Junos OS to Allocate More Memory for Routing Tables, Firewall Filters, and Layer 3 VPN Labels on page 236

fpc (M320, T320, T640 Routers)

Syntax	<pre> fpc slot-number { pic pic-number { cel { el port-number { channel-group group-number timeslots slot-number; } } ct3 { port port-number { tl link-number { channel-group group-number timeslots slot-number; } } } } framing (sdh | sonet); idle-cell-format { itu-t; payload-pattern payload-pattern-byte; } max-queues-per-interface (8 | 4); no-concatenate; q-pic-large-buffer (large-scale | small-scale); } </pre>
Hierarchy Level	[edit chassis]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure properties for the PICs in individual Flexible PIC Concentrators (FPCs).
Options	<p>slot-number—Slot number in which the FPC is installed.</p> <p>Range: 0 through 7</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring the Junos OS to Enable SONET/SDH Framing for SONET/SDH PICs on page 147 • Configuring the Junos OS to Enable a SONET PIC to Operate in Channelized (Multiplexed) Mode on page 153

fpc (MX Series 3D Universal Edge Routers)

Syntax	<pre> fpc slot-number { inline-services { flow-table-size { ipv4-flow-table-size units; ipv4-flow-table-size units; } } pic number { inline-services { bandwidth (1g | 10g); } port-mirror-instance port-mirroring-instance-name-pic-level; tunnel-services { bandwidth (1g | 10g) } } port-mirror-instance port-mirroring-instance-name-fpc-level; } </pre>
Hierarchy Level	[edit chassis]
Release Information	<p>Statement introduced in Junos OS Release 8.2.</p> <p>port-mirror-instance option introduced in Junos OS Release 9.3.</p>
Description	<p>Configure properties for the DPC or MPC and corresponding Packet Forwarding Engines to create tunnel interfaces.</p> <p>(MX Series Virtual Chassis only) To configure properties for MPCs in a member router in an MX Series Virtual Chassis configuration, you must specify the router's Virtual Chassis member number <i>before</i> the fpc statement. Specify the member number in the form member member-id, where member-id is 0 or 1. If you do not specify the member number before the fpc statement, the commit operation fails and the software displays an error message indicating that the fpc statement must include the member number for routers in Virtual Chassis mode.</p>
Options	<p>fpc slot-number—Specify the slot number of the DPC.</p> <p>Range: 0 through 11</p> <p>pic number—Specify the number of the Packet Forwarding Engine. Each DPC includes four Packet Forwarding Engines.</p> <p>Range: 0 through 4</p> <p>port-mirror-instance port-mirroring-instance-name-fpc-level—Associate a port-mirroring instance with the DPC and its corresponding PICs. The port-mirroring instance is configured under the [edit forwarding-options port-mirroring] hierarchy level.</p> <p>The remaining statements are explained separately.</p>

Required Privilege Level interface—To view this statement in the configuration.
 interface-control—To add this statement to the configuration.

Related Documentation

- [Configuring Port-Mirroring Instances on MX Series 3D Universal Edge Routers on page 110](#)
- [Enabling Inline Service Interfaces](#)

fpc (TX Matrix and TX Matrix Plus Routers)

Syntax

```
fpc slot-number {
  pic pic-number {
    atm-cell-relay-accumulation;
    atm-l2circuit-mode (cell | aal5 | trunk trunk);
    framing (sdh | sonet);
    idle-cell-format {
      itu-t;
      payload-pattern payload-pattern-byte;
    }
    max-queues-per-interface (8 | 4);
    no-concatenate;
    no-mcast-replication;
    q-pic-large-buffer (large-scale | small-scale);
  }
}
```

Hierarchy Level [edit chassis *lcc number*]

Release Information Statement introduced before Junos OS Release 7.4.

Description On a TX Matrix or TX Matrix Plus router, configure properties for the PICs in individual FPCs.

Options *slot-number*—Slot number in which the FPC is installed.
Range: 0 through 7

The remaining statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.
 interface-control—To add this statement to the configuration.


Related Documentation

- [TX Matrix Router and T640 Router Configuration Overview on page 47](#)
- [TX Matrix Plus Router Configuration Overview on page 52](#)
- [Configuring the Junos OS to Enable SONET/SDH Framing for SONET/SDH PICs on page 147](#)
- [TX Matrix Router Chassis and Interface Names on page 50](#)
- [TX Matrix Plus Router Chassis and Interface Names on page 56](#)

fpc-feb-connectivity

Syntax	<pre>fpc-feb-connectivity { fpc <i>number</i> feb (<i>slot-number</i> | none); }</pre>
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 8.0.
Description	On the M120 router only, configure a connection between any Flexible PIC Concentrator (FPC) and any Forwarding Engine Board (FEB).
Options	<p>fpc <i>number</i>—Specify the FPC slot number. Range: 0 through 5</p> <p>feb <i>slot-number</i>—Specify the FEB slot number. Range: : 0 through 5</p> <p>none—Disconnect the FPC from the FEB.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring the Junos OS to Support FPC to FEB Connectivity on M120 Routers on page 105

fpc-resync

Syntax	fpc-resync;
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 10.2.
Description	(On M320, T320, T640, T1600, T4000, TX Matrix, and TX Matrix Plus routers only) When a Flexible PIC Concentrator (FPC) is brought online, resynchronize the sequence numbers of the FPC with the other active FPCs.
	<div>  <p>NOTE: In order to prevent traffic blackholing, the <code>fpc-resync</code> command will have no effect if a single LMNR based FPC and one or more I-chip FPCs exist in the same chassis.</p> </div>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online on page 165 • <i>TX Matrix Router Hardware Guide</i>

framing

Syntax	framing (sdh | sonet);
Hierarchy Level	[edit chassis fpc slot-number pic pic-number], [edit chassis lcc number fpc slot-number pic pic-number] (Routing Matrix)
Release Information	Statement introduced before Junos OS Release 7.4.
Description	On SONET/SDH PICs only, configure the framing type.
Default	sonet
Options	sdh—SDH framing. sonet—SONET framing.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring the Junos OS to Enable SONET/SDH Framing for SONET/SDH PICs on page 147

fru-poweron-sequence

Syntax	<code>fru-poweron-sequence fru-poweron-sequence;</code>
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 10.0. Statement introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers. Statement introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers. Statement introduced in Junos OS Release 12.3 for T640, T1600, and T4000 routers.
Description	(MX Series 3D Universal Edge Routers only) Configure the power-on sequence for the DPCs in the chassis for routers with the enhanced AC Power Entry Module (PEM). (T640 routers, T1600 routers, T4000 routers, MX2020 routers, and PTX Series packet transport routers) Configure the power-on sequence for Flexible PIC Concentrators (FPCs) installed in the chassis.
Options	(MX Series 3D Universal Edge Routers only) fru-poweron-sequence —Power-on sequence for the DPCs in the chassis. The numbers indicate the slot number of the DPCs.



NOTE: If the power-on sequence is not configured by including the **fru-poweron-sequence** statement, Junos OS uses the `/var/log/poweron_seq.log` file to determine the power-on sequence for the last power-on operation for the DPCs and the same sequence is used. If the `/var/log/boot_seq.log` file, is not available, Junos OS uses the ascending order of the slot numbers of the DPCs as the sequence to power on the DPCs.

(T640 routers, T1600 routers, T4000 routers, MX2020 routers, and PTX Series packet transport routers) **fru-poweron-sequence**—Power-on sequence for the FPCs in the chassis. The numbers indicate the slot number of the FPCs.



NOTE:

- If the configured sequence contains invalid numbers, Junos OS considers only the valid numbers in the sequence. The invalid numbers are silently discarded.
- If the power-on sequence is not configured by including the **fru-poweron-sequence** statement, Junos OS uses the ascending order of the slot numbers of the FPCs as the sequence to power on the FPCs.

Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
---------------------------------	---

- Related Documentation**
- [Configuring the Power-On Sequence for DPCs on MX Series Routers with the Enhanced AC PEM on page 126](#)
 - [Configuring the Power-On Sequence for FPCs on PTX Series Packet Transport Routers](#)
 - [Configuring the Power-On Sequence for FPCs on T640, T1600, and T4000 Routers on page 137](#)

frequency-only

Syntax	frequency-only;
Hierarchy Level	[edit protocols ptp slave]
Release Information	Statement introduced in Junos OS Release 12.2.
Description	Configure frequency synchronization.



NOTE: This option is configured only when PTP is used for frequency synchronization and not for phase synchronization.

Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Precision Time Protocol on page 201 • Example: Configuring Precision Time Protocol on page 205 • Precision Time Protocol Overview on page 38

hash-key (Chassis LAG)

Syntax	<pre> hash-key { family { inet { layer-3; layer-4; symmetric-hash { complement; } } } multiservice { source-mac; destination-mac; payload { ip { layer-3 (source-ip-only | destination-ip-only); layer-4; } } } } </pre>
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i>]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	(MX Series 3D Universal Edge Routers only) Configure data used in a hash key for a PIC for symmetrical load balancing on an 802.3ad Link Aggregation Group.
Options	<p>family—Configure data used in a hash key for a protocol family. This statement has the following suboptions:</p> <ul style="list-style-type: none"> • inet—Configure data used in a hash key for the inet protocol family. • multiservice—Configure data used in a hash key for the multiservice protocol family.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs for MX Series Routers on page 111

hybrid

Syntax	<pre> hybrid { synchronous-ethernet-mapping { clock-source <i>ip-address</i> { interface <i>interface1-name</i>; interface <i>interface2-name</i>; } } } </pre>
Hierarchy Level	[edit protocols ptp slave]
Release Information	Statement introduced in Junos OS Release 12.2R2.
Description	<p>Configure hybrid mode.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Hybrid Mode and ESMC Quality Level Mapping on page 209 • Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 212 • Understanding Hybrid Mode on page 39 • Precision Time Protocol Overview on page 38 • Synchronous Ethernet Overview on page 25

idle-cell-format

Syntax	<pre>idle-cell-format { itu-t; payload-pattern <i>payload-pattern-byte</i>; }</pre>
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> idle-cell-format], [edit chassis lcc <i>number</i> fpc <i>slot-number</i> pic <i>pic-number</i> idle-cell-format] (Routing Matrix)
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For ATM2 PICs only, configure the format of the idle cell header and payload bytes.
Options	<p>itu-t—Configure the idle cell header to use the International Telecommunications Union (ITU-T) standard of 0x00000001.</p> <p>Default: (4 bytes): 0x00000000</p> <p><i>payload-pattern-byte</i>—Configure the idle cell payload pattern. The payload pattern byte can range from 0x00 through 0xff.</p> <p>Default: cell payload (48 bytes)</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the Junos OS to Enable Idle Cell Format and Payload Patterns for ATM Devices on page 220


inet (chassis)

Syntax	<pre>inet { layer-3; layer-4; symmetric-hash { complement; } }</pre>
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> hash-key family]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	(MX Series 3D Universal Edge Routers only) Configure data used in a hash key for the inet protocol family when configuring PIC-level symmetrical load balancing on an 802.3ad Link Aggregation Group.
Options	<p>layer-3—Include Layer 3 IP data in the hash key.</p> <p>layer-4—Include Layer 4 IP data in the hash key.</p> <p>symmetric-hash—Configure symmetric hash key with source and destination ports.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs for MX Series Routers on page 111

ingress-policer-overhead

Syntax	<code>ingress-policer-overhead bytes;</code>
Hierarchy Level	<code>[edit chassis fpc slot-number pic pic-number]</code>
Release Information	Statement introduced before Junos OS Release 11.1
Description	Add the configured number of bytes to the length of a packet entering the interface.
Options	bytes —Number of bytes added to a packet entering an interface. Range: 0–255 bytes Default: 0
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>ingress-shaping-overhead</i>• <i>Policer Overhead to Account for Rate Shaping Overview</i>• <i>Example: Configuring Policer Overhead to Account for Rate Shaping</i>• Configuring a Policer Overhead on page 160• <i>CoS on Enhanced IQ2 PICs Overview</i>

input-current (T4000 Routers)

Syntax	<code>input-current <i>amps-in-each-feed</i>;</code>
Hierarchy Level	[edit chassis pem]
Release Information	Statement introduced in Junos OS Release 12.3.
Description	Configure the amount of input current received in each feed. The value assigned to the input-current statement must be equal to the input current capability of each feed.
	<div>  <p>NOTE: Before configuring input current for your router, see the <i>T4000 Core Router Hardware Guide</i> for special considerations.</p> </div>
Options	<p>Values:</p> <ul style="list-style-type: none"> • 40—Indicates 40 A of input current is received in each feed. • 60—Indicates 60 A of input current is received in each feed. <p>Default: 60 A</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring the Six-Input DC Power Supply on page 247

lacp

Syntax	<pre>lacp { link-protection { non-revertive; } system-priority <i>priority</i>; }</pre>
Hierarchy Level	[edit chassis aggregated-devices ethernet]
Release Information	Statement introduced in Junos OS Release 9.3.
Description	For aggregated Ethernet interfaces only, configure Link Aggregation Control Protocol (LACP) parameters at the global level for use by LACP at the interface level.
Options	The statements are described separately.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Junos OS for Supporting Aggregated Devices on page 167

lcc

```
Syntax  lcc number {
        fpc slot-number {
            pic pic-number {
                atm-cell-relay-accumulation;
                atm-l2circuit-mode (cell | aal5 | trunk trunk);
                framing (sdh | sonet);
                idle-cell-format {
                    itu-t;
                    payload-pattern payload-pattern-byte;
                }
                max-queues-per-interface (8 | 4);
                no-concatenate;
                no-mcast-replication;
            }
        }
        online-expected;
        offline;
    }
    q-pic-large-buffer {
        large-scale;
    }
}
```

Hierarchy Level [edit chassis]

Release Information Statement introduced before Junos OS Release 7.4.

Description Configure a T640 router (on a routing matrix based on a TX Matrix router) or a T1600 router (on a routing matrix based on a TX Matrix Plus router) or a T4000 router (on a routing matrix based on a TX Matrix Plus router).

Options *number*—Specify a T640 router or a T1600 router or a T4000 router on a routing matrix.
Range:

- 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.

The remaining statements are explained separately.

Required Privilege interface—To view this statement in the configuration.
Level interface-control—To add this statement to the configuration.

**Related
Documentation**

- [TX Matrix Router and T640 Router Configuration Overview on page 47](#)
- [Using the Junos OS to Configure a T640 Router Within a Routing Matrix on page 63](#)
- [TX Matrix Plus Router Configuration Overview on page 52](#)
- [Using the Junos OS to Configure a T1600 or T4000 Router Within a Routing Matrix on page 79](#)
- *TX Matrix Router Hardware Guide*
- *TX Matrix Plus Router Hardware Guide*

lcc-mode

Syntax	<pre>lcc-mode { lcc <i>lcc_number</i>{ mode <i>mode</i>; } }</pre>
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 13.1 for TX Matrix Plus routers with 3D SIBs.
Description	Set the line-card chassis (LCC) in a routing matrix to function as a T1600 router or a T4000 router. If you set the value of the <i>mode</i> variable as empty , then the line-card chassis goes offline. If the <i>mode</i> statement is not configured, then by default the LCC functions as a T1600 router.
Default	If you do not include the lcc-mode statement, the LCC functions as a T1600 router.
Options	<p>lcc <i>number</i>—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 <i>number</i> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none"> • 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. <p>mode <i>mode</i>—Configure the LCC to function as a T1600 or a T4000 router. The value of the <i>mode</i> variable can be set as t1600, t4000, or empty.</p>
Required Privilege Level	interface-control
Related Documentation	<ul style="list-style-type: none"> • <i>Overview of a Routing Matrix with a TX Matrix Plus Router</i> • <i>Example: Configuring a Routing Matrix with a TX Matrix Plus Router in Mixed Mode</i>

linerate-mode

Syntax	linerate-mode;
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> linerate-mode], [edit chassis lcc <i>number</i> fpc <i>slot-number</i> pic <i>pic-number</i> linerate-mode] (Routing Matrix)
Release Information	Statement introduced in Junos OS Release 10.1.
Description	For 10-port 10-Gigabit Oversubscribed Ethernet (OSE) PICs only, configure the line rate operation.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Junos OS Network Interfaces Library for Routing Devices</i>

link-protection (Protocols LACP)

Syntax	link-protection { non-revertive; }
Hierarchy Level	[edit chassis aggregated-devices ethernet lacp]
Release Information	Statement introduced in Junos OS Release 9.3.
Description	Enable LACP link protection at the global (chassis) level.
Options	The remaining statements are explained separately.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Junos OS for Supporting Aggregated Devices on page 167

local-ip-address (master)

Syntax	<code>local-ip-address <i>local-ip-address</i>;</code>
Hierarchy Level	[edit protocols ptp master interface <i>interface-name</i> unicast-mode clock-client <i>ip-address</i>]
Release Information	Statement introduced in Junos OS Release 12.2.
Description	The IP address of the interface acting as a master.
Options	<i>local-ip-address</i> —IP address of the interface.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Precision Time Protocol on page 201 • Example: Configuring Precision Time Protocol on page 205 • Precision Time Protocol Overview on page 38

local-ip-address (slave)

Syntax	<code>local-ip-address <i>local-ip-address</i>;</code>
Hierarchy Level	[edit protocols ptp slave interface <i>interface-name</i> unicast-mode clock-source <i>ip-address</i>]
Release Information	Statement introduced in Junos OS Release 12.2.
Description	Configure the IP address of the interface acting as the slave.



NOTE: You must configure the same IP address at the [edit interfaces *interface-name*] hierarchy level.

Options	<i>local-ip-address</i> —The IP address of the interface.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Precision Time Protocol on page 201 • Example: Configuring Precision Time Protocol on page 205 • Precision Time Protocol Overview on page 38

master

Syntax

```
master {  
  announce-interval announce-interval--value;  
  clock-step (one-step | two-step);  
  sync-interval sync-interval-value;  
  interface interface-name {  
    unicast-mode {  
      transport ipv4;  
      clock-client ip-address {  
        local-ip-address local-ip-address;  
      }  
    }  
  }  
}
```

Hierarchy Level [edit protocols ptp]

Release Information Statement introduced in Junos OS Release 12.2.

Description Configure the master with parameters.


The remaining statements are explained separately.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- [Configuring Precision Time Protocol on page 201](#)
- [Example: Configuring Precision Time Protocol on page 205](#)
- [Precision Time Protocol Overview on page 38](#)

maximum-ecmp

Syntax	<code>maximum-ecmp <i>next-hops</i>;</code>
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 10.1.
Description	(M10i routers with Enhanced CFEB, and M320, M120, MX Series, and T Series routers) Configure 16, 32, or 64 ECMP next hops for RSVP or LDP LSPs, or MPLS static LSPs that are configured using <code>set protocols mpls static-label-switched-path</code> .
	<div>  <p>NOTE: MX Series routers with one or more Modular Port Concentrator (MPC) cards and with Junos OS 11.4 or earlier installed, support the configuration of the <code>maximum-ecmp</code> statement with only 16 next hops. You should <i>not</i> configure the <code>maximum-ecmp</code> statement with 32 or 64 next hops. When you commit the configuration with 32 or 64 next hops, the following warning message appears:</p> <p>Error: Number of members in Unilist NH exceeds the maximum supported 16 on Trio.</p> </div>
Default	16
Options	<code>next-hops</code> —Specify the number of next hops (16, 32, or 64) for RSVP or LDP LSPs, or MPLS static LSPs
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring ECMP Next Hops for RSVP and LDP LSPs for Load Balancing on page 171

maximum-links

Syntax	maximum-links <i>maximum-links-limit</i> ;
Hierarchy Level	[edit chassis aggregated-devices]
Release Information	Statement introduced in Junos OS Release 11.1 for T Series routers. Statement introduced in Junos OS Release 12.1X48 for PTX Series Packet Transport Routers. Statement introduced in Junos OS Release 12.2 for MX Series routers.
Description	Configure the maximum links limit for aggregated devices.
Options	<i>maximum-links-limit</i> —Maximum links limit for aggregated devices. Range: 16, 32; (PTX Series routers only in Junos OS Release 12.3) 64
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Junos OS for Supporting Aggregated Devices on page 167• Configuring an Aggregated Ethernet Interface

max-queues-per-interface

Syntax	max-queues-per-interface (8 | 4);
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i>], [edit chassis lcc <i>number</i> fpc <i>slot-number</i> pic <i>pic-number</i>] (Routing Matrix)
Release Information	Statement introduced before Junos OS Release 7.4. Support for TX Matrix and TX Matrix Plus added in Junos OS Release 9.6. On MIC or MPC interfaces on MX Series routers, configure eight egress queues.
Description	On IQ interfaces on M320, T320, T640, TX Matrix, and TX Matrix Plus routers, or on MIC or MPC interfaces on MX Series routers, configure eight egress queues.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the Junos OS to Support Eight Queues on IQ Interfaces for T Series and M320 Routers on page 107• Configuring Up to 16 Forwarding Classes• Enabling Eight Queues on ATM Interfaces• Configuring the Maximum Number of Queues for Trio MPC/MIC Interfaces

memory-enhanced

Syntax	memory-enhanced { filter; route; vpn-label; }
Hierarchy Level	[edit chassis]
Release Information	Statement added in Junos OS Release 10.4.
Description	Allocate more jtree memory for routing tables and Layer 3 VPNs. The remaining statements are explained separately.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring the Junos OS to Allocate More Memory for Routing Tables, Firewall Filters, and Layer 3 VPN Labels on page 236



mlfr-uni-nni-bundles

Syntax	mlfr-uni-nni-bundles <i>number</i> ;
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure link services management properties.
Options	<p><i>number</i>—Number of Multilink Frame Relay user-to-network interface network-to-network interface (UNI-NNI) (FRF.16) bundles to allocate on a Link Services PIC.</p> <p>Range: 1 through 128</p> <p>Default: 16</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring the Junos OS to Support the Link Services PIC on page 157

multiservice

Syntax	<pre>multiservice { source-mac; destination-mac; payload { ip { layer-3 (source-ip-only | destination-ip-only); layer-4; } } symmetric-hash { complement; } }</pre>
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> hash-key family]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	(MX Series 3D Universal Edge Routers only) Configure data used in a hash key for the multiservice protocol family when configuring PIC-level symmetrical hashing for load balancing on an 802.3ad Link Aggregation Group.
Options	<p>destination-mac—Include destination MAC address in the hash key.</p> <p>payload—Include payload data in the hash key. This option has the following suboptions:</p> <ul style="list-style-type: none">• layer-3—Include Layer 3 IP information in the hash key.• layer-4—Include Layer 4 IP information in the hash key. <p>source-mac—Include source MAC address in the hash key.</p> <p>symmetric-hash—Create a symmetric hash or symmetric hash complement key with any attribute.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs for MX Series Routers on page 111

network-services

Syntax	network-services (ethernet | enhanced-ethernet | ip | enhanced-ip);
Hierarchy Level	[edit chassis]
Release Information	Statement introduced before Junos OS Release 8.5. Options enhanced-ethernet and enhanced-ip introduced in Junos OS Release 11.4.
Description	Set the router's network services to a specific mode of operation.
Options	<p>ethernet—Set the router's network services to Ethernet and use standard, compiled firewall filter format.</p> <p>enhanced-ethernet—Set the router's network services to enhanced Ethernet and use enhanced mode capabilities. Only Trio MPCs and MS-DPCs are powered on in the chassis.</p> <p>ip—Set the router's network services to Internet Protocol and use standard, compiled firewall filter format.</p> <p>enhanced-ip—Set the router's network services to enhanced Internet Protocol and use enhanced mode capabilities. Only Trio MPCs and MS-DPCs are powered on in the chassis. Non-service DPCs do not work with enhanced network services mode options.</p>
	<p> NOTE: Only Multiservices DPCs (MS-DPCs) are powered on with the enhanced network services mode options. No other DPCs function with the enhanced network services mode options.</p>
	<p> NOTE: Whenever tunnel interfaces -pe/-pd are created using the MS-DPC instead of the MPC, the interface will not be able to process register messages. The MS-MPC and the MS-DPC have different multicast architecture and they are incompatible if the chassis is configured to "enhanced-ip" mode.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Network Services Mode Overview on page 43 • Firewall Filters and Enhanced Network Services Mode Overview • Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers on page 127 • Configuring Enhanced IP Network Services for a Virtual Chassis

no-concatenate

Syntax	no-concatenate;
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i>], [edit chassis lcc <i>number</i> fpc <i>slot-number</i> pic <i>pic-number</i>] (Routing Matrix)
Release Information	Statement introduced before Junos OS Release 7.4.
Description	<p>Do not concatenate (multiplex) the output of a SONET/SDH PIC (an interface with a name <i>so-fpc/pic/port</i>).</p> <p>When configuring and displaying information about interfaces that are operating in channelized mode, you must specify the channel number in the interface name (<i>physical:channel</i>); for example, <i>so-2/2/0:0</i> and <i>so-2/2/0:1</i>.</p> <p>On SONET OC48 interfaces that are configured for channelized (multiplexed) mode, the bytes e1-quiet and bytes f1 options in the sonet-options statement have no effect. The bytes f2, bytes z3, bytes z4, and path-trace options work correctly on channel 0. They work in the transmit direction only on channels 1, 2, and 3.</p>
Default	Output is concatenated (multiplexed).
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the Junos OS to Enable a SONET PIC to Operate in Channelized (Multiplexed) Mode on page 153

no-multi-rate

Syntax	no-multi-rate;
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i>]
Release Information	Statement introduced in Junos OS Release 11.2.
Description	Disable the rate-selectability configuration. This statement is supported only on the 8-port SONET/SDH OC3/STM1 (Multi-Rate) MIC with SFP.
Default	Rate-selectability is enabled.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring a Port Speed on page 161

no-route-localize

Syntax	no-route-localize;
Hierarchy Level	[edit policy-options policy-statement <i>policy-name</i> term <i>term-name</i> then]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Enforce installation of routes on all FIB-remote Packet Forwarding Engines.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Example: Configuring Packet Forwarding Engine FIB Localization on page 68

non-revertive (Chassis)

Syntax	non-revertive;
Hierarchy Level	[edit chassis aggregated-devices ethernet lacp link-protection]
Release Information	Statement introduced in Junos OS Release 9.3. Statement introduced in Junos OS Release 11.4 for EX Series switches.
Description	Disable the ability to switch to a better priority link (if one is available) once a link is established as active and a collection or distribution is enabled.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Junos OS for Supporting Aggregated Devices on page 167 • Configuring LACP Link Protection of Aggregated Ethernet Interfaces (CLI Procedure)

number-of-ports

Syntax	<code>number-of-ports <i>active-ports</i>;</code>
Hierarchy Level	<code>[edit chassis fpc <i>slot-number</i>]</code>
Release Information	Statement introduced in Junos OS Release 10.1.
Description	Enable or disable 8 or 12 physical ports on a 16-port 10-Gigabit Ethernet MPC (16x10GE 3D MPC).
Options	<i>active-ports</i> —Specify the number of ports (8 or 12) to enable or disable.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the Number of Active Ports on a 16-Port 10-Gigabit Ethernet MPC on MX Series Routers on page 113

offline

Syntax	<code>offline;</code>
Hierarchy Level	<code>[edit chassis <i>lcc number</i>]</code>
Release Information	Statement introduced before Junos OS Release 7.4.
Description	(Routing matrix based on the TX Matrix and TX Matrix Plus routers only) On a TX Matrix router, configure a T640 router so that it is not part of the routing matrix. On a TX Matrix Plus router, configure a T1600 or T4000 router so that it is not part of the routing matrix.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• online-expected on page 381• TX Matrix Router and T640 Router Configuration Overview on page 47• TX Matrix Plus Router Configuration Overview on page 52• Configuring the Junos OS to Enable the TX Matrix Router to Generate an Alarm If a T640 Router Stays Offline on page 65• Configuring the Junos OS to Enable the TX Matrix Plus Router to Generate an Alarm If a T1600 or T4000 Router Stays Offline on page 80



offline-on-fabric-bandwidth-reduction

Syntax	offline-on-fabric-bandwidth-reduction;
Hierarchy Level	[edit chassis fpc <i>slot-number</i>]
Release Information	Statement introduced in Junos OS Release 12.1.
Description	Configure an FPC with degraded fabric bandwidth offline, to avoid causing a traffic black hole in the chassis for an extended time.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Disabling an FPC with Degraded Fabric Bandwidth on page 234• Traffic Black Hole Caused by Fabric Degradation on page 225

on-disk-failure (Chassis Routing Engine)

Syntax	on-disk-failure { disk-failure-action (halt | reboot); }
Hierarchy Level	[edit chassis routing-engine]
Release Information	Statement introduced before JUNOS Release 7.4. The disk-failure-action statement added in JUNOS Release 9.0.
Description	Instruct the router to halt or reboot if it detects hard disk errors on the Routing Engine.
Options	The remaining statement is explained separately.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the Junos OS to Enable a Routing Engine to Reboot on Hard Disk Errors on page 238

on-error

Syntax	<pre>on-error { raise-alarm; power (cycle | off); write-coredump; }</pre>
Hierarchy Level	[edit chassis fpc <i>slot-number</i> sanity-poll] [edit chassis lcc <i>number</i> fpc <i>number</i> sanity-poll] (Routing Matrix)
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Instruct the FPC to perform actions during an error condition.
Options	<p>raise-alarm—Generate and display a chassis alarm in case of an error.</p> <p>power cycle—Reboot the FPC after generating a core file. This statement is useful in case of temporary software errors that are eliminated after reboot.</p> <p>power off—Halt the FPC and keep it offline. This statement is useful in case of permanent hardware failures.</p> <div style="margin-top: 20px;">  <p>CAUTION: The power off statement halts the FPC. Ensure that you have backup paths through different FPC to avoid service outage.</p> </div> <div style="margin-top: 20px;">  <p>NOTE: The power cycle and power off statements are mutually exclusive: You can configure either the power cycle or the power off statement for an error.</p> </div> <p>write-coredump—Trigger the core file in case of an error.</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Sanity Polling for FPCs on T Series Routers on page 240 • sanity-poll on page 401 • retry-count on page 397


online-expected

Syntax	online-expected;
Hierarchy Level	[edit chassis <i>lcc number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	(TX Matrix and TX Matrix Plus routing matrix only) On a TX Matrix router, configure a T640 router so that if it does not come online, an alarm is sent to the TX Matrix router. On a TX Matrix Plus router, configure a T1600 or a T4000 router so that if it does not come online, an alarm is sent to the TX Matrix Plus router.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • TX Matrix Router and T640 Router Configuration Overview on page 47 • TX Matrix Plus Router Configuration Overview on page 52 • Configuring the Junos OS to Enable the TX Matrix Router to Generate an Alarm If a T640 Router Stays Offline on page 65 • Configuring the Junos OS to Enable the TX Matrix Plus Router to Generate an Alarm If a T1600 or T4000 Router Stays Offline on page 80 • offline on page 378

oss-map

Syntax	<pre>oss-map { model-name t640|t1600; }</pre>
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 12.3R3, 13.1R2, and 13.2R1 for T4000 routers.
Description	Configure the operations support systems (OSS) mapping feature to map a T4000 chassis to a T1600 chassis or a T640 chassis, so that the T4000 chassis is represented as a T1600 chassis or a T640 chassis, respectively. The configuration helps prevent requalifying the T1600 chassis and T640 chassis as a new chassis on the OSS.
Options	<p>model-name t640—Perform OSS mapping on a T4000 chassis to represent it as a T640 chassis, thereby overriding the chassis model name as displayed in the output of the show chassis hardware, the show snmp mib walk system, and the show snmp mib walk jnxBoxAnatomy operational commands.</p> <p>model-name t1600—Perform OSS mapping on a T4000 chassis to represent it as a T1600 chassis, thereby overriding the chassis model name as displayed in the output of the show chassis hardware, the show snmp mib walk system, and the show snmp mib walk jnxBoxAnatomy operational commands.</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring OSS Mapping to Represent a T4000 Chassis as a T1600 or a T640 Chassis on page 138• Example: Configuring a T4000 Chassis to Represent a T640 Chassis on page 309• show chassis oss-map on page 1165• Understanding Operations Support Systems Mapping on page 19

packet-scheduling

Syntax	(packet-scheduling | no-packet-scheduling);
Hierarchy Level	[edit chassis]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	(M 160 routers only) Enable packet-scheduling mode, in which the Packet Director application-specific integrated circuit (ASIC) schedules packet dispatches to compensate for transport delay differences. This preserves the interpacket gaps as the packets are distributed from the Packet Director ASIC to the Packet Forwarding Engine.
Default	no-packet-scheduling
<div>  <p>NOTE: The packet-scheduling feature is available on M160 routers only.</p> </div>	
Options	<p>no-packet-scheduling—Do not schedule packets.</p> <p>packet-scheduling—Schedule packets to preserve interpacket gaps.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring the Junos OS to Enable an M160 Router to Operate in Packet Scheduling Mode on page 104

payload

Syntax	<pre>payload { ip { layer-3; layer-4; } }</pre>
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> hash-key family multiservice]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	(MX Series 3D Universal Edge Routers only) Include payload data in a hash key for the multiservice protocol family when configuring PIC-level symmetrical load balancing on an 802.3ad Link Aggregation Group.
Options	<p>ip—Include IPv4 payload data in the hash key. This option has the following suboptions:</p> <ul style="list-style-type: none">• layer-3—Include Layer 3 IP information in the hash key.• layer-4—Include Layer 4 IP information in the hash key.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs for MX Series Routers on page 111

pem (M320 Routers)

Syntax	<pre>pem { minimum <i>number</i>; }</pre>
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 7.4.
Description	Configure the minimum number of Power Entry Modules (PEMs) on an M320 router. With this configuration, PEM absent alarms are generated only if the PEM count falls below the minimum specified.
Options	minimum <i>number</i> —Minimum number of PEMs on the router. Range: 0 through 3
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the Junos OS to Support Entry-Level Configuration on an M320 Router with a Minimum Number of SIBs and PIMs on page 108• sib on page 403

pem (T640, T1600, and T4000 Routers with Six-Input DC Power Supply)

Syntax	<pre>pem { feeds <i>number-of-input-feeds</i>; input-current <i>amps-in-each-feed</i>; }</pre>
Hierarchy Level	[edit chassis] [edit chassis lcc <i>lcc-number</i>] (Routing Matrix)
Release Information	Statement introduced in Junos OS Release 12.1. Option feeds introduced in Junos OS Release 12.1. Option input-current introduced for T4000 routers in Junos OS Release 12.3.
Description	Configure the power supply parameters of the six-input DC power supply on T640, T1600, or T4000 routers.
Options	feeds <i>number-of-input-feeds</i> —Number of input feeds connected to the six-input DC power supply. (For T4000 routers only) input-current <i>amps-in-each-feed</i> —Input current (in amperes) in each feed.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the Six-Input DC Power Supply on page 247

pic (M Series, MX Series, and T Series Routers)

```
Syntax  pic pic-number {
        cel {
            el port-number {
                channel-group group-number timeslots slot-number;
            }
        }
        ct3 {
            port port-number {
                tl link-number {
                    channel-group group-number timeslots slot-number;
                }
            }
        }
        framing (sdh | sonet);
        idle-cell format {
            itu-t;
            payload-pattern payload-pattern-byte;
        }
        inline-services {
            bandwidth (1g | 10g);
        }
        max-queues-per-interface (8 | 4);
        no-concatenate;
    }
```

Hierarchy Level [edit chassis fpc *slot-number*]

Release Information Statement introduced before Junos OS Release 7.4.

Description Configure properties for an individual PIC.

Options *pic-number*—Slot number in which the PIC is installed.
Range: 0 through 3

The remaining statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.
 interface-control—To add this statement to the configuration.

Related Documentation

- [Configuring the Junos OS to Enable SONET/SDH Framing for SONET/SDH PICs on page 147](#)
- [Configuring the Junos OS to Enable a SONET PIC to Operate in Channelized \(Multiplexed\) Mode on page 153](#)
- [Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 175](#)
- [Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 154](#)

- *Enabling Inline Service Interfaces*

pic (TX Matrix and TX Matrix Plus Routers)

Syntax `pic pic-number {
 aggregate-ports;
 atm-cell-relay-accumulation;
 atm-l2circuit-mode (cell | aal5 | trunk trunk);
 egress-policer-overhead (count);
 framing (sdh | sonet);
 idle-cell-format {
 itu-t;
 payload-pattern payload-pattern-byte;
 }
 ingress-policer-overhead (count);
 max-queues-per-interface (8 | 4);
 no-concatenate;
 no-mcast-replication;
 q-pic-large-buffer (large-scale | small-scale);
 }`

Hierarchy Level `[edit chassis lcc number fpc slot-number]`

Release Information Statement introduced before Junos OS Release 7.4.

Description On a TX Matrix or TX Matrix Plus router, configure properties for an individual PIC.

Options *pic-number*—Slot number in which the PIC is installed.

Range: 0 through 3

The remaining statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.
 interface-control—To add this statement to the configuration.

Related Documentation

- [TX Matrix Router and T640 Router Configuration Overview on page 47](#)
- [TX Matrix Plus Router Configuration Overview on page 52](#)
- [Configuring the Junos OS to Enable SONET/SDH Framing for SONET/SDH PICs on page 147](#)

policer-drop-probability-low

Syntax	policer-drop-probability-low;
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 11.4R1.
Description	<p>Reduces the possibility that policers configured on the router might drop packets. For some Juniper Networks routers, policers can mark packets as out-of-specification in accordance with TCP. By default, these policers begin to randomly drop packets when the current credit exceeds the credit limit. In the context of TCP, this random drop mechanism helps to smooth the flow of traffic. The policer-drop-probability-low statement causes the policers to operate as strict rate limiters and to ignore the standard TCP behavior.</p> <p>The policer-drop-probability-low statement is applicable to the following routing platforms:</p> <ul style="list-style-type: none"> • M7i • M10i • M120 • M320 • MX Series
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>show pfe cfeb</i> • <i>show pfe feb</i> • <i>show pfe fpc</i>

port (Chassis)

Syntax	<code>port <i>port-number</i>;</code>
Hierarchy Level	<code>[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> ct3]</code>
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure the channelized T3 port number on the PIC.
Options	<i>port-number</i> —Port number. Range: 0 through 1
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 175

power

Syntax	<code>power (off | on);</code>
Hierarchy Level	<code>[edit chassis fpc <i>slot-number</i>]</code>
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure the Flexible PIC Concentrator (FPC) to stay offline or to come online automatically.
Default	on
Options	off —Take the FPC offline, and configure it to stay offline, as, for example, after a system reboot. on —Bring the FPC online, and configure it to come online automatically, as, for example, after a system reboot.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the Junos OS to Make a Flexible PIC Concentrator Stay Offline on page 145

priority1

Syntax	<code>priority1 priority1-value;</code>
Hierarchy Level	[edit protocols ptp]
Release Information	Statement introduced in Junos OS Release 12.2. Statement introduced in Junos OS Release 12.2 for the ACX Series Universal Access Routers.
Description	<p>Configure the priority as one of the following:</p> <ul style="list-style-type: none"> • In the slave, the priority value is set to select the best master clock. Note that in order to select a particular master clock, the priority value in the master clock's announce message must be equal to or lower than the configured <i>priority1-value</i>. • In the master, the priority value is set to represent itself in the announce message to other slaves. • In the boundary node, the slave uses this value to determine the best master clock, whereas the master uses this value from the announce message of the selected master clock. <p>Note that the lower value takes precedence.</p>
Options	<p><i>priority1-value</i>—The priority value of the clock.</p> <p>Range: 0 through 255</p> <p>Default: 128</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Precision Time Protocol on page 201 • Precision Time Protocol Overview on page 38 • <i>IEEE 1588v2 Precision Timing Protocol (PTP) on ACX Series Universal Access Routers</i>

priority2

Syntax	<code>priority2 priority2-value;</code>
Hierarchy Level	[edit protocols ptp]
Release Information	Statement introduced in Junos OS Release 12.2. Statement introduced in Junos OS Release 12.2 for the ACX Series Universal Access Routers.
Description	<p>Configure the priority2 value. This value is used to differentiate and prioritize the master clocks to avoid confusion when the priority1-value is the same for different master clocks in a network.</p> <p>Note that the lower value takes precedence.</p>
Options	<p>priority2-value—The priority value of the clock.</p> <p>Range: 0 through 255</p> <p>Default: 128</p>
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Precision Time Protocol on page 201• Example: Configuring Precision Time Protocol on page 205• Precision Time Protocol Overview on page 38• <i>IEEE 1588v2 Precision Timing Protocol (PTP) on ACX Series Universal Access Routers</i>

q-pic-large-buffer

Syntax	<code>q-pic-large-buffer (large-scale | small-scale);</code>
Hierarchy Level	<code>[edit chassis fpc slot-number pic pic-number]</code> <code>[edit chassis lcc number fpc slot-number pic pic-number (Routing Matrix)]</code>
Release Information	Statement introduced in Junos OS Release 7.4. Support for TX Matrix and TX Matrix Plus hierarchy added in Junos OS Release 9.6.
Description	Configure delay buffers.



NOTE: When you commit the configuration after including the `q-pic-large-buffer` statement for a PIC, the Junos OS temporarily takes the PIC offline and brings it back online before the new configuration is activated and becomes the current operational configuration.

Default `small-scale`

Options `large-scale`—(Optional) Set the average packet size used to calculate the number of notification queue entries in the IQ PIC to 256 bytes. Useful for slower interfaces (T1, E1, and NxDS0 interfaces configured on Channelized IQ PICs and Gigabit Ethernet VLANs configured on Gigabit Ethernet IQ PICs).

`small-scale`—(Optional) Set the average packet size used to calculate the number of notification queue entries in the IQ PIC to 40 bytes.



NOTE: You cannot configure the `large-scale` and the `small-scale` options on MX Series routers. Include only the `q-pic-large-buffer` statement to enable the large delay buffer size on Enhanced Queuing DPCs on MX Series routers.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.


Related Documentation

- [Configuring the Junos OS to Enable Larger Delay Buffers for T1, E1, and DS0 Interfaces Configured on Channelized IQ PICs on page 158](#)
- [Configuring Schedulers](#)

quality-level (hybrid)

Syntax	quality-level (prs | st2 | tnc | st3e | st3 | smc | st4) | (prc | ssu-a | ssu-b | sec);
Hierarchy Level	[edit protocols ptp slave clock-class-to-quality-level-mapping]
Release Information	Statement introduced in Junos OS Release 12.2R2.
Description	Configure the quality level for the timing source so that the router knows the best available source with which to synchronize. The quality level specifies the accuracy level of the clock.
Options	<p>prs—Primary reference source—Stratum 1</p> <p>st2—Stratum 2</p> <p>tnc—Transit node clock</p> <p>st3e—Stratum 3E</p> <p>st3—Stratum 3</p> <p>smc—SONET minimum clock</p> <p>st4—Stratum 4</p> <p>prc—Primary reference clock</p> <p>ssu-a—Synchronization supply unit A</p> <p>ssu-b—Synchronization supply unit B</p> <p>sec—SDH equipment clock</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring Hybrid Mode and ESMC Quality Level Mapping on page 209• Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 212• Understanding Hybrid Mode on page 39• Precision Time Protocol Overview on page 38• Synchronous Ethernet Overview on page 25

red-buffer-occupancy

Syntax	<pre>red-buffer-occupancy { weighted-averaged [instant-usage-weight-exponent <i>exponent-value</i>]; }</pre>
Hierarchy Level	<pre>[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i>], [edit chassis lcc <i>number</i> fpc <i>slot-number</i> pic <i>pic-number</i>]</pre>
Release Information	Statement introduced in Junos OS Release 8.3.
Description	<p>Configure the IQ PIC to base random early detection (RED) queue management on a <i>simple moving average</i> buffer occupancy calculation. If you do not include this statement, the IQ PIC bases RED on an <i>instantaneous</i> buffer occupancy value. As an option, you can specify that the IQ PIC bases RED on a <i>weighted moving average</i> of buffer occupancy values.</p> <p>If you configure this feature on a channelized OC12 intelligent queuing (IQ) PIC, the PIC reboots.</p>
Options	<p>weighted-averaged—Configure the IQ PIC to base RED processing on a simple moving average of instantaneous buffer occupancy values instead of an instantaneous buffer occupancy.</p> <p>instant-usage-weight-exponent <i>exponent-value</i>—(Optional) Specify the integer to be used as the negative exponent of 2 to express a weight value. The PIC performs weighted RED (WRED) by based on a calculation of average buffer occupancy that applies the specified weight value to the instantaneous buffer occupancy and then factors the weighted value into the calculation of average buffer occupancy. Valid exponent range is from 1 through 31 (weight values from 2^{-1} through 2^{-31}). If you do not specify this option, the default exponent value is 0, which results in a weight value of $2^0 = 1$. With a weight value of 1, the calculation of weighted average buffer occupancy yields the same value as the simple average buffer occupancy.</p>
<div style="display: flex; align-items: flex-start;"> <div style="flex: 1; text-align: center; margin-right: 10px;">  </div> <div style="flex: 3;"> <p>NOTE: You can specify an exponent value greater than 31, and the value displays in the output of <code>show</code> commands. However, the PIC replaces the out-of-range value with the <i>operational</i> value of 31, which results in a weight value of $2^{-31} = 1 / 2^{31} = 0.0000000004656612873077392578125$.</p> </div> </div>	
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> Configuring Weighted RED Buffer Occupancy Example: Configuring Weighted RED Buffer Occupancy

redundancy-mode

Syntax	redundancy-mode (increased-bandwidth | redundant)
Hierarchy Level	[edit chassis fabric]
Release Information	Statement introduced in Junos OS Release 12.2.
Description	(MX240, MX480, and MX960 routers only) Configure the active control boards to be in redundancy mode or increased fabric bandwidth mode. In increased fabric bandwidth mode, which is the default behavior for MX Series routers with Switch Control Board (SCB), the maximum number of available fabric planes are used. The MX Series routers that contain the enhanced Switch Control Board (SCB) with Trio chips and the MPC3E, the control boards operate in redundancy fabric mode (all the FPCs use 4 fabric planes as active planes) by default.
Options	<p>increased-bandwidth—Enable increased fabric bandwidth mode for the control boards, which causes all the available fabric planes to be used.</p> <p>redundant—Enable redundancy mode for the control boards, which causes all the FPCs to use 4 fabric planes as active planes.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Detection and Corrective Actions of FPCs with Degraded Fabric on MX Series Routers on page 232• Detection and Recovery of Fabric-Related Failures Caused by Traffic Black Holes on MX Series Routers on page 226• Corrective Actions for Fabric Failures on MX Series Routers on page 229• Router Chassis Configuration Statements on page 313• show chassis fabric redundancy-mode on page 926• Configuring Redundancy Fabric Mode for Active Control Boards on MX Series Routers on page 235

retry-count

Syntax	<code>retry-count <i>number</i>;</code>
Hierarchy Level	[edit chassis fpc <i>slot-number</i> sanity-poll] [edit chassis lcc <i>number</i> fpc <i>number</i> sanity-poll] (Routing Matrix) [edit chassis cluster redundancy-group <i>group-number</i> ip-monitoring]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Number of times sanity polling periodically checks for an error condition in the FPC.
Options	<i>number</i> —Number of times sanity polling is allowed to check for an error condition. Range: 1 through 30 Default: 10
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Sanity Polling for FPCs on T Series Routers on page 240 • sanity-poll on page 401 • on-error on page 380

route (chassis)

Syntax	<code>route;</code>
Hierarchy Level	[edit chassis memory-enhanced]
Release Information	Statement added in Junos OS Release 10.4.
Description	Allocate more jtree memory for routing tables over firewall filters.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring the Junos OS to Allocate More Memory for Routing Tables, Firewall Filters, and Layer 3 VPN Labels on page 236


routing-engine (Chassis)

Syntax	<pre>routing-engine { on-disk-failure { disk-failure-action (halt | reboot); } }</pre>
Hierarchy Level	[edit chassis]
Release Information	Statement introduced before Junos OS Release 7.4. The disk-failure-action statement added in Junos OS Release 9.0.
Description	Configure a Routing Engine to halt or reboot automatically when a hard disk error occurs. A hard disk error may cause a Routing Engine to enter a state in which it responds to local pings and interfaces remain up, but no other processes are responding. Rebooting or halting prevents this.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the Junos OS to Enable a Routing Engine to Reboot on Hard Disk Errors on page 238• Junos High Availability Configuration Guide

route-localization

Syntax	<pre>route-localization { inet; inet6; }</pre>
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Configure FIB localization for IPv4 and IPv6 routes.
Options	inet —Configure FIB localization for IPv4 routes. inet6 —Configure FIB localization for IPv6 routes.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Example: Configuring Packet Forwarding Engine FIB Localization on page 68


route-memory-enhanced

Syntax	route-memory-enhanced;
Hierarchy Level	[edit chassis]
Release Information	Statement added in Junos OS Release 9.6.
Description	<p>Reallocate the jtree memory on the Packet Forwarding Engine to allocate more memory for routing tables, and Layer 3 VPNs. This statement is supported on the following routers:</p> <ul style="list-style-type: none"> • M10i and M7i routers with Enhanced CFEB • M320 routers with Enhanced III FPC1, Enhanced III FPC2, and Enhanced III FPC3 • M120 routers • MX Series routers • T640, T1600, and TX routers with Enhanced Scaling FPC3 and Enhanced Scaling FPC4
	<div>  <p>NOTE: For T Series routers only. With Junos OS Release 10.2, enhanced jtree memory allocation is turned OFF by default. For Junos OS Release 9.3 to 10.1, the default routing tables (inet.0 and inet6.0) use both memory segments by default.</p> </div>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring the Junos OS to Allocate More Memory for Routing Tables, Firewall Filters, and Layer 3 VPN Labels on page 236

sampling-instance

Syntax	sampling-instance <i>instance-name</i> ;
Hierarchy Level	[edit chassis fpc <i>slot-number</i>] [edit chassis lcc <i>number</i> fpc <i>slot-number</i>] (Routing Matrix)
Release Information	Statement introduced in Junos OS Release 9.6.
Description	<p>Associate a defined sampling instance with a specific FPC, MPC, or DPC for active sampling instances configured at the [edit forwarding-options sampling] hierarchy level.</p> <p>For M120 routers with FEB, this statement must also be configured under [edit chassis feb <slot number>], in addition to the [edit forwarding-options sampling] hierarchy level.</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Associating Sampling Instances for Active Flow Monitoring with a Specific FPC, MPC, or DPC on page 239• Junos Services Interfaces Configuration Guide

sanity-poll

Syntax	<pre>sanity-poll { retry-count <i>number</i>; on-error { raise-alarm; power (cycle | off); write-coredump; } }</pre>
Hierarchy Level	<pre>[edit chassis fpc <i>slot-number</i>] [edit chassis lcc <i>number</i> fpc <i>number</i>] (Routing Matrix)</pre>
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Enable sanity polling and start periodic sanity checking for a particular FPC. The periodic sanity check includes checking for error conditions such as “register sanity issues,” “high temperature,” “hardware failure,” and so on in the FPC.
	<div>  <p>NOTE: Currently, periodic sanity check is performed only on the routing chip register.</p> </div>
Options	The remaining statements are explained separately.
Required Privilege Level	<pre>interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.</pre>
Related Documentation	<ul style="list-style-type: none"> • Configuring Sanity Polling for FPCs on T Series Routers on page 240 • retry-count on page 397 • on-error on page 380

service-package

Syntax	service-package (layer-2 | layer-3);
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> adaptive-services]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced on MX Series 3D Universal Edge Routers with MS-DPCs in Junos OS Release 9.6.
Description	For adaptive services interfaces, enable a service package on the specified Physical Interface Card (PIC).
Default	layer-3
Options	layer-2 —Enable a Layer 2 service package on the specified PIC. layer-3 —Enable a Layer 3 service package on the specified PIC.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the Junos OS to Enable Service Packages on Adaptive Services Interfaces on page 181• Configuring the Junos OS to Support Layer 2 Services on MX Series 3D Universal Edge Routers with MS-DPCs on page 126• Junos Services Interfaces Configuration Guide

session-offload

Syntax	session-offload;
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>number</i> adaptive-services service-package extension-provider]
Release Information	Statement introduced on MX Series 3D Universal Edge Routers with MS-DPCs in Junos OS Release 9.6.
Description	Enable session offloading on a per-PIC basis for a Multiservices PIC.
Default	Session offloading is disabled.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the Junos OS to Enable Session Offloading on MX Series 3D Universal Edge Routers with MS-DPCs on page 127

sfm (Chassis)

Syntax	<code>sfm slot-number power off;</code>
Hierarchy Level	[edit chassis]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	<p>For routers with SFMs, configure an SFM to stay offline.</p> <p>By default, if you use the request chassis sfm CLI command to take an SFM offline, the SFM will attempt to restart when you enter a commit CLI command. To prevent a restart, configure an SFM to stay offline. This feature is useful for repair situations. The SFM remains offline until you delete this statement.</p>
Options	<p>slot-number—Slot number in which the SFM is installed.</p> <p>power off—Take the SFM offline and configure it to remain offline.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring the Junos OS to Make an SFM Stay Offline on page 104 • Junos High Availability Configuration Guide

sib

Syntax	<pre>sib { minimum <i>number</i>; }</pre>
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 7.4.
Description	Configure the minimum number of SIBs on an M320 router. With this configuration, SIB absent alarms are generated only if the SIB count falls below the minimum specified.
Options	<p>number—Minimum number of SIBs on the router.</p> <p>Range: 0 through 3</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring the Junos OS to Support Entry-Level Configuration on an M320 Router with a Minimum Number of SIBs and PIMs on page 108 • pem on page 385

slow-pfe-alarm

Syntax	slow-pfe-alarm;
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 12.1R6.
Description	Enable the slow Packet Forwarding Engine alarm on an MX240 router and a TX Matrix router.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Slow Packet Forwarding Engine Alarm on page 242

sonet

Syntax	sonet { device-count <i>number</i> ; }
Hierarchy Level	[edit chassis aggregated-devices]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure properties for SONET/SDH aggregated devices on the router.
Options	The remaining statements are explained separately.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Junos OS for Supporting Aggregated Devices on page 167

slave

```
Syntax  slave {
        announce-interval announce-interval-value
        announce-timeout announce-timeout-value;
        delay-request delay-request-value;
        frequency-only;
        grant-duration interval
        interface interface-name {
            unicast-mode {
                transport ipv4;
                clock-source ip-address {
                    local-ip-address local-ip-address {
                        asymmetry number;
                    }
                }
            }
        }
        sync-interval interval;
    }
```

Hierarchy Level [edit protocols ptp]

Release Information Statement introduced in Junos OS Release 12.2.

Description Configure the slave with parameters.

The remaining statements are explained separately.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- [Configuring Precision Time Protocol on page 201](#)
- [Example: Configuring Precision Time Protocol on page 205](#)
- [Precision Time Protocol Overview on page 38](#)
- [IEEE 1588v2 Precision Timing Protocol \(PTP\) on ACX Series Universal Access Routers](#)

sparse-dlcis

Syntax	sparse-dlcis;
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i>];
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Support a full data-link connection identifier (DLCI) range (1 through 1022). This enables you to use circuit cross-connect (CCC) and translation cross-connect (TCC) features by means of Frame Relay on T1 and E1 interfaces.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the Junos OS to Support the Sparse DLCI Mode on Channelized STM1 or Channelized DS3 PICs on page 152

speed

Syntax	<code>speed (oc3-stm1 | oc12-stm4 | oc48-stm16);</code>
Hierarchy Level	<code>[edit chassis fpc slot-number pic pic-number port port-number]</code>
Release Information	Statement introduced in Junos OS Release 11.2.
Description	Configure the port speed. This statement is supported only on the SONET/SDH (Multi-Rate) MICs with SFP, the Channelized SONET/SDH OC3/STM1 (Multi-Rate) MICs with SFP, and ATM MICs.
Default	<code>oc3-stm1</code>
Options	<code>oc3-stm1</code> —OC3 or STM1. <code>oc12-stm4</code> —OC12 or STM4. <code>oc48-stm16</code> —OC48 or STM16.



NOTE: You can configure the `oc12-stm4`, `oc3-stm1`, and `oc48-stm16` port speed options for SONET/SDH OC3/STM1 (Multi-Rate) MICs. However, for Channelized SONET/SDH OC3/STM1 (Multi-Rate) MICs with SFP and ATM MICs, you can configure only the `oc12-stm4` and `oc3-stm1` port speed options.

Also, for ATM MICs, you can configure the `oc12-stm4` port speed option only for ports 0 and 4. If you configure the `oc12-stm4` port speed option for port 0, then ports 1, 2, and 3 are disabled. Similarly, if you configure the `oc12-stm4` port speed for port 4, then ports 5, 6, and 7 are disabled.

Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring a Port Speed on page 161

symmetric-hash

Syntax	<code>symmetric-hash { complement; }</code>
Hierarchy Level	[edit chassis fpc slot-number pic slot-number hash-key family inet], [edit chassis fpc slot-number pic slot-number hash-key family multiservice]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	(MX Series 3D Universal Edge Routers only) Configure the symmetric hash or symmetric hash complement at the PIC level for configuring symmetrical load balancing on an 802.3ad Link Aggregation Group.
Options	complement —Include the complement of the symmetric hash in the hash key.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs for MX Series Routers on page 111

sync-interval

Syntax	<code>sync-interval <i>sync-interval-value</i>;</code>
Hierarchy Level	[edit protocols ptp master]
Release Information	Statement introduced in Junos OS Release 12.2.
Description	Configure the logarithmic mean interval for sync interval messages to be sent by the master. By default, 64 sync interval messages are sent per second.
Options	<i>sync-interval-value</i> —The sync interval value for sync interval messages to be sent by the master. Range: -6 through +6 Default: 0
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Precision Time Protocol on page 201• Example: Configuring Precision Time Protocol on page 205• Precision Time Protocol Overview on page 38

synchronization (M Series, T Series, and PTX Series)

Syntax	<pre>synchronization { primary (external-a | external-b | fpc-slot-number | gps-0-10mhz | gps-0-5mhz | gps-1-10mhz | gps-1-5mhz | bits-a | bits-b); secondary (external-a | external-b | fpc-slot-number | gps-0-10mhz | gps-0-5mhz | gps-1-10mhz | gps-1-5mhz | bits-a | bits-b); signal-type (t1 | e1); switching-mode (revertive | non-revertive); transmitter-enable; validation-interval seconds; y-cable-line-termination; }</pre>
Hierarchy Level	[edit chassis]
Release Information	<p>Statement introduced in Junos OS Release 7.6.</p> <p>Statement introduced in Junos OS Release 9.3 for M120 routers.</p> <p>Statement introduced in Junos OS Release 10.2 for T320, T640, and T1600 routers.</p> <p>Statement introduced in Junos OS Release 12.1X48 for PTX Series Packet Transport Routers.</p>
Description	<p>(M320, M40e, M120, T320, T640, and T1600 routers and PTX Series Packet Transport Routers only) Configure an external synchronization interface to synchronize the internal Stratum 3 clock to an external source, and then synchronize the chassis interface clock to that source.</p>
Options	<p>primary—First external timing source specified in the configuration hierarchy. This statement has the following suboptions:</p> <ul style="list-style-type: none"> external-a—Use external-a as the primary clock synchronization source. external-b—Use external-b as the primary clock synchronization source. fpc-slot-number—Use fpc-slot-number as the primary clock synchronization source. For the PTX5000 Packet Transport Router, replace <i>slot-number</i> with a value from 0 through 7. gps-0-10mhz—Use gps-0-10mhz as the primary clock synchronization source. gps-0-5mhz—Use gps-0-5mhz as the primary clock synchronization source. gps-1-10mhz—Use gps-1-10mhz as the primary clock synchronization source. gps-1-5mhz—Use gps-1-5mhz as the primary clock synchronization source. bits-a—Use bits-a as the primary clock synchronization source. bits-b—Use bits-b as the primary clock synchronization source. <p>secondary—Second external timing source specified in the configuration hierarchy.</p> <ul style="list-style-type: none"> external-a—Use external-a as the secondary clock synchronization source. external-b—Use external-b as the secondary clock synchronization source.

- **fpc-slot-number**—Use **fpc-slot-number** as the secondary clock synchronization source. For the PTX5000 Packet Transport Router, replace *slot-number* with a value from 0 to 7.
- **gps-0-10mhz**—Use **gps-0-10mhz** as the secondary clock synchronization source.
- **gps-0-5mhz**—Use **gps-0-5mhz** as the secondary clock synchronization source.
- **gps-1-10mhz**—Use **gps-1-10mhz** as the secondary clock synchronization source.
- **gps-1-5mhz**—Use **gps-1-5mhz** as the secondary clock synchronization source.
- **bits-a**—Use **bits-a** as the secondary clock synchronization source.
- **bits-b**—Use **bits-b** as the secondary clock synchronization source.

signal-type—Specify the line encoding mode for interfaces: either **t1** or **e1**. For the M40e router, only the **t1 signal-type** mode is supported.

Default: t1

switching-mode—Specify **revertive** if a lower-priority synchronization can be switched to a valid, higher-priority synchronization.

Default: non-revertive

transmitter-enable—(M320 routers only) Control whether the diagnostic timing signal is transmitted.

validation-interval—Validate the synchronized deviation. If revertive switching is enabled and a higher-priority clock is validated, the clock module is directed to the higher-priority clock, and all configured and active synchronizations are validated. The validation timer resumes after the current validation interval expires. This feature is not supported on PTX Series Packet Transport Routers.

Range: (M320, M40e, T320, T640, T1600 routers) 90 through 86,400 seconds. (M120 routers) 30 through 86,400 seconds.

Default: (M320, M40e, T320, T640, T1600 routers) 90 seconds. (M120 routers) 30 seconds

y-cable-line-termination—(M320 routers only) Specify that a single signal be wired to both Control Boards (CBs) using a Y-cable.

Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
---------------------------------	---

Related Documentation	<ul style="list-style-type: none">• Configuring the Junos OS to Support an External Clock Synchronization Interface for M Series and T Series Routers on page 183
------------------------------	---

synchronization (MX Series)

```

Syntax  synchronization {
    clock-mode (auto-select | free-run);
    esmc-transmit {
        interfaces (all | interface-name);
    }
    hold-interval {
        configuration-change seconds;
        restart seconds;
        switchover seconds;
    }
    interfaces {
        external {
            signal-type (2048khz | e1 | t1);
            e1-options {
                framing (g704 | g704-no-crc4);
                line-encoding (ami | hdb3);
                sabit number;
            }
            t1-options {
                framing (esf | sf);
                line-encoding (ami | b8zs);
            }
        }
    }
    network-option (option-1 | option-2);
    output {
        interfaces external {
            holdover-mode-disable;
            minimum-quality (prc | prs | sec | smc | ssu-a | ssu-b | st2 | st3 | st3e | st4 | stu | tnc);
            source-mode (chassis | line);
            tx-dnu-to-line-source-enable;
            wander-filter-disable;
        }
    }
    quality-mode-enable;
    selection-mode (configured-quality|received-quality);
    source {
        (external-a | external-b) {
            priority number;
            quality-level (prc | prs | sec | smc | ssu-a | ssu-b | st2 | st3 | st3e | st4 | stu | tnc);
            request (force-switch | lockout);
        }
        interfaces (interface-name | external){
            priority number;
            quality-level (prc | prs | sec | smc | ssu-a | ssu-b | st2 | st3 | st3e | st4 | stu | tnc);
            request (force-switch | lockout);
            wait-to-restore minutes;
        }
    }
    switchover-mode (revertive | non-revertive);
}

```

Hierarchy Level [edit chassis]

Release Information Statement introduced in Junos OS Release 10.4.
Options **interfaces**, **output**, and **source interfaces external** introduced in Junos OS Release 12.3.

Description (MX5-T, MX10-T, MX40-T, MX80-T, MX240, MX480, and MX960 routers) Configure Synchronous Ethernet parameters. For configuration details, see [“Configuring Clock Synchronization Interface for MX Series Routers” on page 185](#).

(MX240, MX480, and MX960 routers with Enhanced MX SCB) Configure centralized clocking parameters.

- Starting in Junos 12.2, configure distribution of the selected chassis clock source to downstream network elements through supported line interfaces.
- Starting in Junos 12.3, configure an external building-integrated timing supply (BITS) timing source. You can also configure the selected chassis clock, or an incoming Synchronous Ethernet or PTP line source for transmission out the external interface.

For configuration details, see [“Example: Configuring Centralized Clocking on the Enhanced MX Switch Control Board” on page 300](#).



.....
NOTE: Unified ISSU is not supported when clock synchronization is configured for Synchronous Ethernet.
.....

Options **clock-mode (auto-select | free-run)**—Specify the mode of operation to select the clock source either from a free-run local oscillator or from an external qualified clock. On MX240, MX480, and MX960 routers with enhanced MPCs, the free-run clock is provided by a local oscillator. On other MX Series routers, the free-run clock is provided by the SCB. The default setting is auto-select mode.

esmc-transmit interfaces (all | interface-name)—Enable Ethernet Synchronization Message Channel (ESMC) packet transmission.

hold-interval (configuration-change | restart | switchover) seconds—Specify the chassis synchronization hold interval type and clock selection wait time:

- **configuration-change**—Clock select wait time after change in configuration. The range is 15 through 60 seconds. The default is ???
- **restart**—Clock select wait time after reboot. The range is 60 through 180 seconds. The default is 120 seconds.
- **switchover**—Switchover wait time after clock recovery. The range is 30 to 60 seconds. The default is 30 seconds.

interfaces external—(Enhanced MX SCB only) Configure the external interface for operating with a connected external device. This interface can be configured as a clock source, which then becomes a candidate for selection as the chassis clock source by the clock source selection algorithm.

- **signal-type (2048khz | e1 | t1)**—Specify the external interface signal type:
 - **2048khz**—2048-KHz clock signal
 - **e1**—E1-coded 2048-KHz signal on 120-ohm balanced line
 - **t1**—T1-coded 1.544-MHz signal on 100-ohm balanced line
- **e1-options**—Specify the E1 options:
 - **framing (g704 | g704-no-crc4)**—Specify the framing format:
 - **g704**—G.704 framing format for E1 interfaces
 - **g704-no-crc4**—G.704 framing with no CRC4 for E1 interfaces
 - **line-encoding (ami | hdb3)**—Specify the line encoding:
 - **ami**—Alternate mark inversion (AMI)
 - **hdb3**—High-density bipolar 3 code (HDB3)
 - **sabit number**—Specify the San synchronization status bit used for exchanging SSN quality. The value can be 4, 5, 6, 7, or 8. The default is 4.
- **t1-options**—Specify the T1 options:
 - **framing (esf | sf)**—Specify the framing format:
 - **esf**—Extended superframe (ESF)
 - **sf**—Superframe (SF)

- **line-encoding (ami | b8zs)**—Specify the line encoding:

- **ami**— Alternate mark inversion (AMI)
- **b8zs**—8-bit zero suppression, bipolar with 8-zero substitution (B8ZS)

network-option (option-1 | option-2)—Specify the synchronization networking:

- **option-1**— EEC-1 maps to G.813 option 1 clock
- **option-2**—EEC-2 maps to G.812 type IV clock

output interfaces external—(Enhanced MX SCB only) Specify the properties of the external output interface:

- **holdover-mode-disable**—Disable holdover.
- **minimum-quality (prc | prs | sec | smc | ssu-a | ssu-b | st2 | st3 | st3e | st4 | stu | tnc)**—Specify the minimum quality level threshold for selection of this clock (see [Table 29 on page 415](#)). If the quality level of the output clock source drops below the configured minimum quality level threshold, the external output clock is squelched.

Table 29: Quality Levels

Quality Level	Description
prc	Timing quality of a primary reference clock (option-1 only).
prs	Clock traceable to a primary reference source (option-2 only).
sec	Timing quality of an SDH equipment clock (option-1 only).
smc	Clock traceable to a self-timed SONET (option-2 only).
ssu-a	Timing quality of a type I or IV slave clock (option-1 only).
ssu-b	Timing quality of a type VI slave clock (option-1 only).
st2	Clock traceable to Stratum 2 (option-2 only).
st3	Clock traceable to Stratum 3 (option-2 only).
st3e	Clock traceable to Stratum 3E (option-2 only).
st4	Clock traceable to Stratum 4 free-run (option-2 only).
stu	Clock traceable to an unknown quality (option-2 only).
tnc	Clock traceable to a transit node clock (option-2 only).

- **source-mode (chassis | line)**—Specify source mode for selecting source to output:
 - **chassis**—Chassis clock for output
 - **line**—Best line clock source for output
- **tx-dnu-to-line-source-enable**—Set Tx QL to DNU/DUS on line source interface that has been selected as the external output source.
- **wander-filter-disable**—Disable wander filtering.

quality-mode-enable—Specify the clock selection, quality level, and priority setting. The quality level (QL) parameter for a Synchronous Ethernet interface is optional when quality mode is enabled and the selection mode is set to **received-quality**. The default QL for a Synchronous Ethernet interface is based on the value of **network-option**: **option-1** selects **SEC** and **option-2** selects **ST3**. [Table 30 on page 416](#) shows whether SSM QL is supported for a given external interface signal type and framing. The default setting is disabled.

Table 30: SSM-QL Support by Signal Type and Framing

Signal Type	Framing	SSM QL Supported
E1	G.704	yes
E1	G.704 no CRC4	no
T1	ESF	yes
T1	SF	no
2048 KHz	Not applicable	no

selection-mode (configured-quality | received-quality)—Specify whether the clock source selection should use the configured or received ESMC or SSM quality level for a qualifying interface. In both selection modes, the interface qualifies for clock source selection only when the received ESMC or SSM quality level on the interface is equal to or greater than the configured ESMC or SSM quality level for the interface.

- When the **selection-mode** statement is set as **configured-quality**, the clock source selection algorithm uses the ESMC or SSM quality level configured for a qualifying interface.
- When the **selection-mode** statement is set as **received-quality**, the clock source selection algorithm uses the ESMC or SSM quality level received on the qualifying interface.



NOTE: For the **selection-mode** statement configuration to take effect, you must set the **quality-mode-enable** statement at the [edit chassis synchronization] hierarchy level.

source (external-a | external-b | interfaces (interface-name | external))—Specify clock sources. The primary clock source is **external-a**, the secondary clock source is **external-b**. The clock source is chosen using the clock selection process.

(Enhanced MX SCB only) Specify the **external** interface to select the external clock source configured in **interfaces external**.

- **priority number**—Specify a priority level from 1 to 5. When not specified, **external-a** has higher default priority than **external-b**, and **external-b** has higher default priority than other Gigabit Ethernet or 10-Gigabit Ethernet clock sources, which have the lowest default priority. Any priority you configure is higher than any default priority.
- **quality-level (prc | prs | sec | smc | ssu-a | ssu-b | st2 | st3 | st3e | st4 | stu | tnc)**—Specify the **quality-level** option based on the configured **network-option**. For quality level details, see [Table 29 on page 415](#).



NOTE: Starting with Junos OS Release 12.2R1, the **quality-level** parameter for a Synchronous Ethernet interface is optional when quality mode is enabled and the selection mode is set to received quality. The default QL for a Synchronous Ethernet interface is **SEC** for the **option-1** network type and **ST3** for the **option-2** network type.

- Both option I and option II SSM quality levels (QL) are supported:
 - For option-1, QL must be configured for external clocks (**external-a** or **external-b**) whether or not QL is enabled.
 - For option-2, the default QL for external clocks is **QL_STU** whether or not QL is enabled.
- QL is set to **DNU** for network-option 1 and set to **DUS** for network-option 2, if quality-level is not configured and no ESMC messages are received.
- On the selected active source (primary or secondary, whichever is active), even if ESMC transmit is not enabled, a **DNU** ESMC will be sent out if **network-option** is 1, and **DUS** ESMC will be sent out if **network-option** is 2. This is applicable only for sources of Ethernet interface type to avoid source looping.
- **request force-switch**—Force a switch to this source if the source is enabled and not locked out. You can configure only one source to be force-switched.
- **request lockout**—You can configure lockout for any source. When configured, this source is not considered by the clock selection process.
- **wait-to-restore minutes**—(**interfaces** only) Specify a time for each port to be up before opening the ESMC—from 0 through 12 minutes. When a port's signal transitions out of the signal fail state, it must be fault free for the **wait-to-restore** time before it is again considered by the clock selection process.

switchover-mode (revertive | non-revertive)—Specify revertive or non-revertive switchover mode:

- In revertive mode (the default), the system switches from a lower to a higher quality clock source whenever the higher quality clock source becomes available.
- In non-revertive mode, the system continues to use the current clock source as long as it is valid.

Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
---------------------------------	---

- | | |
|------------------------------|---|
| Related Documentation | <ul style="list-style-type: none">• Synchronous Ethernet Overview on page 25• show chassis synchronization (MX Series Routers) on page 1260• Configuring Clock Synchronization Interface for MX Series Routers on page 185• Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC on page 197• Example: Configuring Centralized Clocking on the Enhanced MX Switch Control Board on page 300• <i>request chassis synchronization mode</i>• Clock Sources for PTX Series Packet Transport Routers on page 190 |
|------------------------------|---|

synchronous-ethernet-mapping

Syntax	<pre>synchronous-ethernet-mapping { clock-source <i>ip-address</i> { interface <i>interface1-name</i>; interface <i>interface2-name</i>; } }</pre>
Hierarchy Level	[edit protocols ptp slave hybrid]
Release Information	Statement introduced in Junos OS Release 12.2R2.
Description	<p>Configure the Synchronous Ethernet mapping for hybrid mode.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Hybrid Mode and ESMC Quality Level Mapping on page 209 • Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 212 • Understanding Hybrid Mode on page 39 • Precision Time Protocol Overview on page 38 • Synchronous Ethernet Overview on page 25

system-priority

Syntax	<code>system-priority <i>priority</i>;</code>
Hierarchy Level	[edit chassis aggregated-devices ethernet lacp]
Release Information	Statement introduced in Junos OS Release 9.3. Statement introduced in Junos OS Release 11.4 for EX Series switches.
Description	<p>Define LACP system priority for aggregated Ethernet interfaces at the global (chassis) level.</p> <p>The device with the lower system priority value determines which links between LACP partner devices are active and which are in standby for each LACP group. The device on the controlling end of the link uses port priorities to determine which ports are bundled into the aggregated bundle and which ports are put in standby mode. Port priorities on the other device (the noncontrolling end of the link) are ignored. In priority comparisons, numerically lower values have higher priority. Therefore, the system with the numerically lower value (higher priority value) for LACP system priority becomes the controlling system. If both devices have the same LACP system priority (for example, they are both configured with the default setting of 127), the device MAC address determines which switch is in control.</p>
Options	<p><i>priority</i>—Priority for the aggregated Ethernet system. A smaller value indicates a higher priority.</p> <p>Range: 0 through 65535</p> <p>Default: 127</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Junos OS for Supporting Aggregated Devices on page 167• Configuring LACP Link Protection of Aggregated Ethernet Interfaces (CLI Procedure)

t1

Syntax	<pre>t1 <i>link-number</i> { <i>channel-group channel-number</i> timeslots <i>slot-number</i>; }</pre>
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> ct3 port <i>port-number</i>];
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure channelized T1 port and channel specifications.
Options	<p><i>link-number</i>—T1 link.</p> <p>Range: 0 through 27 for DS0 naming</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 175

traffic-manager

Syntax	<pre>traffic-manager { egress-shaping-overhead <i>number</i>; ingress-shaping-overhead <i>number</i>; mode <i>session-shaping</i>; }</pre>
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i>], [edit chassis lcc <i>number</i> fpc <i>slot-number</i> pic <i>pic-number</i>] (Routing Matrix)
Release Information	Statement introduced in Junos OS Release 8.3.
Description	Enable CoS queuing, scheduling, and shaping on an L2TP session.



NOTE: Committing changes to **traffic-manager** automatically restarts any necessary components (PICs, DPCs, or FPCs).

Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Configuring CoS for L2TP Tunnels on ATM Interfaces</i>• <i>egress-shaping-overhead</i>• <i>ingress-shaping-overhead</i>• <i>mode (Layer 2 Tunneling Protocol Shaping)</i>


transport (slave)

Syntax	transport ipv4;
Hierarchy Level	[edit protocols ptp slave interface <i>interface-name</i> unicast-mode]
Release Information	Statement introduced in Junos OS Release 12.2.
Description	Configure the encapsulation type for Precision Time Protocol (PTP) packet transport . Currently, IPv4 is the only supported encapsulation type for PTP. The remaining statements are explained separately.
Options	IPv4 —The encapsulation type for Precision Time Protocol packet transport as IPv4.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Precision Time Protocol on page 201 • Example: Configuring Precision Time Protocol on page 205 • Precision Time Protocol Overview on page 38


transport (master)

Syntax	transport ipv4;
Hierarchy Level	[edit protocols ptp master interface <i>interface-name</i> unicast-mode]
Release Information	Statement introduced in Junos OS Release 12.2.
Description	Configure the encapsulation type for Precision Time Protocol packet transport. Currently, IPv4 is the only supported encapsulation type for PTP. The remaining statements are explained separately.
Options	IPv4 —The encapsulation type for Precision Time Protocol packet transport as IPv4.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Precision Time Protocol on page 201 • Example: Configuring Precision Time Protocol on page 205 • Precision Time Protocol Overview on page 38

tunnel-services (Chassis)

Syntax	<pre>tunnel-services { bandwidth (1g | 10g | 20g | 40g); tunnel-only; }</pre>
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>number</i>]
Release Information	Statement introduced in Junos OS Release 8.2.
Description	<p>For MX Series 3D Universal Edge Routers, configure the amount of bandwidth for tunnel services.</p> <p>For M7i, M10i, M120, M320, T Series and TX Matrix routers with IQ2 PICs and IQ2E PICs, configure support for per unit scheduling for GRE tunnels. You can specify the IQ2 and IQ2E PICs to work exclusively in tunnel mode or as a regular PIC. The default setting uses IQ2 and IQ2E PICs as a regular PIC. If you do not configure the tunnel-only option, the IQ2 and IQ2E PICs operate as regular PICs. For M7i, M10i, M120, M320, T Series and TX Matrix routers with IQ2 PICs and IQ2E PICs, you can use the tunnel-only option to specify that an IQ2 or IQ2E PIC work in tunnel mode only.</p>
	<div>  <p>NOTE: Bandwidth rates of 20 gigabits per second and 40 gigabits per second require use of an MX Series router with the 100-Gigabit Ethernet Modular Port Concentrator (MPC) and the 100-Gigabit CFP MIC.</p> </div>
Options	<p>tunnel-only (Optional)—For M7i, M10i, M120, M320, T Series and TX Matrix routers with IQ2 PICs and IQ2E PICs, specify that an IQ2 or IQ2E PIC work in tunnel mode only.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Example: Configuring Tunnel Interfaces on a Gigabit Ethernet 40-Port DPC on page 295 • Example: Configuring Tunnel Interfaces on a 10-Gigabit Ethernet 4-Port DPC on page 296 • Example: Configuring Tunnel Interfaces on the MPC3E on page 296 • bandwidth (Tunnel Services) on page 327 • [edit chassis] Hierarchy Level • Configuring Layer 3 Tunnel Services Interfaces on an MX Series Router with a DPC

ucode-imem-remap

Syntax	ucode-imem-remap;
Hierarchy Level	[edit chassis feb slot <i>number</i>]
Release Information	Statement introduced in Junos OS Release 10.4R2.
Description	<p>M120 routers with a single type-1 FPC mapped to an FEB support a microcode remap feature to resolve microcode overflow resulting in bad PIC combinations.</p> <p>You can enable the microcode remap by using the ucode-imem-remap statement at the [edit chassis feb slot <i>number</i>] hierarchy level. The default microcode map will continue to be available if the ucode-imem-remap statement is not configured.</p>
	<div>  <p>NOTE: On M120 routers, the FEB is automatically restarted once the ucode-imem-remap statement is configured and committed.</p> </div>
Required Privilege Level	<p>interfaces—To view this statement in the configuration.</p> <p>interfaces-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Router Chassis Configuration Statements on page 313


unicast-mode (master)

Syntax	<pre>unicast-mode { transport ipv4; clock-client ip-address { local-ip-address local-ip-address; } }</pre>
Hierarchy Level	[edit protocols ptp master interface <i>interface-name</i>]
Release Information	Statement introduced in Junos OS Release 12.2.
Description	<p>Configure the master in unicast mode. You can set this option when PTP unicast mode of messaging is needed.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Precision Time Protocol on page 201• Example: Configuring Precision Time Protocol on page 205• Precision Time Protocol Overview on page 38

unicast-mode (slave)

Syntax	<pre>unicast-mode { clock-source ip-address { local-ip-address local-ip-address; asymmetry number; } } transport ipv4; }</pre>
Hierarchy Level	[edit protocols ptp slave interface <i>interface-name</i>]
Release Information	Statement introduced in Junos OS Release 12.2.
Description	<p>Configure the slave in unicast mode. You can set this option when PTP unicast mode of messaging is needed.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Precision Time Protocol on page 201 • Example: Configuring Precision Time Protocol on page 205 • Precision Time Protocol Overview on page 38 • <i>IEEE 1588v2 Precision Timing Protocol (PTP) on ACX Series Universal Access Routers</i>

unicast-negotiation

Syntax	unicast-negotiation;
Hierarchy Level	[edit protocols ptp]
Release Information	Statement introduced in Junos OS Release 12.2.
Description	Configure unicast negotiation. Unicast negotiation is a method by which the announce, synchronization, and delay response packet rates are negotiated between the master and the slave before a PTP session is established.
	<div> NOTE: When unicast negotiation is enabled, you cannot commit any packet rate–related configuration.</div>
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Precision Time Protocol on page 201• Example: Configuring Precision Time Protocol on page 205• Precision Time Protocol Overview on page 38• IEEE 1588v2 Precision Timing Protocol (PTP) on ACX Series Universal Access Routers

vpn-label

Syntax	vpn-label;
Hierarchy Level	[edit chassis memory-enhanced]
Release Information	Statement added in Junos OS Release 10.4.
Description	Allocate more jtree memory for Layer 3 VPN labels.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the Junos OS to Allocate More Memory for Routing Tables, Firewall Filters, and Layer 3 VPN Labels on page 236

vrf-mtu-check

Syntax	vrf-mtu-check;
Hierarchy Level	[edit chassis]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 11.1 for EX Series switches.
Description	On M Series routers (except the M120 and M320 router), T Series routers, and on EX Series 8200 switches, configure path maximum transmission unit (MTU) checks on the outgoing interface for unicast traffic routed on a virtual private network (VPN) routing and forwarding (VRF) instance.
Default	Disabled.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Configuring Path MTU Checks for VPNs</i>• Configuring the Junos OS to Enable MTU Path Check for a Routing Instance on M Series Routers on page 102

vtmapping

Syntax	vtmapping (itu-t | klm);
Hierarchy Level	[edit interfaces <i>interface-name</i> sonet-options]; [edit chassis fpc <i>number</i> pic <i>number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	<p>For the Channelized STM1 IQ PIC or Channelized STM1 PIC, configure virtual tributary mapping.</p> <p>For the Channelized STM1 PIC, you configure virtual tributary mapping at the [edit chassis fpc <i>number</i> pic <i>number</i>] hierarchy level.</p>
Options	<p>itu-t—International Telephony Union standard.</p> <p>klm—KLM standard.</p> <p>Default: klm</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• <i>Configuring Virtual Tributary Mapping of Channelized STM1 Interfaces</i>• Configuring the Junos OS to Support Channelized STM1 Interface Virtual Tributary Mapping on page 177

PART 3

Administration

- [Administrative Commands on page 433](#)
- [Monitoring Commands on page 493](#)

CHAPTER 27

Administrative Commands

clear chassis alarms fabric degraded

Syntax (TX Matrix Plus Router with 3D SIBs)	clear chassis alarms fabric degraded lcc <i>number</i> fpc <i>number</i>
Release Information	Command introduced in Junos OS Release 13.2 for a routing matrix with a TX Matrix Plus routers and 3D SIBs.
Description	Clear the fabric degraded alarm for an FPC.
Options	<p>lcc <i>number</i>—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">• 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. <p>fpc <i>number</i>—Flexible PIC Concentrator (FPC) slot number. On a TX Matrix Plus router in the TXP-T1600-3D, TXP-T4000-3D, or TXP-Mixed-LCC-3D configuration, specify the number of a T1600 or T4000 router by using the lcc <i>number</i> option and replace fpc <i>number</i> with a value from 0 through 7.</p>
Required Privilege Level	clear
Related Documentation	<ul style="list-style-type: none">• <i>show system alarms</i>

Sample Output

show system alarms
(TX Matrix Plus router
with 3D SIBs)

```
user@host> 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:
-----
3 alarms currently active
Alarm time          Class  Description
2013-05-08 17:35:34 UTC  Minor  SIB 3 Not Online
2013-05-08 17:35:34 UTC  Minor  SIB 2 Not Online
2013-05-08 18:19:24 UTC  Major  FPC 5 degraded fabric condition detected

user@host> clear chassis alarms fabric degraded lcc 0 fpc 5
lcc0-re1:
-----

user@host> 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:
-----
2 alarm currently active
Alarm time          Class  Description
2013-05-08 17:36:34 UTC  Minor  SIB 3 Not Online
2013-05-08 17:36:34 UTC  Minor  SIB 2 Not Online
```

clear chassis display message

Syntax	clear chassis display message
Syntax (TX Matrix Router)	clear chassis display message <lcc <i>number</i> | scc>
Syntax (TX Matrix Plus Router)	clear chassis display message <lcc <i>number</i> | sfc <i>number</i> >
Syntax (QFabric Systems)	clear chassis display message <node-device <i>name</i> | interconnect-device <i>name</i> >
Release Information	Command introduced in Junos OS Release 7.5. Command introduced in Junos OS Release 9.0 for EX Series switches. sfc option for the TX Matrix Plus routers introduced in Junos OS Release 9.6. Command introduced in Junos OS Release 11.1 for the QFX Series.
Description	(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.
Options	none —Clear or stop a text message on the craft interface display. interconnect-device <i>name</i> —(QFabric systems only) (Optional) On a QFabric system, clear or stop a text message on the LCD panel display on the specified Interconnect device. lcc <i>number</i> —(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number. Replace <i>number</i> with the following values depending on the LCC configuration: <ul style="list-style-type: none">• 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.

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 on page 489](#)
- [show chassis craft-interface on page 515](#)

List of Sample Output

[clear chassis display message on page 438](#)

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|
      +-----+
```



request chassis afeb

Syntax	request chassis afeb (offline | online | restart)
Release Information	Command introduced in Junos OS Release 13.2.
Description	Control the operation of the compact Forwarding Engine Board (FEB).
Options	<p>offline—Take the FEB offline.</p> <p>online—Bring the FEB online.</p> <p>restart—Restart the FEB.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show chassis afeb on page 496
List of Sample Output	request chassis afeb online (MX104 Router) on page 439
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

```
request chassis afeb online (MX104 Router)  user@host> request chassis afeb online
AFEB is already online
```

request chassis cb

Syntax	request chassis cb (offline | online) slot <i>slot-number</i>
Syntax (TX Matrix Router)	request chassis cb (offline | online) <slot <i>slot-number</i> | lcc <i>number</i> slot <i>cb-slot-number</i> | scc <i>number</i> slot <i>cb-slot-number</i> >
Syntax (TX Matrix Plus Router)	request chassis cb (offline | online) <slot <i>slot-number</i> | lcc <i>number</i> slot <i>cb-slot-number</i> | sfc <i>number</i> slot <i>cb-slot-number</i> >
Syntax (QFabric System)	request chassis cb (offline | online) interconnect-device <i>name</i> slot <i>slot-number</i> <interconnect-device <i>name</i> slot <i>slot-number</i> (offline | online)>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS 9.4 for EX Series switches. sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6. Command introduced in Junos OS 11.3 for QFX Series. 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.
Description	(M120, M320, and MX Series routers and T Series routers, QFabric systems, and EX8200 switches only) Control the operation of the Control Board (CB). For information about the meaning of “CBs” on the switches, see <i>EX Series Switches Hardware and CLI Terminology Mapping</i> .
Options	offline —Take the Control Board offline.
	<div><p>NOTE: On a QFabric system, to bring the backup Control Board on a QFX3008-I Interconnect device offline, issue the <code>request chassis cb slot <i>backup-slot-number</i> offline</code> command.</p></div>
	<div><p>NOTE: Only backup Control Board can be turned offline or online. To turn a Control Board offline or to bring it back online, the Routing Engine should be turned offline first.</p></div>
	online —Bring the Control Board online.
	interconnect-device <i>name</i> —(QFabric systems only) (Optional) Bring the QFX3008-I Interconnect device Control Board either offline or online:
	slot <i>slot-number</i> —Control Board slot number:

- (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 **cb-slot-number** with a value from 0 through 1.

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 **cb-slot-number** with a value from 0 through 1.

- M320 router—Replace **slot-number** with a value from 0 through 1.
- MX480/MX240 routers—Replace **slot-number** with a value from 0 through 1.
- MX960 router—Replace **slot-number** with a value from 0 through 2.
- MX2020 and MX2010 routers—Replace **slot-number** with 0 or 1.
- EX8208 switch—Replace **slot-number** with a value from 0 through 2.
- EX8216 switch—Replace **slot-number** with a value from 0 through 1.
- QFabric System—Replace **slot-number** with a value from 0 through 1.

lcc number—(TX Matrix, 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.

sfc number—(TX Matrix Plus routers only) (Optional) Change the CB status for the TX Matrix Plus router (switch-fabric chassis). Replace **number** with 0.

Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"> • show chassis environment cb on page 601 • <i>Switching Control Board Redundancy</i> • <i>Routing Engine and Switching Control Board Redundancy Configuration Statements</i>
List of Sample Output	request chassis cb on page 442 request chassis cb interconnect-device (QFabric System) on page 442 request chassis cb (MX2020 Router) on page 442 request chassis cb (MX2010 Router) on page 442
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis cb

```
user@host> request chassis cb offline slot 1
Backup CB 1 cannot be set offline, backup RE is online
```

**request chassis cb
interconnect-device
(QFabric System)**

```
user@switch> request chassis cb interconnect-device interconnect1 offline slot 1
Backup CB 1 cannot be set offline, backup RE is online
```

**request chassis cb
(MX2020 Router)**

```
user@host> request chassis cb offline slot 1
Backup CB 1 cannot be set offline, backup RE is online
```

**request chassis cb
(MX2010 Router)**

```
user@host> request chassis cb offline slot 1
Backup CB 1 cannot be set offline, backup RE is online
```

request chassis cfep

Syntax	request chassis cfep (offline | online | restart)
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M7i and M10i routers only) Control the operation of the Compact Forwarding Engine Board (CFEB).
Options	<p>offline—Take the CFEB offline.</p> <p>online—Bring the CFEB online.</p> <p>restart—Restart the CFEB.</p>
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"> • show chassis cfep on page 511 • <i>Configuring CFEB Redundancy on the M10i Router</i> • <i>CFEB Overview</i>
List of Sample Output	request chassis cfep on page 443
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis cfep user@host> request chassis cfep offline
CFEB Offlined

request chassis cip

Syntax	<code>request chassis cip (offline | online) slot <i>slot-number</i></code>
Release Information	Command introduced for the TX Matrix Plus router in Junos OS Release 9.6.
Description	(TX Matrix Plus routers only) Control the operation of the Connector Interface Panel (CIP).
Options	<p>offline—Take the CIP offline.</p> <p>online—Bring the CIP online.</p> <p>slot <i>slot-number</i>—CIP slot number. Replace <i>slot-number</i> with a value ranging from 0 through 1.</p>
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none">• show chassis cip on page 513• <i>Installing a T1600 CIP</i>• <i>Installing a T640 CIP</i>• <i>Installing a TX-CIP</i>• <i>Installing an M320 CIP</i>• <i>Installing the M40e CIP</i>• <i>Installing the T1600 CIP</i>• <i>Installing the T320 CIP</i>• <i>CIP Overview</i>
List of Sample Output	request chassis cip offline slot (TX Matrix Plus Router) on page 444 request chassis cip offline slot (TX Matrix Plus Router) on page 444
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

<code>request chassis cip offline slot (TX Matrix Plus Router)</code>	<pre>user@host > request chassis cip offline slot 0 CIP 0 offline done</pre>
<code>request chassis cip offline slot (TX Matrix Plus Router)</code>	<pre>user@host > request chassis cip online slot 0 CIP 0 online done</pre>

request chassis fabric plane

Syntax	<code>request chassis fabric plane <i>plane-number</i> (offline | online)</code>
Release Information	<p>Command introduced in Junos OS Release 8.0.</p> <p>Command introduced in Junos OS Release 9.4 for EX Series switches.</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>
Description	Control the operation of the specified fabric plane.
Options	<p>offline—Take the fabric plane offline. Use the <code>request chassis fabric plane <i>plane-number</i> offline</code> command to clear a FAULT state on a fabric plane. To bring the fabric plane back online, use the <code>request chassis fabric plane <i>plane-number</i> online</code> command.</p> <p>online—Bring the fabric plane online.</p> <p>plane <i>plane-number</i>—Fabric plane number.</p> <ul style="list-style-type: none"> For the M120 router, replace <i>plane-number</i> with a value from 0 through 3. For the MX480 and MX240 routers, replace <i>plane-number</i> with a value from 0 through 7. For the MX2020 and MX2010 routers, replace <i>plane-number</i> with a value from 0 through 7. For the MX960 router, replace <i>plane-number</i> with a value from 0 through 5. For the EX8208 switch, replace <i>plane-number</i> with a value from 0 through 11. For the EX8216 switch, replace <i>plane-number</i> with a value from 0 through 7.
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"> show chassis fabric plane on page 876 show chassis fabric plane-location on page 921 <i>show chassis fabric summary</i> <i>Fabric Management Overview</i>
List of Sample Output	<p>request chassis fabric plane 0 online on page 446</p> <p>request chassis fabric plane 0 offline on page 446</p> <p>request chassis fabric plane 0 online (EX8200 switch) on page 446</p> <p>request chassis fabric plane (MX2020 Router) on page 446</p> <p>request chassis fabric plane (MX2010 Router) on page 446</p>
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

<code>request chassis fabric plane 0 online</code>	<code>user@host> request chassis fabric plane 0 online</code> Online initiated, use “show chassis fabric plane” to verify
<code>request chassis fabric plane 0 offline</code>	<code>user@host> request chassis fabric plane 0 offline</code> Offline initiated, use “show chassis fabric plane” to verify
<code>request chassis fabric plane 0 online</code> (EX8200 switch)	<code>user@host> request chassis fabric plane 0 online</code> Plane 0 is already active
<code>request chassis fabric plane (MX2020 Router)</code>	<code>user@host> request chassis fabric plane 2 online</code> Plane 2 is already active
<code>request chassis fabric plane (MX2010 Router)</code>	<code>user@host> request chassis fabric plane 4 online</code> Plane 4 is already active

request chassis feb

Syntax	request chassis feb (offline | online | restart) slot <i>slot-number</i>
Syntax (ACX Series Routers)	request chassis feb restart slot <i>slot-number</i>
Release Information	Command introduced in Junos OS Release 8.0. Command introduced in Junos OS Release 12.2 for the ACX Series Universal Access Routers.
Description	(M120 router only) Control the operation of the specified Forwarding Engine Board (FEB). (ACX Series routers) Restart the specified FEB.
Options	offline —Take the specified FEB offline. online —Bring the specified FEB online. restart —Restart the specified FEB. slot <i>slot-number</i> —FEB slot number. Replace <i>slot-number</i> with a value from 0 through 5.
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"> • show chassis feb on page 971 • show chassis fabric feb on page 813 • show chassis fpc-feb-connectivity on page 1018 • <i>feb</i> • <i>Switching Control Board Redundancy</i>
List of Sample Output	request chassis feb offline slot 0 on page 448 request chassis feb online slot 0 on page 448 request chassis feb restart slot 0 on page 448
Output Fields	When you enter this command, you are provided feedback on the status of your request.

request chassis feb (M120 Router)

**request chassis feb
offline slot 0** user@host> request chassis feb offline slot 0
Offline initiated, use “show chassis feb” to verify

**request chassis feb
online slot 0** user@host> request chassis feb online slot 0
Online initiated, use “show chassis feb” to verify

**request chassis feb
restart slot 0** user@host> request chassis feb restart slot 0
Restart initiated, use “show chassis feb” to verify

request chassis feb (ACX Series Routers)

user@host> request chassis feb restart slot 0
FEB will be restarted NOW.

request chassis fpc

Syntax	request chassis fpc (offline | online | restart) slot <i>slot-number</i>
Syntax (TX Matrix and TX Matrix Plus Routers)	request chassis fpc (offline | online | restart) slot <i>slot-number</i> <lcc <i>number</i> >
Syntax (MX Series Routers)	request chassis fpc (offline | online | restart) slot <i>slot-number</i> <all-members> <local> <member <i>member-id</i> >
Syntax (MX2020 3D Universal Edge Routers)	request chassis fpc (offline | online | restart) slot <i>slot-number</i>
Syntax (MX2010 3D Universal Edge Routers)	request chassis fpc (offline | online | restart) slot <i>slot-number</i>
Syntax (QFabric System)	request chassis fpc <interconnect-device <i>name</i> slot <i>slot-number</i> (offline | online)> <(offline | online) interconnect-device <i>name</i> slot <i>slot-number</i> > <slot <i>slot-number</i> interconnect-device <i>name</i> (offline | online)>
Syntax (PTX Series Packet Transport Routers)	request chassis fpc (offline | online | restart) slot <i>slot-number</i>
Release Information	<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 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>
Description	(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> .
Options	<p>offline—Take the FPC offline.</p> <p>online—Bring the FPC online.</p> <p>interconnect-device <i>name</i>—(QFabric systems only) Bring the Flexible Port Concentrator (FPC) on the QFX3008-I Interconnect device either offline or online:</p>

- (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 988](#)
- [show chassis fpc-feb-connectivity on page 1018](#)
- [show chassis fabric fpcs on page 819](#)
- [Configuring the Junos OS to Make a Flexible PIC Concentrator Stay Offline on page 145](#)
- [Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online on page 165](#)

- *MX960 Flexible PIC Concentrator Description*

List of Sample Output	request chassis fpc on page 452
	request chassis fpc (MX Series Routers with Media Services Blade [MSB]) on page 452
	request chassis fpc (MX2020 Router) on page 452
	request chassis fpc (MX2010 Router) on page 452
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 fpm resync

Syntax	request chassis fpm resync
Syntax (TX Matrix Routers)	request chassis fpm resync (<i>lcc number</i> | <i>scc</i>)
Syntax (TX Matrix Plus Routers)	request chassis fpm resync (<i>lcc number</i> | <i>sfc number</i>)
Syntax (MX Series Routers)	request chassis fpm resync <all-members> <local> <member <i>member-id</i> >
Syntax (MX2010 3D Universal Edge Routers)	request chassis fpm resync
Syntax (MX2020 3D Universal Edge Routers)	request chassis fpm resync
Release Information	Command introduced before Junos OS Release 7.4. sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6. 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.
Description	(M40e, M120, M160, M320, MX Series, and T Series routers only) Resynchronize the craft interface status.
Options	<p>all-members—(MX Series routers only) (Optional) Resynchronize the craft interface status on all members of the Virtual Chassis configuration.</p> <p>lcc number—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number. Replace <i>number</i> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none"> • 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. <p>local—(MX Series routers only) (Optional) Resynchronize the craft interface status on the local Virtual Chassis member.</p>

member *member-id*—(MX Series routers only) (Optional) Resynchronize the craft interface status on the specified member of the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

scc—(TX Matrix routers only) Resynchronize the craft interface status on the TX Matrix router (switch-card chassis).

sfc *number*—(TX Matrix Plus routers only) Resynchronize the craft interface status on the TX Matrix Plus router (or switch-fabric chassis). Replace *number* with 0.

Required Privilege Level maintenance

Related Documentation

- [show chassis environment fpm on page 648](#)
- [Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online on page 165](#)

List of Sample Output [request chassis fpm resync on page 454](#)
[request chassis fpm resync \(MX2010 Router\) on page 454](#)

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis fpm resync

```
user@host> request chassis fpm resync
Front Panel resynced
```

request chassis fpm resync (MX2010 Router)

```
user@host > request chassis fpm resync
Front Panel resynced.
```

request chassis lcc

Syntax (TX Matrix and TX Matrix Plus Routers)	<code>request chassis lcc (offline | online) slot <i>slot-number</i></code>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(TX Matrix and TX Matrix Plus routers only) On a TX Matrix router, control the operation of a T640 LCC that is connected to the TX Matrix router. On a TX Matrix Plus router, control the operation of a LCC that is connected to the TX Matrix Plus router.
Options	<p>offline—On a routing matrix based on the TX Matrix router (switch-card chassis), take the T640 router (line-card chassis) offline. On a routing matrix based on a TX Matrix Plus router (switch-fabric chassis), take the router (line-card chassis) offline.</p> <p>online—On a routing matrix based on the TX Matrix router (switch-card chassis), bring the T640 router (line-card chassis) online. On a routing matrix based on a TX Matrix Plus router (switch-fabric chassis), bring the router (line-card chassis) online.</p> <p>slot <i>slot-number</i>—On a TX Matrix router (switch-card chassis), the slot number of a T640 router (line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router (switch-fabric chassis), the slot number of a router (line-card chassis) that is connected to the TX Matrix Plus (switch-fabric chassis) router.</p> <p><i>slot-number</i> has the following values depending on the LCC configuration</p> <p>Replace <i>slot-number</i> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • show chassis lccs on page 1149 • <i>Configuring Line-Card Upgrade Groups for Nonstop Software Upgrade (CLI Procedure)</i> • <i>fpc</i>
List of Sample Output	request chassis lcc on page 456
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

```
request chassis lcc          user@host> request chassis lcc offline slot 0
```


request chassis mcs

Syntax	<code>request chassis mcs (offline | online | restart) slot <i>slot-number</i></code>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M40e and M160 routers only) Control the operation of the Miscellaneous Control Subsystem (MCS).
Options	<p>offline—Take the MCS offline.</p> <p>online—Bring the MCS online.</p> <p>restart—Restart the MCS.</p> <p>slot <i>slot-number</i>—MCS slot number. Replace <i>slot-number</i> with 0 or 1.</p>
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"> • show chassis environment mcs on page 669
List of Sample Output	request chassis mcs on page 457
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

```
request chassis mcs      user@host> request chassis mcs online slot 0
                          MCS 0 appears to be online already
```

request chassis mic

Syntax `request chassis mic (offline | online) fpc-slot slot-number mic-slot slot-number`

Release Information Command introduced in Junos OS Release 10.1.
 Command introduced in Junos OS Release 12.3 for ACX4000 Series Router.
 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.

Description (MX Series routers only) Control the operation of the Modular Interface Cards (MICs) installed on a Modular Port Concentrator (MPC).



NOTE: On MX960 routers, if the MIC is not functioning correctly, you should take the MPC offline, replace it with a new MPC, and reinstall the MIC. On MX104 routers, the `request chassis mic` command is not supported on FPC slot 2 and MIC slot 0.

Options `offline`—Take the MIC offline.

`online`—Bring the MIC online.

`fpc-slot slot-number`—FPC slot number where the MIC is installed:

- ACX4000 router—Replace *fpc-slot* with the value 0 or 1.
- MX80 router—Replace *fpc-slot* with the value 1. This command is not supported on FPC slot 0.
- MX104 router—Replace *fpc-slot* with the 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.
- MX960 router—Replace *fpc-slot* with a value from 0 through 11.
- MX2020 router—Replace *fpc-slot* with a value from 0 through 19.
- MX2010 router—Replace *fpc-slot* with a value from 0 through 9.

`mic-slot slot-number`—MIC slot number. Replace *slot-number* with 0 or 1.

Required Privilege Level maintenance

Related Documentation • [show chassis hardware on page 1020](#)

List of Sample Output [request chassis mic online on page 459](#)
[request chassis mic \(MX Routers with Media Services Blade \[MSB\]\) on page 459](#)

[request chassis mic online \(MX104 Router\) on page 459](#)
[request chassis mic online \(MX2010 Router\) on page 459](#)

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

[request chassis mic
online](#)

```
user@host> request chassis mic online fpc-slot 1 mic-slot 1
```

[request chassis mic
\(MX Routers with
Media Services Blade
\[MSB\]\)](#)

```
user@host> request chassis mic fpc-slot 1 mic-slot 0
Possible completions:
  offline          Take MIC offline
  online           Bring MIC online
```

[request chassis mic
online \(MX104 Router\)](#)

```
user@host > request chassis mic mic-slot 0 fpc-slot 1 online
fpc 1 mic 0 offline initiated, use "show chassis fpc pic-status 1" to verify
```

[request chassis mic
online \(MX2010
Router\)](#)

```
user@host> request chassis mic online fpc-slot 1 mic-slot 0
FPC 1, MIC 0 is already online
```

request chassis optics

Syntax	<code>request chassis optics fpc-slot <i>fpc-slot-number</i> reactivate</code>
Release Information	Command introduced in Junos OS Release 12.3 for MX240, MX480, and MX960 3D Universal Edge Routers.
Description	(MX240, MX480, and MX960 routers) Control the status of the optical transceiver.
Options	<p>fpc-slot <i>fpc-slot-number</i>—Slot number of the line card that houses the optical transceiver.</p> <ul style="list-style-type: none">• MX240 router—Replace <i>fpc-slot-number</i> with a value from 0 through 2.• MX480 router—Replace <i>fpc-slot-number</i> with a value from 0 through 5.• MX960 router—Replace <i>fpc-slot-number</i> with a value from 0 through 11. <p>reactivate—Reactivate the optical transceiver.</p>
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none">• <i>Supported Network Interface Standards by Transceiver</i>• <i>CHASSISD System Log Messages</i>
List of Sample Output	request chassis optics (MX480 router) on page 460
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

<code>request chassis optics (MX480 router)</code>	<pre>user@host> request chassis optics fpc-slot 5 reactivate Enable FPC 5 non-nebs optics.</pre>
--	---

request chassis pcg

Syntax	<code>request chassis pcg (offline | online) slot <i>slot-number</i></code>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M40e and M160 routers) Control the operation of the Packet Forwarding Engine (PFE) clock generator (PCG).
Options	<p>offline—Take the PCG offline.</p> <p>online—Bring the PCG online.</p> <p>slot <i>slot-number</i>—PCG slot number. Replace <i>slot-number</i> with 0 or 1.</p>
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none">• show chassis environment pcg on page 671
List of Sample Output	request chassis pcg on page 461
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

`request chassis pcg` `user@host> request chassis pcg online slot 0`
PCG 1 appears to be already online

request chassis pic

Syntax	<code>request chassis pic (offline | online) fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i></code>
Syntax (ACX4000 Series Routers)	<code>request chassis pic (offline | online) fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i></code>
Syntax (TX Matrix and TX Matrix Plus Routers)	<code>request chassis pic (offline | online) fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i> <lcc <i>number</i>></code>
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 12.3 for ACX4000 Routers.
Description	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: 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
```

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.

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 1020](#)
- [show chassis pic on page 1166](#)
- *Configuring the PIC Type*

List of Sample Output [request chassis pic on page 465](#)

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 redundancy feb slot

Syntax	<code>request chassis redundancy feb slot <i>slot-number</i> (switch-to-backup | revert-from-backup)</code>
Release Information	Command introduced in Junos OS Release 8.2.
Description	(M120 routers only) Control the operation of the specified Forwarding Engine Board (FEB) in a redundancy group.
Options	<p><i>slot-number</i>—FEB slot number. Replace <i>slot-number</i> with a value from 0 through 5.</p> <p><i>switch-to-backup</i>—Initiate a switchover from the specified active FEB to the backup FEB for the redundancy group.</p> <p><i>revert-from-backup</i>—Initiate a revert to the specified FEB following a switchover to the backup FEB for a redundancy group.</p>
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none">• show chassis redundancy feb on page 1198• <i>Configuring FEB Redundancy on the M120 Router</i>• <i>Switching Control Board Redundancy</i>
List of Sample Output	request chassis redundancy feb slot 2 switch-to-backup on page 466 request chassis redundancy feb slot 3 revert-to-backup on page 466
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

`request chassis redundancy feb slot 2 switch-to-backup`

```
user@host> request chassis redundancy feb slot 2 switch-to-backup
Switch initiated, use "show chassis redundancy febs" to verify
```

`request chassis redundancy feb slot 3 revert-to-backup`

```
user@host> request chassis redundancy feb slot 3 revert-to-backup
Revert initiated, use "show chassis redundancy febs" to verify
```

request chassis routing-engine master

Syntax	request chassis routing-engine master (acquire | release | switch) <force> <no-confirm>
Syntax (TX Matrix Routers)	request chassis routing-engine master (acquire | release | switch) (lcc <i>number</i> | scc | all-chassis) <force> <no-confirm>
Syntax (TX Matrix Plus Routers)	request chassis routing-engine master (acquire | release | switch) (lcc <i>number</i> | sfc | all-chassis | all-lcc) <force> <no-confirm>
Syntax (MX Series Routers)	request chassis routing-engine master (acquire | release | switch) <all-members> <force> <local> <member <i>member-id</i> > <no-confirm>
Syntax (MX104 3D Universal Edge Routers)	request chassis routing-engine master (acquire | release | switch) <no-confirm>
Syntax (MX2010 and MX2020 3D Universal Edge Routers)	request chassis routing-engine master (acquire | release | switch <check>) <no-confirm>
Syntax (QFX Series)	request chassis routing-engine master (release | switch) <check> <interconnect-device <i>name</i> > <node-group <i>name</i> > <no-confirm>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>all-chassis option added in Junos OS Release 8.0.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>sfc 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>
Description	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.

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, MX240, MX480, MX960, MX2010, and MX2020 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 MX104 router.

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 1201](#)
- *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 471](#)
[request chassis routing-engine master switch on page 471](#)

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 scg

Syntax	request chassis scg (offline | online) slot <i>slot-number</i>
Syntax (TX Matrix and TX Matrix Plus Routers)	request chassis scg lcc <i>number</i> (offline | online) slot <i>slot-number</i>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(T Series routers only) Control the operation of the specified SONET Clock Generator (SCG).
Options	<p>lcc <i>number</i>—(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"> • 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. <p>offline—Take the SCG offline. When you change the SCG status to offline, the unit is not powered down.</p> <p>online—Bring the SCG online.</p> <p>slot <i>slot-number</i>—SCG slot number. Replace <i>slot-number</i> with 0 or 1.</p>
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"> • show chassis environment scg on page 692 • <i>Configuring the Clock Source</i> • <i>T320 SONET Clock Generator (SCG) Description</i>
List of Sample Output	request chassis scg on page 473
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

`request chassis scg`

```
user@host> request chassis scg online slot 0
Online initiated, use "show chassis environment scg" to verify
```

request chassis sfb

Syntax	<code>request chassis sfb (offline | online) slot <i>slot-number</i></code>
Release Information	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.
Description	Control the operation of the Switch Fabric Board (SFB).
Options	offline —Take the Switch Fabric Board offline. online —Bring the Switch Fabric Board online. slot <i>slot-number</i> —Switch Fabric Board slot number. Replace <i>slot-number</i> with a value of 0 through 7.
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none">• show chassis sfb on page 1224
List of Sample Output	request chassis sfb on page 474 request chassis sfb (MX2010 Routers) on page 474
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis sfb	<pre>user@host> request chassis sfb offline slot 1 Backup SFB 1 cannot be set offline, backup RE is online</pre>
request chassis sfb (MX2010 Routers)	<pre>user@host> request chassis sfb offline slot 7 Offline initiated, use "show chassis sfb" to verify</pre>

request chassis sfm master switch

Syntax	request chassis sfm master switch <no-confirm>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M40e and M160 routers only) Control which Switching and Forwarding Module (SFM) is master.
Options	no-confirm —(Optional) Do not display a switch warning or query.
Additional Information	<p>By default, the SFM in slot 0 (SFM0) is the master and the SFM in slot 1 (SFM1) is the backup. 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. To change the default master SFM, include the sfm statement at the [edit chassis redundancy] hierarchy level in the configuration. For more information, see the <i>Junos OS Administration Library for Routing Devices</i>.</p> <p>All installed SFMs are always working together to forward packets. If an SFM fails, the other SFMs take over and traffic continues to flow uninterrupted.</p>
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"> • show chassis sfm on page 1226 • <i>Switching the Global Master and Backup Roles in a Virtual Chassis Configuration</i>
List of Sample Output	request chassis sfm master switch on page 475 request chassis sfm master switch no-confirm on page 475
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis sfm master switch	<pre>user@host> request chassis sfm master switch warning: Traffic will be interrupted while the PFE is re-initialized Toggle mastership between system forwarding module? [yes,no] (no) yes Switch initiated, use "show chassis sfm" to verify</pre>
request chassis sfm master switch no-confirm	<pre>user@host> request chassis sfm master switch no-confirm Switch initiated, use "show chassis sfm" to verify</pre>

request chassis sfm

Syntax	<code>request chassis sfm (offline | online | restart) slot <i>slot-number</i></code>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M40e and M160 routers only) Control the operation of the specified Switching and Forwarding Module (SFM).
Options	<p>offline—Take the SFM offline.</p> <p>online—Bring the SFM online.</p> <p>restart—Restart the SFM.</p> <p>slot <i>slot-number</i>—SFM slot number. Replace <i>slot-number</i> with a value from 0 through 3.</p>
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none">• show chassis sfm on page 1226• <i>Configuring SFM Redundancy on M40e and M160 Routers</i>• <i>M40e Switching and Forwarding Module (SFM) Description</i>
List of Sample Output	request chassis sfm (M40e) on page 476 request chassis sfm (M160) on page 476
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis sfm (M40e)	<pre>user@host> request chassis sfm slot 1 restart M40e router: error: SFM 0 is transitioning to online state.</pre>
request chassis sfm (M160)	<pre>user@host> request chassis sfm slot 1 restart M160 router: Restart initiated, use "show chassis sfm" to verify</pre>

request chassis sib

Syntax	request chassis sib (offline | online) slot <i>slot-number</i>
Syntax (TX Matrix Router)	request chassis sib (all-chassis | lcc <i>number</i> | scc) (offline | online) slot <i>slot-number</i> (start-receiver <i>number</i> | stop-receiver <i>number</i>)
Syntax (TX Matrix Plus Router)	request chassis sib (all-lcc | f13 <i>slot-number</i> | f2s <i>sib-slot/sib-f2s-slot-number</i> | lcc <i>number</i> | (offline | online) slot <i>slot-number</i>)
Release Information	Command introduced before Junos OS Release 7.4. f13 and f2s options for the TX Matrix Plus router introduced in Junos OS Release 9.6.
Description	(M320 routers and T Series routers only) Control the operation of the specified Switch Interface Board (SIB).
Options	<p>all-chassis—(TX Matrix routers only) Control the status of the specified SIB.</p> <p>all-lcc—(TX Matrix Plus router only) On TX Matrix Plus router, control the operation of the SIB on all routers connected to the TX Matrix Plus router.</p> <p>f13 slot-number—Control the operation of F13 SIBs. Replace <i>slot-number</i> with a value 0, 1, 3, 4, 6, 7, 8, 9, 11, or 12.</p> <p>f2s sib-slot/sib-f2s-slot-number—(TX Matrix Plus routers only) (Optional) Control the operation of the SIB F2s. Replace <i>sib-slot</i> with a value from 0 through 4, followed by a <i>sib-f2s-slot-number</i> value 0, 2, 4 or 6.</p> <p>lcc number—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number. Replace <i>number</i> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none"> • 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. <p>scc—(TX Matrix router only) TX Matrix router (switch-card chassis) on a routing matrix.</p> <p>offline—Take the SIB offline.</p>



NOTE: On PTX5000, when the last sib is taken offline, a message displays that if no SIB is brought online within 10 seconds, system will take action to address the fabric down condition. When all SIBs go offline on PTX5000, the system detects fabric black hole condition and if no SIBs come online within 10 seconds, automate fabric blackhole actions are taken to stop the traffic black hole condition. For details on black hole condition, see [“Traffic Black Hole Caused by Fabric Degradation” on page 225](#).

online—Bring the SIB online.

slot slot-number—SIB slot number. For the T320 router, replace **slot-number** with a value from 0 through 2. For the T640 router, TX Matrix router, and T1600 router in a routing matrix, replace **slot-number** with a value from 0 through 4.

start-receiver number—(TX Matrix routers only) Start the SIB optical receiver. Replace **number** with a value from 0 through 3.

stop-receiver number—(TX Matrix routers only) Stop the SIB optical receiver. Replace **number** with a value from 0 through 3.

Required Privilege Level maintenance

Related Documentation

- [show chassis sibs on page 1229](#)
- [show chassis environment sib on page 712](#)
- [Configuring the Junos OS to Upgrade and Downgrade Switch Interface Boards on a TX Matrix Router on page 64](#)
- [M320 SIB Description](#)

List of Sample Output [request chassis sib on page 478](#)
[request chassis sib on page 478](#)

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis sib

```
user@host> request chassis sib slot 0 online
Online initiated, use "show chassis sibs" to verify
```

request chassis sib

```
user@host> request chassis sib f13 slot 0 offline
Offline initiated, use "show chassis sibs" to verify
```

request chassis sib f13 train-link-receive slot

Syntax	<code>request chassis sib f13 train-link-receive slot <i>SFC-SIB-F13-slot-num</i></code>
Syntax (TX Matrix Plus Router)	<code>request chassis sib f13 train-link-receive slot <i>SFC-SIB-F13-slot-num</i></code>
Release Information	Command introduced in Junos OS Release 10.1.
Description	(TX Matrix Plus router only) Control the receiving link of the specified Switch Interface Board (SIB) of the SFC.
Options	<code>slot <i>SFC-SIB-F13-slot-num</i></code> — SFC SIB slot number. Replace it with 0, 3, 6, 8 or 11.
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"> • request chassis sib f13 train-link-transmit slot on page 480 • Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 81
List of Sample Output	request chassis sib f13 train-link-receive slot on page 479
Output Fields	When you enter this command, the SFC is ready to receive traffic from the T1600 or T4000 router (LCC).

Sample Output

`request chassis sib f13 train-link-receive slot` `user@host> request chassis sib f13 train-link-receive slot 0`

request chassis sib f13 train-link-transmit slot

Syntax	<code>request chassis sib f13 train-link-transmit slot <i>SFC-SIB-F13-slot-num</i></code>
Release Information	Command introduced in Junos OS Release 10.1.
Description	(TX Matrix Plus router only) Control the transmission link of the specified Switch Interface Board (SIB) of the SFC.
Options	<code>slot <i>SFC-SIB-F13-slot-num</i></code> —SFC SIB slot number. Replace it with 0, 3, 6, 8 or 11.
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none">• request chassis sib f13 train-link-receive slot on page 479• Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 81
List of Sample Output	request chassis sib f13 train-link-transmit slot on page 480
Output Fields	When you enter this command, the SFC is ready to transmit traffic to the T1600 or T4000 router (LCC).

Sample Output

`request chassis sib f13 train-link-transmit slot` `user@host> request chassis sib f13 train-link-transmit slot 0`

request chassis sib optics lcc

Syntax	<code>request chassis sib optics lcc <i>number</i> sib-slot <i>number</i> optics-slot <i>number</i> (enable | disable)</code>
Release Information	Command introduced in Junos OS Release 13.1 for TX Matrix Routers with 3D SIBs.
Description	(TX Matrix Plus routers with 3D SIBs only) Control the operation of the high-speed links on the LCCs by enabling or disabling the high-speed links.
Options	<p>lcc <i>number</i>—Line-card chassis number. Replace the <i>number</i> with the following values depending on the LCC configuration.</p> <ul style="list-style-type: none"> 0 through 7, 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. <p>sib-slot <i>number</i>—SIB slot number. Replace the <i>number</i> with a value from 0 to 15.</p> <p>optics-slot <i>number</i>—Optics slot number for high-speed link cable. Replace the <i>number</i> with a value from 0 to 15.</p> <p>enable—Start the high-speed linkss on the cables and enable the FPCs.</p> <p>disable—Disable the FPCs and stop the high-speed links on the cables.</p>
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"> show chassis fabric optical-links
List of Sample Output	request chassis sib optics lcc on page 481 request chassis sib optics lcc on page 481
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

```
request chassis sib optics lcc      user@host> request chassis sib optics lcc 7 optics-slot 6 sib-slot 6 enable
Optics 6 enable initiated, use "show chassis fabric optical-links detail" to
verify

request chassis sib optics lcc      user@host> request chassis sib optics lcc 7 optics-slot 6 sib-slot 6 disable
Optics 6 disable initiated, use "show chassis fabric optical-links detail" to
verify
```

request chassis sib optics sfc

Syntax	<code>request chassis sib optics sfc <i>slot-number</i> sib-slot <i>number</i> optics-slot <i>number</i> (enable | disable)</code>
Release Information	Command introduced in Junos OS Release 13.1 for TX Matrix Routers with 3D SIBs.
Description	(TX Matrix Plus routers with 3D SIBs only) Control the operation of the high-speed links on the SIBs by enabling or disabling the high-speed links.
Options	<p>sfc <i>slot-number</i>—SFC slot number. Replace the <i>slot-number</i> with 0.</p> <p>sib-slot <i>number</i>—SIBslot number. Replace the <i>number</i> with a value from 0 to 15.</p> <p>optics-slot <i>number</i>—Optics slot number for high-speed link cable. Replace the <i>number</i> with a value from 0 to 15.</p> <p>enable—Start the high-speed links on the cables and enable the FPCs.</p> <p>disable—Disable the FPCs and stop the HSLs on the cables.</p>
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none">• show chassis fabric optical-links
List of Sample Output	request chassis sib optics sfc on page 482 request chassis sib optics sfc on page 482
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

<code>request chassis sib optics sfc</code>	<pre>user@host> request chassis sib optics sfc 0 optics-slot 6 sib-slot 6 enable Optics 6 enable initiated, use "show chassis fabric optical-links detail" to verify</pre>
<code>request chassis sib optics sfc</code>	<pre>user@host> request chassis sib optics sfc 0 optics-slot 6 sib-slot 6 disable Optics 6 disable initiated, use "show chassis fabric optical-links detail" to verify</pre>

request chassis sib train-link-receive slot

Syntax	<code>request chassis sib train-link-receive slot <i>LCC-SIB-ST-SIB-L-slot-num</i></code>
Release Information	Command introduced in Junos OS Release 10.1.
Description	(T1600 Router (LCC), T4000 Router (LCC), and TX Matrix Plus router only) Control the receiving link of the specified Switch Interface Board (SIB) of the LCC.
Options	<code>slot <i>LCC-SIB-ST-SIB-L-slot-num</i></code> — LCC SIB slot number. Replace it with a value from 0 through 4.
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"> • request chassis sib train-link-transmit slot on page 484 • Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 81
List of Sample Output	request chassis sib train-link-receive slot on page 483
Output Fields	When you enter this command, the LCC is ready to receive traffic from the SFC.

Sample Output

```
request chassis sib
train-link-receive slot    user@host> request chassis sib train-link-receive slot 0
```

request chassis sib train-link-transmit slot

Syntax	request chassis sib train-link-transmit slot <i>LCC-SIB-ST-SIB-L-slot-num</i>
Syntax (TX Matrix Plus Routing Platform)	request chassis sib train-link-receive slot <i>LCC-SIB-ST-SIB-L-slot-num</i>
Release Information	Command introduced in Junos OS Release 10.1.
Description	(T1600 Router (LCC), T4000 (LCC) and TX Matrix Plus router only) Control the transmission link of the specified Switch Interface Board (SIB) of the LCC.
Options	slot <i>LCC-SIB-ST-SIB-L-slot-num</i> — LCC SIB slot number. Replace it with a value from 0 through 4.
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none">• request chassis sib train-link-receive slot on page 483• Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 81
List of Sample Output	request chassis sib train-link-transmit slot on page 484
Output Fields	When you enter this command, the LCC is ready to transmit traffic to the SFC.

Sample Output

<code>request chassis sib train-link-transmit slot</code>	<code>user@host> request chassis sib train-link-transmit slot 0</code>
---	---

request chassis spmb restart

Syntax	<code>request chassis spmb restart slot <i>slot-number</i></code>
Syntax (TX Matrix Router)	<code>request chassis spmb restart (lcc <i>number</i> | scc) slot <i>slot-number</i></code>
Syntax (TX Matrix Plus Router)	<code>request chassis spmb restart (lcc <i>number</i> | sfc <i>number</i>) slot <i>slot-number</i></code>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>sfc option for the TX Matrix Plus router introduced in Junos OS Release 9.6.</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>
Description	Restart the specified Switch Processor Mezzanine Board (SPMB) on the Control Board (CB).
Options	<p>lcc <i>number</i>—(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"> • 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. <p>scc—(TX Matrix routers only) TX Matrix router (switch-card chassis) in the routing matrix.</p> <p>sfc <i>number</i>—(TX Matrix Plus routers only) The switch-fabric chassis number of the TX Matrix Plus router. Replace the <i>number</i> variable with a value 0.</p> <p>slot <i>slot-number</i>—The SPMB slot number. Replace <i>slot-number</i> with 0 or 1.</p>
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"> • show chassis spmb on page 1240 • show chassis spmb sibs on page 1250
List of Sample Output	<p>request chassis spmb restart on page 486</p> <p>request chassis spmb restart (MX2010 Router) on page 486</p>
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

`request chassis spmb
restart`

`user@host> request chassis spmb restart slot 0`

`request chassis spmb
restart (MX2010
Router)`

`user@host> request chassis spmb restart slot 0`
Restart initiated, use "show chassis spmb" to verify

request chassis synchronization switch

Syntax	request chassis synchronization switch
Syntax (M Series, T Series)	request chassis synchronization switch (external-a | external-b)
Syntax (PTX Series)	request chassis synchronization switch (bits-a | bits-b | fpc-slot-number | gps-0-10mhz | gps-0-5mhz | gps-1-10mhz | gps-1-5mhz)
Release Information	<p>Command introduced in Junos OS Release 7.6.</p> <p>Command introduced in Junos OS Release 8.3 for M40e routers.</p> <p>Command introduced in Junos OS Release 9.3 for M120 routers.</p> <p>Command introduced in Junos OS Release 10.2 for T320, T640, and T1600 routers.</p> <p>Command introduced in Junos OS Release 12.1 for PTX Series Packet Transport Routers.</p>
Description	(M320, M40e, M120, T320, T640, and T1600 routers and PTX Packet Transport Routers only) Change the external clock source used for chassis synchronization.
Options	<p>external-a—(Routing matrix only) Change the synchronization source to external source A.</p> <p>external-b—(Routing matrix only) Change the synchronization source to external source B.</p> <p>bits-a—(PTX Series only) Change the synchronization source to the BITS external source A.</p> <p>bits-b—(PTX Series only) Change the synchronization source to the BITS external source B.</p> <p>fpc-slot-number—(PTX Series only) Change the synchronization source to an FPC in the slot specified. For the PTX5000 Packet Transport Router, replace <i>slot-number</i> with a value from 0 through 7.</p> <p>gps-0-10mhz—(PTX Series only) Change the synchronization source to the 10 MHz GPS source on CCG port 0.</p> <p>gps-0-5mhz—(PTX Series only) Change the synchronization source to the 5 MHz GPS source on CCG port 0.</p> <p>gps-1-10mhz—(PTX Series only) Change the synchronization source to the 10 MHz GPS source on CCG port 1.</p> <p>gps-1-5mhz—(PTX Series only) Change the synchronization source to the 5 Hz GPS source on CCG port 1.</p>
Required Privilege Level	maintenance

Related Documentation	<ul style="list-style-type: none">• show chassis synchronization on page 1256• Configuring Clock Synchronization Interface for MX Series Routers on page 185• <i>Supported Time Synchronization Standard</i>
List of Sample Output	request chassis synchronization switch (M Series, T Series) on page 488 request chassis synchronization switch (PTX Series) on page 488
Output Fields	When you enter this command, you are provided feedback on the status of your request. Not configured indicates that the source is not configured. Present indicates that the source is configured and present. Qualified indicates that the source is being used for synchronization.

Sample Output

[request chassis synchronization switch \(M Series, T Series\)](#)

```
user@host> request chassis synchronization switch external-a
switching to external-a, status: qualified
```

[request chassis synchronization switch \(PTX Series\)](#)

```
user@host> request chassis synchronization switch fpc-2
switching to fpc-2, status: qualified
```


set chassis display message

Syntax	set chassis display message " <i>message</i> " <permanent>
Syntax (TX Matrix Router)	set chassis display message " <i>message</i> " (<i>lcc number</i> | <i>scc</i>) <permanent>
Syntax (TX Matrix Plus Router)	set chassis display message " <i>message</i> " (<i>fpc-slot slot-number</i> | <i>lcc number</i> | <i>sfc number</i>) <permanent>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches. sfc option for TX Matrix Plus router introduced in Junos OS Release 9.6.
Description	Display or stop a text message on the craft interface display, which is on the front of the router, or on the LCD panel display on the switch. The craft interface alternates the display of text messages with standard craft interface messages three times, switching between messages every 60 seconds.



NOTE: On T Series routers, when this command is executed with the **permanent** option, the display of the text message alternates with that of the standard craft interface message continuously every 60 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.

Options **"message"**—Message to display. On the craft interface display, if the message is longer than 20 characters, it wraps onto the next line. If a word does not fit on one line, the entire word moves down to the next line. Any portion of the message that does not fit on the display is truncated. An empty pair of quotation marks ("") deletes the text message from the craft interface display. On the LCD panel display, the message is limited to 16 characters.

fpc-slot slot-number—(TX Matrix Plus routers and EX4200 and QFX Series only) On the router or switch, display the text message on the craft interface for a specific Flexible PIC Concentrator (FPC). Replace **slot-number** with a value from 0 through 31. On the switch, display the text message for a specific member of a Virtual Chassis, where **fpc-slot slot-number** corresponds to the member ID. Replace **slot-number** with a value from 0 through 9. On the QFX Series, the **slot-number** is always 0. On a TX Matrix Plus router with 3D SIBs replace **slot-number** with a value from 0 through 63.

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.

permanent—(Optional) Display a text message on the craft interface display or LCD panel display permanently.

scc—(TX Matrix routers only) Display the text message on the craft interface display of the TX Matrix router (switch-card chassis).

sfc number—(TX Matrix Plus routers only) Display the text message on the craft interface display of the TX Matrix Plus router (or switch-fabric chassis).

Required Privilege Level	clear
Related Documentation	<ul style="list-style-type: none">• <i>Configuring the LCD Panel on EX Series Switches (CLI Procedure)</i>• clear chassis display message on page 436• show chassis craft-interface on page 515• <i>Understanding the Implementation of System Log Messages on the QFabric System</i>
List of Sample Output	set chassis display message (Creating) on page 491 set chassis display message (Deleting) on page 491
Output Fields	See show chassis craft-interface for an explanation of output fields.

Sample Output

set chassis display message (Creating)

The following example shows how to set the display message and verify the result:

```
user@host> set chassis display message "NOC contact Dusty (888) 555-1234"
message sent

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) 555-1234   |
+-----+
```

set chassis display message (Deleting)

The following example shows how to delete the display message and verify that the message is removed:

```
user@host> set chassis display message ""
message sent

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  |
+-----+
```


CHAPTER 28

Monitoring Commands

show chassis adc

Syntax	show chassis adc
Release Information	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.
Description	Display chassis information about the adapter cards (ADCs).
Options	none —Display information about all adapter cards.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> show chassis environment adc on page 590
List of Sample Output	show chassis adc (MX2020 Router) on page 495 show chassis adc (MX2010 Router) on page 495
Output Fields	Table 31 on page 494 lists the output fields for the show chassis adc command. Output fields are listed in the approximate order in which they appear.

Table 31: show chassis adc Output Fields

Field Name	Field Description
Slot	Slot number.
State	Status of the adapter card. <ul style="list-style-type: none"> Online—The adapter card is online and running. Offline—Adapter card is powered down.
Uptime	How long the Routing Engine has been connected to the adapter card and, therefore, how long the adapter card has been up and running.

Sample Output

show chassis adc (MX2020 Router)

```
user@host> show chassis adc
Slot  State                               Uptime
0     Online 1 hour, 21 minutes, 7 seconds
1     Online 1 hour, 21 minutes, 3 seconds
2     Online 1 hour, 20 minutes, 59 seconds
3     Online 1 hour, 20 minutes, 54 seconds
4     Online 1 hour, 20 minutes, 50 seconds
5     Online 1 hour, 20 minutes, 46 seconds
6     Online 1 hour, 20 minutes, 42 seconds
7     Online 1 hour, 20 minutes, 37 seconds
8     Online 1 hour, 20 minutes, 33 seconds
9     Online 1 hour, 20 minutes, 28 seconds
10    Online 1 hour, 20 minutes, 24 seconds
11    Online 1 hour, 20 minutes, 19 seconds
12    Online 1 hour, 20 minutes, 15 seconds
13    Online 1 hour, 20 minutes, 8 seconds
14    Online 1 hour, 20 minutes, 4 seconds
15    Online 1 hour, 19 minutes, 59 seconds
16    Online 1 hour, 19 minutes, 55 seconds
17    Online 1 hour, 19 minutes, 50 seconds
18    Online 1 hour, 19 minutes, 45 seconds
19    Online 1 hour, 19 minutes, 39 seconds
```

show chassis adc (MX2010 Router)

```
user@host > show chassis adc
Slot  State                               Uptime
0     Online 12 hours, 17 minutes, 38 seconds
1     Online 12 hours, 17 minutes, 30 seconds
2     Online 12 hours, 17 minutes, 22 seconds
3     Online 12 hours, 17 minutes, 14 seconds
4     Online 12 hours, 17 minutes, 6 seconds
5     Online 12 hours, 16 minutes, 58 seconds
6     Online 12 hours, 16 minutes, 49 seconds
7     Online 12 hours, 16 minutes, 41 seconds
8     Online 12 hours, 16 minutes, 33 seconds
9     Online 12 hours, 16 minutes, 25 seconds
```

show chassis afeb

Syntax	show chassis afeb
Release Information	Command introduced in Junos OS Release 13.2.
Description	Display compact Forwarding Engine Board status.
Options	This command has no options.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> request chassis afeb on page 439
List of Sample Output	show chassis afeb (MX104 Router) on page 497
Output Fields	Table 32 on page 496 lists the output fields for the show chassis afeb command. Output fields are listed in the approximate order in which they appear.

Table 32: show chassis afeb

Field Name	Field Description
State	<p>State of the compact Forwarding Engine Board:</p> <ul style="list-style-type: none"> • Offline—FEB is powered down. • Online—FEB is operational and running. • Check—FEB is in alarmed state because of the following reasons: <ul style="list-style-type: none"> • Hardware error. • PFE is unable to boot.
Temperature	Temperature of the air passing by the FEB, in degrees Celsius or in both degrees Celsius and degrees Fahrenheit.
CPU Utilization	Total percentage of CPU being used.
Interrupt Utilization	Of the total CPU being used by the FEB processor, the percentage being used for interrupts.
Heap Utilization	Percentage of heap space (dynamic memory) being used by the FEB processor. If this number exceeds 80 percent, you might experience a software problem (memory leak).
Buffer Utilization	Percentage of buffer space being used by the FEB processor for buffering internal messages.
Total CPU DRAM	Total DRAM, in megabytes, available to the FEB processor.
Start time	Time when the Routing Engine detected that the FEB was running.
Uptime	How long the Routing Engine has been connected to the FEB and, therefore, how long the compact Forwarding Engine Board has been up and running.

Sample Output

show chassis afdb
(MX104 Router)

```
user@host> show chassis afdb
FEB status:
Slot 0 information:
  State                Online
  Temperature          31 degrees C / 87 degrees F
  CPU utilization       3 percent
  Interrupt utilization 0 percent
  Heap utilization      11 percent
  Buffer utilization     13 percent
  Total CPU DRAM        2048 MB
  Start time:           2013-05-27 08:50:03 IST
  Uptime:               3 hours, 29 minutes, 34 seconds
```

show chassis alarms

Syntax	show chassis alarms
Syntax (TX Matrix Routers)	show chassis alarms <lcc <i>number</i> | scc>
Syntax (TX Matrix Plus Routers)	show chassis alarms <lcc <i>number</i> | sfc <i>number</i> >
Syntax (MX Series Routers)	show chassis alarms <all-members> <local> <member <i>member-id</i> >
Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers)	show chassis alarms
Syntax (QFX Series)	show chassis alarms <interconnect-device <i>name</i> > <node-device <i>name</i> >
Syntax (PTX Series Packet Transport Routers)	show chassis alarms
Syntax (ACX Series Universal Access Routers)	show chassis alarms
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches. sfc option for the TX Matrix Plus router introduced in Junos OS Release 9.6. Command introduced in Junos OS Release 11.1 for the QFX Series. 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.
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_ILLEGALSIZERR	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
<hr/>	
Chip Type: R Chip	Code
CMALARM_RCHIP_SRAM_PARITY_ERR	512
<hr/>	
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 Alarm Entry and Its Attributes*
- [Chassis Conditions That Trigger Alarms on page 253](#)

List of Sample Output

- [show chassis alarms \(Alarms Active\) on page 505](#)
- [show chassis alarms \(No Alarms Active\) on page 505](#)
- [show chassis alarms \(Fan Tray\) on page 505](#)
- [show chassis alarms \(MX104 Router\) on page 505](#)
- [show chassis alarms \(MX2010 Router\) on page 505](#)
- [show chassis alarms \(MX2020 Router\) on page 505](#)
- [show chassis alarms \(T4000 Router\) on page 505](#)
- [show chassis alarms \(Unreachable Destinations Present on a T Series Router\) on page 506](#)
- [show chassis alarms \(FPC Offline Due to Unreachable Destinations on a T Series Router\) on page 506](#)
- [show chassis alarms \(SCG Absent on a T Series Router\) on page 507](#)
- [show chassis alarms \(Alarms Active on a TX Matrix Router\) on page 507](#)
- [show chassis alarms \(TX Matrix Plus router with 3D SIBs\) on page 507](#)
- [show chassis alarms \(Alarms on a T4000 Router After the enhanced-mode Statement is Enabled\) on page 508](#)
- [show chassis alarms \(Backup Routing Engine\) on page 508](#)
- [show chassis alarms \(Alarms Active on the QFX Series\) on page 508](#)

[show chassis alarms node-device \(Alarms Active on the QFabric System\) on page 508](#)

[show chassis alarms \(Alarms Active on the QFabric System\) on page 509](#)

[show chassis alarms \(Alarms Active on an EX8200 Switch\) on page 509](#)

[show chassis alarms \(Alarms Active on a PTX5000 Packet Transport Router\) on page 509](#)

[show chassis alarms \(Alarms Active on an ACX2000 Universal Access Router\) on page 510](#)

Output Fields [Table 33 on page 504](#) lists the output fields for the **show chassis alarms** command. Output fields are listed in the approximate order in which they appear.

Table 33: 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: Minor or Major .
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 (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)**

```
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
```

Destinations on a T Series Router)

```

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
2012-07-19 10:07:32 UTC Minor SIB F13 0 Temperature Warm
2012-07-19 10:07:07 UTC Minor SIB F2S 0/6 Temperature Warm
2012-07-19 10:07:07 UTC Minor SIB F2S 0/4 Temperature Warm
2012-07-19 10:07:07 UTC Minor SIB F2S 0/2 Temperature Warm
2012-07-19 10:07:07 UTC Minor SIB F2S 0/0 Temperature Warm
2012-07-19 10:07:07 UTC Minor SIB F13 6 Temperature Warm
2012-07-19 10:06:42 UTC Minor SIB F2S 2/6 Temperature Warm
2012-07-19 10:06:42 UTC Minor SIB F2S 2/4 Temperature Warm

```

```

2012-07-19 10:06:42 UTC Minor SIB F2S 2/2 Temperature Warm
2012-07-19 10:06:42 UTC Minor SIB F2S 2/0 Temperature Warm
2012-07-19 10:06:42 UTC Minor SIB F13 3 Temperature Warm
2012-07-19 10:06:17 UTC Minor Temperature Warm
2012-07-19 10:06:17 UTC Minor SIB F2S 1/6 Temperature Warm
2012-07-19 10:06:17 UTC Minor SIB F2S 1/4 Temperature Warm
2012-07-19 10:06:17 UTC Minor SIB F2S 1/2 Temperature Warm
2012-07-19 10:06:17 UTC Minor SIB F2S 1/0 Temperature Warm
lcc0-re0:

```

```

-----
Alarm time          Class Description
2012-07-19 10:04:13 UTC Minor Temperature Warm
2012-07-19 10:04:13 UTC Minor SIB 2 Temperature Warm
2012-07-19 10:04:13 UTC Minor SIB 1 Temperature Warm
2012-07-19 10:04:13 UTC Minor SIB 0 Temperature Warm

```

```
lcc2-re0:
```

```

-----
Alarm time          Class Description
2012-07-19 10:04:18 UTC Minor Temperature Warm
2012-07-19 10:04:18 UTC Minor SIB 2 Temperature Warm
2012-07-19 10:04:18 UTC Minor SIB 1 Temperature Warm
2012-07-19 10:04:18 UTC Minor SIB 0 Temperature Warm

```

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 (Alarms Active on the QFX Series)

```

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)

```

user@switch> show chassis alarms node-device ED3691
node-device ED3694
3 alarms currently active

```

Active on the QFabric System)

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

```
user@switch> show chassis alarms
```

```
23 alarms currently active
```

**PTX5000 Packet
Transport Router)**

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
(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 cfeb

Syntax	show chassis cfeb
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M7i and M10i routers only) Display status information about the Compact Forwarding Engine Board (CFEB).
Options	This command has no options.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • request chassis cfeb on page 443 • <i>Configuring CFEB Redundancy on the M10i Router</i> • <i>CFEB Overview</i>
List of Sample Output	show chassis cfeb (M7i) on page 512 show chassis cfeb (M10i) on page 512
Output Fields	Table 34 on page 511 lists the output fields for the show chassis cfeb command. Output fields are listed in the approximate order in which they appear.

Table 34: show chassis cfeb Output Fields

Field Name	Field Description
State	Status of the CFEB: <ul style="list-style-type: none"> • Online—CFEB is online and running. • Offline—CFEB is powered down.
Intake Temperature	Temperature of the air before flowing past the CFEB.
Exhaust Temperature	Temperature of the air after flowing past the CFEB.
CPU utilization	Percentage of CPU being used by the CFEB processor.
Interrupt utilization	Of the total CPU being used by the CFEB processor, the percentage being used for interrupts
Heap Utilization	Percentage of heap space (dynamic memory) being used by the CFEB processor. If this number exceeds 80 percent, there may be a software problem (memory leak).
Buffer Utilization	Percentage of buffer space being used by the CFEB processor for buffering internal messages
Total CPU DRAM	Amount of DRAM available to the CFEB CPU.

Table 34: show chassis cfep Output Fields (*continued*)

Field Name	Field Description
Internet Processor II	Information about the CFEB processor.
Start time	Time when the Routing Engine detected that the CFEB was running.
Uptime	How long the Routing Engine has been connected to the CFEB and, therefore, how long the Flexible PIC Concentrator (FPC) has been up and running.

Sample Output

show chassis cfep (M7i)

```

user@host> show chassis cfep
CFEB status:
  State                               Online
  Intake Temperature                   27 degrees C / 80 degrees F
  Exhaust Temperature                  33 degrees C / 91 degrees F
  CPU utilization                       3 percent
  Interrupt utilization                 0 percent
  Heap utilization                      8 percent
  Buffer utilization                     21 percent
  Total CPU DRAM                       128 MB
  Internet Processor II                Version 1, Foundry IBM, Part number 164
  Start time:                          2003-06-11 11:41:22 PDT
  Uptime:                              1 hour, 39 minutes, 31 seconds

```

show chassis cfep (M10i)

```

user@host> show chassis cfep
CFEB status:
Slot 0 information:
  StateMaster
  Intake temperature                   35 degrees C / 95 degrees F
  Exhaust temperature                  43 degrees C / 109 degrees F
  CPU utilization                       3 percent
  Interrupt utilization                 0 percent
  Heap utilization                      10 percent
  Buffer utilization                     22 percent
  Total CPU DRAM                       128 MB
  Internet Processor II                Version 1, Foundry IBM, Part number 164
  Start time:                          2004-11-01 03:24:15 PST
  Uptime:                              12 hours, 56 minutes, 18 seconds
Slot 1 information:
  State                               Backup

```


show chassis cip

Syntax (TX Matrix Plus Router)	show chassis cip
Release Information	Command introduced in Junos OS Release 9.6.
Description	(TX Matrix Plus routers only) Display environmental information about the Connector Interface Panel (CIP) that provides Ethernet Control Plane connectivity to line-card chassis (LCCs), switch fabric chassis, and other devices.
Options	This command has no options.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • request chassis cip on page 444 • <i>Installing a T1600 CIP</i> • <i>Installing a T640 CIP</i> • <i>Installing a TX-CIP</i> • <i>Installing an M320 CIP</i> • <i>Installing an M320 CIP</i> • <i>Installing the T1600 CIP</i> • <i>Installing the T320 CIP</i> • <i>CIP Overview</i>
Output Fields	Table 35 on page 513 lists the output fields for the show chassis cip command. Output fields are listed in the approximate order in which they appear.

Table 35: show chassis cip Output Fields

Field Name	Field Description
Eswitch	Ethernet switch used to connect to the LCC or to a JCS1200: 0 or 1.
Port	<p>Physical port number of the Ethernet switch:</p> <ul style="list-style-type: none"> • Port numbers: 4 to 8 on Ethernet switch 0 can be used to connect up to four (reserved for future use) other SFCs or optional JCS1200s. <p>NOTE: The current configuration of the routing matrix based on a TX Matrix Plus router supports only one SFC.</p> <ul style="list-style-type: none"> • Port numbers 0 to 15 on Ethernet switch 1 can be used to connect up to 16 LCCs. <p>NOTE: The current configuration of a routing matrix based on a TX Matrix Plus router supports only up to eight LCCs. You can connect LCCs to the port numbers corresponding to LCC0 to LCC7 (0 to 15) on the Ethernet switch 1.</p>

Table 35: show chassis cip Output Fields (*continued*)

Field Name	Field Description
Type	Type of CIP: <ul style="list-style-type: none"> XE—Ethernet switch 0 ports used for connections to the SFC control plane or other devices such as JCS1200. GE—Ethernet switch 1 ports used for connections to the LCC control plane.
Connected-to	Show control plane connection to a specific LCC or SFC.
Link	State of the connection to an LCC control plane, SFC control plane, or other devices: Up or Down .
Speed	Ethernet link speed.
Duplex	Type of Ethernet link: Full or Half Duplex .
Auto-neg	Status of autonegotiation for the CIP connection to the LCC, SFC, or other devices: On or Off .

show chassis cip (TX Matrix Plus Router)

```

user@host> show chassis cip
sfc0-cip0
Eswitch Port Type Connected-to Link Speed Duplex Auto-Neg
0 4 XE SFC1 Down 0 Full Off
0 5 XE SFC0 Down 0 Full Off
0 6 XE SFC3 Down 0 Full Off
0 7 XE SFC2 Down 0 Full Off
0 8 XE SFC4 Down 0 Full Off
1 0 GE LCC0 Up 1000Mbps Full On
1 1 GE LCC8 Down 0 Half On
1 2 GE LCC1 Up 1000Mbps Full On
1 3 GE LCC9 Down 0 Half On
1 4 GE LCC2 Up 1000Mbps Full On
1 5 GE LCC10 Down 0 Half On
1 6 GE LCC3 Up 1000Mbps Full On
1 7 GE LCC11 Down 0 Half On
1 8 GE LCC4 Down 0 Half On
1 9 GE LCC12 Down 0 Half On
1 10 GE LCC5 Down 0 Half On
1 11 GE LCC13 Down 0 Half On
1 12 GE LCC6 Down 0 Half On
1 13 GE LCC14 Down 0 Half On
1 14 GE LCC7 Down 0 Half On
1 15 GE LCC15 Down 0 Half On
1 16 GE GE17 Up 1000Mbps Full On
1 17 GE GE16 Down 0 Half On

```

show chassis craft-interface

Syntax	show chassis craft-interface
Syntax (MX Series Routers)	show chassis craft-interface <all-members> <local> <member <i>member-id</i> >
Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers)	show chassis craft-interface
Syntax (TX Matrix Routers)	show chassis craft-interface <lcc <i>number</i> | scc>
Syntax (TX Matrix Plus Routers)	show chassis craft-interface <lcc <i>number</i> | sfc <i>number</i> >
Syntax (ACX Series Universal Access Routers)	show chassis craft-interface
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>sfc option for the TX Matrix Plus router introduced in Junos OS Release 9.6.</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>
Description	For routers or switches that have a display on the craft interface, show the messages that are currently displayed. On all routers except for the M20 router, you must enter this command on the master Routing Engine.
Options	<p>none—(TX Matrix, TX Matrix Plus routers, MX104, MX2010, and MX2020 routers, and ACX Series routers only) On a TX Matrix router, show messages that are currently displayed on the craft interface on the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, show messages that are currently displayed on the craft interface on the TX Matrix Plus router and its attached routers.</p> <p>all-members—(MX Series routers only) (Optional) Display information currently on the craft interface for all members of the Virtual Chassis configuration.</p> <p>lcc <i>number</i>—(TX Matrix, TX Matrix Plus routers only) (Optional) On a TX Matrix router, show messages that are currently displayed on the craft interface for a specified T640 router (line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, show messages that are currently displayed on the craft interface for a specified router (line-card chassis) 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.

local—(MX Series routers only) (Optional) Display information currently on the craft interface for the local Virtual Chassis member.

member *member-id*—(MX Series routers only) (Optional) Display information currently on the craft interface 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.

scc—(TX Matrix router only) (Optional) Show messages that are currently displayed on the craft interface for the TX Matrix router (switch-card chassis).

sfc *number*—(TX Matrix Plus router only) (Optional) Show messages that are currently displayed on the craft interface for the respective TX Matrix Plus router (switch-fabric chassis). Replace *number* variable with 0.

Required Privilege Level view

Related Documentation

- [clear chassis display message on page 436](#)
- [set chassis display message on page 489](#)

List of Sample Output

- [show chassis craft-interface \(M20 Router\) on page 519](#)
- [show chassis craft-interface \(M40 Router\) on page 519](#)
- [show chassis craft-interface \(M120 Router\) on page 519](#)
- [show chassis craft-interface \(M160 Router\) on page 520](#)
- [show chassis craft-interface \(MX104 Router\) on page 520](#)
- [show chassis craft-interface \(MX2010 Router\) on page 521](#)
- [show chassis craft-interface \(MX2020 Router\) on page 522](#)
- [show chassis craft-interface \(T4000 Router\) on page 523](#)
- [show chassis craft-interface \(TX Matrix Routing Matrix\) on page 523](#)
- [show chassis craft-interface \(TX Matrix Plus Routing Matrix\) on page 526](#)
- [show chassis craft-interface \(TX Matrix Plus router with 3D SIBs\) on page 529](#)
- [show chassis craft-interface \(ACX2000 Universal Access Router\) on page 531](#)

Output Fields [Table 36 on page 517](#) lists the output fields for the **show chassis craft-interface** command. Output fields are listed in the approximate order in which they appear.

Table 36: show chassis craft-interface Output Fields

Field Name	Field Description
LCD screen or FPM Display Contents	<p>Contents of the Front Panel Module display:</p> <ul style="list-style-type: none"> • router-name—Name of the router. • Up—How long the router has been operational, in days, hours, minutes, and seconds. • message—Information about the router traffic load, the power supply status, the fan status, and the temperature status. The display of this information changes every 2 seconds. If a text message has been created with the set chassis display command, this message appears on all four lines of the craft interface display. The display alternates between the text message and the standard system status messages every 2 seconds.
SFC Front Panel Switch Settings	<p>(TX Matrix Plus Routers)—Display the SFC front panel switch settings:</p> <p>SFC Chassis Number and Config Size are settings on physical switches located on the left side of the craft interface of the TX Matrix Plus router.</p> <ul style="list-style-type: none"> • SFC Chassis Number—This field always displays the value 00. • Config Size—The value of this field is 0 for the TX Matrix Plus router. The value of this field is 3 for TX Matrix Plus router with 3D SIBs.
Front Panel System LEDs	(MX104, MX2010, and MX2020 Routers) Status of the Front Panel System LEDs. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit.
Front Panel Alarm Indicators	(MX104, MX2010, and MX2020 Routers) Status of the Front Panel Alarm indicators. A dot (.) indicates the relay is off. An asterisk (*) indicates the relay is active.
Input Relay	Status of the configured input relay ports—0 through 3. The mode is normally open or closed. The status is clear or raised.
Output Relay	Status of the configured output ports—0 or 1. The mode is normally open or closed. The status is clear or raised.
Front Panel FPC LEDs	(MX2010 and MX2020 Routers) Status of the Front Panel Flexible PIC Concentrator (FPC) LEDs. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit. On MX2010 routers, there are 10 (0-9) FPCs LEDs. On MX2020 routers, there are 20 (0-9 and 10-19) FPCs LEDs.
CB LEDs	Status of the Control Board (CB) LEDs. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit.
PS LEDs	(MX2010 and MX2020 Routers) Status of the Power Supply (PS) LEDs. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit. On MX2010 routers, there are 9 (0-8) PS LEDs. On MX2020 routers, there are 18 (0-8 and 9-17) PS LEDs.
PS Status	(MX104 Routers) Status of the Power Supply (PS). Green indicates that the power supply is functioning. Red indicates that the power supply is not functioning. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit.
FAN Tray LEDs	(MX2010 and MX2020 Routers) Status of the Fan Tray LEDs. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit.
Front Panel SFB LEDs	(MX2010 and MX2020 Routers) Status of the Front Panel Switch Fabric Boards (SFB) LEDs. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit.

Table 36: show chassis craft-interface Output Fields (*continued*)

Field Name	Field Description
Front Panel Chassis Info	(MX2010 and MX2020 Routers) Information about the chassis such as the chassis number and role. User can set the chassis number in multi-chassis configurations.
MCS and SFM LEDs	Status of the Miscellaneous Control Subsystem (MCS) and Switching and Forwarding Module (SFM) LEDs. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit. When neither a dot nor an asterisk is displayed, there is no board in that slot.
SIB LEDs	Status of the Switch Interface Board (SIB) LEDs. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit.
SCG LEDs	Status of the SONET Clock Generator (SCG) LEDs. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit.

Sample Output

**show chassis
craft-interface (M20
Router)**

```
user@host> show chassis craft-interface
Red alarm:      LED off, relay off
Yellow alarm:   LED on, relay on
Host OK LED:    On
Host fail LED:  Off
FPCs           0  1  2  3
-----
Green  .  *  *.
Red    ....
LCD screen:
+-----+
|host   |
|1 Alarm active|
|Y: FERF|
|       |
+-----+
```

**show chassis
craft-interface (M40
Router)**

```
user@host> show chassis craft-interface
Front Panel LCD Display: enabled
Red alarm:      LED off, relay off
Yellow alarm:   LED off, relay off
Host OK LED:    On
Host Fail LED:  Off
NICs           0  1  2  3  4  5  6  7
-----
Green  *.  *.  *.  *.
Red    .....
LCD Screen:
+-----+
|host   |
|Up: 27+18:52:37|
|       |
|52.649kpps Load|
|       |
+-----+
```

**show chassis
craft-interface (M120
Router)**

```
user@host> show chassis craft-interface
Front Panel System LEDs:
Routing Engine  0  1
-----
OK              *  .
Fail            .  .
Master          *  .

Front Panel Alarm Indicators:
-----
Red LED        *
Yellow LED     .
Major relay    *
Minor relay     .

Front Panel FPC LEDs:
FPC            0  1  2  3  4  5
-----
Red            .  .  .  .  .  .
Green          .  *  .  *  *  *
```

```

CB LEDs:
  CB    0    1
-----
Amber   .    .
Green  *    *

PS LEDs:
  PS    0    1
-----
Red     .    .
Green  *    *

FEB LEDs:
  FEB   0    1    2    3    4    5
-----
Red     .    .    .    .    .    .
Green   .    .    .    *    *    *
Active  .    .    .    *    *    *

```

**show chassis
craft-interface (M160
Router)**

```

user@host> show chassis craft-interface
FPM Display contents:
+-----+
|hosts   |
|Up: 1+16:46|
|        |
|Fans OK |
+-----+

```

```

Front Panel System LEDs:
Host    0    1
-----
OK       .    *
Fail     .    .
Master   .    *

```

```

Front Panel Alarm Indicators:
-----
Red LED   .
Yellow LED .
Major relay.
Minor relay.

```

```

Front Panel FPC LEDs:
FPC    0    1    2    3    4    5    6    7
-----
Red     .    .    .    .    .    .    .    .
Green  *    *    .    .    .    .    .    .

```

```

MCS and SFM LEDs:
MCS    0    1      SFM    0    1    2    3
-----
Amber   .            .    .
Green   .            .    .
Blue    *            *    *

```

**show chassis
craft-interface (MX104
Router)**

```

user@host > show chassis craft-interface
Front Panel System LEDs:
Routing Engine    0    1
-----
OK                *    .

```



```

Fail          .   .
Master        *   .

```

Front Panel Alarm Indicators:

```

-----
Red LED       .
Yellow LED    *
Major relay    .
Minor relay    *

```

Input relay:

```

-----
Port   Mode   Status
0      Open   Clear
1      Open   Clear
2      Open   Clear
3      Open   Clear

```

Output relay:

```

-----
Port   Mode   Status
0      Open   Clear
1      Open   Clear

```

PS Status:

```

PS    0    1

```

```

-----
Red    .   .
Green  *   .

```

**show chassis
craft-interface
(MX2010 Router)**

```
user@host > show chassis craft-interface
```

Front Panel System LEDs:

```
Routing Engine    0    1
```

```

-----
OK              *   .
Fail            .   *
Master          *   .

```

Front Panel Alarm Indicators:

```

-----
Red LED         .
Yellow LED      *
Major relay      .
Minor relay      *

```

Front Panel FPC LEDs:

```

FPC    0    1    2    3    4    5    6    7    8    9
-----
Red     .     .     .     .     .     .     .     .     .     .
Green  *     *     .     .     .     .     .     .     *     *

```

CB LEDs:

```
CB    0    1
```

```

-----
Amber    .     .
Green   *     *

```

PS LEDs:

```
PS    0    1    2    3    4    5    6    7    8
```

```

-----
Red     .     .     .     .     .     .     .     .     .

```

```
Green . . . . *
```

```
Fan Tray LEDs:
```

```
FT 0 1 2 3
```

```
-----
Red . . . .
Green * * * *
```

```
Front Panel SFB LEDs:
```

```
SFB 0 1 2 3 4 5 6 7
```

```
-----
Red . . . . .
Green * * * * *
```

```
Front Panel Chassis Info:
```

```
Chassis Number 0x0
```

```
Chassis Role S
```

**show chassis
craft-interface
(MX2020 Router)**

```
user@host > show chassis craft-interface
```

```
Front Panel System LEDs:
```

```
Routing Engine 0 1
```

```
-----
OK * *
```

```
Fail . .
```

```
Master * .
```

```
Front Panel Alarm Indicators:
```

```
-----
Red LED .
```

```
Yellow LED .
```

```
Major relay .
```

```
Minor relay .
```

```
Front Panel FPC LEDs:
```

```
FPC 0 1 2 3 4 5 6 7 8 9
```

```
-----
Red . . . . .
```

```
Green * * * * *
```

```
Front Panel FPC LEDs:
```

```
FPC 10 11 12 13 14 15 16 17 18 19
```

```
-----
Red . . . . .
```

```
Green * * * * *
```

```
CB LEDs:
```

```
CB 0 1
```

```
-----
Amber . .
```

```
Green * *
```

```
PS LEDs:
```

```
PS 0 1 2 3 4 5 6 7 8
```

```
-----
Red . . . . .
```

```
Green * * * * * . * *
```

```
PS LEDs:
```

```
PS 9 10 11 12 13 14 15 16 17
```

```
-----
Red . . . . .
```

```
Green * * * * *
```

```
Fan Tray LEDs:
```

```
FT 0 1 2 3
```

```
-----
Red . . . .
```

```

Green * * * *
Front Panel SFB LEDs:
SFB 0 1 2 3 4 5 6 7

```

```

-----
Red . . . . .
Green * * * * *
Front Panel Chassis Info:
Chassis Number 0x57
Chassis Role M

```

**show chassis
craft-interface (T4000
Router)**

```

user@host> show chassis craft-interface
FPM Display contents:

```

```

+-----+
|stymphalian      |
|2 Alarms active  |
|R: Front Top Fan Tra|
|Y: PEM 1 Absent  |
+-----+

```

```

Front Panel System LEDs:
Routing Engine    0    1

```

```

-----
OK                *    *
Fail              .    .
Master            *    .

```

```

Front Panel Alarm Indicators:

```

```

-----
Red LED          *
Yellow LED       *
Major relay      *
Minor relay      *

```

```

Front Panel FPC LEDs:
FPC    0    1    2    3    4    5    6    7

```

```

-----
Red    .    .    .    .    .    .    .    .
Green  *    .    .    *    .    *    *    .

```

```

CB LEDs:
CB    0    1

```

```

-----
Amber  .    .
Green  *    *
Blue   *    .

```

```

SCG LEDs:
SCG    0    1

```

```

-----
Amber  .    .
Green  *    *
Blue   *    .

```

```

SIB LEDs:
SIB    0    1    2    3    4

```

```

-----
Red    .    .    .    .    .
Green  *    *    *    *    *

```

```

user@host> show chassis craft-interface

```

show chassis
craft-interface (TX
Matrix Routing Matrix)

scc-re0:

FPM Display contents:

```
+-----+
|bradley      |
|8 Alarms active|
|R: SIB 2 Absent|
|R: SIB 1 Absent|
+-----+
```

Front Panel System LEDs:

Routing Engine 0 1

```
+-----+
OK           * .
Fail         . .
Master       * .
```

Front Panel Alarm Indicators:

```
+-----+
Red LED      *
Yellow LED   *
Major relay   *
Minor relay   *
```

CB LEDs:

CB 0 1

```
+-----+
Amber. .
Green * .
Blue * .
```

SIB LEDs:

SIB 0 1 2 3 4

```
+-----+
Fail . . . . .
OK   . . . . *
Active . . . . *
```

lcc0-re0:

FPM Display contents:

```
+-----+
|hybrid       |
|5 Alarms active|
|R: SIB 2 Absent|
|R: SIB 1 Absent|
+-----+
```

Front Panel System LEDs:

Routing Engine 0 1

```
+-----+
OK           * .
Fail         . .
Master       * .
```

Front Panel Alarm Indicators:

```
+-----+
Red LED      *
Yellow LED   *
Major relay   *
Minor relay   *
```

```
Front Panel FPC LEDs:
FPC   0   1   2   3   4   5   6   7
-----
```

```
Red   . . . . .
Green * * . . . .
```

```
CB LEDs:
```

```
CB    0   1
-----
```

```
Amber. .
Green * .
Blue  * .
```

```
SCG LEDs:
```

```
SCG   0   1
-----
```

```
Amber. .
Green * .
Blue  * .
```

```
SIB LEDs:
```

```
SIB   0   1   2   3   4
-----
```

```
Red   . . . . .
Green . . . . *
```

```
lcc2-re0:
```

```
-----
FPM Display contents:
```

```
+-----+
| prius          |
| 5 Alarms active |
| R: SIB 2 Absent |
| R: SIB 1 Absent |
+-----+
```

```
Front Panel System LEDs:
```

```
Routing Engine   0   1
-----
```

```
OK                * .
Fail              . .
Master            * .
```

```
Front Panel Alarm Indicators:
```

```
-----
Red LED           *
Yellow LED        *
Major relay       *
Minor relay       *
```

```
Front Panel FPC LEDs:
```

```
FPC   0   1   2   3   4   5   6   7
-----
```

```
Red   . . . . .
Green * * * . . . .
```

```
CB LEDs:
```

```
CB    0   1
-----
```

```
Amber. .
Green * .
```

```
Blue   * .

SCG LEDs:
  SCG  0  1
-----
Amber.  .
Green  * .
Blue   * .

SIB LEDs:
  SIB  0  1  2  3  4
-----
Red    . . . . .
Green.  . . . *
```

`show chassis`
`craft-interface (TX`

```
user@host> show chassis craft-interface
sfc0-re0:
-----
```

Matrix Plus Routing Matrix)

FPM Display Contents:

```
+-----+
|noname      |
|12 Alarms active |
|R: SIB F13 12 Absent|
|R: SIB F13 9 Absent|
+-----+
```

SFC Front Panel Switch Settings:

```
SFC Chassis Number : 00
Config Size        : 1
```

Front Panel System LEDs:

```
Routing Engine    0    1
```

```
-----
OK                *    *
Fail              .    .
Master            *    .
```

Front Panel Alarm Indicators:

```
-----
Red LED          *
Yellow LED       *
Major relay      *
Minor relay      *
```

Front Panel F13 SIB LEDs:

SIB	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Fail
OK	*	.	.	*	.	.	*	.	*	.	.	*
Active	.	.	.	*	.	.	*	.	*	.	.	*

PS LEDs:

```
PS    0    1
```

```
-----
Red    .    *
Green  *    .
```

Fan Tray LEDs:

```
FT    0    1    2    3    4    5
```

```
-----
Red    .    .    .    .    *    *
Green  *    *    *    *    .    .
```

CB LEDs:

```
CB    0    1
```

```
-----
Amber  .    .
Green  *    *
Blue   *    .
```

1cc0-re0:

FPM Display contents:

```
+-----+
|noname1      |
|1 Alarm active |
|R: PEM 1 Not OK |
|              |
+-----+
```

Front Panel System LEDs:

Routing Engine	0	1
----------------	---	---

OK	*	*
Fail	.	.
Master	*	.

Front Panel Alarm Indicators:

Red LED	*
Yellow LED	.
Major relay	*
Minor relay	.

Front Panel FPC LEDs:

FPC	0	1	2	3	4	5	6	7
-----	---	---	---	---	---	---	---	---

Red	.	.	.	.	.	.	.	.
Green	.	*	.	*	*	.	.	*

CB LEDs:

CB	0	1
----	---	---

Amber	.	.
Green	*	*
Blue	*	.

SCG LEDs:

SCG	0	1
-----	---	---

Amber	.	.
Green	*	*
Blue	*	.

SIB LEDs:

SIB	0	1	2	3	4
-----	---	---	---	---	---

Red	.	.	.	.	.
Green	*	*	*	*	*

lcc1-re0:

FPM Display contents:

```

+-----+
|noname2          |
|2 Alarms active  |
|R: FPC 0 PIC 0 Failu|
|R: PEM 1 Not OK   |
+-----+

```

Front Panel System LEDs:

Routing Engine	0	1
----------------	---	---

OK	*	*
Fail	.	.
Master	*	.

Front Panel Alarm Indicators:

Red LED	*
---------	---


```

Yellow LED  .
Major relay  *
Minor relay  .

Front Panel FPC LEDs:
FPC    0    1    2    3    4    5    6    7
-----
Red     .     .     .     .     .     .     .     .
Green   *     *     *     .     .     *     .     .

CB LEDs:
CB     0    1
-----
Amber   .     .
Green   *     *
Blue    *     .

SCG LEDs:
SCG    0    1
-----
Amber   .     .
Green   *     *
Blue    *     .

SIB LEDs:
SIB    0    1    2    3    4
-----
Red     .     .     .     .     .
Green   *     *     *     *     *

```

```

show chassis
craft-interface (TX

```

```

user@host> show chassis craft-interface
sfc0-re0:

```

Matrix Plus router with
3D SIBs)

FPM Display Contents:

```

+-----+
|noname      |
|48 Alarms active |
|R: LCC 2 Major Error|
|R: LCC 0 Major Error|
+-----+

```

SFC Front Panel Switch Settings:

```

SFC Chassis Number : 00
Config Size        : 3

```

Front Panel System LEDs:

```

Routing Engine    0    1

```

```

-----
OK                *    *
Fail              .    .
Master            *    .

```

Front Panel Alarm Indicators:

```

-----
Red LED          *
Yellow LED       *
Major relay      *
Minor relay      *

```

Front Panel F13 SIB LEDs:

SIB	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Fail
OK	*	.	.	*	.	.	*
Active	*	.	.	*	.	.	*

PS LEDs:

```

PS    0    1

```

```

-----
Red    *    .
Green  .    *

```

Fan Tray LEDs:

```

FT    0    1    2    3    4    5

```

```

-----
Red    .    .    .    .    .    *
Green  *    *    *    *    *    .

```

CB LEDs:

```

CB    0    1

```

```

-----
Amber  .    .
Green  *    *
Blue   *    .

```

lcc0-re0:

FPM Display contents:

```

+-----+
|noname1      |
|14 Alarms active |
|R: PEM 1 Not OK |
|R: FPC 7 misconfig |
+-----+

```

```

Front Panel System LEDs:
Routing Engine    0    1
-----
OK                *    *
Fail              .    .
Master           *    .

Front Panel Alarm Indicators:
-----
Red LED          *
Yellow LED       *
Major relay      *
Minor relay      *

Front Panel FPC LEDs:
FPC    0    1    2    3    4    5    6    7
-----
Red    .    .    .    .    .    .    .    .
Green  .    .    .    .    *    .    .    .

CB LEDs:
CB    0    1
-----
Amber  .    .
Green  *    *
Blue   *    .

SCG LEDs:
SCG   0    1
-----
Amber  .    .
Green  *    *
Blue   *    .

SIB LEDs:
SIB   0    1    2    3    4
-----
Red    .    .    .    .    .
Green  *    *    *    .    .

```

`show chassis`
`craft-interface`

```

user@host> show chassis craft-interface
Front Panel System LEDs:
Routing Engine

```

**(ACX2000 Universal
Access Router)**

```
-----  
OK                *  
Fail              .
```

Front Panel Alarm Indicators:

```
-----  
Red LED          .  
Yellow LED       .  
Major relay      .  
Minor relay      .
```

Input relay:

```
-----  
Port   Mode   Status  
0      Open   Clear  
1      Open   Clear  
2      Open   Clear  
3      Open   Clear
```

Output relay:

```
-----  
Port   Mode   Status  
0      Open   Clear  
1      Open   Clear
```

PS Status:

```
PS    0    1
```

```
-----  
Red    .    .  
Green  *    *
```

show chassis environment

Syntax	show chassis environment
Syntax (T320, T640, T1600, and T4000 Routers)	show chassis environment <cb <i>cb-slot-number</i> > <fpc <i>fpc-slot-number</i> > <fpm> <pem <i>pem-slot-number</i> > <routing-engine <i>re-slot-number</i> > <scg <i>scg-slot-number</i> > <sib <i>sib-slot-number</i> >
Syntax (TX Matrix Routers)	show chassis environment <lcc <i>number</i> | scc>
Syntax (TX Matrix Plus Routers)	show chassis environment <cb <i>cb-slot-number</i> > <cip <i>cip-slot-number</i> > <fpc <i>fpc-slot-number</i> > <fpm> <lcc <i>number</i> > <pem <i>pem-slot-number</i> > <routing-engine <i>re-slot-number</i> > <scg <i>scg-slot-number</i> > < sfc <i>number</i> > <sib <i>sib-slot-number</i> >
Syntax (MX Series Routers)	show chassis environment <all-members> <local> <member <i>member-id</i> >
Syntax (MX104 3D Universal Edge Routers)	show chassis environment <cb> <pem <i>pem-slot-number</i> > <routing-engine <i>re-slot-number</i> >
Syntax (MX2010 and MX2020 3D Universal Edge Routers)	show chassis environment <adc <i>adc-slot-number</i> > <cb <i>cb-slot-number</i> > <fpc <i>fpc-slot-number</i> > <fpm> <monitored> <psm <i>psm-slot-number</i> > <routing-engine <i>re-slot-number</i> > <sfb <i>sfb-slot-number</i> >
Syntax (EX Series Switch)	show chassis environment <all-members> <cb <i>cb-slot-number</i> > <fpc <i>fpc-slot-number</i> > <local>

	<code><member <i>member-id</i>></code> <code><routing-engine <i>re-slot-number</i>></code>
Syntax (EX Series Switch)	<code>show chassis environment</code> <code><all-members></code> <code><cb <i>cb-slot-number</i>></code> <code><fpc <i>fpc-slot-number</i>></code> <code><local></code> <code><member <i>member-id</i>></code> <code><power-supply-unit <i>psu-slot-number</i>></code> <code><routing-engine <i>slot-number</i>></code>
Syntax (QFX Series)	<code>show chassis environment</code> <code><cb <i>slot-number</i> <interconnect-device name>></code> <code><fpc <i>slot-number</i> <interconnect-device name>></code> <code><interconnect-device name <slot-number></code> <code><node-device name></code> <code><pem <i>slot-number</i> (interconnect-device name <i>slot-number</i>) | (node-device name)></code> <code><routing-engine name <interconnect-device name <i>slot-number</i>>></code>
Syntax (PTX Series Packet Transport Routers)	<code>show chassis environment</code> <code><cb <i>cb-slot-number</i>></code> <code><ccg <i>ccg-slot-number</i> ></code> <code><fpc <i>fpc-slot-number</i>></code> <code><fpm></code> <code><monitored></code> <code><pdu <i>pdu-slot-number</i>></code> <code><routing-engine <i>re-slot-number</i>></code> <code><sib <i>sib-slot-number</i>></code>
Syntax (ACX Series Universal Access Routers)	<code>show chassis environment</code> <code><cb <i>cb-slot-number</i>></code> <code><pem <i>pem-slot-number</i>></code> <code><routing-engine <i>re-slot-number</i>></code>
Release Information	Command introduced before 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 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.
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.

- 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 on page 590](#)
- [show chassis environment cb on page 601](#)
- [show chassis environment ccg](#)
- [show chassis environment cip](#)
- [show chassis environment fpc on page 620](#)
- [show chassis environment fpm on page 648](#)
- [show chassis environment lcc](#)
- [show chassis environment mcs on page 669](#)

- [show chassis environment monitored on page 655](#)
- [show chassis environment pcg on page 671](#)
- [*show chassis environment pdu*](#)
- [show chassis environment pem on page 673](#)
- [show chassis environment psm on page 682](#)
- [*show chassis environment psu*](#)
- [show chassis environment routing-engine on page 687](#)
- [show chassis environment scg on page 692](#)
- [show chassis environment sfb on page 698](#)
- [show chassis environment sib on page 712](#)
- [*show chassis environment sfc*](#)

List of Sample Output

[show chassis environment \(J2300 Router\) on page 541](#)
[show chassis environment \(J4300 or J6300 Router\) on page 541](#)
[show chassis environment \(M5 Router\) on page 541](#)
[show chassis environment \(M7i Router\) on page 541](#)
[show chassis environment \(M10 Router\) on page 541](#)
[show chassis environment \(M10i Router\) on page 542](#)
[show chassis environment \(M20 Router\) on page 542](#)
[show chassis environment \(M40 Router\) on page 542](#)
[show chassis environment \(M40e Router\) on page 543](#)
[show chassis environment \(M120 Router\) on page 543](#)
[show chassis environment \(M160 Router\) on page 544](#)
[show chassis environment \(M320 Router\) on page 545](#)
[show chassis environment \(MX104 Router\) on page 546](#)
[show chassis environment \(MX240 Router\) on page 546](#)
[show chassis environment \(MX240 Router with Enhanced MX SCB\) on page 547](#)
[show chassis environment \(MX480 Router\) on page 548](#)
[show chassis environment \(MX480 Router with Enhanced MX SCB\) on page 549](#)
[show chassis environment \(MX960 Router\) on page 550](#)
[show chassis environment \(MX960 Router with Enhanced MX SCB\) on page 551](#)
[show chassis environment \(MX2020 Router\) on page 554](#)
[show chassis environment \(MX2010 Router\) on page 564](#)
[show chassis environment \(T320 Router\) on page 569](#)
[show chassis environment \(T640 Router\) on page 570](#)
[show chassis environment \(T4000 Router\) on page 570](#)
[show chassis environment \(TX Matrix Router\) on page 572](#)
[show chassis environment \(T1600 Router\) on page 574](#)
[show chassis environment \(TX Matrix Plus Router\) on page 574](#)
[show chassis environment \(TX Matrix Plus router with 3D SIBs\) on page 577](#)
[show chassis environment \(EX4200 Standalone Switch\) on page 580](#)
[show chassis environment \(EX8216 Switch\) on page 581](#)
[show chassis environment \(QFX Series\) on page 581](#)

[show chassis environment interconnect-device \(QFabric System\) on page 581](#)
[show chassis environment node-device \(QFabric System\) on page 584](#)
[show chassis environment pem node-device \(QFabric System\) on page 585](#)
[show chassis environment \(PTX5000 Packet Transport Router\) on page 585](#)
[show chassis environment \(ACX2000 Universal Access Router\) on page 588](#)
[show chassis environment \(ACX4000 Universal Access Router\) on page 588](#)

Output Fields Table 37 on page 539 lists the output fields for the **show chassis environment** command. Output fields are listed in the approximate order in which they appear.

Table 37: show chassis environment Output Fields

Field Name	Field Description
Class	<p>Information about the category or class of chassis component:</p> <ul style="list-style-type: none"> • Power: Power information: <ul style="list-style-type: none"> • (M5, M10, M20, and M40 routers and EX Series switches only) Power supply status: OK, Testing, (during initial power-on), Failed, or Absent. • (M7i, M10i, M40e, M120, M160, M320, and T Series routers and EX Series switches only) Power Entry Modules status: OK, Testing, (during initial power-on), Check, Failed, or Absent. • (PTX Series only) Power information is reported in PDU or PSM combinations. The status is: OK, Testing, (during initial power-on), Check, Failed, or Absent. • Temp: Temperature of air flowing through the chassis in degrees Celsius (C) and Fahrenheit (F). 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. • Pic: On ACX4000 Routers, multiple temperature channels on a MIC. The status is: OK and the Measurement is in degrees Celsius (C) and Fahrenheit (F). • Fan: Fan status: OK, Testing (during initial power-on), Failed, or Absent. 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. Measurement indicates actual fan RPM (PTX and MX2010 and MX2020 Routers only). • Misc: Information about other components of the chassis. <ul style="list-style-type: none"> • On some routers, this field indicates the status of one or more additional components. • On the M40e, M160, and M320 router, Misc includes CIP (Connector Interface Panel). OK indicates that the CIP is present. Absent indicates that the CIP is not present. • On T Series routers, Misc includes CIP and SPMB (Switch Processor Mezzanine Board). OK indicates that the CIP or SPMB is present. Absent indicates that the CIP or SPMB is not present. • On PTX Series Packet Transport Routers, Misc includes the SPMB (Switch Processor Mezzanine Board). The SPMB is located on the control boards. OK indicates that the control board is present. Absent indicates that the control board is not present.
Item	<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>

Table 37: show chassis environment Output Fields (*continued*)

Field Name	Field Description
Status	<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">• OK: The fans are operational.• Testing: The fans are being tested during initial power-on.• Failed: The fans have failed or the fans are not spinning.• Absent: The fan tray is not installed. <p>If the Class is Power, the power supply status can be:</p> <ul style="list-style-type: none">• OK: The power component is operational.• Testing: The power component is being tested during initial power-on.• Check: There is insufficient power---that is, fewer than the minimum required feeds are connected.• Failed: The inputs leads have failed.• Absent: The power component is not installed.
Measurement	<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	

```
user@host> show chassis environment
```

show chassis environment (M40 Router)

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 Absent
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
      Routing Engine 1                  Absent
      Routing Engine 1 CPU               Absent
      AFEB 0 AFEB Processor              OK          33 degrees C / 91 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
      Fan 5                             OK          Spinning at normal speed

```

show chassis environment (MX240 Router)

```

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 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)

```
user@host> show chassis environment
```

Class	Item	Status	Measurement
Temp	PEM 0	OK	40 degrees C / 104 degrees F

Router with Enhanced
MX SCB)

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)

user@host> show chassis environment

Class	Item	Status	Measurement
Temp	PEM 0	OK	35 degrees C / 95 degrees F

Router with Enhanced
MX SCB)

	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)

user@host> show chassis environment

Class	Item	Status	Measurement
Temp	PEM 0	Absent	

Router with Enhanced
MX SCB)

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

Fans	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
	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 (MX2020 Router)

user@host> show chassis environment

Class	Item	Status	Measurement
Temp	PSM 0	Absent	
	PSM 1	Absent	
Temp	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
Temp	PDM 0	OK	
	PDM 1	Absent	
	PDM 2	Absent	
	PDM 3	OK	
Temp	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 (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
Fan Tray 0 Fan 2	OK	3480 RPM
Fan Tray 0 Fan 3	OK	3480 RPM
Fan Tray 0 Fan 4	OK	3360 RPM

Fan Tray 0 Fan 5	OK	3360 RPM
Fan Tray 0 Fan 6	OK	3480 RPM
Fan Tray 1 Fan 1	OK	3360 RPM
Fan Tray 1 Fan 2	OK	3360 RPM
Fan Tray 1 Fan 3	OK	3360 RPM
Fan Tray 1 Fan 4	OK	3480 RPM
Fan Tray 1 Fan 5	OK	3480 RPM
Fan Tray 1 Fan 6	OK	3480 RPM
Fan Tray 2 Fan 1	OK	3360 RPM
Fan Tray 2 Fan 2	OK	3360 RPM
Fan Tray 2 Fan 3	OK	3480 RPM
Fan Tray 2 Fan 4	OK	3480 RPM
Fan Tray 2 Fan 5	OK	3360 RPM
Fan Tray 2 Fan 6	OK	3480 RPM
Fan Tray 3 Fan 1	OK	3360 RPM
Fan Tray 3 Fan 2	OK	3360 RPM
Fan Tray 3 Fan 3	OK	3480 RPM
Fan Tray 3 Fan 4	OK	3480 RPM
Fan Tray 3 Fan 5	OK	3480 RPM
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
	Rear Tray Bottom fan	OK	Spinning at normal speed
Misc	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
	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
Misc	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)**

```
user@host> show chassis environment
sfc0-re0:
```

Matrix Plus router with
3D SIBs)

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	

lcc0-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
Fans	SIB 6 Exhaust	OK	38 degrees C / 100 degrees F
	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 (QFX 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

```
user@switch> show chassis environment interconnect-device IC-A0004
```

**show chassis
environment**

Class	Item	Status	Measurement
	CB 0		
	CB 0 L Intake	OK	30 degrees C / 86 degrees F

interconnect-device
(QFabric System)

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

```
user@switch> show chassis environment node-device node1
Class Item                               Status Measurement
Power node1 Power Supply 0              Absent
```


node-device (QFabric System)

```

Fans    node1 Power Supply 1      Absent
        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

```

user@switch> show chassis environment
Class Item          Status Measurement
Temp PDU 0          OK

```

(PTX5000 Packet Transport Router)

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
(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**

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.

(ACX4000 Universal
Access Router)

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 adc

Syntax	<code>show chassis environment adc</code> <code><adc-slot-number></code>
Release Information	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.
Description	Display chassis environmental information about the adapter cards.
Options	<p>none—Display environmental information about all adapter cards.</p> <p>adc-slot-number—(Optional) Display environmental information about the specified adapter card. For MX2020 routers, replace adc-slot-number with a value of 0 through 19. For MX2010 routers, replace adc-slot-number with a value of 0 through 9.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> show chassis adc on page 494
List of Sample Output	show chassis environment adc (MX2020 Router) on page 591 show chassis environment adc (MX2010 Router) on page 597
Output Fields	Table 38 on page 590 lists the output fields for the show chassis environment adc command. Output fields are listed in the approximate order in which they appear.

Table 38: show chassis environment adc Output Fields

Field Name	Field Description
State	<p>Status of the adapter card.</p> <ul style="list-style-type: none"> Online—The adapter card is online and running. Offline—Adapter card is powered down.
Temperature	<p>Temperature in Celsius (C) and Fahrenheit (F) of the air flowing past the adapter card.</p> <ul style="list-style-type: none"> Temperature Intake—Measures the temperature of the air intake. Temperature Exhaust—Measures the temperature of the hot air exhaust. ADC-XF1—Measures the temperature of the ADC chipset, ADC-XF1. ADC-XF0—Measures the temperature of the ADC chipset, ADC-XF0.
Power	<p>Power required and measured on the adapter card. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.</p>

Sample Output

show chassis
environment adc
(MX2020 Router)

```
user@host> show chassis environment adc
ADC 0 status:
  State      Online
  Intake Temperature 39 degrees C / 102 degrees F
  Exhaust Temperature 50 degrees C / 122 degrees F
  ADC-XF1 Temperature 58 degrees C / 136 degrees F
  ADC-XF0 Temperature 64 degrees C / 147 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL 1029 mV
    LTC3880-XF0-1.0v-CH0 1029 mV
    LTC3880-XF0-1.0v-CH1 1033 mV
    LTC3880-XF0-1.5v-RAIL 1499 mV
    LTC3880-XF0-1.5v-CH0 1499 mV
    LTC3880-XF0-1.5v-CH1 1501 mV
    LTC3880-XF1-1.0v-RAIL 1029 mV
    LTC3880-XF1-1.0v-CH0 1029 mV
    LTC3880-XF1-1.0v-CH1 1033 mV
    LTC3880-XF1-1.5v-RAIL 1499 mV
    LTC3880-XF1-1.5v-CH0 1499 mV
    LTC3880-XF1-1.5v-CH1 1502 mV
ADC 1 status:
  State      Online
  Intake Temperature 38 degrees C / 100 degrees F
  Exhaust Temperature 48 degrees C / 118 degrees F
  ADC-XF1 Temperature 59 degrees C / 138 degrees F
  ADC-XF0 Temperature 61 degrees C / 141 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL 1029 mV
    LTC3880-XF0-1.0v-CH0 1029 mV
    LTC3880-XF0-1.0v-CH1 1033 mV
    LTC3880-XF0-1.5v-RAIL 1500 mV
    LTC3880-XF0-1.5v-CH0 1500 mV
    LTC3880-XF0-1.5v-CH1 1501 mV
    LTC3880-XF1-1.0v-RAIL 1029 mV
    LTC3880-XF1-1.0v-CH0 1029 mV
    LTC3880-XF1-1.0v-CH1 1033 mV
    LTC3880-XF1-1.5v-RAIL 1500 mV
    LTC3880-XF1-1.5v-CH0 1500 mV
    LTC3880-XF1-1.5v-CH1 1502 mV
ADC 2 status:
  State      Online
  Intake Temperature 36 degrees C / 96 degrees F
  Exhaust Temperature 50 degrees C / 122 degrees F
  ADC-XF1 Temperature 52 degrees C / 125 degrees F
  ADC-XF0 Temperature 59 degrees C / 138 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL 1030 mV
    LTC3880-XF0-1.0v-CH0 1030 mV
    LTC3880-XF0-1.0v-CH1 1033 mV
    LTC3880-XF0-1.5v-CH0 1499 mV
    LTC3880-XF1-1.0v-RAIL 1029 mV
    LTC3880-XF1-1.0v-CH0 1029 mV
    LTC3880-XF1-1.0v-CH1 1033 mV
    LTC3880-XF1-1.5v-CH0 1500 mV
ADC 3 status:
  State      Online
  Intake Temperature 39 degrees C / 102 degrees F
  Exhaust Temperature 50 degrees C / 122 degrees F
```

ADC-XF1 Temperature	61 degrees C / 141 degrees F
ADC-XF0 Temperature	63 degrees C / 145 degrees F
Power	
LTC3880-XF0-1.0v-RAIL	1030 mV
LTC3880-XF0-1.0v-CH0	1030 mV
LTC3880-XF0-1.0v-CH1	1033 mV
LTC3880-XF0-1.5v-RAIL	1500 mV
LTC3880-XF0-1.5v-CH0	1500 mV
LTC3880-XF0-1.5v-CH1	1501 mV
LTC3880-XF1-1.0v-RAIL	1029 mV
LTC3880-XF1-1.0v-CH0	1029 mV
LTC3880-XF1-1.0v-CH1	1033 mV
LTC3880-XF1-1.5v-RAIL	1500 mV
LTC3880-XF1-1.5v-CH0	1500 mV
LTC3880-XF1-1.5v-CH1	1502 mV
ADC 4 status:	
State	Online
Intake Temperature	38 degrees C / 100 degrees F
Exhaust Temperature	49 degrees C / 120 degrees F
ADC-XF1 Temperature	60 degrees C / 140 degrees F
ADC-XF0 Temperature	62 degrees C / 143 degrees F
Power	
LTC3880-XF0-1.0v-RAIL	1029 mV
LTC3880-XF0-1.0v-CH0	1029 mV
LTC3880-XF0-1.0v-CH1	1033 mV
LTC3880-XF0-1.5v-RAIL	1500 mV
LTC3880-XF0-1.5v-CH0	1500 mV
LTC3880-XF0-1.5v-CH1	1501 mV
LTC3880-XF1-1.0v-RAIL	1029 mV
LTC3880-XF1-1.0v-CH0	1029 mV
LTC3880-XF1-1.0v-CH1	1033 mV
LTC3880-XF1-1.5v-RAIL	1500 mV
LTC3880-XF1-1.5v-CH0	1500 mV
LTC3880-XF1-1.5v-CH1	1502 mV
ADC 5 status:	
State	Online
Intake Temperature	37 degrees C / 98 degrees F
Exhaust Temperature	52 degrees C / 125 degrees F
ADC-XF1 Temperature	55 degrees C / 131 degrees F
ADC-XF0 Temperature	66 degrees C / 150 degrees F
Power	
LTC3880-XF0-1.0v-RAIL	1029 mV
LTC3880-XF0-1.0v-CH0	1029 mV
LTC3880-XF0-1.0v-CH1	1033 mV
LTC3880-XF0-1.5v-CH0	1500 mV
LTC3880-XF1-1.0v-RAIL	1030 mV
LTC3880-XF1-1.0v-CH0	1030 mV
LTC3880-XF1-1.0v-CH1	1033 mV
LTC3880-XF1-1.5v-CH0	1500 mV
ADC 6 status:	
State	Online
Intake Temperature	39 degrees C / 102 degrees F
Exhaust Temperature	51 degrees C / 123 degrees F
ADC-XF1 Temperature	58 degrees C / 136 degrees F
ADC-XF0 Temperature	64 degrees C / 147 degrees F
Power	
LTC3880-XF0-1.0v-RAIL	1029 mV
LTC3880-XF0-1.0v-CH0	1029 mV
LTC3880-XF0-1.0v-CH1	1033 mV
LTC3880-XF0-1.5v-RAIL	1499 mV
LTC3880-XF0-1.5v-CH0	1499 mV


```

LTC3880-XF0-1.5v-CH1      1501 mV
LTC3880-XF1-1.0v-RAIL     1029 mV
LTC3880-XF1-1.0v-CH0      1029 mV
LTC3880-XF1-1.0v-CH1      1033 mV
LTC3880-XF1-1.5v-RAIL     1499 mV
LTC3880-XF1-1.5v-CH0      1499 mV
LTC3880-XF1-1.5v-CH1      1502 mV
ADC 7 status:
State                      Online
Intake Temperature        38 degrees C / 100 degrees F
Exhaust Temperature       52 degrees C / 125 degrees F
ADC-XF1 Temperature       61 degrees C / 141 degrees F
ADC-XF0 Temperature       69 degrees C / 156 degrees F
Power
LTC3880-XF0-1.0v-RAIL     1029 mV
LTC3880-XF0-1.0v-CH0      1029 mV
LTC3880-XF0-1.0v-CH1      1033 mV
LTC3880-XF0-1.5v-CH0      1499 mV
LTC3880-XF1-1.0v-RAIL     1029 mV
LTC3880-XF1-1.0v-CH0      1029 mV
LTC3880-XF1-1.0v-CH1      1033 mV
LTC3880-XF1-1.5v-CH0      1500 mV
ADC 8 status:
State                      Online
Intake Temperature        38 degrees C / 100 degrees F
Exhaust Temperature       50 degrees C / 122 degrees F
ADC-XF1 Temperature       63 degrees C / 145 degrees F
ADC-XF0 Temperature       64 degrees C / 147 degrees F
Power
LTC3880-XF0-1.0v-RAIL     1029 mV
LTC3880-XF0-1.0v-CH0      1029 mV
LTC3880-XF0-1.0v-CH1      1033 mV
LTC3880-XF0-1.5v-RAIL     1499 mV
LTC3880-XF0-1.5v-CH0      1499 mV
LTC3880-XF0-1.5v-CH1      1501 mV
LTC3880-XF1-1.0v-RAIL     1030 mV
LTC3880-XF1-1.0v-CH0      1030 mV
LTC3880-XF1-1.0v-CH1      1033 mV
LTC3880-XF1-1.5v-RAIL     1499 mV
LTC3880-XF1-1.5v-CH0      1499 mV
LTC3880-XF1-1.5v-CH1      1502 mV
ADC 9 status:
State                      Online
Intake Temperature        40 degrees C / 104 degrees F
Exhaust Temperature       50 degrees C / 122 degrees F
ADC-XF1 Temperature       59 degrees C / 138 degrees F
ADC-XF0 Temperature       62 degrees C / 143 degrees F
Power
LTC3880-XF0-1.0v-RAIL     1029 mV
LTC3880-XF0-1.0v-CH0      1029 mV
LTC3880-XF0-1.0v-CH1      1033 mV
LTC3880-XF0-1.5v-RAIL     1500 mV
LTC3880-XF0-1.5v-CH0      1500 mV
LTC3880-XF0-1.5v-CH1      1501 mV
LTC3880-XF1-1.0v-RAIL     1029 mV
LTC3880-XF1-1.0v-CH0      1029 mV
LTC3880-XF1-1.0v-CH1      1033 mV
LTC3880-XF1-1.5v-RAIL     1499 mV
LTC3880-XF1-1.5v-CH0      1499 mV
LTC3880-XF1-1.5v-CH1      1502 mV
ADC 10 status:

```

State	Online
Intake Temperature	46 degrees C / 114 degrees F
Exhaust Temperature	52 degrees C / 125 degrees F
ADC-XF1 Temperature	66 degrees C / 150 degrees F
ADC-XF0 Temperature	65 degrees C / 149 degrees F
Power	
LTC3880-XF0-1.0v-RAIL	1030 mV
LTC3880-XF0-1.0v-CH0	1030 mV
LTC3880-XF0-1.0v-CH1	1033 mV
LTC3880-XF0-1.5v-RAIL	1499 mV
LTC3880-XF0-1.5v-CH0	1499 mV
LTC3880-XF0-1.5v-CH1	1501 mV
LTC3880-XF1-1.0v-RAIL	1029 mV
LTC3880-XF1-1.0v-CH0	1029 mV
LTC3880-XF1-1.0v-CH1	1033 mV
LTC3880-XF1-1.5v-RAIL	1500 mV
LTC3880-XF1-1.5v-CH0	1500 mV
LTC3880-XF1-1.5v-CH1	1502 mV
ADC 11 status:	
State	Online
Intake Temperature	47 degrees C / 116 degrees F
Exhaust Temperature	53 degrees C / 127 degrees F
ADC-XF1 Temperature	64 degrees C / 147 degrees F
ADC-XF0 Temperature	65 degrees C / 149 degrees F
Power	
LTC3880-XF0-1.0v-RAIL	1030 mV
LTC3880-XF0-1.0v-CH0	1030 mV
LTC3880-XF0-1.0v-CH1	1033 mV
LTC3880-XF0-1.5v-RAIL	1500 mV
LTC3880-XF0-1.5v-CH0	1500 mV
LTC3880-XF0-1.5v-CH1	1501 mV
LTC3880-XF1-1.0v-RAIL	1029 mV
LTC3880-XF1-1.0v-CH0	1029 mV
LTC3880-XF1-1.0v-CH1	1033 mV
LTC3880-XF1-1.5v-RAIL	1499 mV
LTC3880-XF1-1.5v-CH0	1499 mV
LTC3880-XF1-1.5v-CH1	1502 mV
ADC 12 status:	
State	Online
Intake Temperature	48 degrees C / 118 degrees F
Exhaust Temperature	54 degrees C / 129 degrees F
ADC-XF1 Temperature	66 degrees C / 150 degrees F
ADC-XF0 Temperature	65 degrees C / 149 degrees F
Power	
LTC3880-XF0-1.0v-RAIL	1029 mV
LTC3880-XF0-1.0v-CH0	1029 mV
LTC3880-XF0-1.0v-CH1	1033 mV
LTC3880-XF0-1.5v-RAIL	1500 mV
LTC3880-XF0-1.5v-CH0	1500 mV
LTC3880-XF0-1.5v-CH1	1501 mV
LTC3880-XF1-1.0v-RAIL	1029 mV
LTC3880-XF1-1.0v-CH0	1029 mV
LTC3880-XF1-1.0v-CH1	1033 mV
LTC3880-XF1-1.5v-RAIL	1499 mV
LTC3880-XF1-1.5v-CH0	1499 mV
LTC3880-XF1-1.5v-CH1	1502 mV
ADC 13 status:	
State	Online
Intake Temperature	48 degrees C / 118 degrees F
Exhaust Temperature	55 degrees C / 131 degrees F
ADC-XF1 Temperature	66 degrees C / 150 degrees F

```

ADC-XF0 Temperature      67 degrees C / 152 degrees F
Power
  LTC3880-XF0-1.0v-RAIL  1029 mV
  LTC3880-XF0-1.0v-CH0   1029 mV
  LTC3880-XF0-1.0v-CH1   1033 mV
  LTC3880-XF0-1.5v-RAIL  1500 mV
  LTC3880-XF0-1.5v-CH0   1500 mV
  LTC3880-XF0-1.5v-CH1   1501 mV
  LTC3880-XF1-1.0v-RAIL  1030 mV
  LTC3880-XF1-1.0v-CH0   1030 mV
  LTC3880-XF1-1.0v-CH1   1034 mV
  LTC3880-XF1-1.5v-RAIL  1500 mV
  LTC3880-XF1-1.5v-CH0   1500 mV
  LTC3880-XF1-1.5v-CH1   1503 mV
ADC 14 status:
State      Online
Intake Temperature  50 degrees C / 122 degrees F
Exhaust Temperature 57 degrees C / 134 degrees F
ADC-XF1 Temperature 68 degrees C / 154 degrees F
ADC-XF0 Temperature 72 degrees C / 161 degrees F
Power
  LTC3880-XF0-1.0v-RAIL  1030 mV
  LTC3880-XF0-1.0v-CH0   1030 mV
  LTC3880-XF0-1.0v-CH1   1034 mV
  LTC3880-XF0-1.5v-RAIL  1499 mV
  LTC3880-XF0-1.5v-CH0   1499 mV
  LTC3880-XF0-1.5v-CH1   1501 mV
  LTC3880-XF1-1.0v-RAIL  1030 mV
  LTC3880-XF1-1.0v-CH0   1030 mV
  LTC3880-XF1-1.0v-CH1   1034 mV
  LTC3880-XF1-1.5v-RAIL  1499 mV
  LTC3880-XF1-1.5v-CH0   1499 mV
  LTC3880-XF1-1.5v-CH1   1502 mV
ADC 15 status:
State      Online
Intake Temperature  49 degrees C / 120 degrees F
Exhaust Temperature 56 degrees C / 132 degrees F
ADC-XF1 Temperature 68 degrees C / 154 degrees F
ADC-XF0 Temperature 68 degrees C / 154 degrees F
Power
  LTC3880-XF0-1.0v-RAIL  1030 mV
  LTC3880-XF0-1.0v-CH0   1030 mV
  LTC3880-XF0-1.0v-CH1   1034 mV
  LTC3880-XF0-1.5v-RAIL  1499 mV
  LTC3880-XF0-1.5v-CH0   1499 mV
  LTC3880-XF0-1.5v-CH1   1501 mV
  LTC3880-XF1-1.0v-RAIL  1030 mV
  LTC3880-XF1-1.0v-CH0   1030 mV
  LTC3880-XF1-1.0v-CH1   1034 mV
  LTC3880-XF1-1.5v-RAIL  1499 mV
  LTC3880-XF1-1.5v-CH0   1499 mV
  LTC3880-XF1-1.5v-CH1   1502 mV
ADC 16 status:
State      Online
Intake Temperature  51 degrees C / 123 degrees F
Exhaust Temperature 56 degrees C / 132 degrees F
ADC-XF1 Temperature 67 degrees C / 152 degrees F
ADC-XF0 Temperature 68 degrees C / 154 degrees F
Power
  LTC3880-XF0-1.0v-RAIL  1029 mV
  LTC3880-XF0-1.0v-CH0   1029 mV

```

LTC3880-XF0-1.0v-CH1	1033 mV
LTC3880-XF0-1.5v-RAIL	1499 mV
LTC3880-XF0-1.5v-CH0	1499 mV
LTC3880-XF0-1.5v-CH1	1501 mV
LTC3880-XF1-1.0v-RAIL	1029 mV
LTC3880-XF1-1.0v-CH0	1029 mV
LTC3880-XF1-1.0v-CH1	1033 mV
LTC3880-XF1-1.5v-RAIL	1500 mV
LTC3880-XF1-1.5v-CH0	1500 mV
LTC3880-XF1-1.5v-CH1	1502 mV

ADC 17 status:

State	Online
Intake Temperature	51 degrees C / 123 degrees F
Exhaust Temperature	56 degrees C / 132 degrees F
ADC-XF1 Temperature	68 degrees C / 154 degrees F
ADC-XF0 Temperature	69 degrees C / 156 degrees F

Power

LTC3880-XF0-1.0v-RAIL	1030 mV
LTC3880-XF0-1.0v-CH0	1030 mV
LTC3880-XF0-1.0v-CH1	1033 mV
LTC3880-XF0-1.5v-RAIL	1500 mV
LTC3880-XF0-1.5v-CH0	1500 mV
LTC3880-XF0-1.5v-CH1	1501 mV
LTC3880-XF1-1.0v-RAIL	1030 mV
LTC3880-XF1-1.0v-CH0	1030 mV
LTC3880-XF1-1.0v-CH1	1034 mV
LTC3880-XF1-1.5v-RAIL	1500 mV
LTC3880-XF1-1.5v-CH0	1500 mV
LTC3880-XF1-1.5v-CH1	1502 mV

ADC 18 status:

State	Online
Intake Temperature	52 degrees C / 125 degrees F
Exhaust Temperature	57 degrees C / 134 degrees F
ADC-XF1 Temperature	66 degrees C / 150 degrees F
ADC-XF0 Temperature	71 degrees C / 159 degrees F

Power

LTC3880-XF0-1.0v-RAIL	1030 mV
LTC3880-XF0-1.0v-CH0	1030 mV
LTC3880-XF0-1.0v-CH1	1034 mV
LTC3880-XF0-1.5v-RAIL	1499 mV
LTC3880-XF0-1.5v-CH0	1499 mV
LTC3880-XF0-1.5v-CH1	1501 mV
LTC3880-XF1-1.0v-RAIL	1030 mV
LTC3880-XF1-1.0v-CH0	1030 mV
LTC3880-XF1-1.0v-CH1	1034 mV
LTC3880-XF1-1.5v-RAIL	1500 mV
LTC3880-XF1-1.5v-CH0	1500 mV
LTC3880-XF1-1.5v-CH1	1502 mV

ADC 19 status:

State	Online
Intake Temperature	49 degrees C / 120 degrees F
Exhaust Temperature	56 degrees C / 132 degrees F
ADC-XF1 Temperature	67 degrees C / 152 degrees F
ADC-XF0 Temperature	70 degrees C / 158 degrees F

Power

LTC3880-XF0-1.0v-RAIL	1029 mV
LTC3880-XF0-1.0v-CH0	1029 mV
LTC3880-XF0-1.0v-CH1	1033 mV
LTC3880-XF0-1.5v-RAIL	1499 mV
LTC3880-XF0-1.5v-CH0	1499 mV
LTC3880-XF0-1.5v-CH1	1501 mV

```

LTC3880-XF1-1.0v-RAIL    1030 mV
LTC3880-XF1-1.0v-CH0     1030 mV
LTC3880-XF1-1.0v-CH1     1033 mV
LTC3880-XF1-1.5v-RAIL    1500 mV
LTC3880-XF1-1.5v-CH0     1500 mV
LTC3880-XF1-1.5v-CH1     1502 mV

```

**show chassis
environment adc
(MX2010 Router)**

```
user@host> show chassis environment adc
```

```
ADC 0 status:
```

```

State                               Online
Intake Temperature                  33 degrees C / 91 degrees F
Exhaust Temperature                 42 degrees C / 107 degrees F
ADC-XF1 Temperature                 46 degrees C / 114 degrees F
ADC-XF0 Temperature                 53 degrees C / 127 degrees F
Power
LTC3880-XF0-1.0v-RAIL              998 mV
LTC3880-XF0-1.0v-CH0               998 mV
LTC3880-XF0-1.0v-CH1              1001 mV
LTC3880-XF0-1.5v-RAIL              1454 mV
LTC3880-XF0-1.5v-CH0               1454 mV
LTC3880-XF0-1.5v-CH1              1456 mV
LTC3880-XF1-1.0v-RAIL              998 mV
LTC3880-XF1-1.0v-CH0               998 mV
LTC3880-XF1-1.0v-CH1              1002 mV
LTC3880-XF1-1.5v-RAIL              1454 mV
LTC3880-XF1-1.5v-CH0               1454 mV
LTC3880-XF1-1.5v-CH1              1457 mV

```

```
ADC 1 status:
```

```

State                               Online
Intake Temperature                  32 degrees C / 89 degrees F
Exhaust Temperature                 42 degrees C / 107 degrees F
ADC-XF1 Temperature                 44 degrees C / 111 degrees F
ADC-XF0 Temperature                 52 degrees C / 125 degrees F
Power
LTC3880-XF0-1.0v-RAIL              998 mV
LTC3880-XF0-1.0v-CH0               998 mV
LTC3880-XF0-1.0v-CH1              1002 mV
LTC3880-XF0-1.5v-RAIL              1454 mV
LTC3880-XF0-1.5v-CH0               1454 mV
LTC3880-XF0-1.5v-CH1              1456 mV
LTC3880-XF1-1.0v-RAIL              999 mV
LTC3880-XF1-1.0v-CH0               999 mV
LTC3880-XF1-1.0v-CH1              1002 mV
LTC3880-XF1-1.5v-RAIL              1454 mV
LTC3880-XF1-1.5v-CH0               1454 mV
LTC3880-XF1-1.5v-CH1              1456 mV

```

```
ADC 2 status:
```

```

State                               Online
Intake Temperature                  35 degrees C / 95 degrees F
Exhaust Temperature                 42 degrees C / 107 degrees F
ADC-XF1 Temperature                 48 degrees C / 118 degrees F
ADC-XF0 Temperature                 54 degrees C / 129 degrees F
Power
LTC3880-XF0-1.0v-RAIL              1030 mV
LTC3880-XF0-1.0v-CH0               1030 mV
LTC3880-XF0-1.0v-CH1              1033 mV
LTC3880-XF0-1.5v-RAIL              1500 mV
LTC3880-XF0-1.5v-CH0               1500 mV
LTC3880-XF0-1.5v-CH1              1501 mV
LTC3880-XF1-1.0v-RAIL              1029 mV
LTC3880-XF1-1.0v-CH0               1029 mV

```

LTC3880-XF1-1.0v-CH1	1033 mV
LTC3880-XF1-1.5v-RAIL	1499 mV
LTC3880-XF1-1.5v-CH0	1499 mV
LTC3880-XF1-1.5v-CH1	1502 mV

ADC 3 status:

State	Online
Intake Temperature	35 degrees C / 95 degrees F
Exhaust Temperature	40 degrees C / 104 degrees F
ADC-XF1 Temperature	44 degrees C / 111 degrees F
ADC-XF0 Temperature	51 degrees C / 123 degrees F

Power

LTC3880-XF0-1.0v-RAIL	999 mV
LTC3880-XF0-1.0v-CH0	999 mV
LTC3880-XF0-1.0v-CH1	1002 mV
LTC3880-XF0-1.5v-RAIL	1454 mV
LTC3880-XF0-1.5v-CH0	1454 mV
LTC3880-XF0-1.5v-CH1	1456 mV
LTC3880-XF1-1.0v-RAIL	999 mV
LTC3880-XF1-1.0v-CH0	999 mV
LTC3880-XF1-1.0v-CH1	1002 mV
LTC3880-XF1-1.5v-RAIL	1454 mV
LTC3880-XF1-1.5v-CH0	1454 mV
LTC3880-XF1-1.5v-CH1	1457 mV

ADC 4 status:

State	Online
Intake Temperature	31 degrees C / 87 degrees F
Exhaust Temperature	43 degrees C / 109 degrees F
ADC-XF1 Temperature	48 degrees C / 118 degrees F
ADC-XF0 Temperature	56 degrees C / 132 degrees F

Power

LTC3880-XF0-1.0v-RAIL	1029 mV
LTC3880-XF0-1.0v-CH0	1029 mV
LTC3880-XF0-1.0v-CH1	1033 mV
LTC3880-XF0-1.5v-RAIL	1499 mV
LTC3880-XF0-1.5v-CH0	1499 mV
LTC3880-XF0-1.5v-CH1	1501 mV
LTC3880-XF1-1.0v-RAIL	1030 mV
LTC3880-XF1-1.0v-CH0	1030 mV
LTC3880-XF1-1.0v-CH1	1033 mV
LTC3880-XF1-1.5v-RAIL	1499 mV
LTC3880-XF1-1.5v-CH0	1499 mV
LTC3880-XF1-1.5v-CH1	1502 mV

ADC 5 status:

State	Online
Intake Temperature	33 degrees C / 91 degrees F
Exhaust Temperature	43 degrees C / 109 degrees F
ADC-XF1 Temperature	47 degrees C / 116 degrees F
ADC-XF0 Temperature	54 degrees C / 129 degrees F

Power

LTC3880-XF0-1.0v-RAIL	999 mV
LTC3880-XF0-1.0v-CH0	999 mV
LTC3880-XF0-1.0v-CH1	1002 mV
LTC3880-XF0-1.5v-RAIL	1454 mV
LTC3880-XF0-1.5v-CH0	1454 mV
LTC3880-XF0-1.5v-CH1	1456 mV
LTC3880-XF1-1.0v-RAIL	998 mV
LTC3880-XF1-1.0v-CH0	998 mV
LTC3880-XF1-1.0v-CH1	1002 mV
LTC3880-XF1-1.5v-RAIL	1454 mV
LTC3880-XF1-1.5v-CH0	1454 mV
LTC3880-XF1-1.5v-CH1	1457 mV

ADC 6 status:

State	Online
Intake Temperature	32 degrees C / 89 degrees F
Exhaust Temperature	42 degrees C / 107 degrees F
ADC-XF1 Temperature	47 degrees C / 116 degrees F
ADC-XF0 Temperature	55 degrees C / 131 degrees F
Power	
LTC3880-XF0-1.0v-RAIL	1030 mV
LTC3880-XF0-1.0v-CH0	1030 mV
LTC3880-XF0-1.0v-CH1	1033 mV
LTC3880-XF0-1.5v-RAIL	1499 mV
LTC3880-XF0-1.5v-CH0	1499 mV
LTC3880-XF0-1.5v-CH1	1501 mV
LTC3880-XF1-1.0v-RAIL	1030 mV
LTC3880-XF1-1.0v-CH0	1030 mV
LTC3880-XF1-1.0v-CH1	1033 mV
LTC3880-XF1-1.5v-RAIL	1499 mV
LTC3880-XF1-1.5v-CH0	1499 mV
LTC3880-XF1-1.5v-CH1	1502 mV

ADC 7 status:

State	Online
Intake Temperature	36 degrees C / 96 degrees F
Exhaust Temperature	43 degrees C / 109 degrees F
ADC-XF1 Temperature	46 degrees C / 114 degrees F
ADC-XF0 Temperature	55 degrees C / 131 degrees F
Power	
LTC3880-XF0-1.0v-RAIL	1030 mV
LTC3880-XF0-1.0v-CH0	1030 mV
LTC3880-XF0-1.0v-CH1	1033 mV
LTC3880-XF0-1.5v-RAIL	1500 mV
LTC3880-XF0-1.5v-CH0	1500 mV
LTC3880-XF0-1.5v-CH1	1501 mV
LTC3880-XF1-1.0v-RAIL	1030 mV
LTC3880-XF1-1.0v-CH0	1030 mV
LTC3880-XF1-1.0v-CH1	1033 mV
LTC3880-XF1-1.5v-RAIL	1499 mV
LTC3880-XF1-1.5v-CH0	1499 mV
LTC3880-XF1-1.5v-CH1	1502 mV

ADC 8 status:

State	Online
Intake Temperature	35 degrees C / 95 degrees F
Exhaust Temperature	43 degrees C / 109 degrees F
ADC-XF1 Temperature	44 degrees C / 111 degrees F
ADC-XF0 Temperature	51 degrees C / 123 degrees F
Power	
LTC3880-XF0-1.0v-RAIL	999 mV
LTC3880-XF0-1.0v-CH0	999 mV
LTC3880-XF0-1.0v-CH1	1002 mV
LTC3880-XF0-1.5v-RAIL	1455 mV
LTC3880-XF0-1.5v-CH0	1455 mV
LTC3880-XF0-1.5v-CH1	1456 mV
LTC3880-XF1-1.0v-RAIL	999 mV
LTC3880-XF1-1.0v-CH0	999 mV
LTC3880-XF1-1.0v-CH1	1002 mV
LTC3880-XF1-1.5v-RAIL	1455 mV
LTC3880-XF1-1.5v-CH0	1455 mV
LTC3880-XF1-1.5v-CH1	1457 mV

ADC 9 status:

State	Online
Intake Temperature	31 degrees C / 87 degrees F
Exhaust Temperature	43 degrees C / 109 degrees F

ADC-XF1 Temperature	48 degrees C / 118 degrees F
ADC-XF0 Temperature	56 degrees C / 132 degrees F
Power	
LTC3880-XF0-1.0v-RAIL	1029 mV
LTC3880-XF0-1.0v-CH0	1029 mV
LTC3880-XF0-1.0v-CH1	1033 mV
LTC3880-XF0-1.5v-RAIL	1455 mV
LTC3880-XF0-1.5v-CH0	1455 mV
LTC3880-XF0-1.5v-CH1	1457 mV
LTC3880-XF1-1.0v-RAIL	1029 mV
LTC3880-XF1-1.0v-CH0	1029 mV
LTC3880-XF1-1.0v-CH1	1033 mV
LTC3880-XF1-1.5v-RAIL	1454 mV
LTC3880-XF1-1.5v-CH0	1454 mV
LTC3880-XF1-1.5v-CH1	1457 mV

show chassis environment cb

Syntax	show chassis environment cb <slot>
Syntax (TX Matrix Routers)	show chassis environment cb <lcc number | scc> <slot>
Syntax (TX Matrix Plus Routers)	show chassis environment cb <lcc number | sfc number > <slot>
Syntax (MX Series Routers)	show chassis environment cb <slot> <all-members> <local> <member member-id>
Syntax (MX104 3D Universal Edge Routers)	show chassis environment cb
Syntax (MX2010 and MX2020 3D Universal Edge Routers)	show chassis environment cb <slot>
Syntax (QFabric System)	show chassis environment cb <slot interconnect-device interconnect-device-name> < interconnect-device interconnect-device-name slot>
Release Information	<p>Command introduced before Junos Release 7.4.</p> <p>Command introduced in Junos OS Release 9.4 for EX Series switches.</p> <p>Command introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers.</p> <p>Command introduced in Junos OS Release 12.1 for T4000 Core Routers.</p> <p>sfc option introduced for the TX Matrix Plus router in Junos Release 9.6.</p> <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> <p>Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.</p>
Description	(M120, M320, MX Series, and T Series routers, EX8200 switches, and PTX Series Packet Transport Routers only) Display environmental information about the Control Boards (CBs). For information about the meaning of “CBs” on the switches, see <i>EX Series Switches Hardware and CLI Terminology Mapping</i> .
Options	none —Display environmental information about all CBs. For a TX Matrix router, display environmental information about all CBs on the TX Matrix router and its attached T640 routers. For a TX Matrix Plus router, display environmental information about all CBs on the TX Matrix Plus router and its attached T1600 or T4000 routers.

all-members—(MX Series routers only) (Optional) Display environmental information about the CBs on all the members of the Virtual Chassis configuration.

interconnect-device—(QFabric systems only) Display environmental information about CBs on 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 CBs on the local Virtual Chassis member.

member member-id—(MX Series routers only) (Optional) Display environmental information about the CBs on the specified member of the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

scc—(TX Matrix router only) (Optional) Display environmental information about the CBs in the TX Matrix router (switch-card chassis).

sfc number—(TX Matrix Plus router only) (Optional) Display environmental information about the CBs in the TX Matrix Plus router (or switch-fabric chassis).

slot—(Optional) Display environmental information about the specified CB. On routers and PTX Series Packet Transport Routers, replace *slot* with 0 or 1. On EX Series switches replace *slot* with 0, 1, or 2. On QFX Series switches, replace *slot* with 0 or 1.

Required Privilege Level

view

Related Documentation

- [request chassis cb on page 440](#)
- *Switching Control Board Redundancy*
- *Routing Engine and Switching Control Board Redundancy Configuration Statements*

List of Sample Output

[show chassis environment cb \(M120 Router\) on page 605](#)
[show chassis environment cb \(M320 Router\) on page 605](#)
[show chassis environment cb \(MX80 Router\) on page 605](#)
[show chassis environment cb \(MX104 Router\) on page 606](#)
[show chassis environment cb \(MX240 Router\) on page 606](#)

[show chassis environment cb \(MX240 Router with Enhanced MX SCB\) on page 606](#)
[show chassis environment cb \(MX480 Router\) on page 607](#)
[show chassis environment cb \(MX480 Router with Enhanced MX SCB\) on page 607](#)
[show chassis environment cb \(MX960 Router\) on page 608](#)
[show chassis environment cb \(MX960 Router with Enhanced MX SCB\) on page 608](#)
[show chassis environment cb \(MX2020 Router\) on page 609](#)
[show chassis environment cb \(MX2010 Router\) on page 610](#)
[show chassis environment cb \(T4000 Core Router\) on page 610](#)
[show chassis environment cb \(TX Matrix Router\) on page 611](#)
[show chassis environment cb \(TX Matrix Plus Router\) on page 612](#)
[show chassis environment cb \(EX8200 Switch\) on page 616](#)
[show chassis environment cb \(EX8208 Switch\) on page 617](#)
[show chassis environment cb \(PTX5000 Packet Transport Router\) on page 618](#)
[show chassis environment cb \(QFabric System\) on page 619](#)

Output Fields [Table 39 on page 603](#) lists the output fields for the **show chassis environment cb** command. Output fields are listed in the approximate order in which they appear.

Table 39: show chassis environment cb Output Fields

Field Name	Field Description
State	<p>Status of the CB. If two CBs are installed and online, one is functioning as the master, and the other is the standby.</p> <ul style="list-style-type: none"> • Online—CB is online and running. • Offline—CB is powered down. <p>NOTE: On the EX8208 switch, the installation can include three CBs. See <i>EX Series Switches Hardware and CLI Terminology Mapping</i>.</p>
Temperature	<p>Temperature in Celsius (C) and Fahrenheit (F) of the air flowing past the CB.</p> <ul style="list-style-type: none"> • Temperature Intake—Measures the temperature of the air intake to cool the power supplies. • Temperature Exhaust—Measures the temperature of the hot air exhaust. <p>NOTE: On the MX2010 and MX2020 routers, the intake temperature measures the temperature of the air intake to cool the Control Board (CB). The MX2010 and MX2020 routers include intake and exhaust temperatures for multiple zones (Intake A, Intake B, Intake C, Exhaust A, Exhaust B, and TCBC).</p>
Power	<p>Power required and measured on the CB. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.</p>
BUS Revision	<p>Revision level of the generic bus device. (Not on switches.)</p>
FPGA Revision	<p>Revision level of the field-programmable gate array (FPGA). (Not on switches.)</p>

Table 39: show chassis environment cb Output Fields (*continued*)

Field Name	Field Description
PMBus device (on MX240, MX480, and MX960 routers with Enhanced MX SCB)	<p>Enhanced SCB on MX 240, MX480, and MX960 routers allows the system to save power by supplying only the amount of voltage that is required. Configurable PMBus devices are used to provide the voltage for each individual device. There is one PMBus device for each XF ASIC so that the output can be customized to each device. The following PMBus device information is displayed for routers with Enhanced MX SCB:</p> <ul style="list-style-type: none">• Expected voltage• Measured voltage• Measured current• Calculated power

Sample Output

show chassis
environment cb (M120
Router)

```
user@host> show chassis environment cb
CB 0 status:
  State                Online Master
  Temperature          33 degrees C / 91 degrees F
  Power
    1.2 V              1214 mV
    1.5 V              1495 mV
    2.5 V              2494 mV
    3.3 V              3319 mV
    5.0 V              5085 mV
    3.3 V bias         3296 mV
  Bus Revision         12
  FPGA Revision        17
CB 1 status:
  State                Online Standby
  Temperature          34 degrees C / 93 degrees F
  Power
    1.2 V              1195 mV
    1.5 V              1495 mV
    2.5 V              2504 mV
    3.3 V              3312 mV
    5.0 V              5111 mV
    3.3 V bias         3296 mV
  Bus Revision         12
  FPGA Revision        17
```

show chassis
environment cb (M320
Router)

```
user@host> show chassis environment cb
CB 0 status:
  State                Online Master
  Temperature          29 degrees C / 84 degrees F
  Power:
    1.8 V              1805 mV
    2.5 V              2501 mV
    3.3 V              3293 mV
    4.6 V              4725 mV
    5.0 V              5032 mV
    12.0 V             11975 mV
    3.3 V bias         3286 mV
    8.0 V bias         7589 mV
  BUS Revision         40
  FPGA Revision        7
CB 1 status:
  State                Online Standby
  Temperature          32 degrees C / 89 degrees F
  Power:
    1.8 V              1802 mV
    2.5 V              2482 mV
    3.3 V              3289 mV
    4.6 V              4720 mV
    5.0 V              5001 mV
    12.0 V             11946 mV
    3.3 V bias         3274 mV
    8.0 V bias         7562 mV
  BUS Revision         40
  FPGA Revision        7
```

**show chassis
environment cb (MX80
Router)**

```
user@host> show chassis environment cb
CB 0 status:
State                               Online Master
Temperature                         36 degrees C / 96 degrees F
Power 1
  1.0 V                             1034 mV
  1.0 V MQ                          1037 mV
  1.0 V LU                          1005 mV
  1.2 V                             1218 mV
  1.5 V                             1524 mV
  1.8 V                             1814 mV
  2.5 V                             2558 mV
  3.3 V                             3296 mV
  5.0 V                             5233 mV
  5.0 V bias                        5207 mV
  12.0 V                            12162 mV
```

**show chassis
environment cb
(MX104 Router)**

```
user@host > show chassis environment cb
CB 0 status:
State                               Online Master
Temperature                         33 degrees C / 91 degrees F
Power 1
  0.75 V                            751 mV
  1.0 V                             1005 mV
  1.1 V                             1113 mV
  1.5 V                             1494 mV
  2.5 V                             2518 mV
  3.3 V                             3338 mV
  5.0 V                             4960 mV
  12.0 V                            12006 mV
FPGA Revision                       25
CB 1 status:
State                               Empty
```

**show chassis
environment cb
(MX240 Router)**

```
user@host> show chassis environment cb
CB 0 status:
State                               Online Standby
Temperature                         37 degrees C / 98 degrees F
Power 1
  1.2 V                             1208 mV
  1.5 V                             1521 mV
  1.8 V                             1811 mV
  2.5 V                             2513 mV
  3.3 V                             3332 mV
  5.0 V                             5059 mV
  12.0 V                            12162 mV
  1.25 V                            1260 mV
  3.3 V SM3                         3306 mV
  5.0 V RE                          5085 mV
  12.0 V RE                         11872 mV
Power 2
  11.3 V bias PEM                   11272 mV
  4.6 V bias MidPlane               4827 mV
  11.3 V bias FPD                   11272 mV
  11.3 V bias POE 0                 11292 mV
  11.3 V bias POE 1                 11253 mV
Bus Revision                        42
FPGA Revision                       1
```

show chassis
environment cb
(MX240 Router with
Enhanced MX SCB)

```
user@host> show chassis environment cb
CB 0 status:
State                               Online Standby
Temperature                         37 degrees C / 98 degrees F
Power 1
  1.2 V                             1208 mV
  1.5 V                             1521 mV
  1.8 V                             1811 mV
  2.5 V                             2513 mV
  3.3 V                             3332 mV
  5.0 V                             5059 mV
  12.0 V                             12162 mV
  1.25 V                             1260 mV
  3.3 V SM3                         3306 mV
  5.0 V RE                          5085 mV
  12.0 V RE                         11872 mV
Power 2
  11.3 V bias PEM                   11272 mV
  4.6 V bias MidPlane               4827 mV
  11.3 V bias FPD                   11272 mV
  11.3 V bias POE 0                 11292 mV
  11.3 V bias POE 1                 11253 mV
Bus Revision                        42
FPGA Revision                       1
PMBus                               Expected Measured Measured Calculated
device                             voltage  voltage  current  power
XF ASIC A                         1000 mV   997 mV  11031 mA 10997 mW
XF ASIC B                         1000 mV   996 mV  12125 mA 12076 mW
```

show chassis
environment cb
(MX480 Router)

```
user@host> show chassis environment cb
CB 0 status:
State                               Online Master
Temperature                         41 degrees C / 105 degrees F
Power 1
  1.2 V                             1202 mV
  1.5 V                             1511 mV
  1.8 V                             1798 mV
  2.5 V                             2507 mV
  3.3 V                             3312 mV
  5.0 V                             5027 mV
  12.0 V                             12200 mV
  1.25 V                             1260 mV
  3.3 V SM3                         3293 mV
  5 V RE                            5040 mV
  12 V RE                           11910 mV
Power 2
  11.3 V bias PEM                   11156 mV
  4.6 V bias MidPlane               4801 mV
  11.3 V bias FPD                   11214 mV
  11.3 V bias POE 0                 11098 mV
  11.3 V bias POE 1                 11330 mV
Bus Revision                        42
FPGA Revision                       1
```

show chassis
environment cb

```
user@host> show chassis environment cb
CB 0 status:
State                               Online Master
```

**(MX480 Router with
Enhanced MX SCB)**

```

Temperature                                41 degrees C / 105 degrees F
Power 1
  1.2 V                                    1202 mV
  1.5 V                                    1511 mV
  1.8 V                                    1798 mV
  2.5 V                                    2507 mV
  3.3 V                                    3312 mV
  5.0 V                                    5027 mV
  12.0 V                                   12200 mV
  1.25 V                                   1260 mV
  3.3 V SM3                               3293 mV
  5 V RE                                  5040 mV
  12 V RE                                  11910 mV
Power 2
  11.3 V bias PEM                         11156 mV
  4.6 V bias MidPlane                     4801 mV
  11.3 V bias FPD                         11214 mV
  11.3 V bias POE 0                      11098 mV
  11.3 V bias POE 1                      11330 mV
Bus Revision                              42
FPGA Revision                             1
PMBus Expected Measured Measured Calculated
device voltage voltage current power
  XF ASIC A      1000 mV    997 mV   11031 mA   10997 mW
  XF ASIC B      1000 mV    996 mV   12125 mA   12076 mW

```

**show chassis
environment cb
(MX960 Router)**

```

user@host> show chassis environment cb
CB 0 status:
State                                Online Master
Temperature                          24 degrees C / 75 degrees F
Power 1
  1.2 V                                1965 mV
  1.5 V                                2465 mV
  1.8 V                                2990 mV
  2.5 V                                3296 mV
  3.3 V                                3296 mV
  5.0 V                                6593 mV
  12.0 V                               13187 mV
  3.3 V bias                           3296 mV
  1.25 V                               1994 mV
  3.3 V SM3                            3296 mV
  5 V RE                               6593 mV
  12 V RE                               13174 mV
Power 2                               Sensor failure
Bus Revision                           4
FPGA Revision                           3

```

**show chassis
environment cb**

```

user@host> show chassis environment cb
CB 0 status:
State                                Online Master

```


**(MX960 Router with
Enhanced MX SCB)**

```

Temperature                24 degrees C / 75 degrees F
Power 1
  1.2 V                    1965 mV
  1.5 V                    2465 mV
  1.8 V                    2990 mV
  2.5 V                    3296 mV
  3.3 V                    3296 mV
  5.0 V                    6593 mV
  12.0 V                   13187 mV
  3.3 V bias               3296 mV
  1.25 V                   1994 mV
  3.3 V SM3                3296 mV
  5 V RE                   6593 mV
  12 V RE                  13174 mV
Power 2                    Sensor failure
Bus Revision               4
FPGA Revision              3
PMBus
device      Expected    Measured    Measured    Calculated
            voltage     voltage     current     power
XF ASIC A   1000 mV      997 mV      11031 mA    10997 mW
XF ASIC B   1000 mV      996 mV      12125 mA    12076 mW

```

**show chassis
environment cb
(MX2020 Router)**

```

user@host> show chassis environment cb
CB 0 status:
  State                Online Master
  IntakeA-Zone0 Temperature 44 degrees C / 111 degrees F
  IntakeB-Zone1 Temperature 34 degrees C / 93 degrees F
  IntakeC-Zone0 Temperature 45 degrees C / 113 degrees F
  ExhaustA-Zone0 Temperature 43 degrees C / 109 degrees F
  ExhaustB-Zone1 Temperature 36 degrees C / 96 degrees F
  TCBC-Zone0 Temperature 39 degrees C / 102 degrees F
  Power 1
    1.0 V                1011 mV
    1.2 V                1208 mV
    1.8 V                1801 mV
    2.5 V                2552 mV
    3.3 V                3312 mV
    5.0 V                5040 mV
    5.0 V RE             4988 mV
    12.0 V               12065 mV
    12.0 V RE            12046 mV
  Bus Revision          99
  FPGA Revision         270
CB 1 status:
  State                Online Standby
  IntakeA-Zone0 Temperature 45 degrees C / 113 degrees F
  IntakeB-Zone1 Temperature 41 degrees C / 105 degrees F
  IntakeC-Zone0 Temperature 46 degrees C / 114 degrees F
  ExhaustA-Zone0 Temperature 44 degrees C / 111 degrees F
  ExhaustB-Zone1 Temperature 41 degrees C / 105 degrees F
  TCBC-Zone0 Temperature 45 degrees C / 113 degrees F
  Power 1
    1.0 V                1008 mV
    1.2 V                1208 mV
    1.8 V                1798 mV
    2.5 V                2539 mV
    3.3 V                3325 mV
    5.0 V                5033 mV
    5.0 V RE             4950 mV
    12.0 V               12046 mV
    12.0 V RE            11968 mV

```

```
Bus Revision          99
FPGA Revision         0
```

**show chassis
environment cb
(MX2010 Router)**

```
user@host> show chassis environment cb
CB 0 status:
  State                Online Master
  IntakeA-Zone0 Temperature 36 degrees C / 96 degrees F
  IntakeB-Zone1 Temperature 30 degrees C / 86 degrees F
  IntakeC-Zone0 Temperature 38 degrees C / 100 degrees F
  ExhaustA-Zone0 Temperature 36 degrees C / 96 degrees F
  ExhaustB-Zone1 Temperature 32 degrees C / 89 degrees F
  TCBC-Zone0 Temperature 34 degrees C / 93 degrees F
  Power 1
    1.0 V                1015 mV
    1.2 V                1205 mV
    1.8 V                1804 mV
    2.5 V                2552 mV
    3.3 V                3325 mV
    5.0 V                5020 mV
    5.0 V RE             4988 mV
    12.0 V               12104 mV
    12.0 V RE            12026 mV
  Bus Revision          100
  FPGA Revision         270
CB 1 status:
  State                Online
  IntakeA-Zone0 Temperature 35 degrees C / 95 degrees F
  IntakeB-Zone1 Temperature 28 degrees C / 82 degrees F
  IntakeC-Zone0 Temperature 37 degrees C / 98 degrees F
  ExhaustA-Zone0 Temperature 34 degrees C / 93 degrees F
  ExhaustB-Zone1 Temperature 29 degrees C / 84 degrees F
  TCBC-Zone0 Temperature 32 degrees C / 89 degrees F
  Power 1
    1.0 V                1011 mV
    1.2 V                1208 mV
    1.8 V                1788 mV
    2.5 V                2526 mV
    3.3 V                3319 mV
    5.0 V                5046 mV
    5.0 V RE             4975 mV
    12.0 V               12046 mV
    12.0 V RE            12007 mV
  Bus Revision          100
  FPGA Revision         0
```

**show chassis
environment cb
(T4000 Core Router)**

```
user@host> show chassis environment cb
CB 0 status:
  State                Online Master
  Temperature          33 degrees C / 91 degrees F
  Power 1
    1.8 V                1805 mV
    2.5 V                2523 mV
    3.3 V                3324 mV
    3.3 V bias           3296 mV
    4.6 V                4680 mV
    5.0 V                4893 mV
    8.0 V bias           7572 mV
    12.0 V               11916 mV
  Power 2
    1.0 V                993 mV
```

```

    1.2 V          1210 mV
    3.3 V RE       3330 mV
    Bus Revision   51
    FPGA Revision  5
CB 1 status:
  State           Online Standby
  Temperature      33 degrees C / 91 degrees F
  Power 1
    1.8 V          1810 mV
    2.5 V          2496 mV
    3.3 V          3308 mV
    3.3 V bias     3286 mV
    4.6 V          4692 mV
    5.0 V          4954 mV
    8.0 V bias     7282 mV
    12.0 V         11926 mV
  Power 2
    1.0 V          993 mV
    1.2 V          1185 mV
    3.3 V RE       3316 mV
    Bus Revision   51
    FPGA Revision  5

```

**show chassis
environment cb
(TX Matrix Router)**

```
user@host> show chassis environment cb
```

```

-----
CB 0 status:
  State           Online Master
  Temperature      32 degrees C / 89 degrees F
  Power:
    1.8 V          1797 mV
    2.5 V          2477 mV
    3.3 V          3311 mV
    4.6 V          4727 mV
    5.0 V          5015 mV
    12.0 V         12185 mV
    3.3 V bias     3304 mV
    8.0 V bias     7870 mV
  BUS Revision     40
  FPGA Revision    1
CB 1 status:
  State           Online Standby
...

```

```
1cc0-re0:
```

```

-----
CB 0 status:
  State           Online Master
  Temperature      32 degrees C / 89 degrees F
  Power:
    1.8 V          1787 mV
    2.5 V          2473 mV
    3.3 V          3306 mV
    4.6 V          4793 mV
    5.0 V          5025 mV
    12.0 V         12156 mV
    3.3 V bias     3289 mV
    8.0 V bias     7609 mV
  BUS Revision     40
  FPGA Revision    5
CB 1 status:
  State           Online Standby

```

```
....
BUS Revision          40
FPGA Revision         5
```

```
lcc2-re0:
```

```
-----
CB 0 status:
  State                Online Master
```

```
...
CB 1 status:
  State                Online Standby
...
```

**show chassis
environment cb**

```
user@host> show chassis environment cb
sfc0-re0:
-----
```

(TX Matrix Plus Router)

```

CB 0 status:
State                Online Master
Temperature          38 degrees C / 100 degrees F
Power 1
  1.0 V              1005 mV
  1.1 V              1108 mV
  1.2 V              1205 mV
  1.25 V             1269 mV
  1.5 V              1508 mV
  1.8 V              1814 mV
  2.5 V              2507 mV
  3.3 V              3306 mV
  3.3 V bias         3300 mV
  9.0 V              9058 mV
  9.0 V RE           9107 mV
Power 2
  3.9 V              3963 mV
  5.0 V              5020 mV
  9.0 V              9087 mV
Bus Revision         79
FPGA Revision        23
CB 1 status:
State                Online Standby
Temperature          39 degrees C / 102 degrees F
Power 1
  1.0 V              1002 mV
  1.1 V              1105 mV
  1.2 V              1198 mV
  1.25 V             1276 mV
  1.5 V              1504 mV
  1.8 V              1804 mV
  2.5 V              2507 mV
  3.3 V              3300 mV
  3.3 V bias         3293 mV
  9.0 V              9039 mV
  9.0 V RE           9049 mV
Power 2
  3.9 V              3892 mV
  5.0 V              5040 mV
  9.0 V              9058 mV
Bus Revision         79
FPGA Revision        23

```

```

1cc0-re0:
-----

```

```

CB 0 status:
State                Online Master
Temperature          39 degrees C / 102 degrees F
Power 1
  1.8 V              1799 mV
  2.5 V              2499 mV
  3.3 V              3327 mV
  3.3 V bias         3299 mV
  4.6 V              4673 mV
  5.0 V              4918 mV
  8.0 V bias         7308 mV
  12.0 V             11887 mV
Power 2
  1.0 V              996 mV
  1.2 V              1199 mV
  3.3 V RE           3319 mV

```

```

Bus Revision          51
FPGA Revision         3
CB 1 status:
State                 Online Standby
Temperature            40 degrees C / 104 degrees F
Power 1
  1.8 V               1800 mV
  2.5 V               2496 mV
  3.3 V               3322 mV
  3.3 V bias          3284 mV
  4.6 V               4680 mV
  5.0 V               4954 mV
  8.0 V bias          7284 mV
  12.0 V              11902 mV
Power 2
  1.0 V               998 mV
  1.2 V               1205 mV
  3.3 V RE            3327 mV
Bus Revision          51
FPGA Revision         3

```

```

lcc1-re0:
-----

```

```

CB 0 status:
State                 Online Master
Temperature            41 degrees C / 105 degrees F
Power 1
  1.8 V               1804 mV
  2.5 V               2517 mV
  3.3 V               3300 mV
  3.3 V bias          3284 mV
  4.6 V               4681 mV
  5.0 V               4927 mV
  8.0 V bias          7357 mV
  12.0 V              11907 mV
Power 2
  1.0 V               991 mV
  1.2 V               1202 mV
  3.3 V RE            3301 mV
Bus Revision          51
FPGA Revision         3

```

```

CB 1 status:
State                 Online Standby
Temperature            40 degrees C / 104 degrees F
Power 1
  1.8 V               1805 mV
  2.5 V               2528 mV
  3.3 V               3324 mV
  3.3 V bias          3289 mV
  4.6 V               4694 mV
  5.0 V               4959 mV
  8.0 V bias          7311 mV
  12.0 V              11926 mV
Power 2
  1.0 V               998 mV
  1.2 V               1200 mV
  3.3 V RE            3313 mV
Bus Revision          51
FPGA Revision         3

```

```

lcc2-re0:

```

```

-----
CB 0 status:
State                Online Master
Temperature           41 degrees C / 105 degrees F
Power 1
  1.8 V              1805 mV
  2.5 V              2494 mV
  3.3 V              3333 mV
  3.3 V bias         3296 mV
  4.6 V              4673 mV
  5.0 V              4901 mV
  8.0 V bias         7343 mV
  12.0 V             11916 mV
Power 2
  1.0 V              993 mV
  1.2 V              1213 mV
  3.3 V RE           3328 mV
Bus Revision          51
FPGA Revision         3
CB 1 status:
State                Online Standby
Temperature           41 degrees C / 105 degrees F
Power 1
  1.8 V              1804 mV
  2.5 V              2523 mV
  3.3 V              3334 mV
  3.3 V bias         3291 mV
  4.6 V              4697 mV
  5.0 V              4969 mV
  8.0 V bias         7308 mV
  12.0 V             11936 mV
Power 2
  1.0 V              996 mV
  1.2 V              1200 mV
  3.3 V RE           3328 mV
Bus Revision          51
FPGA Revision         3

```

```

lcc3-re0:
-----

```

```

CB 0 status:
State                Online Master
Temperature           37 degrees C / 98 degrees F
Power 1
  1.8 V              1809 mV
  2.5 V              2510 mV
  3.3 V              3296 mV
  3.3 V bias         3291 mV
  4.6 V              4670 mV
  5.0 V              4905 mV
  8.0 V bias         7211 mV
  12.0 V             11882 mV
Power 2
  1.0 V              996 mV
  1.2 V              1188 mV
  3.3 V RE           3326 mV
Bus Revision          51
FPGA Revision         5
CB 1 status:
State                Online Standby
Temperature           38 degrees C / 100 degrees F

```

```

Power 1
 1.8 V          1813 mV
 2.5 V          2510 mV
 3.3 V          3322 mV
 3.3 V bias     3289 mV
 4.6 V          4692 mV
 5.0 V          4967 mV
 8.0 V bias     7194 mV
12.0 V          11916 mV
Power 2
 1.0 V          996 mV
 1.2 V          1205 mV
 3.3 V RE       3273 mV
Bus Revision    51
FPGA Revision   5

```

show chassis
environment cb
(EX8200 Switch)

```
user@host> show chassis environment cb
```

```

CB 0 status:
State                Online Master
Temperature Intake    20 degrees C / 68 degrees F
Temperature Exhaust   24 degrees C / 75 degrees F
Power 1
 1.1 V                1086 mV
 1.2 V                1179 mV
 1.2 V *              1182 mV
 1.2 V *              1182 mV
 1.25 V               1211 mV
 1.5 V                1472 mV
 1.8 V                1756 mV
 2.5 V                2449 mV
 3.3 V                3254 mV
 3.3 V bias           3300 mV
 5.0 V                4911 mV
12.0 V               11891 mV
Power 2
 3.3 V bias *         3615 mV
 3.3 V bias *         3615 mV
 3.3 V bias *         3567 mV
 3.3 V bias *         3664 mV
 4.3 V bias *         4224 mV
 4.3 V bias *         4215 mV
 4.3 V bias *         4224 mV
 4.3 V bias *         4205 mV
 4.3 V bias *         4195 mV
 4.3 V bias *         4215 mV
 5.0 V bias           4920 mV
CB 1 status:
State                Online Standby
Temperature Intake    19 degrees C / 66 degrees F
Temperature Exhaust   23 degrees C / 73 degrees F
Power 1
 1.1 V                1082 mV
 1.2 V                1169 mV
 1.2 V *              1179 mV
 1.2 V *              1179 mV
 1.25 V               1214 mV
 1.5 V                1482 mV
 1.8 V                1759 mV
 2.5 V                2481 mV
 3.3 V                3248 mV

```



```

3.3 V bias          3306 mV
5.0 V              4911 mV
12.0 V            11910 mV
Power 2
3.3 V bias *       3644 mV
3.3 V bias *       3664 mV
3.3 V bias *       3586 mV
3.3 V bias *       3654 mV
4.3 V bias *       4224 mV
4.3 V bias *       4215 mV
4.3 V bias *       4224 mV
4.3 V bias *       4205 mV
4.3 V bias *       4244 mV
4.3 V bias *       4215 mV
5.0 V bias         4930 mV
CB 2 status:
State              Online
Temperature Intake 19 degrees C / 66 degrees F
Temperature Exhaust 23 degrees C / 73 degrees F
Power 1
1.2 V              1195 mV
1.5 V              1511 mV
1.8 V              1804 mV
2.5 V              2526 mV
3.3 V              3300 mV
3.3 V bias         3306 mV
12.0 V            12220 mV

```

**show chassis
environment cb
(EX8208 Switch)**

```

user@host> show chassis environment cb
CB 0 status:
State              Online Master
Temperature Intake 20 degrees C / 68 degrees F
Temperature Exhaust 24 degrees C / 75 degrees F
Power 1
1.1 V              1086 mV
1.2 V              1179 mV
1.2 V *            1182 mV
1.2 V *            1182 mV
1.25 V             1211 mV
1.5 V              1466 mV
1.8 V              1759 mV
2.5 V              2455 mV
3.3 V              3261 mV
3.3 V bias         3300 mV
5.0 V              4930 mV
12.0 V            11891 mV
Power 2
3.3 V bias *       3606 mV
3.3 V bias *       3615 mV
3.3 V bias *       3567 mV
3.3 V bias *       3673 mV
4.3 V bias *       4224 mV
4.3 V bias *       4215 mV
4.3 V bias *       4234 mV
4.3 V bias *       4205 mV
4.3 V bias *       4186 mV
4.3 V bias *       4215 mV
5.0 V bias         4940 mV
CB 1 status:
State              Online Standby
Temperature Intake 19 degrees C / 66 degrees F

```

```
Temperature Exhaust      23 degrees C / 73 degrees F
Power 1
  1.1 V                  1086 mV
  1.2 V                  1169 mV
  1.2 V *                1179 mV
  1.2 V *                1179 mV
  1.25 V                 1211 mV
  1.5 V                  1479 mV
  1.8 V                  1759 mV
  2.5 V                  2475 mV
  3.3 V                  3235 mV
  3.3 V bias             3306 mV
  5.0 V                  4930 mV
  12.0 V                 11891 mV
Power 2
  3.3 V bias *           3644 mV
  3.3 V bias *           3664 mV
  3.3 V bias *           3586 mV
  3.3 V bias *           3654 mV
  4.3 V bias *           4215 mV
  4.3 V bias *           4224 mV
  4.3 V bias *           4215 mV
  4.3 V bias *           4215 mV
  4.3 V bias *           4234 mV
  4.3 V bias *           4224 mV
  5.0 V bias             4920 mV
CB 2 status:
State                     Online
Temperature Intake        20 degrees C / 68 degrees F
Temperature Exhaust       24 degrees C / 75 degrees F
Power 1
  1.2 V                  1202 mV
  1.5 V                  1508 mV
  1.8 V                  1804 mV
  2.5 V                  2520 mV
  3.3 V                  3300 mV
  3.3 V bias             3300 mV
  12.0 V                 12200 mV
```

`show chassis`
`environment cb`

```
user@host> show chassis environment cb
CB 0 status:
State                     Online Master
```

(PTX5000 Packet Transport Router)

```

Intake Temperature      38 degrees C / 100 degrees F
Exhaust A Temperature   45 degrees C / 113 degrees F
Exhaust B Temperature   42 degrees C / 107 degrees F
Power 1
  1.2 V                 1200 mV
  1.25 V                1250 mV
  2.5 V                 2500 mV
  3.3 V                 3300 mV
Power 2
  1.0 V                 1000 mV
  3.3 V bias            3293 mV
  3.9 V                 3921 mV
Bus Revision            132
FPGA Revision           27
CB 1 status:
State                   Online Standby
Intake Temperature      34 degrees C / 93 degrees F
Exhaust A Temperature   39 degrees C / 102 degrees F
Exhaust B Temperature   36 degrees C / 96 degrees F
Power 1
  1.2 V                 1199 mV
  1.25 V                1250 mV
  2.5 V                 2499 mV
  3.3 V                 3299 mV
Power 2
  1.0 V                 1000 mV
  3.3 V bias            3312 mV
  3.9 V                 3961 mV
Bus Revision            132
FPGA Revision           28

```

**show chassis
environment cb
(QFabric System)**

```

user@switch> show chassis environment cb interconnect-device IC-123 0
CB 0 status:
State                   Online Master
Left Intake Temperature 33 degrees C / 91 degrees F
Right Intake Temperature 33 degrees C / 91 degrees F
Left Exhaust Temperature 36 degrees C / 96 degrees F
Right Exhaust Temperature 35 degrees C / 95 degrees F
Power                   OK
  VDD 3V3               3294 mV
  VDD 2V5               2436 mV
  VDD 1V8               1746 mV
  VDD 1V5               1460 mV
  VDD 1V25              1210 mV
  VDD 1V2               1164 mV
  CPU CORE 1V2          1120 mV
  VDD 1V0               968 mV
  VDD 5V0               5088 mV
  CPU MP BIAS 4V3       4050 mV
  BIAS 3V3              3180 mV
  VTT 0V9               866 mV

```

show chassis environment fpc

Syntax	show chassis environment fpc <slot>
Syntax (TX Matrix and TX Matrix Plus Routers)	show chassis environment fpc <lcc number> <slot>
Syntax (MX Series Routers)	show chassis environment fpc <slot> <all-members> <local> <member <i>member-id</i> >
Syntax (MX2010 3D Universal Edge Routers)	show chassis environment fpc <slot>
Syntax (MX2020 3D Universal Edge Routers)	show chassis environment fpc <slot>
Syntax (QFX Series)	show chassis environment fpc <fpc-slot> interconnect-device <i>name</i>
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 QFX Series. Command introduced 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 12.3 for MX2020 3D Universal Edge Routers. Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.
Description	(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 <i>name</i> —(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 449](#)
 - [show chassis fpc on page 988](#)
 - [show chassis fpc-feb-connectivity on page 1018](#)
 - [Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online on page 165](#)
 - [MX960 Flexible PIC Concentrator Description](#)

- List of Sample Output**
- [show chassis environment fpc \(M120 Router\) on page 624](#)
 - [show chassis environment fpc \(M160 Router\) on page 624](#)
 - [show chassis environment fpc \(M320 Router\) on page 625](#)
 - [show chassis environment fpc \(MX2020 Router\) on page 626](#)
 - [show chassis environment fpc \(MX2010 Router\) on page 628](#)
 - [show chassis environment fpc \(MX240 Router\) on page 631](#)
 - [show chassis environment fpc \(MX480 Router\) on page 632](#)
 - [show chassis environment fpc \(MX960 Router\) on page 632](#)
 - [show chassis environment fpc \(MX480 Router with 100-Gigabit Ethernet CFP\) on page 634](#)
 - [show chassis environment fpc \(MX240, MX480, MX960 with Application Services Modular Line Card\) on page 636](#)
 - [show chassis environment fpc \(T320, T640, and T1600 Routers\) on page 636](#)
 - [show chassis environment fpc \(T4000 Router\) on page 637](#)
 - [show chassis environment fpc lcc \(TX Matrix Router\) on page 642](#)
 - [show chassis environment fpc lcc \(TX Matrix Plus Router\) on page 643](#)
 - [show chassis environment fpc \(QFX Series\) on page 644](#)
 - [show chassis environment fpc interconnect-device \(QFabric Systems\) on page 644](#)
 - [show chassis environment fpc 0 \(PTX5000 Packet Transport Router\) on page 645](#)
 - [show chassis environment FPC 1 \(MX Routers with Media Services Blade \[MSB\]\) on page 646](#)

Output Fields [Table 40 on page 623](#) lists the output fields for the **show chassis environment fpc** command. Output fields are listed in the approximate order in which they appear.

Table 40: show chassis environment fpc Output Fields

Field Name	Field Description
State	<p>Status of the FPC:</p> <ul style="list-style-type: none"> • Unknown—FPC is not detected by the router. • Empty—No FPC is present. • Present—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. • Ready—FPC is in intermediate or transition state. • Announce online—Intermediate state during which the FPC is coming up but not yet online, and the chassis manager acknowledges the chassisd FPC online initiative. • Online—FPC is online and running. • Offline—FPC is powered down. • Diagnostics—FPC is set to operate in diagnostics mode.
Temperature	(M40e and M160 routers and QFX Series only) Temperature of the air flowing past the FPC.
PMB Temperature	(PTX Series only) Temperature of the air flowing past the PMB (bottom of the FPC).
Temperature Intake	(M320 routers, MX2010 routers, MX2020 routers, and PTX Series only) Temperature of the air flowing into the chassis.
Temperature Top	(T Series routers only) Temperature of the air flowing past the top of the FPC.
Temperature Exhaust	<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 (Exhaust A and Exhaust B).</p>
Temperature Bottom	(T Series routers only) Temperature of the air flowing past the bottom of the FPC.
TL <i>n</i> Temperature	(PTX Series only) Temperature of the air flowing past the specified TL area of the packet forwarding engine (PFE) on the FPC.
TQ <i>n</i> Temperature	(PTX Series only) Temperature of the air flowing past the specified TQ area of the packet forwarding engine (PFE) on the FPC.
Temperature MMBO	(T640 router only) Temperature of the air flowing past the type 3 FPC.
Temperature MMB1	(M320 and T Series routers only) Temperature of the air flowing past the type 1, type 2, and type 3 FPC.
Power	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.
CMB Revision or BUS revision	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

user@host> show chassis environment fpc
```


**show chassis
environment fpc (M160
Router)**

```
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

```
user@host> show chassis environment fpc
FPC 0 status:
  State           Online
  Temperature Intake 32 degrees C / 89 degrees F
```

100-Gigabit Ethernet
CFP)

```

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**

```
user@host> show chassis environment fpc
```

FPC 0 status:

State	Online
-------	--------

(T320, T640, and
T1600 Routers)

```

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 0 (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

```
user@host> show chassis environment fpc lcc 0  
lcc0-re0:  
-----
```

(TX Matrix Plus Router)

```
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)**

```
user@switch> show chassis environment fpc 0
FPC 0 status:
State                               Online
Temperature                         42 degrees C / 107 degrees F
```

**show chassis
environment fpc**

```
user@switch> show chassis environment fpc interconnect-device interconnect1 0
FC 0 FPC 0 status:
State                               Online
```

**interconnect-device
(QFabric Systems)**

```
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**

```
user@switch> show chassis environment fpc 0
FPC 0 status:
State                Online
```

(PTX5000 Packet Transport Router)

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 FPC1(MX)**

```
user@switch> show chassis environment fpc 1
FPC 1 status:
State                Online
```

Routers with Media Services Blade [MSB])

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 fpm

Syntax	show chassis environment fpm
Syntax (TX Matrix Routers)	show chassis environment fpm <lcc <i>number</i> | scc>
Syntax (TX Matrix Plus Routers)	show chassis environment fpm <lcc <i>number</i> | sfc <i>number</i> >
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6.</p> <p>Command introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers.</p> <p>Command introduced in Junos OS Release 12.1 for 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>
Description	(M40e, M120, M160, M320, MX Series, and T Series routers and the PTX Series Packet Transport Routers only) Display environmental information about the front panel module in the router.
Options	<p>none—(TX Matrix and TX Matrix Plus routers only) On a TX Matrix router, display environmental information about the front panel modules (craft interfaces) on the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display environmental information about the front panel modules (craft interfaces) on the TX Matrix Plus router and its attached routers.</p> <p>lcc <i>number</i>—(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">• 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. <p>scc—(TX Matrix router only) (Optional) Display environmental information about the front panel module (craft interface) on the TX Matrix router (or switch-card chassis).</p> <p>sfc <i>number</i>—(TX Matrix Plus router only) (Optional) Display environmental information about the front panel module (craft interface) on the TX Matrix Plus router (or switch-fabric chassis).</p>

Required Privilege Level view

Related Documentation

- [request chassis fpm resync on page 453](#)

List of Sample Output

- [show chassis environment fpm \(M40e and M160 Routers\) on page 650](#)
- [show chassis environment fpm \(M320 Router\) on page 651](#)
- [show chassis environment fpm \(MX2010 Router\) on page 651](#)
- [show chassis environment fpm \(MX2020 Router\) on page 651](#)
- [show chassis environment fpm \(MX240 Router\) on page 651](#)
- [show chassis environment fpm \(MX480 Router\) on page 651](#)
- [show chassis environment fpm \(T Series Routers\) on page 651](#)
- [show chassis environment fpm lcc \(TX Matrix Router\) on page 651](#)
- [show chassis environment fpm scc \(TX Matrix Router\) on page 652](#)
- [show chassis environment fpm sfc \(TX Matrix Plus Router\) on page 652](#)
- [show chassis environment fpm \(T4000 Core Router\) on page 653](#)
- [show chassis environment fpm \(PTX5000 Packet Transport Router\) on page 654](#)

Output Fields Table 41 on page 649 lists the output fields for the **show chassis environment fpm** command. Output fields are listed in the approximate order in which they appear.

Table 41: show chassis environment fpm Output Fields

Field Name	Field Description
State	FPM status: <ul style="list-style-type: none"> • Online—FPM is online and running. • Offline—FPM is powered down.
FPM CMB Voltage	(M40e and M160 routers only) Information about the voltage supplied to the FPM chassis management bus (CMB) device. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.
FPM GBUS Voltage	(M320 and T Series routers only) Information about the voltage supplied to the FPM generic bus (GBUS) device. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.
FPM I2CS Voltage	(PTX Series only) Information about the voltage supplied to the FPM generic bus (I2CS) device. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.
FPM Display Voltage	Information about the voltage supplied to the FPM display. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.
FPM CMB Temperature	(M40e and M160 routers only) Temperature of the air flowing past the FPM CMB device
FPM GBUS Temperature	(M320 and T Series routers only) Temperature of the air flowing past the FPM GBUS device.
FPM I2CS Temperature	(PTX Series only) Temperature of the air flowing past the FPM I2CS device.

Table 41: show chassis environment fpm Output Fields (*continued*)

Field Name	Field Description
FPM Display Temperature	Temperature of the air flowing past the FPM display.
CMB Revision	(M40e and M160 routers only) Revision level of the CMB device.
GBUS Revision	(M320 and T Series routers only) Revision level of the GBUS device.
I2CS Revision	(MX2010 routers, MX2020 routers, and PTX Series only) Revision level of the I2CS device.

Sample Output

**show chassis
environment fpm**

```
user@host> show chassis environment fpm
FPM status:
  State                Online
```

(M40e and M160 Routers)

```

FPM CMB Voltage:
  5.0 V bias      5030 mV
  8.0 V bias      8083 mV
FPM Display Voltage:
  5.0 V bias      4998 mV
FPM CMB temperature  34 degrees C / 93 degrees F
FPM Display temperature 35 degrees C / 95 degrees F
CMB Revision        12

```

show chassis environment fpm (M320 Router)

```

user@host> show chassis environment fpm
FPM status:
  State                        Online
FPM GBUS Voltage:
  5.0 V                        5006 mV
  1.8 V bias                   1799 mV
  3.3 V bias                   3294 mV
  5.0 V bias                   4998 mV
  8.0 V bias                   7682 mV
FPM GBUS temperature          30 degrees C / 86 degrees F
GBUS Revision                 51

```

show chassis environment fpm (MX2010 Router)

```

user@host > show chassis environment fpm
FPM status:
  State                        Online
I2CS Revision                 4

```

show chassis environment fpm (MX2020 Router)

```

user@host > show chassis environment fpm
FPM status:
  State                        Online
I2CS Revision                 3

```

show chassis environment fpm (MX240 Router)

```

user@host> show chassis environment fpm
FPM status:
  State                        Online
I2CS Revision                 41

```

show chassis environment fpm (MX480 Router)

```

user@host> show chassis environment fpm
FPM status:
  State                        Online
I2CS Revision                 41

```

show chassis environment fpm (T Series Routers)

```

user@host> show chassis environment fpm
FPM status:
  State                        Online
FPM GBUS Voltage:
  1.8 V bias                   1787 mV
  3.3 V bias                   3286 mV
  5.0 V bias                   4991 mV
  8.0 V bias                   7162 mV
FPM Display Voltage:
  5.0 V                        4996 mV
FPM GBUS temperature          29 degrees C / 84 degrees F
FPM Display temperature       26 degrees C / 78 degrees F
GBUS Revision                 37

```

**show chassis
environment fpm lcc
(TX Matrix Router)**

```
user@host> show chassis environment fpm lcc 0
lcc0-re0:
-----
FPM status:
State                               Online
FPM GBUS Voltage:
  1.8 V bias                        1797 mV
  3.3 V bias                        3294 mV
  5.0 V bias                        5015 mV
  8.0 V bias                        7470 mV
FPM Display Voltage:
  5.0 V                            5018 mV
FPM GBUS temperature                25 degrees C / 77 degrees F
FPM Display temperature             29 degrees C / 84 degrees F
GBUS Revision                       37
```

**show chassis
environment fpm scc
(TX Matrix Router)**

```
user@host> show chassis environment fpm scc
scc-re0:
-----
FPM status:
State                               Online
FPM GBUS Voltage:
  1.8 V bias                        1789 mV
  3.3 V bias                        3296 mV
  5.0 V bias                        5003 mV
  8.0 V bias                        7592 mV
FPM Display Voltage:
  5.0 V                            5010 mV
FPM GBUS temperature                22 degrees C / 71 degrees F
FPM Display temperature             27 degrees C / 80 degrees F
GBUS Revision                       37
```

**show chassis
environment fpm sfc**

```
user@host> show chassis environment fpm sfc
sfc0-re0:
```

(TX Matrix Plus Router)

```

-----
FPM status:
State                               Online
FPM I2CS Voltage:
  3.3 V                             3300 mV
  5.0 V                             5001 mV
  9.0 V FPD                         8672 mV
FPM I2CS temperature                33 degrees C / 91 degrees F
I2CS Revision                       69

```

lcc0-re0:

```

-----
FPM status:
State                               Online
FPM GBUS Voltage:
  1.8 V bias                        1802 mV
  3.3 V bias                        3301 mV
  5.0 V bias                        4984 mV
  8.0 V bias                        7377 mV
FPM Display Voltage:
  5.0 V                             5015 mV
FPM GBUS temperature                30 degrees C / 86 degrees F
FPM Display temperature              32 degrees C / 89 degrees F
GBUS Revision                       37

```

lcc1-re0:

```

-----
FPM status:
State                               Online
FPM GBUS Voltage:
  1.8 V bias                        1789 mV
  3.3 V bias                        3311 mV
  5.0 V bias                        5013 mV
  8.0 V bias                        7467 mV
FPM Display Voltage:
  5.0 V                             5015 mV
FPM GBUS temperature                29 degrees C / 84 degrees F
FPM Display temperature              31 degrees C / 87 degrees F
GBUS Revision                       37

```

 show chassis
 environment fpm
 (T4000 Core Router)

```

user@host> show chassis environment fpm
CB 0 status:
State                               Online Master
Temperature                         34 degrees C / 93 degrees F
Power 1
  1.8 V                             1804 mV
  2.5 V                             2499 mV
  3.3 V                             3317 mV
  3.3 V bias                        3291 mV
  4.6 V                             4663 mV
  5.0 V                             4905 mV
  8.0 V bias                        7658 mV
  12.0 V                            11877 mV
Power 2
  1.0 V                             996 mV
  1.2 V                             1207 mV
  3.3 V RE                          3354 mV
Bus Revision                        51
FPGA Revision                       5
CB 1 status:
State                               Online Standby

```

Temperature	36 degrees C / 96 degrees F
Power 1	
1.8 V	1791 mV
2.5 V	2494 mV
3.3 V	3321 mV
3.3 V bias	3301 mV
4.6 V	4666 mV
5.0 V	4945 mV
8.0 V bias	7645 mV
12.0 V	11897 mV
Power 2	
1.0 V	991 mV
1.2 V	1201 mV
3.3 V RE	3289 mV
Bus Revision	51
FPGA Revision	5

user@host> show chassis environment fpm

FPM status:

State	Online
FPM GBUS Voltage:	
1.8 V bias	1802 mV
3.3 V bias	3294 mV
5.0 V bias	5003 mV
8.0 V bias	7306 mV
FPM Display Voltage:	
5.0 V	5010 mV
FPM GBUS temperature	26 degrees C / 78 degrees F
FPM Display temperature	29 degrees C / 84 degrees F
GBUS Revision	37

**show chassis
environment fpm
(PTX5000 Packet
Transport Router)**

user@host> show chassis environment fpm

FPM status:

State	Online
FPM I2CS Voltage:	
3.3 V	3300 mV
5.0 V	4975 mV
FPM I2CS temperature	37 degrees C / 98 degrees F
I2CS Revision	109

show chassis environment monitored

Syntax	show chassis environment monitored
Release Information	Command introduced in Junos OS Release 12.1 for PTX Series Packet Transport 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.
Description	<p>(PTX Series Packet Transport Routers, and MX2010 and MX2020 routers) Display status information for monitored temperatures.</p> <p>On the PTX Series Packet Transport Routers, and on MX2010 and MX2020 routers, you can configure which temperatures are monitored for computing temperature alarms. Use this command to display only the temperatures that are monitored. Temperatures that are not included in the temperature alarm computations are not displayed.</p>
Options	This command has no options.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show chassis environment on page 533 • <i>Chassis-Level Feature Guide</i> • <i>Chassis Operational Mode Commands</i> • <i>PTX Series Getting Started Guide</i>
List of Sample Output	show chassis environment monitored (PTX5000 Packet Transport Router) on page 656 show chassis environment monitored (MX2010 Router) on page 656 show chassis environment monitored (MX2020 Router) on page 659
Output Fields	Table 42 on page 655 lists the output fields for the show chassis environment monitored command. Output fields are listed in the approximate order in which they appear.

Table 42: show chassis environment monitored Output Fields

Field Name	Field Description
Item	<p>Chassis component:</p> <ul style="list-style-type: none"> • (PTX Series Packet Transport Routers, and MX2010 and MX2020 routers)—Information about the chassis, Routing Engines, Control Boards (CBs), Switch Interface Boards (SIBs), PICs, and Flexible PIC Concentrators (FPCs).
Status	Status of the specified item. Status can be OK or Alarm .
Measurement	Temperature of the air flowing past the specified chassis component. Temperature is displayed in degrees Celsius (C) and degrees Fahrenheit (F).

Sample Output

**show chassis
environment
monitored (PTX5000
Packet Transport
Router)**

```
user@host> show chassis environment monitored
Class Item                               Status      Measurement
Routing Engine 0 CPU                    OK          71 degrees C / 159 degrees F
Routing Engine 1 CPU                    OK          62 degrees C / 143 degrees F
CB 0 Exhaust A                          OK          45 degrees C / 113 degrees F
CB 0 Exhaust B                          OK          41 degrees C / 105 degrees F
CB 1 Exhaust A                          OK          39 degrees C / 102 degrees F
CB 1 Exhaust B                          OK          36 degrees C / 96 degrees F
```

**show chassis
environment**

```
user@host > show chassis environment monitored
Class Item                               Status      Measurement
Temp CB 0 IntakeA-Zone0                 OK          37 degrees C / 98 degrees F
```


monitored (MX2010 Router)

CB 0 IntakeB-Zone1	OK	31 degrees C / 87 degrees F
CB 0 IntakeC-Zone0	OK	39 degrees C / 102 degrees F
CB 0 ExhaustA-Zone0	OK	36 degrees C / 96 degrees F
CB 0 ExhaustB-Zone1	OK	32 degrees C / 89 degrees F
CB 0 TCBC-Zone0	OK	34 degrees C / 93 degrees F
CB 1 IntakeA-Zone0	OK	36 degrees C / 96 degrees F
CB 1 IntakeB-Zone1	OK	28 degrees C / 82 degrees F
CB 1 IntakeC-Zone0	OK	38 degrees C / 100 degrees F
CB 1 ExhaustA-Zone0	OK	36 degrees C / 96 degrees F
CB 1 ExhaustB-Zone1	OK	30 degrees C / 86 degrees F
CB 1 TCBC-Zone0	OK	33 degrees C / 91 degrees F
SPMB 0 Intake	OK	30 degrees C / 86 degrees F
SPMB 1 Intake	OK	28 degrees C / 82 degrees F
Routing Engine 0 CPU	OK	32 degrees C / 89 degrees F
Routing Engine 1 CPU	Present	
SFB 0 Intake-Zone0	OK	46 degrees C / 114 degrees F
SFB 0 Exhaust-Zone1	OK	38 degrees C / 100 degrees F
SFB 0 IntakeA-Zone0	OK	35 degrees C / 95 degrees F
SFB 0 IntakeB-Zone1	OK	31 degrees C / 87 degrees F
SFB 0 Exhaust-Zone0	OK	39 degrees C / 102 degrees F
SFB 0 SFB-XF2-Zone1	OK	44 degrees C / 111 degrees F
SFB 0 SFB-XF1-Zone0	OK	47 degrees C / 116 degrees F
SFB 0 SFB-XF0-Zone0	OK	56 degrees C / 132 degrees F
SFB 1 Intake-Zone0	OK	34 degrees C / 93 degrees F
SFB 1 Exhaust-Zone1	OK	34 degrees C / 93 degrees F
SFB 1 IntakeA-Zone0	OK	29 degrees C / 84 degrees F
SFB 1 IntakeB-Zone1	OK	29 degrees C / 84 degrees F
SFB 1 Exhaust-Zone0	OK	32 degrees C / 89 degrees F
SFB 1 SFB-XF2-Zone1	OK	42 degrees C / 107 degrees F
SFB 1 SFB-XF1-Zone0	OK	40 degrees C / 104 degrees F
SFB 1 SFB-XF0-Zone0	OK	42 degrees C / 107 degrees F
SFB 2 Intake-Zone0	OK	33 degrees C / 91 degrees F
SFB 2 Exhaust-Zone1	OK	33 degrees C / 91 degrees F
SFB 2 IntakeA-Zone0	OK	28 degrees C / 82 degrees F
SFB 2 IntakeB-Zone1	OK	28 degrees C / 82 degrees F
SFB 2 Exhaust-Zone0	OK	31 degrees C / 87 degrees F
SFB 2 SFB-XF2-Zone1	OK	41 degrees C / 105 degrees F
SFB 2 SFB-XF1-Zone0	OK	39 degrees C / 102 degrees F
SFB 2 SFB-XF0-Zone0	OK	42 degrees C / 107 degrees F
SFB 3 Intake-Zone0	OK	33 degrees C / 91 degrees F
SFB 3 Exhaust-Zone1	OK	33 degrees C / 91 degrees F
SFB 3 IntakeA-Zone0	OK	29 degrees C / 84 degrees F
SFB 3 IntakeB-Zone1	OK	28 degrees C / 82 degrees F
SFB 3 Exhaust-Zone0	OK	31 degrees C / 87 degrees F
SFB 3 SFB-XF2-Zone1	OK	43 degrees C / 109 degrees F
SFB 3 SFB-XF1-Zone0	OK	40 degrees C / 104 degrees F
SFB 3 SFB-XF0-Zone0	OK	42 degrees C / 107 degrees F
SFB 4 Intake-Zone0	OK	34 degrees C / 93 degrees F
SFB 4 Exhaust-Zone1	OK	34 degrees C / 93 degrees F
SFB 4 IntakeA-Zone0	OK	29 degrees C / 84 degrees F
SFB 4 IntakeB-Zone1	OK	28 degrees C / 82 degrees F
SFB 4 Exhaust-Zone0	OK	32 degrees C / 89 degrees F
SFB 4 SFB-XF2-Zone1	OK	43 degrees C / 109 degrees F
SFB 4 SFB-XF1-Zone0	OK	42 degrees C / 107 degrees F
SFB 4 SFB-XF0-Zone0	OK	43 degrees C / 109 degrees F
SFB 5 Intake-Zone0	OK	34 degrees C / 93 degrees F
SFB 5 Exhaust-Zone1	OK	34 degrees C / 93 degrees F
SFB 5 IntakeA-Zone0	OK	30 degrees C / 86 degrees F
SFB 5 IntakeB-Zone1	OK	28 degrees C / 82 degrees F
SFB 5 Exhaust-Zone0	OK	32 degrees C / 89 degrees F
SFB 5 SFB-XF2-Zone1	OK	41 degrees C / 105 degrees F

SFB 5 SFB-XF1-Zone0	OK	41 degrees C / 105 degrees F
SFB 5 SFB-XF0-Zone0	OK	44 degrees C / 111 degrees F
SFB 6 Intake-Zone0	OK	35 degrees C / 95 degrees F
SFB 6 Exhaust-Zone1	OK	34 degrees C / 93 degrees F
SFB 6 IntakeA-Zone0	OK	30 degrees C / 86 degrees F
SFB 6 IntakeB-Zone1	OK	29 degrees C / 84 degrees F
SFB 6 Exhaust-Zone0	OK	33 degrees C / 91 degrees F
SFB 6 SFB-XF2-Zone1	OK	44 degrees C / 111 degrees F
SFB 6 SFB-XF1-Zone0	OK	43 degrees C / 109 degrees F
SFB 6 SFB-XF0-Zone0	OK	46 degrees C / 114 degrees F
SFB 7 Intake-Zone0	OK	39 degrees C / 102 degrees F
SFB 7 Exhaust-Zone1	OK	34 degrees C / 93 degrees F
SFB 7 IntakeA-Zone0	OK	34 degrees C / 93 degrees F
SFB 7 IntakeB-Zone1	OK	29 degrees C / 84 degrees F
SFB 7 Exhaust-Zone0	OK	37 degrees C / 98 degrees F
SFB 7 SFB-XF2-Zone1	OK	43 degrees C / 109 degrees F
SFB 7 SFB-XF1-Zone0	OK	47 degrees C / 116 degrees F
SFB 7 SFB-XF0-Zone0	OK	52 degrees C / 125 degrees F
FPC 0 Intake	OK	36 degrees C / 96 degrees F
FPC 0 Exhaust A	OK	42 degrees C / 107 degrees F
FPC 0 Exhaust B	OK	51 degrees C / 123 degrees F
FPC 0 LU 0 TSen	OK	49 degrees C / 120 degrees F
FPC 0 LU 0 Chip	OK	50 degrees C / 122 degrees F
FPC 0 LU 1 TSen	OK	49 degrees C / 120 degrees F
FPC 0 LU 1 Chip	OK	54 degrees C / 129 degrees F
FPC 0 LU 2 TSen	OK	49 degrees C / 120 degrees F
FPC 0 LU 2 Chip	OK	45 degrees C / 113 degrees F
FPC 0 LU 3 TSen	OK	49 degrees C / 120 degrees F
FPC 0 LU 3 Chip	OK	46 degrees C / 114 degrees F
FPC 0 MQ 0 TSen	OK	40 degrees C / 104 degrees F
FPC 0 MQ 0 Chip	OK	41 degrees C / 105 degrees F
FPC 0 MQ 1 TSen	OK	40 degrees C / 104 degrees F
FPC 0 MQ 1 Chip	OK	44 degrees C / 111 degrees F
FPC 0 MQ 2 TSen	OK	40 degrees C / 104 degrees F
FPC 0 MQ 2 Chip	OK	38 degrees C / 100 degrees F
FPC 0 MQ 3 TSen	OK	40 degrees C / 104 degrees F
FPC 0 MQ 3 Chip	OK	41 degrees C / 105 degrees F
FPC 1 Intake	OK	34 degrees C / 93 degrees F
FPC 1 Exhaust A	OK	46 degrees C / 114 degrees F
FPC 1 Exhaust B	OK	54 degrees C / 129 degrees F
FPC 1 LU 0 TSen	OK	45 degrees C / 113 degrees F
FPC 1 LU 0 Chip	OK	55 degrees C / 131 degrees F
FPC 1 LU 1 TSen	OK	45 degrees C / 113 degrees F
FPC 1 LU 1 Chip	OK	44 degrees C / 111 degrees F
FPC 1 LU 2 TSen	OK	45 degrees C / 113 degrees F
FPC 1 LU 2 Chip	OK	50 degrees C / 122 degrees F
FPC 1 LU 3 TSen	OK	45 degrees C / 113 degrees F
FPC 1 LU 3 Chip	OK	58 degrees C / 136 degrees F
FPC 1 XM 0 TSen	OK	45 degrees C / 113 degrees F
FPC 1 XM 0 Chip	OK	52 degrees C / 125 degrees F
FPC 1 XF 0 TSen	OK	45 degrees C / 113 degrees F
FPC 1 XF 0 Chip	OK	63 degrees C / 145 degrees F
FPC 1 PLX Switch TSen	OK	45 degrees C / 113 degrees F
FPC 1 PLX Switch Chip	OK	47 degrees C / 116 degrees F
FPC 8 Intake	OK	32 degrees C / 89 degrees F
FPC 8 Exhaust A	OK	44 degrees C / 111 degrees F
FPC 8 Exhaust B	OK	37 degrees C / 98 degrees F
FPC 8 LU 0 TCAM TSen	OK	41 degrees C / 105 degrees F
FPC 8 LU 0 TCAM Chip	OK	49 degrees C / 120 degrees F
FPC 8 LU 0 TSen	OK	41 degrees C / 105 degrees F
FPC 8 LU 0 Chip	OK	52 degrees C / 125 degrees F

FPC 8 MQ 0 TSen	OK	41 degrees C / 105 degrees F
FPC 8 MQ 0 Chip	OK	47 degrees C / 116 degrees F
FPC 8 LU 1 TCAM TSen	OK	39 degrees C / 102 degrees F
FPC 8 LU 1 TCAM Chip	OK	42 degrees C / 107 degrees F
FPC 8 LU 1 TSen	OK	39 degrees C / 102 degrees F
FPC 8 LU 1 Chip	OK	46 degrees C / 114 degrees F
FPC 8 MQ 1 TSen	OK	39 degrees C / 102 degrees F
FPC 8 MQ 1 Chip	OK	45 degrees C / 113 degrees F
FPC 9 Intake	OK	34 degrees C / 93 degrees F
FPC 9 Exhaust A	OK	41 degrees C / 105 degrees F
FPC 9 Exhaust B	OK	54 degrees C / 129 degrees F
FPC 9 LU 0 TSen	OK	51 degrees C / 123 degrees F
FPC 9 LU 0 Chip	OK	52 degrees C / 125 degrees F
FPC 9 LU 1 TSen	OK	51 degrees C / 123 degrees F
FPC 9 LU 1 Chip	OK	55 degrees C / 131 degrees F
FPC 9 LU 2 TSen	OK	51 degrees C / 123 degrees F
FPC 9 LU 2 Chip	OK	47 degrees C / 116 degrees F
FPC 9 LU 3 TSen	OK	51 degrees C / 123 degrees F
FPC 9 LU 3 Chip	OK	47 degrees C / 116 degrees F
FPC 9 MQ 0 TSen	OK	40 degrees C / 104 degrees F
FPC 9 MQ 0 Chip	OK	42 degrees C / 107 degrees F
FPC 9 MQ 1 TSen	OK	40 degrees C / 104 degrees F
FPC 9 MQ 1 Chip	OK	44 degrees C / 111 degrees F
FPC 9 MQ 2 TSen	OK	40 degrees C / 104 degrees F
FPC 9 MQ 2 Chip	OK	38 degrees C / 100 degrees F
FPC 9 MQ 3 TSen	OK	40 degrees C / 104 degrees F
FPC 9 MQ 3 Chip	OK	40 degrees C / 104 degrees F
ADC 0 Intake	OK	35 degrees C / 95 degrees F
ADC 0 Exhaust	OK	44 degrees C / 111 degrees F
ADC 0 ADC-XF1	OK	48 degrees C / 118 degrees F
ADC 0 ADC-XF0	OK	59 degrees C / 138 degrees F
ADC 1 Intake	OK	34 degrees C / 93 degrees F
ADC 1 Exhaust	OK	45 degrees C / 113 degrees F
ADC 1 ADC-XF1	OK	53 degrees C / 127 degrees F
ADC 1 ADC-XF0	OK	56 degrees C / 132 degrees F
ADC 8 Intake	OK	35 degrees C / 95 degrees F
ADC 8 Exhaust	OK	41 degrees C / 105 degrees F
ADC 8 ADC-XF1	OK	52 degrees C / 125 degrees F
ADC 8 ADC-XF0	OK	55 degrees C / 131 degrees F
ADC 9 Intake	OK	33 degrees C / 91 degrees F
ADC 9 Exhaust	OK	42 degrees C / 107 degrees F
ADC 9 ADC-XF1	OK	55 degrees C / 131 degrees F
ADC 9 ADC-XF0	OK	56 degrees C / 132 degrees F

show chassis environment

```
user@host > show chassis environment monitored
```

Class	Item	Status	Measurement
Temp	CB 0 IntakeA-Zone0	OK	44 degrees C / 111 degrees F

monitored (MX2020 Router)

CB 0 IntakeB-Zone1	OK	34 degrees C / 93 degrees F
CB 0 IntakeC-Zone0	OK	46 degrees C / 114 degrees F
CB 0 ExhaustA-Zone0	OK	44 degrees C / 111 degrees F
CB 0 ExhaustB-Zone1	OK	36 degrees C / 96 degrees F
CB 0 TCBC-Zone0	OK	39 degrees C / 102 degrees F
CB 1 IntakeA-Zone0	OK	46 degrees C / 114 degrees F
CB 1 IntakeB-Zone1	OK	43 degrees C / 109 degrees F
CB 1 IntakeC-Zone0	OK	47 degrees C / 116 degrees F
CB 1 ExhaustA-Zone0	OK	45 degrees C / 113 degrees F
CB 1 ExhaustB-Zone1	OK	42 degrees C / 107 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	43 degrees C / 109 degrees F
Routing Engine 0 CPU	OK	34 degrees C / 93 degrees F
Routing Engine 1 CPU	OK	42 degrees C / 107 degrees F
SFB 0 Intake-Zone0	OK	52 degrees C / 125 degrees F
SFB 0 Exhaust-Zone1	OK	45 degrees C / 113 degrees F
SFB 0 IntakeA-Zone0	OK	47 degrees C / 116 degrees F
SFB 0 IntakeB-Zone1	OK	38 degrees C / 100 degrees F
SFB 0 Exhaust-Zone0	OK	49 degrees C / 120 degrees F
SFB 0 SFB-XF2-Zone1	OK	59 degrees C / 138 degrees F
SFB 0 SFB-XF1-Zone0	OK	65 degrees C / 149 degrees F
SFB 0 SFB-XF0-Zone0	OK	65 degrees C / 149 degrees F
SFB 1 Intake-Zone0	OK	53 degrees C / 127 degrees F
SFB 1 Exhaust-Zone1	OK	45 degrees C / 113 degrees F
SFB 1 IntakeA-Zone0	OK	48 degrees C / 118 degrees F
SFB 1 IntakeB-Zone1	OK	39 degrees C / 102 degrees F
SFB 1 Exhaust-Zone0	OK	48 degrees C / 118 degrees F
SFB 1 SFB-XF2-Zone1	OK	60 degrees C / 140 degrees F
SFB 1 SFB-XF1-Zone0	OK	64 degrees C / 147 degrees F
SFB 1 SFB-XF0-Zone0	OK	66 degrees C / 150 degrees F
SFB 2 Intake-Zone0	OK	54 degrees C / 129 degrees F
SFB 2 Exhaust-Zone1	OK	46 degrees C / 114 degrees F
SFB 2 IntakeA-Zone0	OK	48 degrees C / 118 degrees F
SFB 2 IntakeB-Zone1	OK	39 degrees C / 102 degrees F
SFB 2 Exhaust-Zone0	OK	50 degrees C / 122 degrees F
SFB 2 SFB-XF2-Zone1	OK	63 degrees C / 145 degrees F
SFB 2 SFB-XF1-Zone0	OK	67 degrees C / 152 degrees F
SFB 2 SFB-XF0-Zone0	OK	67 degrees C / 152 degrees F
SFB 3 Intake-Zone0	OK	54 degrees C / 129 degrees F
SFB 3 Exhaust-Zone1	OK	46 degrees C / 114 degrees F
SFB 3 IntakeA-Zone0	OK	50 degrees C / 122 degrees F
SFB 3 IntakeB-Zone1	OK	40 degrees C / 104 degrees F
SFB 3 Exhaust-Zone0	OK	50 degrees C / 122 degrees F
SFB 3 SFB-XF2-Zone1	OK	64 degrees C / 147 degrees F
SFB 3 SFB-XF1-Zone0	OK	66 degrees C / 150 degrees F
SFB 3 SFB-XF0-Zone0	OK	68 degrees C / 154 degrees F
SFB 4 Intake-Zone0	OK	55 degrees C / 131 degrees F
SFB 4 Exhaust-Zone1	OK	48 degrees C / 118 degrees F
SFB 4 IntakeA-Zone0	OK	51 degrees C / 123 degrees F
SFB 4 IntakeB-Zone1	OK	42 degrees C / 107 degrees F
SFB 4 Exhaust-Zone0	OK	51 degrees C / 123 degrees F
SFB 4 SFB-XF2-Zone1	OK	63 degrees C / 145 degrees F
SFB 4 SFB-XF1-Zone0	OK	66 degrees C / 150 degrees F
SFB 4 SFB-XF0-Zone0	OK	68 degrees C / 154 degrees F
SFB 5 Intake-Zone0	OK	55 degrees C / 131 degrees F
SFB 5 Exhaust-Zone1	OK	49 degrees C / 120 degrees F
SFB 5 IntakeA-Zone0	OK	51 degrees C / 123 degrees F
SFB 5 IntakeB-Zone1	OK	43 degrees C / 109 degrees F
SFB 5 Exhaust-Zone0	OK	51 degrees C / 123 degrees F
SFB 5 SFB-XF2-Zone1	OK	65 degrees C / 149 degrees F

SFB 5 SFB-XF1-Zone0	OK	66 degrees C / 150 degrees F
SFB 5 SFB-XF0-Zone0	OK	71 degrees C / 159 degrees F
SFB 6 Intake-Zone0	OK	55 degrees C / 131 degrees F
SFB 6 Exhaust-Zone1	OK	49 degrees C / 120 degrees F
SFB 6 IntakeA-Zone0	OK	51 degrees C / 123 degrees F
SFB 6 IntakeB-Zone1	OK	43 degrees C / 109 degrees F
SFB 6 Exhaust-Zone0	OK	51 degrees C / 123 degrees F
SFB 6 SFB-XF2-Zone1	OK	64 degrees C / 147 degrees F
SFB 6 SFB-XF1-Zone0	OK	66 degrees C / 150 degrees F
SFB 6 SFB-XF0-Zone0	OK	68 degrees C / 154 degrees F
SFB 7 Intake-Zone0	OK	55 degrees C / 131 degrees F
SFB 7 Exhaust-Zone1	OK	49 degrees C / 120 degrees F
SFB 7 IntakeA-Zone0	OK	51 degrees C / 123 degrees F
SFB 7 IntakeB-Zone1	OK	43 degrees C / 109 degrees F
SFB 7 Exhaust-Zone0	OK	52 degrees C / 125 degrees F
SFB 7 SFB-XF2-Zone1	OK	66 degrees C / 150 degrees F
SFB 7 SFB-XF1-Zone0	OK	67 degrees C / 152 degrees F
SFB 7 SFB-XF0-Zone0	OK	70 degrees C / 158 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	60 degrees C / 140 degrees F
FPC 0 LU 0 TSen	OK	56 degrees C / 132 degrees F
FPC 0 LU 0 Chip	OK	59 degrees C / 138 degrees F
FPC 0 LU 1 TSen	OK	56 degrees C / 132 degrees F
FPC 0 LU 1 Chip	OK	61 degrees C / 141 degrees F
FPC 0 LU 2 TSen	OK	56 degrees C / 132 degrees F
FPC 0 LU 2 Chip	OK	52 degrees C / 125 degrees F
FPC 0 LU 3 TSen	OK	56 degrees C / 132 degrees F
FPC 0 LU 3 Chip	OK	52 degrees C / 125 degrees F
FPC 0 MQ 0 TSen	OK	49 degrees C / 120 degrees F
FPC 0 MQ 0 Chip	OK	49 degrees C / 120 degrees F
FPC 0 MQ 1 TSen	OK	49 degrees C / 120 degrees F
FPC 0 MQ 1 Chip	OK	52 degrees C / 125 degrees F
FPC 0 MQ 2 TSen	OK	49 degrees C / 120 degrees F
FPC 0 MQ 2 Chip	OK	45 degrees C / 113 degrees F
FPC 0 MQ 3 TSen	OK	49 degrees C / 120 degrees F
FPC 0 MQ 3 Chip	OK	46 degrees C / 114 degrees F
FPC 1 Intake	OK	39 degrees C / 102 degrees F
FPC 1 Exhaust A	OK	48 degrees C / 118 degrees F
FPC 1 Exhaust B	OK	55 degrees C / 131 degrees F
FPC 1 LU 0 TSen	OK	52 degrees C / 125 degrees F
FPC 1 LU 0 Chip	OK	54 degrees C / 129 degrees F
FPC 1 LU 1 TSen	OK	52 degrees C / 125 degrees F
FPC 1 LU 1 Chip	OK	56 degrees C / 132 degrees F
FPC 1 LU 2 TSen	OK	52 degrees C / 125 degrees F
FPC 1 LU 2 Chip	OK	49 degrees C / 120 degrees F
FPC 1 LU 3 TSen	OK	52 degrees C / 125 degrees F
FPC 1 LU 3 Chip	OK	50 degrees C / 122 degrees F
FPC 1 MQ 0 TSen	OK	48 degrees C / 118 degrees F
FPC 1 MQ 0 Chip	OK	48 degrees C / 118 degrees F
FPC 1 MQ 1 TSen	OK	48 degrees C / 118 degrees F
FPC 1 MQ 1 Chip	OK	51 degrees C / 123 degrees F
FPC 1 MQ 2 TSen	OK	48 degrees C / 118 degrees F
FPC 1 MQ 2 Chip	OK	45 degrees C / 113 degrees F
FPC 1 MQ 3 TSen	OK	48 degrees C / 118 degrees F
FPC 1 MQ 3 Chip	OK	45 degrees C / 113 degrees F
FPC 2 Intake	OK	39 degrees C / 102 degrees F
FPC 2 Exhaust A	OK	48 degrees C / 118 degrees F
FPC 2 Exhaust B	OK	58 degrees C / 136 degrees F
FPC 2 LU 0 TSen	OK	55 degrees C / 131 degrees F
FPC 2 LU 0 Chip	OK	57 degrees C / 134 degrees F

FPC 2 LU 1 TSen	OK	55 degrees C / 131 degrees F
FPC 2 LU 1 Chip	OK	63 degrees C / 145 degrees F
FPC 2 LU 2 TSen	OK	55 degrees C / 131 degrees F
FPC 2 LU 2 Chip	OK	51 degrees C / 123 degrees F
FPC 2 LU 3 TSen	OK	55 degrees C / 131 degrees F
FPC 2 LU 3 Chip	OK	52 degrees C / 125 degrees F
FPC 2 MQ 0 TSen	OK	48 degrees C / 118 degrees F
FPC 2 MQ 0 Chip	OK	50 degrees C / 122 degrees F
FPC 2 MQ 1 TSen	OK	48 degrees C / 118 degrees F
FPC 2 MQ 1 Chip	OK	52 degrees C / 125 degrees F
FPC 2 MQ 2 TSen	OK	48 degrees C / 118 degrees F
FPC 2 MQ 2 Chip	OK	47 degrees C / 116 degrees F
FPC 2 MQ 3 TSen	OK	48 degrees C / 118 degrees F
FPC 2 MQ 3 Chip	OK	47 degrees C / 116 degrees F
FPC 3 Intake	OK	41 degrees C / 105 degrees F
FPC 3 Exhaust A	OK	48 degrees C / 118 degrees F
FPC 3 Exhaust B	OK	58 degrees C / 136 degrees F
FPC 3 LU 0 TSen	OK	56 degrees C / 132 degrees F
FPC 3 LU 0 Chip	OK	59 degrees C / 138 degrees F
FPC 3 LU 1 TSen	OK	56 degrees C / 132 degrees F
FPC 3 LU 1 Chip	OK	61 degrees C / 141 degrees F
FPC 3 LU 2 TSen	OK	56 degrees C / 132 degrees F
FPC 3 LU 2 Chip	OK	51 degrees C / 123 degrees F
FPC 3 LU 3 TSen	OK	56 degrees C / 132 degrees F
FPC 3 LU 3 Chip	OK	53 degrees C / 127 degrees F
FPC 3 MQ 0 TSen	OK	50 degrees C / 122 degrees F
FPC 3 MQ 0 Chip	OK	51 degrees C / 123 degrees F
FPC 3 MQ 1 TSen	OK	50 degrees C / 122 degrees F
FPC 3 MQ 1 Chip	OK	55 degrees C / 131 degrees F
FPC 3 MQ 2 TSen	OK	50 degrees C / 122 degrees F
FPC 3 MQ 2 Chip	OK	47 degrees C / 116 degrees F
FPC 3 MQ 3 TSen	OK	50 degrees C / 122 degrees F
FPC 3 MQ 3 Chip	OK	50 degrees C / 122 degrees F
FPC 4 Intake	OK	41 degrees C / 105 degrees F
FPC 4 Exhaust A	OK	48 degrees C / 118 degrees F
FPC 4 Exhaust B	OK	59 degrees C / 138 degrees F
FPC 4 LU 0 TSen	OK	56 degrees C / 132 degrees F
FPC 4 LU 0 Chip	OK	60 degrees C / 140 degrees F
FPC 4 LU 1 TSen	OK	56 degrees C / 132 degrees F
FPC 4 LU 1 Chip	OK	64 degrees C / 147 degrees F
FPC 4 LU 2 TSen	OK	56 degrees C / 132 degrees F
FPC 4 LU 2 Chip	OK	51 degrees C / 123 degrees F
FPC 4 LU 3 TSen	OK	56 degrees C / 132 degrees F
FPC 4 LU 3 Chip	OK	54 degrees C / 129 degrees F
FPC 4 MQ 0 TSen	OK	49 degrees C / 120 degrees F
FPC 4 MQ 0 Chip	OK	53 degrees C / 127 degrees F
FPC 4 MQ 1 TSen	OK	49 degrees C / 120 degrees F
FPC 4 MQ 1 Chip	OK	55 degrees C / 131 degrees F
FPC 4 MQ 2 TSen	OK	49 degrees C / 120 degrees F
FPC 4 MQ 2 Chip	OK	48 degrees C / 118 degrees F
FPC 4 MQ 3 TSen	OK	49 degrees C / 120 degrees F
FPC 4 MQ 3 Chip	OK	49 degrees C / 120 degrees F
FPC 5 Intake	OK	42 degrees C / 107 degrees F
FPC 5 Exhaust A	OK	49 degrees C / 120 degrees F
FPC 5 Exhaust B	OK	61 degrees C / 141 degrees F
FPC 5 LU 0 TSen	OK	58 degrees C / 136 degrees F
FPC 5 LU 0 Chip	OK	61 degrees C / 141 degrees F
FPC 5 LU 1 TSen	OK	58 degrees C / 136 degrees F
FPC 5 LU 1 Chip	OK	64 degrees C / 147 degrees F
FPC 5 LU 2 TSen	OK	58 degrees C / 136 degrees F
FPC 5 LU 2 Chip	OK	56 degrees C / 132 degrees F

FPC 5 LU 3 TSen	OK	58 degrees C / 136 degrees F
FPC 5 LU 3 Chip	OK	54 degrees C / 129 degrees F
FPC 5 MQ 0 TSen	OK	51 degrees C / 123 degrees F
FPC 5 MQ 0 Chip	OK	53 degrees C / 127 degrees F
FPC 5 MQ 1 TSen	OK	51 degrees C / 123 degrees F
FPC 5 MQ 1 Chip	OK	55 degrees C / 131 degrees F
FPC 5 MQ 2 TSen	OK	51 degrees C / 123 degrees F
FPC 5 MQ 2 Chip	OK	50 degrees C / 122 degrees F
FPC 5 MQ 3 TSen	OK	51 degrees C / 123 degrees F
FPC 5 MQ 3 Chip	OK	49 degrees C / 120 degrees F
FPC 6 Intake	OK	42 degrees C / 107 degrees F
FPC 6 Exhaust A	OK	50 degrees C / 122 degrees F
FPC 6 Exhaust B	OK	61 degrees C / 141 degrees F
FPC 6 LU 0 TSen	OK	58 degrees C / 136 degrees F
FPC 6 LU 0 Chip	OK	62 degrees C / 143 degrees F
FPC 6 LU 1 TSen	OK	58 degrees C / 136 degrees F
FPC 6 LU 1 Chip	OK	64 degrees C / 147 degrees F
FPC 6 LU 2 TSen	OK	58 degrees C / 136 degrees F
FPC 6 LU 2 Chip	OK	56 degrees C / 132 degrees F
FPC 6 LU 3 TSen	OK	58 degrees C / 136 degrees F
FPC 6 LU 3 Chip	OK	56 degrees C / 132 degrees F
FPC 6 MQ 0 TSen	OK	51 degrees C / 123 degrees F
FPC 6 MQ 0 Chip	OK	58 degrees C / 136 degrees F
FPC 6 MQ 1 TSen	OK	51 degrees C / 123 degrees F
FPC 6 MQ 1 Chip	OK	61 degrees C / 141 degrees F
FPC 6 MQ 2 TSen	OK	51 degrees C / 123 degrees F
FPC 6 MQ 2 Chip	OK	51 degrees C / 123 degrees F
FPC 6 MQ 3 TSen	OK	51 degrees C / 123 degrees F
FPC 6 MQ 3 Chip	OK	51 degrees C / 123 degrees F
FPC 7 Intake	OK	42 degrees C / 107 degrees F
FPC 7 Exhaust A	OK	50 degrees C / 122 degrees F
FPC 7 Exhaust B	OK	61 degrees C / 141 degrees F
FPC 7 LU 0 TSen	OK	58 degrees C / 136 degrees F
FPC 7 LU 0 Chip	OK	59 degrees C / 138 degrees F
FPC 7 LU 1 TSen	OK	58 degrees C / 136 degrees F
FPC 7 LU 1 Chip	OK	64 degrees C / 147 degrees F
FPC 7 LU 2 TSen	OK	58 degrees C / 136 degrees F
FPC 7 LU 2 Chip	OK	54 degrees C / 129 degrees F
FPC 7 LU 3 TSen	OK	58 degrees C / 136 degrees F
FPC 7 LU 3 Chip	OK	53 degrees C / 127 degrees F
FPC 7 MQ 0 TSen	OK	51 degrees C / 123 degrees F
FPC 7 MQ 0 Chip	OK	53 degrees C / 127 degrees F
FPC 7 MQ 1 TSen	OK	51 degrees C / 123 degrees F
FPC 7 MQ 1 Chip	OK	54 degrees C / 129 degrees F
FPC 7 MQ 2 TSen	OK	51 degrees C / 123 degrees F
FPC 7 MQ 2 Chip	OK	48 degrees C / 118 degrees F
FPC 7 MQ 3 TSen	OK	51 degrees C / 123 degrees F
FPC 7 MQ 3 Chip	OK	48 degrees C / 118 degrees F
FPC 8 Intake	OK	42 degrees C / 107 degrees F
FPC 8 Exhaust A	OK	50 degrees C / 122 degrees F
FPC 8 Exhaust B	OK	61 degrees C / 141 degrees F
FPC 8 LU 0 TSen	OK	58 degrees C / 136 degrees F
FPC 8 LU 0 Chip	OK	63 degrees C / 145 degrees F
FPC 8 LU 1 TSen	OK	58 degrees C / 136 degrees F
FPC 8 LU 1 Chip	OK	65 degrees C / 149 degrees F
FPC 8 LU 2 TSen	OK	58 degrees C / 136 degrees F
FPC 8 LU 2 Chip	OK	56 degrees C / 132 degrees F
FPC 8 LU 3 TSen	OK	58 degrees C / 136 degrees F
FPC 8 LU 3 Chip	OK	56 degrees C / 132 degrees F
FPC 8 MQ 0 TSen	OK	50 degrees C / 122 degrees F
FPC 8 MQ 0 Chip	OK	53 degrees C / 127 degrees F

FPC 8 MQ 1 TSen	OK	50 degrees C / 122 degrees F
FPC 8 MQ 1 Chip	OK	58 degrees C / 136 degrees F
FPC 8 MQ 2 TSen	OK	50 degrees C / 122 degrees F
FPC 8 MQ 2 Chip	OK	48 degrees C / 118 degrees F
FPC 8 MQ 3 TSen	OK	50 degrees C / 122 degrees F
FPC 8 MQ 3 Chip	OK	49 degrees C / 120 degrees F
FPC 9 Intake	OK	43 degrees C / 109 degrees F
FPC 9 Exhaust A	OK	51 degrees C / 123 degrees F
FPC 9 Exhaust B	OK	61 degrees C / 141 degrees F
FPC 9 LU 0 TSen	OK	58 degrees C / 136 degrees F
FPC 9 LU 0 Chip	OK	61 degrees C / 141 degrees F
FPC 9 LU 1 TSen	OK	58 degrees C / 136 degrees F
FPC 9 LU 1 Chip	OK	63 degrees C / 145 degrees F
FPC 9 LU 2 TSen	OK	58 degrees C / 136 degrees F
FPC 9 LU 2 Chip	OK	55 degrees C / 131 degrees F
FPC 9 LU 3 TSen	OK	58 degrees C / 136 degrees F
FPC 9 LU 3 Chip	OK	54 degrees C / 129 degrees F
FPC 9 MQ 0 TSen	OK	52 degrees C / 125 degrees F
FPC 9 MQ 0 Chip	OK	53 degrees C / 127 degrees F
FPC 9 MQ 1 TSen	OK	52 degrees C / 125 degrees F
FPC 9 MQ 1 Chip	OK	54 degrees C / 129 degrees F
FPC 9 MQ 2 TSen	OK	52 degrees C / 125 degrees F
FPC 9 MQ 2 Chip	OK	48 degrees C / 118 degrees F
FPC 9 MQ 3 TSen	OK	52 degrees C / 125 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	48 degrees C / 118 degrees F
FPC 10 Exhaust B	OK	54 degrees C / 129 degrees F
FPC 10 LU 0 TSen	OK	53 degrees C / 127 degrees F
FPC 10 LU 0 Chip	OK	54 degrees C / 129 degrees F
FPC 10 LU 1 TSen	OK	53 degrees C / 127 degrees F
FPC 10 LU 1 Chip	OK	58 degrees C / 136 degrees F
FPC 10 LU 2 TSen	OK	53 degrees C / 127 degrees F
FPC 10 LU 2 Chip	OK	51 degrees C / 123 degrees F
FPC 10 LU 3 TSen	OK	53 degrees C / 127 degrees F
FPC 10 LU 3 Chip	OK	51 degrees C / 123 degrees F
FPC 10 MQ 0 TSen	OK	49 degrees C / 120 degrees F
FPC 10 MQ 0 Chip	OK	50 degrees C / 122 degrees F
FPC 10 MQ 1 TSen	OK	49 degrees C / 120 degrees F
FPC 10 MQ 1 Chip	OK	52 degrees C / 125 degrees F
FPC 10 MQ 2 TSen	OK	49 degrees C / 120 degrees F
FPC 10 MQ 2 Chip	OK	48 degrees C / 118 degrees F
FPC 10 MQ 3 TSen	OK	49 degrees C / 120 degrees F
FPC 10 MQ 3 Chip	OK	48 degrees C / 118 degrees F
FPC 11 Intake	OK	39 degrees C / 102 degrees F
FPC 11 Exhaust A	OK	47 degrees C / 116 degrees F
FPC 11 Exhaust B	OK	51 degrees C / 123 degrees F
FPC 11 LU 0 TSen	OK	50 degrees C / 122 degrees F
FPC 11 LU 0 Chip	OK	52 degrees C / 125 degrees F
FPC 11 LU 1 TSen	OK	50 degrees C / 122 degrees F
FPC 11 LU 1 Chip	OK	55 degrees C / 131 degrees F
FPC 11 LU 2 TSen	OK	50 degrees C / 122 degrees F
FPC 11 LU 2 Chip	OK	49 degrees C / 120 degrees F
FPC 11 LU 3 TSen	OK	50 degrees C / 122 degrees F
FPC 11 LU 3 Chip	OK	49 degrees C / 120 degrees F
FPC 11 MQ 0 TSen	OK	47 degrees C / 116 degrees F
FPC 11 MQ 0 Chip	OK	47 degrees C / 116 degrees F
FPC 11 MQ 1 TSen	OK	47 degrees C / 116 degrees F
FPC 11 MQ 1 Chip	OK	51 degrees C / 123 degrees F
FPC 11 MQ 2 TSen	OK	47 degrees C / 116 degrees F
FPC 11 MQ 2 Chip	OK	45 degrees C / 113 degrees F

FPC 11 MQ 3 TSen	OK	47 degrees C / 116 degrees F
FPC 11 MQ 3 Chip	OK	49 degrees C / 120 degrees F
FPC 12 Intake	OK	39 degrees C / 102 degrees F
FPC 12 Exhaust A	OK	47 degrees C / 116 degrees F
FPC 12 Exhaust B	OK	50 degrees C / 122 degrees F
FPC 12 LU 0 TSen	OK	49 degrees C / 120 degrees F
FPC 12 LU 0 Chip	OK	51 degrees C / 123 degrees F
FPC 12 LU 1 TSen	OK	49 degrees C / 120 degrees F
FPC 12 LU 1 Chip	OK	54 degrees C / 129 degrees F
FPC 12 LU 2 TSen	OK	49 degrees C / 120 degrees F
FPC 12 LU 2 Chip	OK	47 degrees C / 116 degrees F
FPC 12 LU 3 TSen	OK	49 degrees C / 120 degrees F
FPC 12 LU 3 Chip	OK	49 degrees C / 120 degrees F
FPC 12 MQ 0 TSen	OK	47 degrees C / 116 degrees F
FPC 12 MQ 0 Chip	OK	46 degrees C / 114 degrees F
FPC 12 MQ 1 TSen	OK	47 degrees C / 116 degrees F
FPC 12 MQ 1 Chip	OK	51 degrees C / 123 degrees F
FPC 12 MQ 2 TSen	OK	47 degrees C / 116 degrees F
FPC 12 MQ 2 Chip	OK	45 degrees C / 113 degrees F
FPC 12 MQ 3 TSen	OK	47 degrees C / 116 degrees F
FPC 12 MQ 3 Chip	OK	47 degrees C / 116 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	51 degrees C / 123 degrees F
FPC 13 LU 0 TSen	OK	50 degrees C / 122 degrees F
FPC 13 LU 0 Chip	OK	52 degrees C / 125 degrees F
FPC 13 LU 1 TSen	OK	50 degrees C / 122 degrees F
FPC 13 LU 1 Chip	OK	54 degrees C / 129 degrees F
FPC 13 LU 2 TSen	OK	50 degrees C / 122 degrees F
FPC 13 LU 2 Chip	OK	48 degrees C / 118 degrees F
FPC 13 LU 3 TSen	OK	50 degrees C / 122 degrees F
FPC 13 LU 3 Chip	OK	48 degrees C / 118 degrees F
FPC 13 MQ 0 TSen	OK	48 degrees C / 118 degrees F
FPC 13 MQ 0 Chip	OK	47 degrees C / 116 degrees F
FPC 13 MQ 1 TSen	OK	48 degrees C / 118 degrees F
FPC 13 MQ 1 Chip	OK	51 degrees C / 123 degrees F
FPC 13 MQ 2 TSen	OK	48 degrees C / 118 degrees F
FPC 13 MQ 2 Chip	OK	46 degrees C / 114 degrees F
FPC 13 MQ 3 TSen	OK	48 degrees C / 118 degrees F
FPC 13 MQ 3 Chip	OK	47 degrees C / 116 degrees F
FPC 14 Intake	OK	41 degrees C / 105 degrees F
FPC 14 Exhaust A	OK	49 degrees C / 120 degrees F
FPC 14 Exhaust B	OK	50 degrees C / 122 degrees F
FPC 14 LU 0 TSen	OK	49 degrees C / 120 degrees F
FPC 14 LU 0 Chip	OK	50 degrees C / 122 degrees F
FPC 14 LU 1 TSen	OK	49 degrees C / 120 degrees F
FPC 14 LU 1 Chip	OK	54 degrees C / 129 degrees F
FPC 14 LU 2 TSen	OK	49 degrees C / 120 degrees F
FPC 14 LU 2 Chip	OK	48 degrees C / 118 degrees F
FPC 14 LU 3 TSen	OK	49 degrees C / 120 degrees F
FPC 14 LU 3 Chip	OK	50 degrees C / 122 degrees F
FPC 14 MQ 0 TSen	OK	48 degrees C / 118 degrees F
FPC 14 MQ 0 Chip	OK	48 degrees C / 118 degrees F
FPC 14 MQ 1 TSen	OK	48 degrees C / 118 degrees F
FPC 14 MQ 1 Chip	OK	52 degrees C / 125 degrees F
FPC 14 MQ 2 TSen	OK	48 degrees C / 118 degrees F
FPC 14 MQ 2 Chip	OK	47 degrees C / 116 degrees F
FPC 14 MQ 3 TSen	OK	48 degrees C / 118 degrees F
FPC 14 MQ 3 Chip	OK	50 degrees C / 122 degrees F
FPC 15 Intake	OK	42 degrees C / 107 degrees F
FPC 15 Exhaust A	OK	51 degrees C / 123 degrees F

FPC 15 Exhaust B	OK	52 degrees C / 125 degrees F
FPC 15 LU 0 TSen	OK	52 degrees C / 125 degrees F
FPC 15 LU 0 Chip	OK	55 degrees C / 131 degrees F
FPC 15 LU 1 TSen	OK	52 degrees C / 125 degrees F
FPC 15 LU 1 Chip	OK	59 degrees C / 138 degrees F
FPC 15 LU 2 TSen	OK	52 degrees C / 125 degrees F
FPC 15 LU 2 Chip	OK	50 degrees C / 122 degrees F
FPC 15 LU 3 TSen	OK	52 degrees C / 125 degrees F
FPC 15 LU 3 Chip	OK	51 degrees C / 123 degrees F
FPC 15 MQ 0 TSen	OK	51 degrees C / 123 degrees F
FPC 15 MQ 0 Chip	OK	53 degrees C / 127 degrees F
FPC 15 MQ 1 TSen	OK	51 degrees C / 123 degrees F
FPC 15 MQ 1 Chip	OK	60 degrees C / 140 degrees F
FPC 15 MQ 2 TSen	OK	51 degrees C / 123 degrees F
FPC 15 MQ 2 Chip	OK	52 degrees C / 125 degrees F
FPC 15 MQ 3 TSen	OK	51 degrees C / 123 degrees F
FPC 15 MQ 3 Chip	OK	53 degrees C / 127 degrees F
FPC 16 Intake	OK	44 degrees C / 111 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	56 degrees C / 132 degrees F
FPC 16 LU 2 TSen	OK	51 degrees C / 123 degrees F
FPC 16 LU 2 Chip	OK	50 degrees C / 122 degrees F
FPC 16 LU 3 TSen	OK	51 degrees C / 123 degrees F
FPC 16 LU 3 Chip	OK	50 degrees C / 122 degrees F
FPC 16 MQ 0 TSen	OK	51 degrees C / 123 degrees F
FPC 16 MQ 0 Chip	OK	50 degrees C / 122 degrees F
FPC 16 MQ 1 TSen	OK	51 degrees C / 123 degrees F
FPC 16 MQ 1 Chip	OK	55 degrees C / 131 degrees F
FPC 16 MQ 2 TSen	OK	51 degrees C / 123 degrees F
FPC 16 MQ 2 Chip	OK	49 degrees C / 120 degrees F
FPC 16 MQ 3 TSen	OK	51 degrees C / 123 degrees F
FPC 16 MQ 3 Chip	OK	52 degrees C / 125 degrees F
FPC 17 Intake	OK	45 degrees C / 113 degrees F
FPC 17 Exhaust A	OK	52 degrees C / 125 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	61 degrees C / 141 degrees F
FPC 17 LU 2 TSen	OK	54 degrees C / 129 degrees F
FPC 17 LU 2 Chip	OK	54 degrees C / 129 degrees F
FPC 17 LU 3 TSen	OK	54 degrees C / 129 degrees F
FPC 17 LU 3 Chip	OK	55 degrees C / 131 degrees F
FPC 17 MQ 0 TSen	OK	53 degrees C / 127 degrees F
FPC 17 MQ 0 Chip	OK	53 degrees C / 127 degrees F
FPC 17 MQ 1 TSen	OK	53 degrees C / 127 degrees F
FPC 17 MQ 1 Chip	OK	57 degrees C / 134 degrees F
FPC 17 MQ 2 TSen	OK	53 degrees C / 127 degrees F
FPC 17 MQ 2 Chip	OK	51 degrees C / 123 degrees F
FPC 17 MQ 3 TSen	OK	53 degrees C / 127 degrees F
FPC 17 MQ 3 Chip	OK	54 degrees C / 129 degrees F
FPC 18 Intake	OK	46 degrees C / 114 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	58 degrees C / 136 degrees F
FPC 18 LU 1 TSen	OK	56 degrees C / 132 degrees F

FPC 18 LU 1 Chip	OK	63 degrees C / 145 degrees F
FPC 18 LU 2 TSen	OK	56 degrees C / 132 degrees F
FPC 18 LU 2 Chip	OK	54 degrees C / 129 degrees F
FPC 18 LU 3 TSen	OK	56 degrees C / 132 degrees F
FPC 18 LU 3 Chip	OK	56 degrees C / 132 degrees F
FPC 18 MQ 0 TSen	OK	54 degrees C / 129 degrees F
FPC 18 MQ 0 Chip	OK	57 degrees C / 134 degrees F
FPC 18 MQ 1 TSen	OK	54 degrees C / 129 degrees F
FPC 18 MQ 1 Chip	OK	62 degrees C / 143 degrees F
FPC 18 MQ 2 TSen	OK	54 degrees C / 129 degrees F
FPC 18 MQ 2 Chip	OK	53 degrees C / 127 degrees F
FPC 18 MQ 3 TSen	OK	54 degrees C / 129 degrees F
FPC 18 MQ 3 Chip	OK	56 degrees C / 132 degrees F
FPC 19 Intake	OK	49 degrees C / 120 degrees F
FPC 19 Exhaust A	OK	56 degrees C / 132 degrees F
FPC 19 Exhaust B	OK	62 degrees C / 143 degrees F
FPC 19 LU 0 TSen	OK	62 degrees C / 143 degrees F
FPC 19 LU 0 Chip	OK	63 degrees C / 145 degrees F
FPC 19 LU 1 TSen	OK	62 degrees C / 143 degrees F
FPC 19 LU 1 Chip	OK	69 degrees C / 156 degrees F
FPC 19 LU 2 TSen	OK	62 degrees C / 143 degrees F
FPC 19 LU 2 Chip	OK	61 degrees C / 141 degrees F
FPC 19 LU 3 TSen	OK	62 degrees C / 143 degrees F
FPC 19 LU 3 Chip	OK	62 degrees C / 143 degrees F
FPC 19 MQ 0 TSen	OK	58 degrees C / 136 degrees F
FPC 19 MQ 0 Chip	OK	62 degrees C / 143 degrees F
FPC 19 MQ 1 TSen	OK	58 degrees C / 136 degrees F
FPC 19 MQ 1 Chip	OK	64 degrees C / 147 degrees F
FPC 19 MQ 2 TSen	OK	58 degrees C / 136 degrees F
FPC 19 MQ 2 Chip	OK	59 degrees C / 138 degrees F
FPC 19 MQ 3 TSen	OK	58 degrees C / 136 degrees F
FPC 19 MQ 3 Chip	OK	60 degrees C / 140 degrees F
ADC 0 Intake	OK	40 degrees C / 104 degrees F
ADC 0 Exhaust	OK	50 degrees C / 122 degrees F
ADC 0 ADC-XF1	OK	58 degrees C / 136 degrees F
ADC 0 ADC-XF0	OK	63 degrees C / 145 degrees F
ADC 1 Intake	OK	38 degrees C / 100 degrees F
ADC 1 Exhaust	OK	48 degrees C / 118 degrees F
ADC 1 ADC-XF1	OK	59 degrees C / 138 degrees F
ADC 1 ADC-XF0	OK	61 degrees C / 141 degrees F
ADC 2 Intake	OK	36 degrees C / 96 degrees F
ADC 2 Exhaust	OK	50 degrees C / 122 degrees F
ADC 2 ADC-XF1	OK	53 degrees C / 127 degrees F
ADC 2 ADC-XF0	OK	59 degrees C / 138 degrees F
ADC 3 Intake	OK	39 degrees C / 102 degrees F
ADC 3 Exhaust	OK	49 degrees C / 120 degrees F
ADC 3 ADC-XF1	OK	61 degrees C / 141 degrees F
ADC 3 ADC-XF0	OK	62 degrees C / 143 degrees F
ADC 4 Intake	OK	39 degrees C / 102 degrees F
ADC 4 Exhaust	OK	49 degrees C / 120 degrees F
ADC 4 ADC-XF1	OK	60 degrees C / 140 degrees F
ADC 4 ADC-XF0	OK	61 degrees C / 141 degrees F
ADC 5 Intake	OK	38 degrees C / 100 degrees F
ADC 5 Exhaust	OK	52 degrees C / 125 degrees F
ADC 5 ADC-XF1	OK	55 degrees C / 131 degrees F
ADC 5 ADC-XF0	OK	65 degrees C / 149 degrees F
ADC 6 Intake	OK	39 degrees C / 102 degrees F
ADC 6 Exhaust	OK	51 degrees C / 123 degrees F
ADC 6 ADC-XF1	OK	58 degrees C / 136 degrees F
ADC 6 ADC-XF0	OK	63 degrees C / 145 degrees F
ADC 7 Intake	OK	39 degrees C / 102 degrees F

ADC 7 Exhaust	OK	52 degrees C / 125 degrees F
ADC 7 ADC-XF1	OK	61 degrees C / 141 degrees F
ADC 7 ADC-XF0	OK	68 degrees C / 154 degrees F
ADC 8 Intake	OK	39 degrees C / 102 degrees F
ADC 8 Exhaust	OK	50 degrees C / 122 degrees F
ADC 8 ADC-XF1	OK	64 degrees C / 147 degrees F
ADC 8 ADC-XF0	OK	63 degrees C / 145 degrees F
ADC 9 Intake	OK	41 degrees C / 105 degrees F
ADC 9 Exhaust	OK	50 degrees C / 122 degrees F
ADC 9 ADC-XF1	OK	60 degrees C / 140 degrees F
ADC 9 ADC-XF0	OK	62 degrees C / 143 degrees F
ADC 10 Intake	OK	46 degrees C / 114 degrees F
ADC 10 Exhaust	OK	53 degrees C / 127 degrees F
ADC 10 ADC-XF1	OK	66 degrees C / 150 degrees F
ADC 10 ADC-XF0	OK	65 degrees C / 149 degrees F
ADC 11 Intake	OK	46 degrees C / 114 degrees F
ADC 11 Exhaust	OK	53 degrees C / 127 degrees F
ADC 11 ADC-XF1	OK	63 degrees C / 145 degrees F
ADC 11 ADC-XF0	OK	64 degrees C / 147 degrees F
ADC 12 Intake	OK	47 degrees C / 116 degrees F
ADC 12 Exhaust	OK	53 degrees C / 127 degrees F
ADC 12 ADC-XF1	OK	65 degrees C / 149 degrees F
ADC 12 ADC-XF0	OK	65 degrees C / 149 degrees F
ADC 13 Intake	OK	48 degrees C / 118 degrees F
ADC 13 Exhaust	OK	55 degrees C / 131 degrees F
ADC 13 ADC-XF1	OK	65 degrees C / 149 degrees F
ADC 13 ADC-XF0	OK	67 degrees C / 152 degrees F
ADC 14 Intake	OK	49 degrees C / 120 degrees F
ADC 14 Exhaust	OK	57 degrees C / 134 degrees F
ADC 14 ADC-XF1	OK	68 degrees C / 154 degrees F
ADC 14 ADC-XF0	OK	72 degrees C / 161 degrees F
ADC 15 Intake	OK	50 degrees C / 122 degrees F
ADC 15 Exhaust	OK	56 degrees C / 132 degrees F
ADC 15 ADC-XF1	OK	68 degrees C / 154 degrees F
ADC 15 ADC-XF0	OK	68 degrees C / 154 degrees F
ADC 16 Intake	OK	51 degrees C / 123 degrees F
ADC 16 Exhaust	OK	57 degrees C / 134 degrees F
ADC 16 ADC-XF1	OK	67 degrees C / 152 degrees F
ADC 16 ADC-XF0	OK	68 degrees C / 154 degrees F
ADC 17 Intake	OK	51 degrees C / 123 degrees F
ADC 17 Exhaust	OK	57 degrees C / 134 degrees F
ADC 17 ADC-XF1	OK	69 degrees C / 156 degrees F
ADC 17 ADC-XF0	OK	69 degrees C / 156 degrees F
ADC 18 Intake	OK	52 degrees C / 125 degrees F
ADC 18 Exhaust	OK	58 degrees C / 136 degrees F
ADC 18 ADC-XF1	OK	67 degrees C / 152 degrees F
ADC 18 ADC-XF0	OK	72 degrees C / 161 degrees F
ADC 19 Intake	OK	50 degrees C / 122 degrees F
ADC 19 Exhaust	OK	58 degrees C / 136 degrees F
ADC 19 ADC-XF1	OK	68 degrees C / 154 degrees F
ADC 19 ADC-XF0	OK	71 degrees C / 159 degrees F

show chassis environment mcs

Syntax	<code>show chassis environment mcs</code> <code><slot></code>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M40e and M160 routers only) Display environmental information about the Miscellaneous Control Subsystems (MCSs).
Options	<p>none—Display environmental information about both MCSs.</p> <p>slot —(Optional) Display environmental information about an individual MCS. Replace slot with 0 or 1</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • request chassis mcs on page 457
List of Sample Output	show chassis environment mcs (M40e Router) on page 670 show chassis environment mcs (M160 Router) on page 670
Output Fields	Table 43 on page 669 lists the output fields for the show chassis environment mcs command. Output fields are listed in the approximate order in which they appear.

Table 43: show chassis environment mcs Output Fields

Field Name	Field Description
State	<p>Status of the MCS:</p> <ul style="list-style-type: none"> • Present—MCS is detected by the chassis daemon but is either not supported by the current version of Junos or MCS is coming up but not yet online. • Online—MCS is online and running. • Offline—MCS is powered down. • Empty—No MCS is present. • Master—MCS is online, operating as master. • Standby—MCS is online, operating as standby.
Temperature	Temperature of the air flowing past the MCS.
Power	Information about the voltage supplied to the MCS. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.
BUS Revision	Revision level of the generic bus device.
FPGA Revision	Revision level of the field-programmable gate array (FPGA) revision.

Sample Output

**show chassis
environment mcs
(M40e Router)**

```
user@host> show chassis environment mcs
MCS 0 status:
  State                               Online Master
  Temperature                         45 degrees C / 113 degrees F
  Power:
    3.3 V                            3283 mV
    5.0 V                            5013 mV
    12.0 V                           11721 mV
    5.0 V bias                       5025 mV
    8.0 V bias                       8229 mV
  BUS Revision                       12
  FPGA Revision                      13
MCS 1 status:
  State                               Online Standby
  Temperature                         42 degrees C / 107 degrees F
  Power:
    3.3 V                            3296 mV
    5.0 V                            4971 mV
    12.0 V                           11814 mV
    5.0 V bias                       4976 mV
    8.0 V bias                       8241 mV
  BUS Revision                       12
  FPGA Revision                      13
```

**show chassis
environment mcs
(M160 Router)**

```
user@host> show chassis environment mcs
MCS 0 status:
  State                               Online Master
  Temperature                         50 degrees C / 122 degrees F
  Power:
    3.3 V                            3306 mV
    5.0 V                            4993 mV
    12.0 V                           11799 mV
    5.0 V bias                       4993 mV
    8.0 V bias                       8288 mV
  BUS Revision                       12
  FPGA Revision                      13
```

show chassis environment pcg

Syntax	<code>show chassis environment pcg</code> <code><slot></code>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M40e and M160 routers only) Display environmental information about the Packet Forwarding Engine clock generators (PCGs).
Options	<p>none—Display environmental information about both PCGs.</p> <p>slot—(Optional) Display environmental information about an individual PCG. Replace slot with 0 or 1.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> request chassis pcg on page 461
List of Sample Output	show chassis environment pcg (M40e Router) on page 672 show chassis environment pcg (M160 Router) on page 672
Output Fields	Table 44 on page 671 lists the output fields for the show chassis environment pcg command. Output fields are listed in the approximate order in which they appear.

Table 44: show chassis environment pcg Output Fields

Field Name	Field Description
PCG slot status	Slot number: 0 or 1.
State	Status of PCG: <ul style="list-style-type: none"> Present—PCG is detected by the chassis process but is either not supported by the current version of Junos OS or PCG is coming up but is not yet online. Online—PCG is powered down. If Online, it can be the Master clock or the Standby clock. Offline—PCG is powered down. Empty—No PCG is present.
Temperature	Temperature of the air flowing past the PCG.
Frequency	Frequency setting and measurement for the PCG.
Power	Information about the voltage supplied to the PCG. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.
BUS Revision	Revision level of the generic bus device.

Sample Output

show chassis environment pcg (M40e Router)

```
user@host> show chassis environment pcg
PCG 0 status:
  State                Online - Master clock
  Temperature           44 degrees C / 111 degrees F
  Frequency:
    Setting             125.00 MHz
    Measurement         124.95 MHz
  Power:
    3.3 V               3266 mV
    5.0 V bias          4964 mV
    8.0 V bias          8112 mV
  BUS Revision         12
PCG 1 status:
  State                Online - Standby
  Temperature           47 degrees C / 116 degrees F
  Frequency:
    Setting             125.00 MHz
    Measurement         124.96 MHz
  Power:
    3.3 V               3271 mV
    5.0 V bias          4979 mV
    8.0 V bias          8117 mV
  BUS Revision         12
```

show chassis environment pcg (M160 Router)

```
user@host> show chassis environment pcg
PCG 0 status:
  State                Online - Master clock
  Temperature           41 degrees C / 105 degrees F
  Frequency:
    Setting             125.00 MHz
    Measurement         125.03 MHz
  Power:
    3.3 V               3286 mV
    5.0 V bias          5010 mV
    8.0 V bias          8183 mV
  BUS Revision         12
PCG 1 status:
  State                Online - Standby
  Temperature           43 degrees C / 109 degrees F
  Frequency:
    Setting             125.00 MHz
    Measurement         125.01 MHz
  Power:
    3.3 V               3288 mV
    5.0 V bias          4993 mV
    8.0 V bias          8197 mV
  BUS Revision         12
```


show chassis environment pem

Syntax	show chassis environment pem <slot>
Syntax (ACX4000 Router)	show chassis environment pem
Syntax (TX Matrix Routers)	show chassis environment pem <lcc number | scc> <slot>
Syntax (TX Matrix Plus Routers)	show chassis environment pem <lcc number | sfc number> <slot>
Syntax (MX Series Router)	show chassis environment pem <slot> <all-members> <local> <member member-id>
Syntax (MX104 Router)	show chassis environment pem <slot>
Syntax (QFX Series)	show chassis environment pem <slot (interconnect-device name slot ) | (node-device name)>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS 11.3 for the QFX Series. Command introduced in Junos OS 12.3R2 for EX Series. Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.
Description	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 1020](#)

List of Sample Output

[show chassis environment pem \(M40e Router\) on page 676](#)
[show chassis environment pem \(M120 Router\) on page 676](#)
[show chassis environment pem \(M160 Router\) on page 676](#)
[show chassis environment pem \(M320 Router\) on page 676](#)
[show chassis environment pem \(MX104 Router\) on page 677](#)
[show chassis environment pem \(MX240 Router\) on page 677](#)
[show chassis environment pem \(MX480 Router\) on page 677](#)
[show chassis environment pem \(MX960 Router\) on page 677](#)

[show chassis environment pem \(T320 Router\) on page 677](#)
[show chassis environment pem \(T640 Router\) on page 677](#)
[show chassis environment pem \(T4000 Router\) on page 678](#)
[show chassis environment pem \(T640/T1600/T4000 Routers With Six-Input DC Power Supply\) on page 678](#)
[show chassis environment pem lcc \(TX Matrix Routing Matrix\) on page 679](#)
[show chassis environment pem scc \(TX Matrix Routing Matrix\) on page 679](#)
[show chassis environment pem sfc \(TX Matrix Plus Routing Matrix\) on page 679](#)
[show chassis environment pem lcc \(TX Matrix Plus Routing Matrix\) on page 680](#)
[show chassis environment pem node-device \(QFabric System\) on page 680](#)
[show chassis environment pem \(QFX Series\) on page 681](#)
[show chassis environment pem interconnect-device \(QFabric System\) on page 681](#)

Output Fields Table 45 on page 675 lists the output fields for the **show chassis environment pem** command. Output fields are listed in the approximate order in which they appear.

Table 45: show chassis environment pem Output Fields

Field Name	Field Description
PEM <i>slot status</i>	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.
Load	(Not available on M40e or M160 routers) Information about the load on supply, in percentage of rated current being used.
Voltage	(M120, M160, M320, T640, T1600, TX Matrix, and TX Matrix Plus routers only) Information about voltage supplied to the PEM. (MX104 routers only) Information about voltage supplied by the PEM to the system.
Current	(T640, T1600, TX Matrix, and TX Matrix Plus routers only) Information about the PEM current.
Power	(T640, T1600, TX Matrix, and TX Matrix Plus routers only) Information about the PEM power.
SCG/CB/SIB	(T640, T1600, TX Matrix, and TX Matrix Plus routers only) SONET Clock Generator/Control Board/Switch Interface Board.
FAN	(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:     OK
PEM 1 status:
  State          Online
  Temperature     OK
  DC Output:     OK

```

show chassis environment pem (MX480 Router)

```

user@host> show chassis environment pem
PEM 0 status:
  State          Online
  Temperature     OK
  DC Input:      OK
  DC Output:     OK
  Voltage:
PEM 1 status:
  State          Online
  Temperature     OK
  DC Input:      OK
  DC Output:     OK
  Voltage:

```

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:     OK

```

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)**

```
user@host> show chassis environment pem
PEM 1 status:
  State                               Online
  Temperature                         36 degrees C / 96 degrees F
```

Routers With Six-Input DC Power Supply)

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:	Present			
State	27 degrees C / 80 degrees F			
Temperature	Check			
DC input:	Voltage	Current	Power	Load
DC output:				
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:	Online			
State	24 degrees C / 75 degrees F			
Temperature	OK			
DC input:	Voltage	Current	Power	Load
DC output:				
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

```
user@host> show chassis environment pem sfc 0
sfc0-re0:
```

(TX Matrix Plus Routing Matrix)

```

PEM 0 status:
State                Online
Temperature          35 degrees C / 95 degrees F
DC Input:            OK
DC Output
Channel 0            Voltage    Current    Power    Load
Channel 1            53820      14140      761      59
Channel 2            53550      12720      681      53
Channel 3            53840      12930      696      54
Channel 4            53690      14990      804      63
Channel 5            53620      15070      808      63
Channel 6            53900      14820      798      62
Channel 7            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
FPC 0                Voltage    Current    Power    Load
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                56408      7575      427      56
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
FPC 0                Voltage    Current    Power    Load
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

```

user@switch> show chassis environment pem node-device node1

```

```

FPC 0 PEM 0 status:

```

```

State                Check

```


node-device (QFabric System)

```

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)

```

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 psm

Syntax	<code>show chassis environment psm</code> <code><psm-slot-number></code>
Release Information	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.
Description	Display chassis environmental information about the power supply module (PSM).
Options	<p>none—Display environmental information about all PSMs.</p> <p>psm-slot-number—(Optional) Display environmental information about the specified 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.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> show chassis environment on page 533
List of Sample Output	show chassis environment psm (MX2020 Router) on page 683 show chassis environment psm (MX2010 Router) on page 685
Output Fields	Table 46 on page 682 lists the output fields for the show chassis environment psm command. Output fields are listed in the approximate order in which they appear.

Table 46: show chassis environment psm Output Fields

Field Name	Field Description
State	Status of the PSM. <ul style="list-style-type: none"> Online—The PSM is online and running. Offline—PSM is powered down.
Temperature	Temperature in Celsius (C) and Fahrenheit (F) of the air flowing past the PSM.
DC Input	State of the DC input power feed for the specified zone at the specified amps and voltage, and load for the PSM.
DC Output	DC power output in Watts for the specified zone at the specified amps and voltage (A @ V), and load and percentage utilization of the maximum capacity for the PSM.
Hours Used	Number of hours the PSM has been operational.

Sample Output

show chassis
environment psm
(MX2020 Router)

```
user@host> show chassis environment psm
PSM 2 status:
  State      Online
  Temperature OK
  DC Input
    Feed      Voltage(V) Current(A) Power(W)
    INP0      50.00      18.90      945.00
    INP1      0.00      0.00      0.00
  DC Output
    Voltage(V) Current(A) Power(W) Load(%)
    51.75      16.50      853.88      40.66
  Hours Used 6140
PSM 3 status:
  State      Online
  Temperature OK
  DC Input
    Feed      Voltage(V) Current(A) Power(W)
    INP0      50.40      18.90      952.56
    INP1      0.00      0.00      0.00
  DC Output
    Voltage(V) Current(A) Power(W) Load(%)
    51.75      16.50      853.88      40.66
  Hours Used 6140
PSM 4 status:
  State      Online
  Temperature OK
  DC Input
    Feed      Voltage(V) Current(A) Power(W)
    INP0      50.40      18.90      952.56
    INP1      0.00      0.00      0.00
  DC Output
    Voltage(V) Current(A) Power(W) Load(%)
    52.00      16.75      871.00      41.48
  Hours Used 6140
PSM 5 status:
  State      Online
  Temperature OK
  DC Input
    Feed      Voltage(V) Current(A) Power(W)
    INP0      50.40      18.90      952.56
    INP1      0.00      0.00      0.00
  DC Output
    Voltage(V) Current(A) Power(W) Load(%)
    52.00      16.50      858.00      40.86
  Hours Used 6140
PSM 6 status:
  State      Online
  Temperature OK
  DC Input
    Feed      Voltage(V) Current(A) Power(W)
    INP0      50.40      18.90      952.56
    INP1      0.00      0.00      0.00
  DC Output
    Voltage(V) Current(A) Power(W) Load(%)
    52.00      16.75      871.00      41.48
  Hours Used 6140
PSM 7 status:
  State      Online
  Temperature OK
  DC Input
    Feed      Voltage(V) Current(A) Power(W)
    INP0      50.40      19.20      967.68
    INP1      0.00      0.00      0.00
  DC Output
    Voltage(V) Current(A) Power(W) Load(%)
    52.00      16.75      871.00      41.48
  Hours Used 6140
PSM 8 status:
  State      Online
  Temperature OK
```

DC Input	Feed	Voltage(V)	Current(A)	Power(W)
	INP0	50.00	20.40	1020.00
	INP1	0.00	0.00	0.00
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)
	51.75	17.00	879.75	41.89
Hours Used	3380			
PSM 11 status:				
State	Online			
Temperature	OK			
DC Input	Feed	Voltage(V)	Current(A)	Power(W)
	INP0	0.00	0.00	0.00
	INP1	50.40	18.30	922.32
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)
	52.00	16.25	845.00	40.24
Hours Used	5615			
PSM 12 status:				
State	Online			
Temperature	OK			
DC Input	Feed	Voltage(V)	Current(A)	Power(W)
	INP0	0.00	0.00	0.00
	INP1	50.40	18.30	922.32
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)
	52.00	16.00	832.00	39.62
Hours Used	6143			
PSM 13 status:				
State	Online			
Temperature	OK			
DC Input	Feed	Voltage(V)	Current(A)	Power(W)
	INP0	0.00	0.00	0.00
	INP1	50.40	18.00	907.20
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)
	52.00	16.00	832.00	39.62
Hours Used	6143			
PSM 14 status:				
State	Online			
Temperature	OK			
DC Input	Feed	Voltage(V)	Current(A)	Power(W)
	INP0	0.00	0.00	0.00
	INP1	50.00	18.30	915.00
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)
	52.00	16.00	832.00	39.62
Hours Used	6143			
PSM 15 status:				
State	Online			
Temperature	OK			
DC Input	Feed	Voltage(V)	Current(A)	Power(W)
	INP0	0.00	0.00	0.00
	INP1	48.80	18.90	922.32
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)
	52.00	16.25	845.00	40.24
Hours Used	6143			
PSM 16 status:				
State	Online			
Temperature	OK			
DC Input	Feed	Voltage(V)	Current(A)	Power(W)
	INP0	0.00	0.00	0.00
	INP1	48.80	18.90	922.32
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)
	52.00	16.25	845.00	40.24
Hours Used	6143			
PSM 17 status:				

```

State          Online
Temperature    OK
DC Input       Feed      Voltage(V)  Current(A)  Power(W)
                INP0      0.00        0.00        0.00
                INP1      48.80       18.90      922.32
DC Output       Voltage(V)  Current(A)  Power(W)  Load(%)
                52.00     16.25     845.00    40.24
Hours Used      5207

```

**show chassis
environment psm
(MX2010 Router)**

```
user@host> show chassis environment psm
```

```
PSM 0 status:
```

```

State          Online
Temperature    OK
DC Input       Feed      Voltage(V)  Current(A)  Power(W)
                INP0      51.20       14.70     752.64
                INP1      0.00        0.00        0.00
DC Output       Voltage(V)  Current(A)  Power(W)  Load(%)
                51.25     13.00     666.25    26.65
Hours Used      2056

```

```
PSM 1 status:
```

```

State          Online
Temperature    OK
DC Input       Feed      Voltage(V)  Current(A)  Power(W)
                INP0      51.20       14.35     734.72
                INP1      0.00        0.00        0.00
DC Output       Voltage(V)  Current(A)  Power(W)  Load(%)
                51.25     12.75     653.44    26.14
Hours Used      2008

```

```
PSM 2 status:
```

```

State          Online
Temperature    OK
DC Input       Feed      Voltage(V)  Current(A)  Power(W)
                INP0      51.20       14.35     734.72
                INP1      0.00        0.00        0.00
DC Output       Voltage(V)  Current(A)  Power(W)  Load(%)
                51.50     13.00     669.50    26.78
Hours Used      2032

```

```
PSM 3 status:
```

```

State          Online
Temperature    OK
DC Input       Feed      Voltage(V)  Current(A)  Power(W)
                INP0      50.40       14.35     723.24
                INP1      0.00        0.00        0.00
DC Output       Voltage(V)  Current(A)  Power(W)  Load(%)
                51.00     12.75     650.25    26.01
Hours Used      2008

```

```
PSM 4 status:
```

```

State          Online
Temperature    OK
DC Input       Feed      Voltage(V)  Current(A)  Power(W)
                INP0      51.20       14.00     716.80
                INP1      0.00        0.00        0.00
DC Output       Voltage(V)  Current(A)  Power(W)  Load(%)
                51.25     13.00     666.25    26.65
Hours Used      2055

```

```
PSM 5 status:
```

```

State          Online
Temperature    OK
DC Input       Feed      Voltage(V)  Current(A)  Power(W)
                INP0      51.20       14.70     752.64
                INP1      0.00        0.00        0.00

```

DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)
Hours Used	51.25	13.00	666.25	26.65
PSM 6 status:	2056			
State	Online			
Temperature	OK			
DC Input	Feed	Voltage(V)	Current(A)	Power(W)
	INP0	50.80	14.70	746.76
	INP1	0.00	0.00	0.00
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)
Hours Used	51.25	13.00	666.25	26.65
PSM 7 status:	2056			
State	Online			
Temperature	OK			
DC Input	Feed	Voltage(V)	Current(A)	Power(W)
	INP0	50.40	14.70	740.88
	INP1	0.00	0.00	0.00
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)
Hours Used	51.25	13.00	666.25	26.65
PSM 8 status:	2056			
State	Online			
Temperature	OK			
DC Input	Feed	Voltage(V)	Current(A)	Power(W)
	INP0	50.40	14.70	740.88
	INP1	0.00	0.00	0.00
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)
Hours Used	51.25	13.00	666.25	26.65

show chassis environment routing-engine

Syntax	show chassis environment routing-engine <slot>
Syntax (TX Matrix Routers)	show chassis environment routing-engine <lcc <i>number</i> | scc> <slot>
Syntax (TX Matrix Plus Routers)	show chassis environment routing-engine <lcc <i>number</i> | sfc <i>number</i> > <slot>
Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers)	show chassis environment routing-engine <slot>
Syntax (MX Series Routers)	show chassis environment routing-engine <slot> <all-members> <local> <member <i>member-id</i> >
Syntax (QFX Series)	show chassis environment routing-engine interconnect-device <i>name</i>
Release Information	<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>sfc 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>
Description	Display Routing Engine environmental status information.
Options	<p>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.</p> <p>all-members—(MX Series routers only) (Optional) Display environmental information about the Routing Engines in all member routers in the Virtual Chassis configuration.</p> <p>interconnect-device <i>name</i>—(QFabric systems only) (Optional) Display environmental information about the Routing Engines for the Interconnect device.</p>

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 467](#)
- [show chassis routing-engine on page 1201](#)

List of Sample Output

- [show chassis environment routing-engine \(Nonredundant\) on page 689](#)
- [show chassis environment routing-engine \(Redundant\) on page 689](#)
- [show chassis environment routing-engine \(MX104 Router\) on page 689](#)
- [show chassis environment routing-engine \(MX2010 Router\) on page 690](#)
- [show chassis environment routing-engine \(MX2020 Router\) on page 690](#)
- [show chassis environment routing-engine \(TX Matrix Plus Router\) on page 690](#)
- [show chassis environment routing-engine \(T4000 Core Router\) on page 690](#)

[show chassis environment routing-engine \(QFX Series\) on page 691](#)
[show chassis environment routing-engine interconnect-device \(QFabric System\) on page 691](#)
[show chassis environment routing-engine \(PTX5000 Packet Transport Router\) on page 691](#)

Output Fields [Table 47 on page 689](#) 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 47: 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"> • Online Master—Routing Engine is online, operating as Master. • Online Standby—Routing Engine is online, operating as Standby. • Offline—Routing Engine is offline.
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**

```
user@ host > show chassis environment routing-engine
Routing Engine 0 status:
  State                Online Master
```

```
routing-engine (MX104 Router)
  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

user@host> show chassis environment routing-engine
Routing Engine 0 status:
  State                Online Master
```

```

routing-engine (T4000
Core Router)
    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)
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 environment scg

Syntax	show chassis environment scg <slot>
Syntax (TX Matrix and TX Matrix Plus Router)	show chassis environment scg <lcc number> <slot>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 12.1 for the T4000 Core Routers.
Description	Display SONET Clock Generator (SCG) environmental information.
Options	<p>none—(TX Matrix and TX Matrix Plus routers only) Display environmental information about all SCGs. On a TX Matrix router, display environmental information about all SCGs on the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display environmental information about all SCGs on the TX Matrix Plus router and its attached routers.</p> <p>lcc number—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number. Replace <i>number</i> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none">• 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. <p>slot—(Optional) Display environmental information about the SCG. Replace slot with 0 or 1.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• request chassis scg on page 472• <i>Configuring the Clock Source</i>• <i>T320 SONET Clock Generator (SCG) Description</i>
List of Sample Output	show chassis environment scg (T Series Routers) on page 694 show chassis environment scg (T4000 Core Routers) on page 694 show chassis environment scg lcc (TX Matrix Router) on page 694

[show chassis environment scg lcc \(TX Matrix Plus Router\) on page 695](#)

[show chassis environment scg \(TX Matrix Plus Router\) on page 695](#)

Output Fields Table 48 on page 693 lists the output fields for the **show chassis environment scg** command. Output fields are listed in the approximate order in which they appear.

Table 48: show chassis environment scg Output Fields

Field Name	Field Description
SCG slot status	Number of the SCG slot: 0 or 1.
State	<p>Status of the SCG:</p> <ul style="list-style-type: none"> • Online—SCG is online and running. • Offline—SCG is powered down. <p>If two SCGs are installed and online, one is functioning as the master, and the other is the standby.</p>
Temperature	Temperature of the air flowing past the SCG.
Power	Power on the SCG. The left column displays required power, in volts. The right column displays measured power, in millivolts.
BUS Revision	Revision level of the generic bus device.

Sample Output

show chassis environment scg (T Series Routers)

```
user@host> show chassis environment scg
SCG 0 status:
State                               Online - Master clock
Temperature                         29 degrees C / 84 degrees F
Power:
  GROUND                            0 mV
  3.3 V                             3297 mV
  5.0 V                             5050 mV
  5.6 V                             5682 mV
  1.8 V bias                        1787 mV
  3.3 V bias                        3277 mV
  5.0 V bias                        4984 mV
  8.0 V bias                        8400 mV
  BUS Revision                      40
SCG 1 status:
State                               Online - Standby
Temperature                         28 degrees C / 82 degrees F
Power:
  GROUND                            0 mV
  3.3 V                             3317 mV
  5.0 V                             5057 mV
  5.6 V                             5689 mV
  1.8 V bias                        1794 mV
  3.3 V bias                        3296 mV
  5.0 V bias                        4991 mV
  8.0 V bias                        8410 mV
  BUS Revision                      40
```

show chassis environment scg (T4000 Core Routers)

```
user@host> show chassis environment scg
SCG 0 status:
State                               Online - Master clock
Temperature                         33 degrees C / 91 degrees F
Power:
  GROUND                            0 mV
  1.8 V bias                        1794 mV
  3.3 V                             3310 mV
  3.3 V bias                        3299 mV
  5.0 V                             5040 mV
  5.0 V bias                        5003 mV
  5.6 V                             5780 mV
  8.0 V bias                        7416 mV
  Bus Revision                      40
SCG 1 status:
State                               Online - Standby
Temperature                         33 degrees C / 91 degrees F
Power:
  GROUND                            0 mV
  1.8 V bias                        1794 mV
  3.3 V                             3319 mV
  3.3 V bias                        3286 mV
  5.0 V                             5047 mV
  5.0 V bias                        5013 mV
  5.6 V                             5758 mV
  8.0 V bias                        7347 mV
  Bus Revision                      40
```

**show chassis
environment scg lcc
(TX Matrix Router)**

```
user@host> show chassis environment scg lcc 0 0
lcc0-re0:
-----
SCG 0 status:
State                Online - Master clock
Temperature           30 degrees C / 86 degrees F
Power:
  GROUND              0 mV
  3.3 V               3321 mV
  5.0 V               5062 mV
  5.6 V               5682 mV
  1.8 V bias          1789 mV
  3.3 V bias          3289 mV
  5.0 V bias          4993 mV
  8.0 V bias          7807 mV
BUS Revision          40
```

**show chassis
environment scg lcc
(TX Matrix Plus
Router)**

```
user@host> show chassis environment scg lcc 0
lcc0-re0:
-----
SCG 0 status:
State                Online - Master clock
Temperature           42 degrees C / 107 degrees F
Power:
  GROUND              0 mV
  1.8 V bias          1800 mV
  3.3 V               3290 mV
  3.3 V bias          3304 mV
  5.0 V               5042 mV
  5.0 V bias          4979 mV
  5.6 V               5765 mV
  8.0 V bias          7682 mV
Bus Revision          40
```

**show chassis
environment scg**

```
user@host> show chassis environment scg
lcc0-re0:
-----
```

(TX Matrix Plus Router)

SCG 0 status:
State Online - Master clock
Temperature 40 degrees C / 104 degrees F
Power
GROUND 0 mV
1.8 V bias 1800 mV
3.3 V 3291 mV
3.3 V bias 3304 mV
5.0 V 5042 mV
5.0 V bias 4979 mV
5.6 V 5765 mV
8.0 V bias 7643 mV
Bus Revision 40

lcc1-re0:

SCG 0 status:
State Online - Master clock
Temperature 37 degrees C / 98 degrees F
Power
GROUND 0 mV
1.8 V bias 1788 mV
3.3 V 3305 mV
3.3 V bias 3284 mV
5.0 V 5042 mV
5.0 V bias 5010 mV
5.6 V 5748 mV
8.0 V bias 7692 mV
Bus Revision 40

lcc2-re0:

SCG 0 status:
State Online - Master clock
Temperature 39 degrees C / 102 degrees F
Power
GROUND 0 mV
1.8 V bias 1785 mV
3.3 V 3306 mV
3.3 V bias 3301 mV
5.0 V 5045 mV
5.0 V bias 4993 mV
5.6 V 5765 mV
8.0 V bias 7838 mV
Bus Revision 40

lcc3-re0:

SCG 0 status:
State Online - Master clock
Temperature 39 degrees C / 102 degrees F
Power
GROUND 0 mV
1.8 V bias 1800 mV
3.3 V 3290 mV
3.3 V bias 3294 mV
5.0 V 5050 mV
5.0 V bias 4984 mV
5.6 V 5780 mV
8.0 V bias 7716 mV
Bus Revision 40

show chassis environment sfb

Syntax	<code>show chassis environment sfb</code> <code><sfb-slot-number></code>
Release Information	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.
Description	Display chassis environmental information about the Switch Fabric Board (SFB).
Options	none —Display environmental information about all Switch Fabric Boards. sfb-slot-number —(Optional) Display environmental information about the specified Switch Fabric Board. For MX2020 and MX2010 routers, replace sfb-slot-number with a value from 0 through 7.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • request chassis sfb on page 474 • show chassis sfb on page 1224
List of Sample Output	show chassis environment sfb (MX2020 Router) on page 699 show chassis environment sfb (MX2010 Router) on page 703
Output Fields	Table 49 on page 698 lists the output fields for the show chassis environment sfb command. Output fields are listed in the approximate order in which they appear.

Table 49: show chassis environment sfb Output Fields

Field Name	Field Description
State	Status of the SFB. <ul style="list-style-type: none"> • Online—The SFB is online and running. • Offline— SFB is powered down.
Temperature	Temperature in Celsius (C) and Fahrenheit (F) of the air flowing past the SFB. <ul style="list-style-type: none"> • Intake—Measures the temperature of the air intake. • Exhaust—Measures the temperature of the hot air exhaust. • SFB-XF2—Measures the temperature of the hot air exhaust for the XF2 fabric plane. • SFB-XF1—Measures the temperature of the hot air exhaust for the XF1 fabric plane. • SFB-XF0—Measures the temperature of the hot air exhaust for the XF0 fabric plane.
Power	Power required and measured on the SFB. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.

Sample Output

show chassis
environment sfb
(MX2020 Router)

```
user@host> show chassis environment sfb
SFB 0 status:
State                               Online
Intake-Zone0 Temperature            51 degrees C / 123 degrees F
Exhaust-Zone1 Temperature            44 degrees C / 111 degrees F
IntakeA-Zone0 Temperature            46 degrees C / 114 degrees F
IntakeB-Zone1 Temperature            37 degrees C / 98 degrees F
Exhaust-Zone0 Temperature            48 degrees C / 118 degrees F
SFB-XF2-Zone1 Temperature            58 degrees C / 136 degrees F
SFB-XF1-Zone0 Temperature            65 degrees C / 149 degrees F
SFB-XF0-Zone0 Temperature            64 degrees C / 147 degrees F
Power
LTC3880-XF2-1.5v-RAIL                1500 mV
LTC3880-XF2-1.5v-CH0                1500 mV
LTC3880-XF2-1.5v-CH1                1500 mV
LTC3880-XF2-1.0v-RAIL                1029 mV
LTC3880-XF2-1.0v-CH0                1029 mV
LTC3880-XF2-1.0v-CH1                1032 mV
LTC3880-XF1-1.5v-RAIL                1499 mV
LTC3880-XF1-1.5v-CH0                1499 mV
LTC3880-XF1-1.5v-CH1                1501 mV
LTC3880-XF1-1.0v-RAIL                1029 mV
LTC3880-XF1-1.0v-CH0                1029 mV
LTC3880-XF1-1.0v-CH1                1033 mV
LTC3880-XF0-1.5v-RAIL                1500 mV
LTC3880-XF0-1.5v-CH0                1500 mV
LTC3880-XF0-1.5v-CH1                1501 mV
LTC3880-XF0-1.0v-RAIL                1029 mV
LTC3880-XF0-1.0v-CH0                1029 mV
LTC3880-XF0-1.0v-CH1                1033 mV
LTC3880-3.3v-RAIL                   3300 mV
LTC3880-3.3v-CH0                   3300 mV
LTC3880-3.3v-CH1                   3299 mV
SFB 1 status:
State                               Online
Intake-Zone0 Temperature            52 degrees C / 125 degrees F
Exhaust-Zone1 Temperature            44 degrees C / 111 degrees F
IntakeA-Zone0 Temperature            47 degrees C / 116 degrees F
IntakeB-Zone1 Temperature            37 degrees C / 98 degrees F
Exhaust-Zone0 Temperature            47 degrees C / 116 degrees F
SFB-XF2-Zone1 Temperature            59 degrees C / 138 degrees F
SFB-XF1-Zone0 Temperature            63 degrees C / 145 degrees F
SFB-XF0-Zone0 Temperature            65 degrees C / 149 degrees F
Power
LTC3880-XF2-1.5v-RAIL                1500 mV
LTC3880-XF2-1.5v-CH0                1500 mV
LTC3880-XF2-1.5v-CH1                1501 mV
LTC3880-XF2-1.0v-RAIL                1030 mV
LTC3880-XF2-1.0v-CH0                1030 mV
LTC3880-XF2-1.0v-CH1                1033 mV
LTC3880-XF1-1.5v-RAIL                1499 mV
LTC3880-XF1-1.5v-CH0                1499 mV
LTC3880-XF1-1.5v-CH1                1500 mV
LTC3880-XF1-1.0v-RAIL                1029 mV
LTC3880-XF1-1.0v-CH0                1029 mV
LTC3880-XF1-1.0v-CH1                1033 mV
LTC3880-XF0-1.5v-RAIL                1500 mV
LTC3880-XF0-1.5v-CH0                1500 mV
```

LTC3880-XF0-1.5v-CH1	1501 mV
LTC3880-XF0-1.0v-RAIL	1030 mV
LTC3880-XF0-1.0v-CH0	1030 mV
LTC3880-XF0-1.0v-CH1	1033 mV
LTC3880-3.3v-RAIL	3300 mV
LTC3880-3.3v-CH0	3300 mV
LTC3880-3.3v-CH1	3299 mV

SFB 2 status:

State	Online
Intake-Zone0 Temperature	52 degrees C / 125 degrees F
Exhaust-Zone1 Temperature	44 degrees C / 111 degrees F
IntakeA-Zone0 Temperature	47 degrees C / 116 degrees F
IntakeB-Zone1 Temperature	37 degrees C / 98 degrees F
Exhaust-Zone0 Temperature	49 degrees C / 120 degrees F
SFB-XF2-Zone1 Temperature	62 degrees C / 143 degrees F
SFB-XF1-Zone0 Temperature	66 degrees C / 150 degrees F
SFB-XF0-Zone0 Temperature	66 degrees C / 150 degrees F

Power

LTC3880-XF2-1.5v-RAIL	1499 mV
LTC3880-XF2-1.5v-CH0	1499 mV
LTC3880-XF2-1.5v-CH1	1500 mV
LTC3880-XF2-1.0v-RAIL	1030 mV
LTC3880-XF2-1.0v-CH0	1030 mV
LTC3880-XF2-1.0v-CH1	1033 mV
LTC3880-XF1-1.5v-RAIL	1500 mV
LTC3880-XF1-1.5v-CH0	1500 mV
LTC3880-XF1-1.5v-CH1	1501 mV
LTC3880-XF1-1.0v-RAIL	1030 mV
LTC3880-XF1-1.0v-CH0	1030 mV
LTC3880-XF1-1.0v-CH1	1033 mV
LTC3880-XF0-1.5v-RAIL	1499 mV
LTC3880-XF0-1.5v-CH0	1499 mV
LTC3880-XF0-1.5v-CH1	1501 mV
LTC3880-XF0-1.0v-RAIL	1030 mV
LTC3880-XF0-1.0v-CH0	1030 mV
LTC3880-XF0-1.0v-CH1	1033 mV
LTC3880-3.3v-RAIL	3300 mV
LTC3880-3.3v-CH0	3300 mV
LTC3880-3.3v-CH1	3299 mV

SFB 3 status:

State	Online
Intake-Zone0 Temperature	53 degrees C / 127 degrees F
Exhaust-Zone1 Temperature	44 degrees C / 111 degrees F
IntakeA-Zone0 Temperature	48 degrees C / 118 degrees F
IntakeB-Zone1 Temperature	38 degrees C / 100 degrees F
Exhaust-Zone0 Temperature	49 degrees C / 120 degrees F
SFB-XF2-Zone1 Temperature	62 degrees C / 143 degrees F
SFB-XF1-Zone0 Temperature	65 degrees C / 149 degrees F
SFB-XF0-Zone0 Temperature	68 degrees C / 154 degrees F

Power

LTC3880-XF2-1.5v-RAIL	1500 mV
LTC3880-XF2-1.5v-CH0	1500 mV
LTC3880-XF2-1.5v-CH1	1500 mV
LTC3880-XF2-1.0v-RAIL	1029 mV
LTC3880-XF2-1.0v-CH0	1029 mV
LTC3880-XF2-1.0v-CH1	1033 mV
LTC3880-XF1-1.5v-RAIL	1500 mV
LTC3880-XF1-1.5v-CH0	1500 mV
LTC3880-XF1-1.5v-CH1	1501 mV
LTC3880-XF1-1.0v-RAIL	1030 mV
LTC3880-XF1-1.0v-CH0	1030 mV

```

LTC3880-XF1-1.0v-CH1      1033 mV
LTC3880-XF0-1.5v-RAIL     1499 mV
LTC3880-XF0-1.5v-CH0      1499 mV
LTC3880-XF0-1.5v-CH1      1501 mV
LTC3880-XF0-1.0v-RAIL     1030 mV
LTC3880-XF0-1.0v-CH0      1030 mV
LTC3880-XF0-1.0v-CH1      1034 mV
LTC3880-3.3v-RAIL         3300 mV
LTC3880-3.3v-CH0          3300 mV
LTC3880-3.3v-CH1          3300 mV
SFB 4 status:
State                      Online
Intake-Zone0 Temperature   54 degrees C / 129 degrees F
Exhaust-Zone1 Temperature  46 degrees C / 114 degrees F
IntakeA-Zone0 Temperature  49 degrees C / 120 degrees F
IntakeB-Zone1 Temperature  39 degrees C / 102 degrees F
Exhaust-Zone0 Temperature  50 degrees C / 122 degrees F
SFB-XF2-Zone1 Temperature  61 degrees C / 141 degrees F
SFB-XF1-Zone0 Temperature  64 degrees C / 147 degrees F
SFB-XF0-Zone0 Temperature  67 degrees C / 152 degrees F
Power
LTC3880-XF2-1.5v-RAIL     1500 mV
LTC3880-XF2-1.5v-CH0      1500 mV
LTC3880-XF2-1.5v-CH1      1500 mV
LTC3880-XF2-1.0v-RAIL     1030 mV
LTC3880-XF2-1.0v-CH0      1030 mV
LTC3880-XF2-1.0v-CH1      1033 mV
LTC3880-XF1-1.5v-RAIL     1499 mV
LTC3880-XF1-1.5v-CH0      1499 mV
LTC3880-XF1-1.5v-CH1      1501 mV
LTC3880-XF1-1.0v-RAIL     1030 mV
LTC3880-XF1-1.0v-CH0      1030 mV
LTC3880-XF1-1.0v-CH1      1033 mV
LTC3880-XF0-1.5v-RAIL     1500 mV
LTC3880-XF0-1.5v-CH0      1500 mV
LTC3880-XF0-1.5v-CH1      1501 mV
LTC3880-XF0-1.0v-RAIL     1030 mV
LTC3880-XF0-1.0v-CH0      1030 mV
LTC3880-XF0-1.0v-CH1      1033 mV
LTC3880-3.3v-RAIL         3299 mV
LTC3880-3.3v-CH0          3299 mV
LTC3880-3.3v-CH1          3299 mV
SFB 5 status:
State                      Online
Intake-Zone0 Temperature   54 degrees C / 129 degrees F
Exhaust-Zone1 Temperature  46 degrees C / 114 degrees F
IntakeA-Zone0 Temperature  49 degrees C / 120 degrees F
IntakeB-Zone1 Temperature  40 degrees C / 104 degrees F
Exhaust-Zone0 Temperature  50 degrees C / 122 degrees F
SFB-XF2-Zone1 Temperature  63 degrees C / 145 degrees F
SFB-XF1-Zone0 Temperature  65 degrees C / 149 degrees F
SFB-XF0-Zone0 Temperature  70 degrees C / 158 degrees F
Power
LTC3880-XF2-1.5v-RAIL     1500 mV
LTC3880-XF2-1.5v-CH0      1500 mV
LTC3880-XF2-1.5v-CH1      1500 mV
LTC3880-XF2-1.0v-RAIL     1029 mV
LTC3880-XF2-1.0v-CH0      1029 mV
LTC3880-XF2-1.0v-CH1      1033 mV
LTC3880-XF1-1.5v-RAIL     1499 mV
LTC3880-XF1-1.5v-CH0      1499 mV

```

LTC3880-XF1-1.5v-CH1	1500 mV
LTC3880-XF1-1.0v-RAIL	1030 mV
LTC3880-XF1-1.0v-CH0	1030 mV
LTC3880-XF1-1.0v-CH1	1033 mV
LTC3880-XF0-1.5v-RAIL	1499 mV
LTC3880-XF0-1.5v-CH0	1499 mV
LTC3880-XF0-1.5v-CH1	1501 mV
LTC3880-XF0-1.0v-RAIL	1029 mV
LTC3880-XF0-1.0v-CH0	1029 mV
LTC3880-XF0-1.0v-CH1	1033 mV
LTC3880-3.3v-RAIL	3299 mV
LTC3880-3.3v-CH0	3299 mV
LTC3880-3.3v-CH1	3300 mV

SFB 6 status:

State	Online
Intake-Zone0 Temperature	54 degrees C / 129 degrees F
Exhaust-Zone1 Temperature	46 degrees C / 114 degrees F
IntakeA-Zone0 Temperature	48 degrees C / 118 degrees F
IntakeB-Zone1 Temperature	40 degrees C / 104 degrees F
Exhaust-Zone0 Temperature	49 degrees C / 120 degrees F
SFB-XF2-Zone1 Temperature	62 degrees C / 143 degrees F
SFB-XF1-Zone0 Temperature	64 degrees C / 147 degrees F
SFB-XF0-Zone0 Temperature	68 degrees C / 154 degrees F

Power

LTC3880-XF2-1.5v-RAIL	1499 mV
LTC3880-XF2-1.5v-CH0	1499 mV
LTC3880-XF2-1.5v-CH1	1501 mV
LTC3880-XF2-1.0v-RAIL	1030 mV
LTC3880-XF2-1.0v-CH0	1030 mV
LTC3880-XF2-1.0v-CH1	1033 mV
LTC3880-XF1-1.5v-RAIL	1499 mV
LTC3880-XF1-1.5v-CH0	1499 mV
LTC3880-XF1-1.5v-CH1	1500 mV
LTC3880-XF1-1.0v-RAIL	1029 mV
LTC3880-XF1-1.0v-CH0	1029 mV
LTC3880-XF1-1.0v-CH1	1033 mV
LTC3880-XF0-1.5v-RAIL	1499 mV
LTC3880-XF0-1.5v-CH0	1499 mV
LTC3880-XF0-1.5v-CH1	1501 mV
LTC3880-XF0-1.0v-RAIL	1029 mV
LTC3880-XF0-1.0v-CH0	1029 mV
LTC3880-XF0-1.0v-CH1	1033 mV
LTC3880-3.3v-RAIL	3300 mV
LTC3880-3.3v-CH0	3300 mV
LTC3880-3.3v-CH1	3300 mV

SFB 7 status:

State	Online
Intake-Zone0 Temperature	53 degrees C / 127 degrees F
Exhaust-Zone1 Temperature	46 degrees C / 114 degrees F
IntakeA-Zone0 Temperature	49 degrees C / 120 degrees F
IntakeB-Zone1 Temperature	40 degrees C / 104 degrees F
Exhaust-Zone0 Temperature	50 degrees C / 122 degrees F
SFB-XF2-Zone1 Temperature	64 degrees C / 147 degrees F
SFB-XF1-Zone0 Temperature	66 degrees C / 150 degrees F
SFB-XF0-Zone0 Temperature	69 degrees C / 156 degrees F

Power

LTC3880-XF2-1.5v-RAIL	1500 mV
LTC3880-XF2-1.5v-CH0	1500 mV
LTC3880-XF2-1.5v-CH1	1501 mV
LTC3880-XF2-1.0v-RAIL	1029 mV
LTC3880-XF2-1.0v-CH0	1029 mV

```

LTC3880-XF2-1.0v-CH1      1033 mV
LTC3880-XF1-1.5v-RAIL     1499 mV
LTC3880-XF1-1.5v-CH0      1499 mV
LTC3880-XF1-1.5v-CH1      1501 mV
LTC3880-XF1-1.0v-RAIL     1030 mV
LTC3880-XF1-1.0v-CH0      1030 mV
LTC3880-XF1-1.0v-CH1      1033 mV
LTC3880-XF0-1.5v-RAIL     1499 mV
LTC3880-XF0-1.5v-CH0      1499 mV
LTC3880-XF0-1.5v-CH1      1501 mV
LTC3880-XF0-1.0v-RAIL     1030 mV
LTC3880-XF0-1.0v-CH0      1030 mV
LTC3880-XF0-1.0v-CH1      1033 mV
LTC3880-3.3v-RAIL         3300 mV
LTC3880-3.3v-CH0          3300 mV
LTC3880-3.3v-CH1          3300 mV

```

show chassis environment sfb (MX2010 Router)

```
user@host> show chassis environment sfb
```

```
SFB 0 status:
```

```

State      Online
Intake-Zone0 Temperature 31 degrees C / 87 degrees F
Exhaust-Zone1 Temperature 22 degrees C / 71 degrees F
IntakeA-Zone0 Temperature 21 degrees C / 69 degrees F
IntakeB-Zone1 Temperature 16 degrees C / 60 degrees F
Exhaust-Zone0 Temperature 23 degrees C / 73 degrees F
SFB-XF2-Zone1 Temperature 30 degrees C / 86 degrees F
SFB-XF1-Zone0 Temperature 28 degrees C / 82 degrees F
SFB-XF0-Zone0 Temperature 38 degrees C / 100 degrees F

```

```
Power
```

```

LTC3880-XF2-1.5v-RAIL     1500 mV
LTC3880-XF2-1.5v-CH0      1500 mV
LTC3880-XF2-1.5v-CH1      1500 mV
LTC3880-XF2-1.0v-RAIL     949 mV
LTC3880-XF2-1.0v-CH0      949 mV
LTC3880-XF2-1.0v-CH1      951 mV
LTC3880-XF1-1.5v-RAIL     1499 mV
LTC3880-XF1-1.5v-CH0      1499 mV
LTC3880-XF1-1.5v-CH1      1500 mV
LTC3880-XF1-1.0v-RAIL     949 mV
LTC3880-XF1-1.0v-CH0      949 mV
LTC3880-XF1-1.0v-CH1      951 mV
LTC3880-XF0-1.5v-RAIL     1499 mV
LTC3880-XF0-1.5v-CH0      1499 mV
LTC3880-XF0-1.5v-CH1      1500 mV
LTC3880-XF0-1.0v-RAIL     1029 mV
LTC3880-XF0-1.0v-CH0      1029 mV
LTC3880-XF0-1.0v-CH1      1032 mV
LTC3880-3.3v-RAIL         3300 mV
LTC3880-3.3v-CH0          3300 mV
LTC3880-3.3v-CH1          3299 mV

```

```
SFB 1 status:
```

```

State      Online
Intake-Zone0 Temperature 32 degrees C / 89 degrees F
Exhaust-Zone1 Temperature 20 degrees C / 68 degrees F
IntakeA-Zone0 Temperature 25 degrees C / 77 degrees F
IntakeB-Zone1 Temperature 15 degrees C / 59 degrees F
Exhaust-Zone0 Temperature 24 degrees C / 75 degrees F
SFB-XF2-Zone1 Temperature 31 degrees C / 87 degrees F
SFB-XF1-Zone0 Temperature 31 degrees C / 87 degrees F
SFB-XF0-Zone0 Temperature 37 degrees C / 98 degrees F

```

```
Power
```

LTC3880-XF2-1.5v-RAIL	1499 mV
LTC3880-XF2-1.5v-CH0	1499 mV
LTC3880-XF2-1.5v-CH1	1500 mV
LTC3880-XF2-1.0v-RAIL	1029 mV
LTC3880-XF2-1.0v-CH0	1029 mV
LTC3880-XF2-1.0v-CH1	1031 mV
LTC3880-XF1-1.5v-RAIL	1499 mV
LTC3880-XF1-1.5v-CH0	1499 mV
LTC3880-XF1-1.5v-CH1	1500 mV
LTC3880-XF1-1.0v-RAIL	1029 mV
LTC3880-XF1-1.0v-CH0	1029 mV
LTC3880-XF1-1.0v-CH1	1031 mV
LTC3880-XF0-1.5v-RAIL	1500 mV
LTC3880-XF0-1.5v-CH0	1500 mV
LTC3880-XF0-1.5v-CH1	1500 mV
LTC3880-XF0-1.0v-RAIL	1029 mV
LTC3880-XF0-1.0v-CH0	1029 mV
LTC3880-XF0-1.0v-CH1	1032 mV
LTC3880-3.3v-RAIL	3299 mV
LTC3880-3.3v-CH0	3299 mV
LTC3880-3.3v-CH1	3299 mV

SFB 2 status:

State	Online
Intake-Zone0 Temperature	26 degrees C / 78 degrees F
Exhaust-Zone1 Temperature	19 degrees C / 66 degrees F
IntakeA-Zone0 Temperature	23 degrees C / 73 degrees F
IntakeB-Zone1 Temperature	15 degrees C / 59 degrees F
Exhaust-Zone0 Temperature	21 degrees C / 69 degrees F
SFB-XF2-Zone1 Temperature	29 degrees C / 84 degrees F
SFB-XF1-Zone0 Temperature	26 degrees C / 78 degrees F
SFB-XF0-Zone0 Temperature	31 degrees C / 87 degrees F

Power

LTC3880-XF2-1.5v-RAIL	1500 mV
LTC3880-XF2-1.5v-CH0	1500 mV
LTC3880-XF2-1.5v-CH1	1500 mV
LTC3880-XF2-1.0v-RAIL	1029 mV
LTC3880-XF2-1.0v-CH0	1029 mV
LTC3880-XF2-1.0v-CH1	1031 mV
LTC3880-XF1-1.5v-RAIL	1499 mV
LTC3880-XF1-1.5v-CH0	1499 mV
LTC3880-XF1-1.5v-CH1	1500 mV
LTC3880-XF1-1.0v-RAIL	1030 mV
LTC3880-XF1-1.0v-CH0	1030 mV
LTC3880-XF1-1.0v-CH1	1031 mV
LTC3880-XF0-1.5v-RAIL	1499 mV
LTC3880-XF0-1.5v-CH0	1499 mV
LTC3880-XF0-1.5v-CH1	1500 mV
LTC3880-XF0-1.0v-RAIL	1029 mV
LTC3880-XF0-1.0v-CH0	1029 mV
LTC3880-XF0-1.0v-CH1	1032 mV
LTC3880-3.3v-RAIL	3300 mV
LTC3880-3.3v-CH0	3300 mV
LTC3880-3.3v-CH1	3300 mV

SFB 3 status:

State	Offline
Reason	No power

SFB 4 status:

State	Online
Intake-Zone0 Temperature	33 degrees C / 91 degrees F
Exhaust-Zone1 Temperature	21 degrees C / 69 degrees F
IntakeA-Zone0 Temperature	24 degrees C / 75 degrees F


```

IntakeB-Zone1 Temperature 17 degrees C / 62 degrees F
Exhaust-Zone0 Temperature 24 degrees C / 75 degrees F
SFB-XF2-Zone1 Temperature 32 degrees C / 89 degrees F
SFB-XF1-Zone0 Temperature 32 degrees C / 89 degrees F
SFB-XF0-Zone0 Temperature 37 degrees C / 98 degrees F
Power
  LTC3880-XF2-1.5v-RAIL      1499 mV
  LTC3880-XF2-1.5v-CH0      1499 mV
LTC3880-XF2-1.5v-CH1      1500 mV
  LTC3880-XF2-1.0v-RAIL      949 mV
  LTC3880-XF2-1.0v-CH0      949 mV
  LTC3880-XF2-1.0v-CH1      952 mV
  LTC3880-XF1-1.5v-RAIL      1500 mV
  LTC3880-XF1-1.5v-CH0      1500 mV
  LTC3880-XF1-1.5v-CH1      1500 mV
  LTC3880-XF1-1.0v-RAIL      1029 mV
  LTC3880-XF1-1.0v-CH0      1029 mV
  LTC3880-XF1-1.0v-CH1      1031 mV
  LTC3880-XF0-1.5v-RAIL      1499 mV
  LTC3880-XF0-1.5v-CH0      1499 mV
  LTC3880-XF0-1.5v-CH1      1500 mV
  LTC3880-XF0-1.0v-RAIL      949 mV
  LTC3880-XF0-1.0v-CH0      949 mV
  LTC3880-XF0-1.0v-CH1      952 mV
  LTC3880-3.3v-RAIL         3299 mV
  LTC3880-3.3v-CH0         3299 mV
  LTC3880-3.3v-CH1         3299 mV
SFB 5 status:
State                               Online
Intake-Zone0 Temperature           27 degrees C / 80 degrees F
Exhaust-Zone1 Temperature           20 degrees C / 68 degrees F
IntakeA-Zone0 Temperature           23 degrees C / 73 degrees F
IntakeB-Zone1 Temperature           15 degrees C / 59 degrees F
Exhaust-Zone0 Temperature           22 degrees C / 71 degrees F
SFB-XF2-Zone1 Temperature           27 degrees C / 80 degrees F
SFB-XF1-Zone0 Temperature           34 degrees C / 93 degrees F
SFB-XF0-Zone0 Temperature           32 degrees C / 89 degrees F
Power
  LTC3880-XF2-1.5v-RAIL      1500 mV
  LTC3880-XF2-1.5v-CH0      1500 mV
  LTC3880-XF2-1.5v-CH1      1500 mV
  LTC3880-XF2-1.0v-RAIL      949 mV
  LTC3880-XF2-1.0v-CH0      949 mV
  LTC3880-XF2-1.0v-CH1      951 mV
  LTC3880-XF1-1.5v-RAIL      1499 mV
  LTC3880-XF1-1.5v-CH0      1499 mV
  LTC3880-XF1-1.5v-CH1      1500 mV
  LTC3880-XF1-1.0v-RAIL      949 mV
  LTC3880-XF1-1.0v-CH0      949 mV
  LTC3880-XF1-1.0v-CH1      951 mV
  LTC3880-XF0-1.5v-RAIL      1499 mV
  LTC3880-XF0-1.5v-CH0      1499 mV
  LTC3880-XF0-1.5v-CH1      1500 mV
  LTC3880-XF0-1.0v-RAIL      1029 mV
  LTC3880-XF0-1.0v-CH0      1029 mV
  LTC3880-XF0-1.0v-CH1      1032 mV
  LTC3880-3.3v-RAIL         3299 mV
  LTC3880-3.3v-CH0         3299 mV
  LTC3880-3.3v-CH1         3299 mV
SFB 6 status:
State                               Online

```

Intake-Zone0 Temperature	32 degrees C / 89 degrees F
Exhaust-Zone1 Temperature	19 degrees C / 66 degrees F
IntakeA-Zone0 Temperature	24 degrees C / 75 degrees F
IntakeB-Zone1 Temperature	15 degrees C / 59 degrees F
Exhaust-Zone0 Temperature	25 degrees C / 77 degrees F
SFB-XF2-Zone1 Temperature	29 degrees C / 84 degrees F
SFB-XF1-Zone0 Temperature	37 degrees C / 98 degrees F
SFB-XF0-Zone0 Temperature	39 degrees C / 102 degrees F

Power

LTC3880-XF2-1.5v-RAIL	1500 mV
LTC3880-XF2-1.5v-CH0	1500 mV
LTC3880-XF2-1.5v-CH1	1500 mV
LTC3880-XF2-1.0v-RAIL	1029 mV
LTC3880-XF2-1.0v-CH0	1029 mV
LTC3880-XF2-1.0v-CH1	1031 mV
LTC3880-XF1-1.5v-RAIL	1499 mV
LTC3880-XF1-1.5v-CH0	1499 mV
LTC3880-XF1-1.5v-CH1	1500 mV
LTC3880-XF1-1.0v-RAIL	949 mV
LTC3880-XF1-1.0v-CH0	949 mV
LTC3880-XF1-1.0v-CH1	951 mV
LTC3880-XF0-1.5v-RAIL	1499 mV
LTC3880-XF0-1.5v-CH0	1499 mV
LTC3880-XF0-1.5v-CH1	1500 mV
LTC3880-XF0-1.0v-RAIL	1029 mV
LTC3880-XF0-1.0v-CH0	1029 mV
LTC3880-XF0-1.0v-CH1	1032 mV
LTC3880-3.3v-RAIL	3300 mV
LTC3880-3.3v-CH0	3300 mV
LTC3880-3.3v-CH1	3299 mV

SFB 7 status:

State

Online

Intake-Zone0 Temperature	31 degrees C / 87 degrees F
Exhaust-Zone1 Temperature	18 degrees C / 64 degrees F
IntakeA-Zone0 Temperature	20 degrees C / 68 degrees F
IntakeB-Zone1 Temperature	13 degrees C / 55 degrees F
Exhaust-Zone0 Temperature	22 degrees C / 71 degrees F
SFB-XF2-Zone1 Temperature	27 degrees C / 80 degrees F
SFB-XF1-Zone0 Temperature	26 degrees C / 78 degrees F
SFB-XF0-Zone0 Temperature	39 degrees C / 102 degrees F

Power

LTC3880-XF2-1.5v-RAIL	1499 mV
LTC3880-XF2-1.5v-CH0	1499 mV
LTC3880-XF2-1.5v-CH1	1500 mV
LTC3880-XF2-1.0v-RAIL	1029 mV
LTC3880-XF2-1.0v-CH0	1029 mV
LTC3880-XF2-1.0v-CH1	1031 mV
LTC3880-XF1-1.5v-RAIL	1499 mV
LTC3880-XF1-1.5v-CH0	1499 mV
LTC3880-XF1-1.5v-CH1	1500 mV
LTC3880-XF1-1.0v-RAIL	1029 mV
LTC3880-XF1-1.0v-CH0	1029 mV
LTC3880-XF1-1.0v-CH1	1031 mV
LTC3880-XF0-1.5v-RAIL	1500 mV
LTC3880-XF0-1.5v-CH0	1500 mV
LTC3880-XF0-1.5v-CH1	1500 mV
LTC3880-XF0-1.0v-RAIL	1029 mV
LTC3880-XF0-1.0v-CH0	1029 mV
LTC3880-XF0-1.0v-CH1	1031 mV
LTC3880-3.3v-RAIL	3300 mV
LTC3880-3.3v-CH0	3300 mV

LTC3880-3.3v-CH1

3299 mV

show chassis environment sfm

Syntax	<code>show chassis environment sfm</code> <code><slot></code>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M40e and M160 routers only) Display Switching and Forwarding Module (SFM) environmental information.
Options	<p>none—Display environmental information about all SFMs.</p> <p>slot—(Optional) Display environmental information about an individual SFM. Replace slot with a value from 0 through 3.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • request chassis sfm on page 476 • request chassis sfm master switch on page 475 • <i>Configuring SFM Redundancy on M40e and M160 Routers</i> • <i>Switching the Global Master and Backup Roles in a Virtual Chassis Configuration</i>
List of Sample Output	<p>show chassis environment sfm (M40e Router) on page 710</p> <p>show chassis environment sfm (M160 Router) on page 710</p>
Output Fields	Table 50 on page 708 lists the output fields for the show chassis environment sfm command. Output fields are listed in the approximate order in which they appear.

Table 50: show chassis environment sfm Output Fields

Field Name	Field Description
SFM slot status	SFM slot number: 0 or 1 on an M40e router, or 0 , 1 , 2 , or 3 on an M160 router.
State	<p>Status of the SFM:</p> <ul style="list-style-type: none"> • Online—SFM is online and running. • Offline—SFM is powered down. <p>If two SFMs are installed and online, one is functioning as the master, and the other is marked as the Standby.</p>
SPP Temperature	Temperature of the air flowing past the Switch Plane Processor card.
SPR Temperature	Temperature of the air flowing past the Switch Plane Router card.
SPP Power	Information about the voltage supplied to the Switch Plane Processor card. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.

Table 50: show chassis environment sfm Output Fields (*continued*)

Field Name	Field Description
SPR Power	Information about the voltage supplied to the Switch Plane Router. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.
CMB Revision	Revision level of the Chassis Management Bus (CMB) device.

Sample Output

show chassis environment sfm (M40e Router)

```
user@host> show chassis environment sfm
SFM 0 status:
  State                               Online
  SPP temperature                     40 degrees C / 104 degrees F
  SPR temperature                     44 degrees C / 111 degrees F
  SPP Power:
    1.5 V                             1501 mV
    2.5 V                             2472 mV
    3.3 V                             3293 mV
    5.0 V                             5028 mV
    5.0 V bias                        4964 mV
  SPR Power:
    1.5 V                             1501 mV
    2.5 V                             2483 mV
    3.3 V                             3308 mV
    5.0 V                             5035 mV
    5.0 V bias                        4981 mV
    8.0 V bias                        8239 mV
  CMB Revision                        12
SFM 1 status:
  State                               Online - Standby
  SPP temperature                     43 degrees C / 109 degrees F
  SPR temperature                     45 degrees C / 113 degrees F
  SPP Power:
    1.5 V                             1503 mV
    2.5 V                             2483 mV
    3.3 V                             3284 mV
    5.0 V                             5045 mV
    5.0 V bias                        4993 mV
  SPR Power:
    1.5 V                             1498 mV
    2.5 V                             2472 mV
    3.3 V                             3284 mV
    5.0 V                             5035 mV
    5.0 V bias                        4991 mV
    8.0 V bias                        8231 mV
  CMB Revision                        12
```

show chassis environment sfm (M160 Router)

```
user@host> show chassis environment sfm
SFM 0 status:
  State                               Online
  SPP temperature                     43 degrees C / 109 degrees F
  SPR temperature                     44 degrees C / 111 degrees F
  SPP Power:
    1.5 V                             1504 mV
    2.5 V                             2474 mV
    3.3 V                             3290 mV
    5.0 V                             5015 mV
    5.0 V bias                        4962 mV
  SPR Power:
    1.5 V                             1498 mV
    2.5 V                             2482 mV
    3.3 V                             3299 mV
    5.0 V                             5020 mV
    5.0 V bias                        4971 mV
    8.0 V bias                        8229 mV
  CMB Revision                        12
```

```

SFM 1 status:
State                               Online
SPP temperature                     47 degrees C / 116 degrees F
SPR temperature                     50 degrees C / 122 degrees F
SPP Power:
  1.5 V                             1499 mV
  2.5 V                             2466 mV
  3.3 V                             3274 mV
  5.0 V                             5025 mV
  5.0 V bias                         4984 mV
SPR Power:
  1.5 V                             1496 mV
  2.5 V                             2470 mV
  3.3 V                             3279 mV
  5.0 V                             5020 mV
  5.0 V bias                         4993 mV
  8.0 V bias                         8222 mV
CMB Revision                         12
SFM 2 status:
State                               Online
SPP temperature                     50 degrees C / 122 degrees F
SPR temperature                     52 degrees C / 125 degrees F
SPP Power:
  1.5 V                             1504 mV
  2.5 V                             2471 mV
  3.3 V                             3294 mV
  5.0 V                             5045 mV
  5.0 V bias                         4981 mV
SPR Power:
  1.5 V                             1496 mV
  2.5 V                             2470 mV
  3.3 V                             3293 mV
  5.0 V                             5028 mV
  5.0 V bias                         4971 mV
  8.0 V bias                         8214 mV
CMB Revision                         12
SFM 3 status:
State                               Online
SPP temperature                     49 degrees C / 120 degrees F
SPR temperature                     48 degrees C / 118 degrees F
SPP Power:
  1.5 V                             1505 mV
  2.5 V                             2484 mV
  3.3 V                             3296 mV
  5.0 V                             5040 mV
  5.0 V bias                         4984 mV
SPR Power:
  1.5 V                             1503 mV
  2.5 V                             2488 mV
  3.3 V                             3302 mV
  5.0 V                             5037 mV
  5.0 V bias                         4993 mV
  8.0 V bias                         8249 mV
CMB Revision                         12

```

show chassis environment sib

Syntax	show chassis environment sib <slot>
Syntax (TX Matrix router)	show chassis environment sib <lcc number| scc> <slot>
Syntax (TX Matrix Plus Router)	show chassis environment sib <sib-slot> <lcc number| sfc number> <f13 sib-slot> <f2s sib-slot/sib-f2s-slot-number>
Release Information	Command introduced before Junos OS Release 7.4. sfc option introduced in Junos OS Release 9.6. for the TX Matrix Plus router. Command introduced in Junos OS 12.1X48 for PTX Series Packet Transport Routers. Command introduced in Junos OS 12.1 for T4000 Core Routers.
Description	Display Switch Interface Board (SIB) environmental information.
Options	<p>none—Display environmental information about all SIBs. On a TX Matrix router, display environmental information about all SIBs on the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display environmental information about all SIBs on the TX Matrix Plus router and its attached routers .</p> <p>f13 sib-slot—(TX Matrix Plus routers only) (Optional) Display SIB F13 environmental information only. Replace sib-slot with one of the following values: 0, 1, 3, 4, 6, 7, 8, 9, 11, or 12. (Slots 2, 5, 10, 13, 14, and 15 are unused).</p> <p>f2s sib-slot/sib-f2s-slot-number—(TX Matrix Plus routers only) (Optional) Display SIB F2s environmental information only. Replace sib-slot with a value from 0 through 4, followed by a sib-f2s-slot-number value of 0, 2, 4 or 6.</p> <p>lcc number—(TX Matrix router, and TX Matrix Plus router only) (Optional) Line-card chassis number. Replace <i>number</i> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none"> • 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 environmental information about the SIB in the TX Matrix router (switch-card chassis).

sfc—(TX Matrix Plus routers only) (Optional) On a TX Matrix Plus router, display environmental information about the SIB in the TX Matrix Plus router (switch-fabric chassis).

sib-slot—(Optional) Display environmental information about the specified SIB. For the M320 router, replace **sib-slot** with a value from 0 through 3. For the T640, T1600, T4000, and TX Matrix routers, replace **sib-slot** with a value from 0 through 4. For the TX Matrix Plus router, see f13 **sib-slot** and f2s **sib-slot/sib-f2s-slot-number**. For the T320 router, replace **sib-slot** with a value from 0 through 2. For the PTX5000 Packet Transport Router, replace **sib-slot** with a value from 0 through 8.

Required Privilege Level view

Related Documentation

- [request chassis sib on page 477](#)
- [show chassis sibs on page 1229](#)
- [Configuring the Junos OS to Upgrade and Downgrade Switch Interface Boards on a TX Matrix Router on page 64](#)
- [M320 SIB Description](#)

List of Sample Output

- [show chassis environment sib \(M320 Router\) on page 715](#)
- [show chassis environment sib 1 \(T640 Router\) on page 715](#)
- [show chassis environment sib 1 \(T4000 Router\) on page 716](#)
- [show chassis environment sib scc \(TX Matrix Router\) on page 716](#)
- [show chassis environment sib \(TX Matrix Plus Router\) on page 717](#)
- [show chassis environment sib sfc \(TX Matrix Plus Router\) on page 727](#)
- [show chassis environment sib f13 \(TX Matrix Plus Router\) on page 733](#)
- [show chassis environment sib f2s \(TX Matrix Plus Router\) on page 733](#)
- [show chassis environment sib \(TX Matrix Plus router with 3D SIBs\) on page 734](#)
- [show chassis environment sib \(PTX5000 Packet Transport Router\) on page 737](#)

Output Fields [Table 51 on page 714](#) lists the output fields for the **show chassis environment sib** command. Output fields are listed in the approximate order in which they appear.

Table 51: show chassis environment sib Output Fields

Field Name	Field Description
SIB slot status	<p>SIB slot number:</p> <ul style="list-style-type: none"> • 0 through 3 on an M320 router. • 0 or 2 on a T320 router. • 0 through 4 on a T640, T1600, T4000, or TX Matrix router. • 0, 1, 3, 4, 6, 7, 8, 9, 11, or 12 for F13 SIBs on a TX Matrix Plus router. (Slots 2, 5, 10, 13, 14, and 15 are unused). • 0 through 4, followed by 0, 2, 4, or 6 for F2S SIBs on a TX Matrix Plus router. For example, SIB F2S 0/4. • 0 through 8 on a PTX5000 Packet Transport Router.
State	<p>Status of the SIB:</p> <ul style="list-style-type: none"> • Online—SIB is online and running. • Offline—SIB is powered down. • Spare (T640, T1600, T4000, and TX Matrix routers only)—SIB is redundant and will move to active state if one of the working SIBs fails. <p>Only four of the SIBs are active at any time. The fifth one is marked Spare. It is activated if there is a fault on one of the active SIBs.</p> <p>Online standby (TX Matrix Plus router only).</p>
Temperature	<p>Temperature of the air flowing past the SIB.</p> <p>On PTX Series Packet Transport Routers, separate temperatures are displayed for Intake, Exhaust, and Junction.</p>
Power	<p>Information about the voltage supplied to the SIB. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.</p>

Sample Output

show chassis
environment sib (M320
Router)

```
user@host> show chassis environment sib
SIB 0 status:
  State                Online
  Temperature          34 degrees C / 93 degrees F
  Power:
    GROUND              0 mV
    1.8 V               1805 mV
    2.5 V               2498 mV
    3.3 V               3306 mV
    1.8 V bias          1789 mV
    3.3 V bias          3299 mV
    5.0 V bias          5003 mV
    8.0 V bias          7374 mV
SIB 1 status:
  State                Online
  Temperature          35 degrees C / 95 degrees F
  Power:
    GROUND              0 mV
    1.8 V               1814 mV
    2.5 V               2477 mV
    3.3 V               3319 mV
    1.8 V bias          1792 mV
    3.3 V bias          3291 mV
    5.0 V bias          4981 mV
    8.0 V bias          7335 mV
SIB 2 status:
  State                Online
  Temperature          33 degrees C / 91 degrees F
  Power:
    GROUND              0 mV
    1.8 V               1811 mV
    2.5 V               2489 mV
    3.3 V               3330 mV
    1.8 V bias          1797 mV
    3.3 V bias          3304 mV
    5.0 V bias          5025 mV
    8.0 V bias          7330 mV
SIB 3 status:
  State                Online
  Temperature          37 degrees C / 98 degrees F
  Power:
    GROUND              0 mV
    1.8 V               1798 mV
    2.5 V               2481 mV
    3.3 V               3328 mV
    1.8 V bias          1792 mV
    3.3 V bias          3313 mV
    5.0 V bias          5013 mV
    8.0 V bias          7467 mV
```

show chassis
environment sib 1
(T640 Router)

```
user@host> show chassis environment sib 1
SIB 1 status:
  State                Online
  Temperature          39 degrees C / 102 degrees F
  Power:
    GROUND              0 mV
    1.8 V               1809 mV
```

2.5 V	2478 mV
3.3 V	3308 mV
1.8 V bias	1794 mV
3.3 V bias	3274 mV
5.0 V bias	4996 mV
8.0 V bias	7247 mV

**show chassis
environment sib 1
(T4000 Router)**

```
user@host> show chassis environment sib 1
SIB 1 status:
State                Online
Temperature          42 degrees C / 107 degrees F
Power
  8.0 V bias         8100 mV
  3.3 V bias         3284 mV
  0.9 V bias         904 mV
  1.1 V bias        1090 mV
  1.5 V bias        1488 mV
  2.5 V bias        2504 mV
  9.0 V             8940 mV
  3.3 V             3288 mV
  XF0 1.0 V         998 mV
  XF0 1.0 V LDO     994 mV
  PCIE SW 1.0 V     990 mV
  XF0 1.8 V        1788 mV
  XF1 1.0 V        1002 mV
  XF2 1.0 V        1002 mV
  XF3 1.0 V         998 mV
  1.2 V            1194 mV
  XF1 1.0 V LDO    1000 mV
  XF2 1.0 V LDO     998 mV
  XF3 1.0 V LDO     998 mV
  XF1 1.8 V        1798 mV
  XF2 1.8 V        1800 mV
  XF3 1.8 V        1794 mV
  1.5 V            1488 mV
  SW 3.3 V         3320 mV
```

**show chassis
environment sib scc
(TX Matrix Router)**

```
user@host> show chassis environment sib scc
scc-re0:
-----
SIB 3 status:
State                Offline
Reason              Offlined by button press
Temperature          0 degrees C / 32 degrees F
Power:
  GROUND             0 mV
  1.8 V              0 mV
  2.5 V              0 mV
  3.3 V              0 mV
  1.8 V bias         0 mV
  3.3 V bias         0 mV
  5.0 V bias         0 mV
  8.0 V bias         0 mV
SIB 4 status:
State                Online
Temperature          42 degrees C / 107 degrees F
Temperature (B)      41 degrees C / 105 degrees F
Power:
  GROUND             0 mV
  1.8 V             1787 mV
```

2.5 V	2488 mV
3.3 V	3294 mV
1.8 V bias	1787 mV
3.3 V bias	3306 mV
5.0 V bias	5010 mV
8.0 V bias	7418 mV
Power (B):	
GROUND	0 mV
1.8 V	1785 mV
2.5 V	2485 mV
3.3 V	3289 mV
1.8 V bias	1799 mV
3.3 V bias	3284 mV
5.0 V bias	4979 mV
8.0 V bias	7882 mV

`show chassis`
`environment sib`

```
user@host> show chassis environment sib
sfc0-re0:
```

**(TX Matrix Plus
Router)**

SIB F13 0 status:

State	Online - Standby
Temperature	54 degrees C / 129 degrees F
Temperature (B)	50 degrees C / 122 degrees F
Power	
1.2 V_0	1205 mV
1.2 V_1	1202 mV
1.2 V_2	1205 mV
1.2 V_3	1208 mV
1.5 V_0	1501 mV
1.5 V_1	1508 mV
1.8 V	1798 mV
2.5 V	2510 mV
3.3 V	3312 mV
9.0 V	8991 mV
9.0 V bias	0 mV
Power (B)	
2.5 V	2510 mV
3.3 V	3318 mV
9.0 V	9024 mV

SIB F13 1 status:

State	Online - Standby
Temperature	45 degrees C / 113 degrees F
Temperature (B)	42 degrees C / 107 degrees F
Power	
1.2 V_0	1202 mV
1.2 V_1	1198 mV
1.2 V_2	1202 mV
1.2 V_3	1202 mV
1.5 V_0	1498 mV
1.5 V_1	1501 mV
1.8 V	1811 mV
2.5 V	2504 mV
3.3 V	3292 mV
9.0 V	8991 mV
9.0 V bias	0 mV
Power (B)	
2.5 V	2507 mV
3.3 V	3306 mV
9.0 V	8970 mV

SIB F13 3 status:

State	Online
Temperature	48 degrees C / 118 degrees F
Temperature (B)	44 degrees C / 111 degrees F
Power	
1.2 V_0	1205 mV
1.2 V_1	1202 mV
1.2 V_2	1202 mV
1.2 V_3	1202 mV
1.5 V_0	1508 mV
1.5 V_1	1504 mV
1.8 V	1798 mV
2.5 V	2520 mV
3.3 V	3300 mV
9.0 V	9009 mV
9.0 V bias	0 mV
Power (B)	
2.5 V	2504 mV
3.3 V	3312 mV
9.0 V	9006 mV

SIB F13 4 status:

State	Online
Temperature	44 degrees C / 111 degrees F
Temperature (B)	40 degrees C / 104 degrees F
Power	
1.2 V_0	1205 mV
1.2 V_1	1205 mV
1.2 V_2	1202 mV
1.2 V_3	1205 mV
1.5 V_0	1508 mV
1.5 V_1	1508 mV
1.8 V	1811 mV
2.5 V	2510 mV
3.3 V	3312 mV
9.0 V	8970 mV
9.0 V bias	0 mV
Power (B)	
2.5 V	2513 mV
3.3 V	3318 mV
9.0 V	9048 mV
SIB F13 6 status:	
State	Online
Temperature	50 degrees C / 122 degrees F
Temperature (B)	46 degrees C / 114 degrees F
Power	
1.2 V_0	1195 mV
1.2 V_1	1205 mV
1.2 V_2	1202 mV
1.2 V_3	1202 mV
1.5 V_0	1495 mV
1.5 V_1	1495 mV
1.8 V	1801 mV
2.5 V	2494 mV
3.3 V	3300 mV
9.0 V	8991 mV
9.0 V bias	0 mV
Power (B)	
2.5 V	2500 mV
3.3 V	3300 mV
9.0 V	9006 mV
SIB F13 7 status:	
State	Online
Temperature	52 degrees C / 125 degrees F
Temperature (B)	49 degrees C / 120 degrees F
Power	
1.2 V_0	1202 mV
1.2 V_1	1202 mV
1.2 V_2	1198 mV
1.2 V_3	1185 mV
1.5 V_0	1501 mV
1.5 V_1	1492 mV
1.8 V	1795 mV
2.5 V	2491 mV
3.3 V	3286 mV
9.0 V	8892 mV
9.0 V bias	0 mV
Power (B)	
2.5 V	2507 mV
3.3 V	3306 mV
9.0 V	8952 mV
SIB F13 8 status:	
State	Online

Temperature	55 degrees C / 131 degrees F
Temperature (B)	50 degrees C / 122 degrees F
Power	
1.2 V_0	1208 mV
1.2 V_1	1205 mV
1.2 V_2	1205 mV
1.2 V_3	1211 mV
1.5 V_0	1514 mV
1.5 V_1	1508 mV
1.8 V	1807 mV
2.5 V	2516 mV
3.3 V	3324 mV
9.0 V	9027 mV
9.0 V bias	0 mV
Power (B)	
2.5 V	2520 mV
3.3 V	3318 mV
9.0 V	9066 mV
SIB F13 9 status:	
State	Online
Temperature	46 degrees C / 114 degrees F
Temperature (B)	41 degrees C / 105 degrees F
Power	
1.2 V_0	1208 mV
1.2 V_1	1202 mV
1.2 V_2	1208 mV
1.2 V_3	1202 mV
1.5 V_0	1504 mV
1.5 V_1	1504 mV
1.8 V	1817 mV
2.5 V	2516 mV
3.3 V	3312 mV
9.0 V	9009 mV
9.0 V bias	0 mV
Power (B)	
2.5 V	2510 mV
3.3 V	3312 mV
9.0 V	9024 mV
SIB F13 11 status:	
State	Online
Temperature	47 degrees C / 116 degrees F
Temperature (B)	42 degrees C / 107 degrees F
Power	
1.2 V_0	1202 mV
1.2 V_1	1205 mV
1.2 V_2	1202 mV
1.2 V_3	1202 mV
1.5 V_0	1501 mV
1.5 V_1	1501 mV
1.8 V	1801 mV
2.5 V	2510 mV
3.3 V	3312 mV
9.0 V	8979 mV
9.0 V bias	0 mV
Power (B)	
2.5 V	2252 mV
3.3 V	5014 mV
9.0 V	9954 mV
SIB F13 12 status:	
State	Online
Temperature	45 degrees C / 113 degrees F


```

Temperature (B)                40 degrees C / 104 degrees F
Power
  1.2 V_0                      1211 mV
  1.2 V_1                      1208 mV
  1.2 V_2                      1205 mV
  1.2 V_3                      1205 mV
  1.5 V_0                      1511 mV
  1.5 V_1                      1501 mV
  1.8 V                        1817 mV
  2.5 V                        2504 mV
  3.3 V                        3318 mV
  9.0 V                        9027 mV
  9.0 V bias                    0 mV
Power (B)
  2.5 V                        2520 mV
  3.3 V                        3338 mV
  9.0 V                        9006 mV
SIB F2S 0/0 status:
State                          Online - Standby
Temperature                    40 degrees C / 104 degrees F
Power
  1.2 V_1                      0 mV
  1.2 V_ASF                    1198 mV
  1.2 V_ASF_B                  1198 mV
  1.2 V_ASF_D                  1202 mV
  1.5 V                        1498 mV
  1.8 V                        1814 mV
  3.3 V                        3300 mV
  3.3 V bias                   3300 mV
  3.3 V ASF                    3286 mV
  9.0 V                        8250 mV
SIB F2S 0/2 status:
State                          Online - Standby
Temperature                    40 degrees C / 104 degrees F
Power
  1.2 V_1                      0 mV
  1.2 V_ASF                    1198 mV
  1.2 V_ASF_B                  1195 mV
  1.2 V_ASF_D                  1202 mV
  1.5 V                        1498 mV
  1.8 V                        1807 mV
  3.3 V                        3300 mV
  3.3 V bias                   3300 mV
  3.3 V ASF                    3286 mV
  9.0 V                        8250 mV
SIB F2S 0/4 status:
State                          Online - Standby
Temperature                    40 degrees C / 104 degrees F
Power
  1.2 V_1                      0 mV
  1.2 V_ASF                    1202 mV
  1.2 V_ASF_B                  1198 mV
  1.2 V_ASF_D                  1202 mV
  1.5 V                        1504 mV
  1.8 V                        1817 mV
  3.3 V                        3300 mV
  3.3 V bias                   3300 mV
  3.3 V ASF                    3306 mV
  9.0 V                        8250 mV
SIB F2S 0/6 status:
State                          Online - Standby

```

Temperature	39 degrees C / 102 degrees F
Power	
1.2 V_1	0 mV
1.2 V_ASF	1202 mV
1.2 V_ASF_B	1198 mV
1.2 V_ASF_D	1202 mV
1.5 V	1495 mV
1.8 V	1814 mV
3.3 V	3300 mV
3.3 V bias	3300 mV
3.3 V ASF	3280 mV
9.0 V	8250 mV
SIB F2S 1/0 status:	
State	Online
Temperature	39 degrees C / 102 degrees F
Power	
1.2 V_1	0 mV
1.2 V_ASF	1195 mV
1.2 V_ASF_B	1192 mV
1.2 V_ASF_D	1195 mV
1.5 V	1488 mV
1.8 V	1798 mV
3.3 V	3300 mV
3.3 V bias	3300 mV
3.3 V ASF	3280 mV
9.0 V	8250 mV
SIB F2S 1/2 status:	
State	Online
Temperature	39 degrees C / 102 degrees F
Power	
1.2 V_1	0 mV
1.2 V_ASF	1205 mV
1.2 V_ASF_B	1202 mV
1.2 V_ASF_D	1205 mV
1.5 V	1501 mV
1.8 V	1820 mV
3.3 V	3300 mV
3.3 V bias	3300 mV
3.3 V ASF	3306 mV
9.0 V	8250 mV
SIB F2S 1/4 status:	
State	Online
Temperature	39 degrees C / 102 degrees F
Power	
1.2 V_1	0 mV
1.2 V_ASF	1198 mV
1.2 V_ASF_B	1195 mV
1.2 V_ASF_D	1195 mV
1.5 V	1498 mV
1.8 V	1811 mV
3.3 V	3300 mV
3.3 V bias	3300 mV
3.3 V ASF	3300 mV
9.0 V	8250 mV
SIB F2S 1/6 status:	
State	Online
Temperature	39 degrees C / 102 degrees F
Power	
1.2 V_1	0 mV
1.2 V_ASF	1195 mV
1.2 V_ASF_B	1195 mV

```

1.2 V_ASF_D          1198 mV
1.5 V                1498 mV
1.8 V                1807 mV
3.3 V                3306 mV
3.3 V bias           3300 mV
3.3 V ASF            3292 mV
9.0 V                8250 mV
SIB F2S 2/0 status:
State                Online
Temperature          39 degrees C / 102 degrees F
Power
1.2 V_1              0 mV
1.2 V_ASF            1195 mV
1.2 V_ASF_B          1195 mV
1.2 V_ASF_D          1198 mV
1.5 V                1498 mV
1.8 V                1804 mV
3.3 V                3300 mV
3.3 V bias           3300 mV
3.3 V ASF            3286 mV
9.0 V                8250 mV
SIB F2S 2/2 status:
State                Online
Temperature          38 degrees C / 100 degrees F
Power
1.2 V_1              0 mV
1.2 V_ASF            1195 mV
1.2 V_ASF_B          1195 mV
1.2 V_ASF_D          1198 mV
1.5 V                1495 mV
1.8 V                1807 mV
3.3 V                3300 mV
3.3 V bias           3300 mV
3.3 V ASF            3300 mV
9.0 V                8250 mV
SIB F2S 2/4 status:
State                Online
Temperature          38 degrees C / 100 degrees F
Power
1.2 V_1              0 mV
1.2 V_ASF            1198 mV
1.2 V_ASF_B          1195 mV
1.2 V_ASF_D          1198 mV
1.5 V                1501 mV
1.8 V                1804 mV
3.3 V                3286 mV
3.3 V bias           3292 mV
3.3 V ASF            3300 mV
9.0 V                8230 mV
SIB F2S 2/6 status:
State                Online
Temperature          38 degrees C / 100 degrees F
Power
1.2 V_1              0 mV
1.2 V_ASF            1202 mV
1.2 V_ASF_B          1198 mV
1.2 V_ASF_D          1202 mV
1.5 V                1501 mV
1.8 V                1817 mV
3.3 V                3300 mV
3.3 V bias           3300 mV

```

3.3 V ASF	3318 mV
9.0 V	8250 mV
SIB F2S 3/0 status:	
State	Online
Temperature	38 degrees C / 100 degrees F
Power	
1.2 V_1	0 mV
1.2 V_ASF	1195 mV
1.2 V_ASF_B	1195 mV
1.2 V_ASF_D	1198 mV
1.5 V	1501 mV
1.8 V	1814 mV
3.3 V	3300 mV
3.3 V bias	3300 mV
3.3 V ASF	3274 mV
9.0 V	8250 mV
SIB F2S 3/2 status:	
State	Online
Temperature	37 degrees C / 98 degrees F
Power	
1.2 V_1	0 mV
1.2 V_ASF	1202 mV
1.2 V_ASF_B	1195 mV
1.2 V_ASF_D	1195 mV
1.5 V	1495 mV
1.8 V	1804 mV
3.3 V	3300 mV
3.3 V bias	3300 mV
3.3 V ASF	3286 mV
9.0 V	8250 mV
SIB F2S 3/4 status:	
State	Online
Temperature	37 degrees C / 98 degrees F
Power	
1.2 V_1	0 mV
1.2 V_ASF	1205 mV
1.2 V_ASF_B	1198 mV
1.2 V_ASF_D	1202 mV
1.5 V	1501 mV
1.8 V	1811 mV
3.3 V	3300 mV
3.3 V bias	3300 mV
3.3 V ASF	3318 mV
9.0 V	8250 mV
SIB F2S 3/6 status:	
State	Online
Temperature	37 degrees C / 98 degrees F
Power	
1.2 V_1	0 mV
1.2 V_ASF	1205 mV
1.2 V_ASF_B	1202 mV
1.2 V_ASF_D	1202 mV
1.5 V	1511 mV
1.8 V	1820 mV
3.3 V	3306 mV
3.3 V bias	3306 mV
3.3 V ASF	3318 mV
9.0 V	8265 mV
SIB F2S 4/0 status:	
State	Online
Temperature	36 degrees C / 96 degrees F

```

Power
  1.2 V_1                0 mV
  1.2 V_ASF              1198 mV
  1.2 V_ASF_B            1198 mV
  1.2 V_ASF_D            1198 mV
  1.5 V                  1501 mV
  1.8 V                  1814 mV
  3.3 V                  3292 mV
  3.3 V bias              3292 mV
  3.3 V ASF               3312 mV
  9.0 V                  8230 mV
SIB F2S 4/2 status:
State                     Online
Temperature               37 degrees C / 98 degrees F
Power
  1.2 V_1                0 mV
  1.2 V_ASF              1198 mV
  1.2 V_ASF_B            1192 mV
  1.2 V_ASF_D            1195 mV
  1.5 V                  1495 mV
  1.8 V                  1807 mV
  3.3 V                  3300 mV
  3.3 V bias              3300 mV
  3.3 V ASF               3300 mV
  9.0 V                  8250 mV
SIB F2S 4/4 status:
State                     Online
Temperature               36 degrees C / 96 degrees F
Power
  1.2 V_1                0 mV
  1.2 V_ASF              1202 mV
  1.2 V_ASF_B            1195 mV
  1.2 V_ASF_D            1202 mV
  1.5 V                  1501 mV
  1.8 V                  1814 mV
  3.3 V                  3300 mV
  3.3 V bias              3300 mV
  3.3 V ASF               3312 mV
  9.0 V                  8250 mV
SIB F2S 4/6 status:
State                     Online
Temperature               36 degrees C / 96 degrees F
Power
  1.2 V_1                0 mV
  1.2 V_ASF              1198 mV
  1.2 V_ASF_B            1195 mV
  1.2 V_ASF_D            1198 mV
  1.5 V                  1498 mV
  1.8 V                  1820 mV
  3.3 V                  3292 mV
  3.3 V bias              3292 mV
  3.3 V ASF               3286 mV
  9.0 V                  8230 mV

lcc0-re0:
-----
SIB 0 status:
State                     Online - Standby
Temperature               49 degrees C / 120 degrees F
Temperature (B)           42 degrees C / 107 degrees F
Power

```

1.2 V	1204 mV
1.5 V	1484 mV
2.5 V	2500 mV
3.3 V	3312 mV
3.3 V bias	3312 mV
5.0 V bias	4956 mV
8.0 V bias	7740 mV
9.0 V	8880 mV
Power (B)	
1.2 V	1206 mV
2.5 V	2500 mV
3.3 V	3316 mV
9.0 V	8988 mV
SIB 1 status:	
State	Online
Temperature	49 degrees C / 120 degrees F
Temperature (B)	42 degrees C / 107 degrees F
Power	
1.2 V	1202 mV
1.5 V	1482 mV
2.5 V	2500 mV
3.3 V	3296 mV
3.3 V bias	3288 mV
5.0 V bias	4986 mV
8.0 V bias	7800 mV
9.0 V	8868 mV
Power (B)	
1.2 V	1206 mV
2.5 V	2512 mV
3.3 V	3312 mV
9.0 V	8952 mV
SIB 2 status:	
State	Online
Temperature	49 degrees C / 120 degrees F
Temperature (B)	42 degrees C / 107 degrees F
Power	
1.2 V	1202 mV
1.5 V	1480 mV
2.5 V	2476 mV
3.3 V	3292 mV
3.3 V bias	3308 mV
5.0 V bias	5010 mV
8.0 V bias	7800 mV
9.0 V	8880 mV
Power (B)	
1.2 V	1204 mV
2.5 V	2516 mV
3.3 V	3308 mV
9.0 V	8988 mV
SIB 3 status:	
State	Online
Temperature	48 degrees C / 118 degrees F
Temperature (B)	42 degrees C / 107 degrees F
Power	
1.2 V	1204 mV
1.5 V	1480 mV
2.5 V	2500 mV
3.3 V	3292 mV
3.3 V bias	3292 mV
5.0 V bias	4986 mV
8.0 V bias	7812 mV

```

    9.0 V                8892 mV
Power (B)
    1.2 V                1198 mV
    2.5 V                2512 mV
    3.3 V                3308 mV
    9.0 V                8892 mV
SIB 4 status:
State                    Online
Temperature              48 degrees C / 118 degrees F
Temperature (B)          42 degrees C / 107 degrees F
Power
    1.2 V                1206 mV
    1.5 V                1482 mV
    2.5 V                2484 mV
    3.3 V                3324 mV
    3.3 V bias           3340 mV
    5.0 V bias           4980 mV
    8.0 V bias           7764 mV
    9.0 V                8784 mV
Power (B)
    1.2 V                1202 mV
    2.5 V                2504 mV
    3.3 V                3308 mV
    9.0 V                8820 mV
lcc1-re0:
-----
SIB 0 status:
State                    Online - Standby
Temperature              49 degrees C / 120 degrees F
Temperature (B)          43 degrees C / 109 degrees F
Power
    1.2 V                1206 mV
    1.5 V                1506 mV
    2.5 V                2496 mV
    3.3 V                3308 mV
    3.3 V bias           3296 mV
    5.0 V bias           4974 mV
    8.0 V bias           7884 mV
    9.0 V                8820 mV
Power (B)
    1.2 V                1200 mV
    2.5 V                2508 mV
    3.3 V                3292 mV
    9.0 V                8892 mV
...

```

show chassis
environment sib sfc

```

user@host> show chassis environment sib sfc
sfc0-re0:
-----

```

(TX Matrix Plus Router)

SIB F13 0 status:	
State	Online - Standby
Temperature	54 degrees C / 129 degrees F
Temperature (B)	50 degrees C / 122 degrees F
Power	
1.2 V_0	1205 mV
1.2 V_1	1205 mV
1.2 V_2	1208 mV
1.2 V_3	1208 mV
1.5 V_0	1501 mV
1.5 V_1	1508 mV
1.8 V	1804 mV
2.5 V	2504 mV
3.3 V	3312 mV
9.0 V	8991 mV
9.0 V bias	0 mV
Power (B)	
2.5 V	2516 mV
3.3 V	3318 mV
9.0 V	9048 mV
SIB F13 1 status:	
State	Online - Standby
Temperature	45 degrees C / 113 degrees F
Temperature (B)	42 degrees C / 107 degrees F
Power	
1.2 V_0	1202 mV
1.2 V_1	1205 mV
1.2 V_2	1198 mV
1.2 V_3	1205 mV
1.5 V_0	1498 mV
1.5 V_1	1495 mV
1.8 V	1801 mV
2.5 V	2507 mV
3.3 V	3306 mV
9.0 V	8970 mV
9.0 V bias	0 mV
Power (B)	
2.5 V	2507 mV
3.3 V	3306 mV
9.0 V	8970 mV
SIB F13 3 status:	
State	Online
Temperature	48 degrees C / 118 degrees F
Temperature (B)	43 degrees C / 109 degrees F
Power	
1.2 V_0	1208 mV
1.2 V_1	1195 mV
1.2 V_2	1202 mV
1.2 V_3	1198 mV
1.5 V_0	1504 mV
1.5 V_1	1504 mV
1.8 V	1801 mV
2.5 V	2510 mV
3.3 V	3312 mV
9.0 V	8970 mV
9.0 V bias	0 mV
Power (B)	
2.5 V	2500 mV
3.3 V	3332 mV
9.0 V	8970 mV
SIB F13 4 status:	

State	Online
Temperature	44 degrees C / 111 degrees F
Temperature (B)	40 degrees C / 104 degrees F
Power	
1.2 V_0	1205 mV
1.2 V_1	1202 mV
1.2 V_2	1205 mV
1.2 V_3	1202 mV
1.5 V_0	1508 mV
1.5 V_1	1511 mV
1.8 V	1811 mV
2.5 V	2510 mV
3.3 V	3312 mV
9.0 V	8952 mV
9.0 V bias	0 mV
Power (B)	
2.5 V	2510 mV
3.3 V	3306 mV
9.0 V	9024 mV
SIB F13 6 status:	
State	Online
Temperature	49 degrees C / 120 degrees F
Temperature (B)	46 degrees C / 114 degrees F
Power	
1.2 V_0	1195 mV
1.2 V_1	1198 mV
1.2 V_2	1202 mV
1.2 V_3	1202 mV
1.5 V_0	1501 mV
1.5 V_1	1495 mV
1.8 V	1801 mV
2.5 V	2507 mV
3.3 V	3306 mV
9.0 V	8979 mV
9.0 V bias	0 mV
Power (B)	
2.5 V	2497 mV
3.3 V	3318 mV
9.0 V	9006 mV
SIB F13 7 status:	
State	Online
Temperature	52 degrees C / 125 degrees F
Temperature (B)	48 degrees C / 118 degrees F
Power	
1.2 V_0	1198 mV
1.2 V_1	1198 mV
1.2 V_2	1202 mV
1.2 V_3	1189 mV
1.5 V_0	1498 mV
1.5 V_1	1498 mV
1.8 V	1804 mV
2.5 V	2491 mV
3.3 V	3292 mV
9.0 V	8904 mV
9.0 V bias	0 mV
Power (B)	
2.5 V	2500 mV
3.3 V	3306 mV
9.0 V	8952 mV
SIB F13 8 status:	
State	Online

Temperature	54 degrees C / 129 degrees F
Temperature (B)	49 degrees C / 120 degrees F
Power	
1.2 V_0	1211 mV
1.2 V_1	1208 mV
1.2 V_2	1208 mV
1.2 V_3	1211 mV
1.5 V_0	1508 mV
1.5 V_1	1511 mV
1.8 V	1801 mV
2.5 V	2513 mV
3.3 V	3324 mV
9.0 V	9048 mV
9.0 V bias	0 mV
Power (B)	
2.5 V	2516 mV
3.3 V	3318 mV
9.0 V	9102 mV
SIB F13 9 status:	
State	Online
Temperature	46 degrees C / 114 degrees F
Temperature (B)	41 degrees C / 105 degrees F
Power	
1.2 V_0	1205 mV
1.2 V_1	1202 mV
1.2 V_2	1205 mV
1.2 V_3	1198 mV
1.5 V_0	1504 mV
1.5 V_1	1504 mV
1.8 V	1817 mV
2.5 V	2507 mV
3.3 V	3306 mV
9.0 V	8991 mV
9.0 V bias	0 mV
Power (B)	
2.5 V	2510 mV
3.3 V	3332 mV
9.0 V	9006 mV
SIB F13 11 status:	
State	Online
Temperature	47 degrees C / 116 degrees F
Temperature (B)	42 degrees C / 107 degrees F
Power	
1.2 V_0	1202 mV
1.2 V_1	1205 mV
1.2 V_2	1202 mV
1.2 V_3	1198 mV
1.5 V_0	1501 mV
1.5 V_1	1504 mV
1.8 V	1807 mV
2.5 V	2510 mV
3.3 V	3306 mV
9.0 V	8991 mV
9.0 V bias	0 mV
Power (B)	
2.5 V	2249 mV
3.3 V	4994 mV
9.0 V	9936 mV
SIB F13 12 status:	
State	Online
Temperature	44 degrees C / 111 degrees F

```

Temperature (B)                40 degrees C / 104 degrees F
Power
  1.2 V_0                      1208 mV
  1.2 V_1                      1202 mV
  1.2 V_2                      1208 mV
  1.2 V_3                      1205 mV
  1.5 V_0                      1511 mV
  1.5 V_1                      1508 mV
  1.8 V                        1814 mV
  2.5 V                        2507 mV
  3.3 V                        3318 mV
  9.0 V                        9039 mV
  9.0 V bias                   0 mV
Power (B)
  2.5 V                        2516 mV
  3.3 V                        3344 mV
  9.0 V                        9006 mV
SIB F2S 0/0 status:
State                          Online - Standby
Temperature                    40 degrees C / 104 degrees F
Power
  1.2 V_1                      0 mV
  1.2 V_ASF                    1198 mV
  1.2 V_ASF_B                  1198 mV
  1.2 V_ASF_D                  1202 mV
  1.5 V                        1498 mV
  1.8 V                        1814 mV
  3.3 V                        3300 mV
  3.3 V bias                   3300 mV
  3.3 V ASF                    3286 mV
  9.0 V                        8250 mV
SIB F2S 0/2 status:
State                          Online - Standby
Temperature                    40 degrees C / 104 degrees F
Power
  1.2 V_1                      0 mV
  1.2 V_ASF                    1198 mV
  1.2 V_ASF_B                  1195 mV
  1.2 V_ASF_D                  1202 mV
  1.5 V                        1498 mV
  1.8 V                        1807 mV
  3.3 V                        3300 mV
  3.3 V bias                   3300 mV
  3.3 V ASF                    3292 mV
  9.0 V                        8250 mV
SIB F2S 0/4 status:
State                          Online - Standby
Temperature                    40 degrees C / 104 degrees F
Power
  1.2 V_1                      0 mV
  1.2 V_ASF                    1198 mV
  1.2 V_ASF_B                  1195 mV
  1.2 V_ASF_D                  1202 mV
  1.5 V                        1501 mV
  1.8 V                        1817 mV
  3.3 V                        3300 mV
  3.3 V bias                   3300 mV
  3.3 V ASF                    3306 mV
  9.0 V                        8250 mV
SIB F2S 0/6 status:
State                          Online - Standby

```

Temperature	39 degrees C / 102 degrees F
Power	
1.2 V_1	0 mV
1.2 V_ASF	1202 mV
1.2 V_ASF_B	1198 mV
1.2 V_ASF_D	1198 mV
1.5 V	1495 mV
1.8 V	1814 mV
3.3 V	3300 mV
3.3 V bias	3300 mV
3.3 V ASF	3280 mV
9.0 V	8250 mV
SIB F2S 1/0 status:	
State	Online
Temperature	39 degrees C / 102 degrees F
Power	
1.2 V_1	0 mV
1.2 V_ASF	1195 mV
1.2 V_ASF_B	1192 mV
1.2 V_ASF_D	1195 mV
1.5 V	1492 mV
1.8 V	1798 mV
3.3 V	3300 mV
3.3 V bias	3300 mV
3.3 V ASF	3280 mV
9.0 V	8250 mV
SIB F2S 1/2 status:	
State	Online
Temperature	39 degrees C / 102 degrees F
Power	
1.2 V_1	0 mV
1.2 V_ASF	1205 mV
1.2 V_ASF_B	1202 mV
1.2 V_ASF_D	1205 mV
1.5 V	1504 mV
1.8 V	1820 mV
3.3 V	3300 mV
3.3 V bias	3300 mV
3.3 V ASF	3306 mV
9.0 V	8250 mV
SIB F2S 1/4 status:	
State	Online
Temperature	39 degrees C / 102 degrees F
Power	
1.2 V_1	0 mV
1.2 V_ASF	1202 mV
1.2 V_ASF_B	1195 mV
1.2 V_ASF_D	1198 mV
1.5 V	1498 mV
1.8 V	1811 mV
3.3 V	3300 mV
3.3 V bias	3300 mV
3.3 V ASF	3300 mV
9.0 V	8250 mV
SIB F2S 1/6 status:	
State	Online
Temperature	39 degrees C / 102 degrees F
Power	
1.2 V_1	0 mV
1.2 V_ASF	1195 mV
1.2 V_ASF_B	1192 mV

```

1.2 V_ASF_D          1198 mV
1.5 V                1498 mV
1.8 V                1807 mV
3.3 V                3306 mV
3.3 V bias           3300 mV
3.3 V ASF            3292 mV
9.0 V                8250 mV
SIB F2S 2/0 status:
State                Online
Temperature          38 degrees C / 100 degrees F
Power
  1.2 V_1            0 mV
  1.2 V_ASF          1195 mV
  1.2 V_ASF_B        1195 mV
  1.2 V_ASF_D        1198 mV
  1.5 V              1498 mV
  1.8 V              1804 mV
  3.3 V              3300 mV
  3.3 V bias         3300 mV
  3.3 V ASF          3292 mV
  9.0 V              8250 mV
...

```

**show chassis
environment sib f13
(TX Matrix Plus
Router)**

```

user@host> show chassis environment sib f13 0
SIB F13 0 status:
State                Online - Standby
Temperature          54 degrees C / 129 degrees F
Temperature (B)      50 degrees C / 122 degrees F
Power
  1.2 V_0            1202 mV
  1.2 V_1            1202 mV
  1.2 V_2            1208 mV
  1.2 V_3            1208 mV
  1.5 V_0            1501 mV
  1.5 V_1            1504 mV
  1.8 V              1801 mV
  2.5 V              2504 mV
  3.3 V              3318 mV
  9.0 V              8991 mV
  9.0 V bias         0 mV
Power (B)
  2.5 V              2510 mV
  3.3 V              3318 mV
  9.0 V              9024 mV

```

**show chassis
environment sib f2s**

```

user@host> show chassis environment sib f2s 0/2
SIB F2S 0/2 status:
State                Online - Standby

```

(TX Matrix Plus Router)

Temperature	40 degrees C / 104 degrees F
Power	
1.2 V_1	0 mV
1.2 V_ASF	1198 mV
1.2 V_ASF_B	1195 mV
1.2 V_ASF_D	1202 mV
1.5 V	1501 mV
1.8 V	1807 mV
3.3 V	3300 mV
3.3 V bias	3300 mV
3.3 V ASF	3286 mV
9.0 V	8250 mV

show chassis environment sib (TX

```
user@host> show chassis environment sib
sfc0-re0:
-----
```

Matrix Plus router with
3D SIBs)

SIB F13 0 status:

State	Online
Board Temperature	44 degrees C / 111 degrees F
XF Junction Temperature	62 degrees C / 143 degrees F
Power	
XF F1 LCC0 1.0 V	999 mV
PCIe Switch 1.0 V	1000 mV
XF F3 LCC0 1.0 V	1000 mV
XF F1/F3 LCC0 1.2 V	1199 mV
XF F1 LCC1 1.0 V	1000 mV
XF F1/F3 LCC1 1.2 V	1199 mV
XF F3 LCC1 1.0 V	1000 mV
XF F1/F3 1.5 V	1499 mV
XF RC LCC0 Base 1.0	1000 mV
XF RC Base 1.2 V	1200 mV
XF RC LCC1 Base 1.0	1000 mV
XF RC Base 1.5 V	1499 mV
3.3 V Base	3300 mV
VSC8248 Base 1.8V	1796 mV
FPGA Core 0.9 V	899 mV
2.5 V Base	2500 mV
1tc3880-3.3v-bias	3343 mV
CXP Base 4.0 V	3999 mV
XF RC LCC0 Mezz 1.0	1000 mV
XF RC Mezz 1.2 V	1199 mV
XF RC LCC1 Mezz 1.0	999 mV
XF RC Mezz 1.5 V	1499 mV
3.3 V Mezz	3299 mV
VSC8248 Mezz 1.8V	1800 mV
CXP Mezz 4.0 V	3999 mV

[...Output Truncated...]

SIB F2S 0/0 status:

State	Online
Board Temperature	32 degrees C / 89 degrees F
XF Junction Temperature	41 degrees C / 105 degrees F
Power	
XF F2S 1.8 V LD0	1775 mV
XF F2S 1.0 V AN	992 mV
XF F2S 1.0 V	1002 mV
XF F2S 1.5 V	1488 mV
1.5 V Base	2500 mV
3.3 V bias	3306 mV
3.3 V Base	3280 mV
12.0 V Base	11928 mV

[...Output Truncated...]

SIB F2S 2/6 status:

State	Online
Board Temperature	28 degrees C / 82 degrees F
XF Junction Temperature	40 degrees C / 104 degrees F
Power	
XF F2S 1.8 V LD0	1782 mV
XF F2S 1.0 V AN	999 mV
XF F2S 1.0 V	1005 mV
XF F2S 1.5 V	1498 mV
1.5 V Base	2510 mV
3.3 V bias	3292 mV
3.3 V Base	3292 mV
12.0 V Base	12024 mV

1cc0-re0:

```

SIB 0 status:
State                               Online
Temperature                         41 degrees C / 105 degrees F
Temperature (B)                     Absent
Max Jn Temperature                  48 degrees C / 118 degrees F
Power
  8.0 V bias                        8156 mV
  3.3 V bias                        3284 mV
  FPGA 0.9 V bias                   908 mV
  FPGA 1.1 V bias                   1086 mV
  FPGA 1.5 V bias                   1487 mV
  FPGA 2.5 V bias                   2525 mV
  3.3 V                             3282 mV
  1.5 V                             1487 mV
  XF HSS 1.5 V                      1501 mV
  XF1 1.0 V                         1001 mV
  XF2 1.0 V                         1003 mV
  XF3 1.0 V                         998 mV
  XF1 1.8 V LDO                     1782 mV
  XF2 1.8 V LDO                     1792 mV
  XF3 1.8 V LDO                     1782 mV
  CLK BUF 2.5 V LDO                 2493 mV
  XF1 1.0 V LDO                     991 mV
  XF2 1.0 V LDO                     991 mV
  XF3 1.0 V LDO                     991 mV
  PCIe SW 3.3 V                     3274 mV
  PCIe 1.0 V                        996 mV
  RETIMER 1.2 V                     1174 mV
  RETIMER IO 1.8 V                  1770 mV
                                     0 mV
Power (B)
  1.2 V                             0 mV
  2.5 V                             0 mV
  3.3 V                             0 mV
  9.0 V                             0 mV
[...Output Truncated...]
lcc2-re0:

```

```

-----
SIB 0 status:
State                               Online
Temperature                         42 degrees C / 107 degrees F
Temperature (B)                     Absent
Max Jn Temperature                  51 degrees C / 123 degrees F
Power
  8.0 V bias                        8146 mV
  3.3 V bias                        3277 mV
  FPGA 0.9 V bias                   903 mV
  FPGA 1.1 V bias                   1089 mV
  FPGA 1.5 V bias                   1479 mV
  FPGA 2.5 V bias                   2515 mV
  3.3 V                             3277 mV
  1.5 V                             1482 mV
  XF HSS 1.5 V                      1501 mV
  XF1 1.0 V                         1001 mV
  XF2 1.0 V                         1003 mV
  XF3 1.0 V                         998 mV
  XF1 1.8 V LDO                     1787 mV
  XF2 1.8 V LDO                     1792 mV
  XF3 1.8 V LDO                     1792 mV
  CLK BUF 2.5 V LDO                 2481 mV
  XF1 1.0 V LDO                     986 mV

```



```
XF2 1.0 V LDO          993 mV
XF3 1.0 V LDO          991 mV
PCIE SW 3.3 V          3279 mV
PCIE 1.0 V              991 mV
RETIMER 1.2 V          1179 mV
RETIMER IO 1.8 V       1772 mV
                        0 mV
Power (B)
 1.2 V                  0 mV
 2.5 V                  0 mV
 3.3 V                  0 mV
 9.0 V                  0 mV
[...Output Truncated...]
```

`show chassis`
`environment sib`

```
user@host> show chassis environment sib
SIB 0 status:
  State                Online
```

(PTX5000 Packet Transport Router)

Exhaust Temperature	37 degrees C / 98 degrees F
Junction Temperature	43 degrees C / 109 degrees F
Power	
1.0 V	1000 mV
1.5 V	1499 mV
1.2 V	1199 mV
3.3 V	3300 mV
0.9 V	900 mV
2.5 V	2500 mV
3.3 V bias	3298 mV
SIB 1 status:	
State	Online
Exhaust Temperature	36 degrees C / 96 degrees F
Junction Temperature	45 degrees C / 113 degrees F
Power	
1.0 V	1000 mV
1.5 V	1500 mV
1.2 V	1200 mV
3.3 V	3300 mV
0.9 V	900 mV
2.5 V	2499 mV
3.3 V bias	3321 mV
SIB 2 status:	
State	Online
Exhaust Temperature	37 degrees C / 98 degrees F
Junction Temperature	41 degrees C / 105 degrees F
Power	
1.0 V	999 mV
1.5 V	1499 mV
1.2 V	1199 mV
3.3 V	3299 mV
0.9 V	900 mV
2.5 V	2500 mV
3.3 V bias	3339 mV
SIB 3 status:	
State	Online
Exhaust Temperature	40 degrees C / 104 degrees F
Junction Temperature	45 degrees C / 113 degrees F
Power	
1.0 V	1000 mV
1.5 V	1500 mV
1.2 V	1199 mV
3.3 V	3299 mV
0.9 V	900 mV
2.5 V	2500 mV
3.3 V bias	3328 mV
SIB 4 status:	
State	Online
Exhaust Temperature	45 degrees C / 113 degrees F
Junction Temperature	57 degrees C / 134 degrees F
Power	
1.0 V	1000 mV
1.5 V	1500 mV
1.2 V	1199 mV
3.3 V	3299 mV
0.9 V	900 mV
2.5 V	2499 mV
3.3 V bias	3333 mV
SIB 5 status:	
State	Online
Exhaust Temperature	43 degrees C / 109 degrees F

Junction Temperature	71 degrees C / 159 degrees F
Power	
1.0 V	1000 mV
1.5 V	1499 mV
1.2 V	1199 mV
3.3 V	3300 mV
0.9 V	900 mV
2.5 V	2500 mV
3.3 V bias	3307 mV
SIB 6 status:	
State	Online
Exhaust Temperature	42 degrees C / 107 degrees F
Junction Temperature	66 degrees C / 150 degrees F
Power	
1.0 V	1000 mV
1.5 V	1499 mV
1.2 V	1200 mV
3.3 V	3300 mV
0.9 V	899 mV
2.5 V	2500 mV
3.3 V bias	3311 mV
SIB 7 status:	
State	Online
Exhaust Temperature	42 degrees C / 107 degrees F
Junction Temperature	67 degrees C / 152 degrees F
Power	
1.0 V	999 mV
1.5 V	1500 mV
1.2 V	1199 mV
3.3 V	3299 mV
0.9 V	900 mV
2.5 V	2499 mV
3.3 V bias	3307 mV
SIB 8 status:	
State	Online
Exhaust Temperature	43 degrees C / 109 degrees F
Junction Temperature	71 degrees C / 159 degrees F
Power	
1.0 V	1000 mV
1.5 V	1500 mV
1.2 V	1199 mV
3.3 V	3299 mV
0.9 V	900 mV
2.5 V	2500 mV
3.3 V bias	3332 mV

show chassis ethernet-switch

Syntax	show chassis ethernet-switch <errors <port>>
Syntax (EX8200 Switch)	show chassis ethernet-switch <statistics <port> | switch <number>
Syntax (T4000 Router)	show chassis ethernet-switch <errors <port> | statistics <port>>
Syntax (TX Matrix Router)	show chassis ethernet-switch <errors <port> | statistics <port>> <lcc <number> | scc>
Syntax (TX Matrix Plus Router)	show chassis ethernet-switch <errors <port> | switch <number> <lcc number | sfc number> <statistics <port> | switch <number>
Syntax (MX Series Router)	show chassis ethernet-switch <all-members> <errors <port>> <local> <member member-id>
Syntax (MX2010 and MX2020 3D Universal Edge Routers)	show chassis ethernet-switch <errors <port> | statistics <port>>
Syntax (PTX Series Packet Transport Routers)	show chassis ethernet-switch <errors <port>> <statistics <port>> <port-state <port>>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.4 for EX Series switches. sfc option introduced in Junos OS Release 9.6 for the TX Matrix Plus router. Command introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport 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.
Description	(M10i, M40e, M120, M160, M320, MX Series, and T Series routers and EX8200 and PTX Series routers only) Display information about the ports on the Control Board (CB) Ethernet switch.
Options	none —Display information about each connected port on the Ethernet switch. On a TX Matrix router, display information about each connected port on the Ethernet switch on the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router,

display information about each connected port on the Ethernet switch on the TX Matrix Plus router and its attached routers.

all-members—(MX Series routers only) (Optional) Display information about the ports on the CB Ethernet switch on all the members of the Virtual Chassis configuration.

errors—(Optional) Display the numbers and types of errors accumulated on all ports of the Ethernet switch.

errors *port*—(Optional) Display the numbers and types of errors accumulated on the specified port (0 through 15) of the Ethernet switch. On the TX Matrix router, replace ***port*** with a value from 0 through 15. On the TX Matrix Plus router and EX8200 switch, replace ***port*** with a value from 0 through 27. On the PTX Series Packet Transport Routers, replace ***port*** with a value from 0 through 25. On the T4000 routers, MX2020 routers, and MX2010 routers, replace ***port*** with a value from 0 through 27.

errors switch *number*—(TX Matrix Plus router only) (Optional) Display the numbers and types of errors accumulated on the specified switch. Replace ***number*** with a value from 0 through 2.

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 the ports on the CB Ethernet switch on the local Virtual Chassis member.

member *member-id*—(MX Series routers only) (Optional) Display information about the ports on the CB Ethernet switch on the specified member of the Virtual Chassis configuration. Replace ***member-id*** with a value of 0 or 1.

port-state—(PTX Series only) (Optional) Display information about current port operation (**Blocking**, **Listening**, or **Disabled**).

scc—(TX Matrix router only) (Optional) Display information about the ports on the CB's Ethernet switch on the TX Matrix router (switch-card chassis).

sfc *number*—(TX Matrix Plus router only) (Optional) Display information about the ports on the CB's Ethernet switch on the TX Matrix Plus router (or switch-fabric chassis). Replace ***number*** with 0.

statistics—(Optional) Display traffic statistics for each connected port on the Ethernet switch.

statistics *port*—(Optional) Display traffic statistics for the specified port on the Ethernet switch. On the TX Matrix router, replace ***port*** with a value from 0 through 25. On the TX Matrix Plus router or EX8200 switch, replace ***port*** with a value from 0 through 27. On the PTX Series Packet Transport Routers, replace ***port*** with a value from 0 through 25. On the T4000 routers, MX2020 routers, and MX2010 routers, replace ***port*** with a value from 0 through 27.

statistics switch *number*—(TX Matrix Plus routers and EX8200 switch only) (Optional) Display traffic statistics for the specified Ethernet switch number. On the TX Matrix Plus router and EX8216 switch, replace ***number*** with a value from 0 through 2. On the EX8208 switch, replace ***number*** with a value from 0 through 1.

Required Privilege Level view

List of Sample Output [show chassis ethernet-switch on page 747](#)
[show chassis ethernet-switch \(MX480 Router with MPC4E\) on page 747](#)
[show chassis ethernet-switch \(MX2010 Router\) on page 748](#)
[show chassis ethernet-switch statistics \(MX2010 Router\) on page 750](#)
[show chassis ethernet-switch \(MX2020 Router\) on page 757](#)
[show chassis ethernet-switch statistics \(MX2020 Router\) on page 760](#)
[show chassis ethernet-switch \(MX2020 Router with MPC4E\) on page 768](#)
[show chassis ethernet-switch \(TX Matrix Router\) on page 770](#)
[show chassis ethernet-switch errors on page 771](#)
[show chassis ethernet-switch statistics on page 772](#)
[show chassis ethernet-switch errors \(TX Matrix Plus Router\) on page 773](#)
[show chassis ethernet-switch sfc errors \(TX Matrix Plus Router\) on page 774](#)
[show chassis ethernet-switch statistics \(TX Matrix Plus Router\) on page 775](#)
[show chassis ethernet-switch \(T4000 Router\) on page 780](#)
[show chassis ethernet-switch errors \(T4000 Router\) on page 780](#)
[show chassis ethernet-switch \(PTX5000 Packet Transport Router\) on page 781](#)
[show chassis ethernet-switch statistics \(PTX5000 Packet Transport Router\) on page 783](#)
[show chassis ethernet-switch port-state \(PTX5000 Packet Transport Router\) on page 787](#)

Output Fields [Table 52 on page 743](#) lists the output fields for the **show chassis ethernet-switch** command. Output fields are listed in the approximate order in which they appear.

Table 52: show chassis ethernet-switch Output Fields

Field Name	Field Description
Link is good on port <i>n</i> connected to device	Information about the link between each port on the CB's Ethernet switch and one of the following devices:
or	<ul style="list-style-type: none"> FPC0 (Flexible PIC Concentrator 0) through FPC7 Local controller Routing Engine Other Routing Engine (on a system with two Routing Engines) SPMB (Switch Processor Mezzanine Board) (TX Matrix router only) LCC0 (line-card chassis 0) through LCC3
Link is good on Fast Ethernet port <i>n</i> connected to device	
or	
Link is good on Gigabit Ethernet port <i>n</i> connected to device	
or	
Link is down on Gigabit Ethernet port connected to device	
Speed is	Speed at which the Ethernet link is running: 10 Mb or 100 Mb . When the device is RE or Other RE on the TX Matrix router, the speed is 1000 Mb . NOTE: Irrespective of the device, the speed is 1000 Mb on the MX2010 and MX2020 routers.
Duplex is	Duplex type of the Ethernet link: full or half .
Autonegotiate is Enabled (or Disabled)	By default, built-in Fast Ethernet ports on a PIC autonegotiate whether to operate at 10 Mbps or 100 Mbps. All other interfaces automatically choose the correct speed based on the PIC type and whether the PIC is configured to operate in multiplexed mode (using the no-concatenate statement at the [edit chassis] hierarchy level, as described in the <i>Junos OS System Basics Configuration Guide</i>).
Flow Control TX is Enabled (or Disabled)	(MX2010 routers, MX2020 routers, and PTX Series) Flow control in the transmit direction is enabled (or disabled). Flow control regulates the flow of packets from the switch to the remote side of the connection.
Flow Control RX is Enabled (or Disabled)	(MX2010 routers, MX2020 routers, and PTX Series) Flow control in the receive direction is enabled (or disabled). Flow control regulates the flow of packets from the remote side of the connection to the switch.
MLT3	Number of multilevel threshold-3 (MLT-3) Fast Ethernet errors detected.
Accumulated error counts for port <i>n</i> connected to device FPC <i>n</i> : (error output only)	
Lock	Number of lock errors detected.
Xmit	Number of transmission errors detected.
ESD	Number of electrostatic discharge (ESD) errors detected.
False Carrier	Number of false carrier errors detected.

Table 52: show chassis ethernet-switch Output Fields (*continued*)

Field Name	Field Description
Disconnects	Number of disconnect errors detected.
FX mode	Number of errors detected on an Ethernet link over optical fiber.
Statistics for port <i>n</i> connected to device FPC <i>n</i> (statistics output only)	
TX Packets 64 Octets	(MX2010 and MX2020 routers) Number of packets of size 64 octets transmitted.
TX Packets 65 - 127 Octets	(MX2010 and MX2020 routers) Number of packets of size 65 through 127 octets transmitted.
TX Packets 128 - 255 Octets	(MX2010 and MX2020 routers) Number of packets of size 128 through 255 octets transmitted.
TX Packets 256 - 511 Octets	(MX2010 and MX2020 routers) Number of packets of size 256 through 511 octets transmitted.
TX Packets 512 - 1023 Octets	(MX2010 and MX2020 routers) Number of packets of size 512 through 1023 octets transmitted.
TX Packets 1024 - 1518 Octets	(MX2010 and MX2020 routers) Number of packets of size 1024 through 1518 octets transmitted.
TX Packets 1519 - 2047 Octets	(MX2010 and MX2020 routers) Number of packets of size 1519 through 2047 octets transmitted.
TX Packets 2048 - 4095 Octets	(MX2010 and MX2020 routers) Number of packets of size 2048 through 4095 octets transmitted.
TX Packets 4096 - 9216 Octets	(MX2010 and MX2020 routers) Number of packets of size 4096 through 9216 octets transmitted.
TX 1519 - 1522 Good Vlan frms	(MX2010 and MX2020 routers) Number of transmitted frames of size 1519 through 1522 octets that are good VLAN frames.
TX Octets	Number of octets sent.
TX Unicast packets	Number of unicast packets sent.
TX Multicast packets	Number of multicast packets sent.
TX Broadcast packets	Number of broadcast packets sent.
TX Single Collision frames	(MX2010 and MX2020 routers) Number of packets sent after one collision.
TX Mult. Collision frames	(MX2010 and MX2020 routers) Number of packets sent after multiple collisions.

Table 52: show chassis ethernet-switch Output Fields (*continued*)

Field Name	Field Description
TX Late collisions	Number of packets aborted during sending because of collisions after 64 bytes.
TX Excessive collisions	Number of packets not sent because of too many collisions.
TX Dropped packets	Number of transmitted packets that were dropped.
TX PAUSEMAC Ctrl Frames	Number of Media Access Control (MAC) frames containing PAUSE commands that were sent.
TX Oversize Packets	Number of oversize packets that were sent.
TX FCS Error Counter	Number of packets discarded because of frame check sequence errors.
TX Fragment Counter	Number of fragmented packets sent.
TX Byte Counter	Number of bytes sent.
TX Packet OK Counter	Number of viable packets sent.
TX Pause Packet Counter	Number of PAUSE packets sent.
RX Packets 64 Octets	(MX2010 and MX2020 routers) Number of packets of size 64 octets received.
RX Packets 65 - 127 Octets	(MX2010 and MX2020 routers) Number of packets of size 65 through 127 octets received.
RX Packets 128 - 255 Octets	(MX2010 and MX2020 routers) Number of packets of size 128 through 255 octets received.
RX Packets 256 - 511 Octets	(MX2010 and MX2020 routers) Number of packets of size 256 through 511 octets received.
RX Packets 512 - 1023 Octets	(MX2010 and MX2020 routers) Number of packets of size 512 through 1023 octets received.
RX Packets 1024 - 1518 Octets	(MX2010 and MX2020 routers) Number of packets of size 1024 through 1518 octets received.
RX Packets 1519 - 2047 Octets	(MX2010 and MX2020 routers) Number of packets of size 1519 through 2047 octets received.
RX Packets 2048 - 4095 Octets	(MX2010 and MX2020 routers) Number of packets of size 2048 through 4095 octets received.
RX Packets 4096 - 9216 Octets	(MX2010 and MX2020 routers) Number of packets of size 4096 through 9216 octets received.

Table 52: show chassis ethernet-switch Output Fields (*continued*)

Field Name	Field Description
RX Octets	Number of octets received.
RX Unicast packets	Number of unicast packets received.
RX Multicast packets	Number of multicast packets received.
RX Broadcast packets	Number of broadcast packets received.
RX FCS Errors	Number of packets discarded because of frame check sequence errors.
RX Alignment Errors	Number of incomplete octets received.
RX Dropped Packets	Number of incoming packets that were dropped.
RX Fragments	Number of fragmented packets received.
RX Symbol Errors	Number of symbols received that the router did not correctly decode.
RX MAC Control	Number of Media Access Control (MAC) packets received.
RX Oversize Packets	Number of oversize packets received.
RX Undersize Packets	Number of undersize packets received.
RX Jabbers	Total number of frames received that exceed the maximum byte count and contain CRC errors .
RX Control Frame Counter	Number of control frames received.
RX Pause Frame Counter	Number of pause frames received.
RX FCS Errors	Number of packets discarded because of frame check sequence errors.
RX Fragments	Number of fragmented packets received.
RX Byte Counter	Number of bytes received.
RX Packet OK Counter	Number of viable packets received.

Sample Output

`show chassis
ethernet-switch`

```
user@host> show chassis ethernet-switch
Link is good on port 0 connected to device: FPC0
  Speed is 100 MB
  Duplex is full

Link is good on port 1 connected to device: FPC1
  Speed is 100 MB
  Duplex is full

Link is good on port 2 connected to device: FPC2
  Speed is 100 MB
  Duplex is full

Link is good on port 3 connected to device: FPC3
  Speed is 100 MBb
  Duplex is full

Link is good on port 7 connected to device: Local controller
  Speed is 100 MB
  Duplex is full

Link is good on port 9 connected to device: SPMB
  Speed is 100 MB
  Duplex is full

Link is good on port 13 connected to device: FPC5
  Speed is 100 MB
  Duplex is full
```

`show chassis
ethernet-switch`

```
user@host > show chassis ethernet-switch
Displaying summary for switch 0
Link is down on GE port 0 connected to device: FPC0
```

(MX480 Router with MPC4E)

```
Link is down on GE port 1 connected to device: FPC1

Link is good on GE port 2 connected to device: FPC2
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 3 connected to device: FPC3
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 4 connected to device: FPC4
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is down on GE port 5 connected to device: FPC5

Link is down on GE port 6 connected to device: FPC6

Link is down on GE port 7 connected to device: FPC7

Link is down on GE port 8 connected to device: FPC8

Link is down on GE port 9 connected to device: FPC9

Link is down on GE port 10 connected to device: FPC10

Link is down on GE port 11 connected to device: FPC11

Link is good on GE port 12 connected to device: Other RE
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 13 connected to device: RE-GigE
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is down on GE port 14 connected to device: Debug-GigE
```

**show chassis
ethernet-switch
(MX2010 Router)**

```
user@host > show chassis ethernet-switch
Displaying summary for switch 0
Link is good on GE port 0 connected to device: FPC0
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
```

Flow Control RX is Disabled

Link is good on GE port 1 connected to device: FPC1
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 2 connected to device: FPC3
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 3 connected to device: FPC2
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 4 connected to device: FPC5
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 5 connected to device: FPC4
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 6 connected to device: FPC6
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 7 connected to device: FPC7
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 8 connected to device: FPC8
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 9 connected to device: FPC9
Speed is 1000Mb
Duplex is full

```
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled
```

```
Link is good on GE port 20 connected to device: Other RE-GigE
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled
```

```
Link is good on GE port 21 connected to device: RE-GigE
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled
```

```
Link is down on GE port 22 connected to device: Debug-GigE
```

```
Link is good on GE port 23 connected to device: SPMB
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled
```

```
Link is down on XE port 24 connected to device: SFP+ 0
```

```
Link is down on XE port 25 connected to device: SFP+ 1
```

```
Link is down on XE port 26 connected to device: RE-10GigE
```

```
Link is down on XE port 27 connected to device: Other RE-10GigE
```

show chassis
ethernet-switch

```
user@host > show chassis ethernet-switch statistics
Displaying port statistics for switch 0
Statistics for port 0 connected to device FPC0:
```

statistics (MX2010 Router)

```

TX Packets 64 Octets          5088623
TX Packets 65-127 Octets     2637257
TX Packets 128-255 Octets    84829
TX Packets 256-511 Octets   120193
TX Packets 512-1023 Octets  252371
TX Packets 1024-1518 Octets 7189736
TX Packets 1519-2047 Octets 0
TX Packets 2048-4095 Octets 0
TX Packets 4096-9216 Octets 0
TX 1519-1522 Good Vlan frms 0
TX Octets                    15373009
TX Multicast Packets         14
TX Broadcast Packets        1679654
TX Single Collision frames   0
TX Mult. Collision frames    0
TX Late Collisions           0
TX Excessive Collisions      0
TX Collision frames          0
TX PAUSEMAC Ctrl Frames      0
TX MAC ctrl frames           0
TX Frame deferred Xtns       0
TX Frame excessive deferl    0
TX Oversize Packets          0
TX Jabbers                    0
TX FCS Error Counter         0
TX Fragment Counter          0
TX Byte Counter              3041239292
RX Packets 64 Octets         874260
RX Packets 65-127 Octets     26066124
RX Packets 128-255 Octets    1386532
RX Packets 256-511 Octets   150539
RX Packets 512-1023 Octets  4636799
RX Packets 1024-1518 Octets  92601
RX Packets 1519-2047 Octets 0
RX Packets 2048-4095 Octets 0
RX Packets 4096-9216 Octets 0
RX Octets                    33206855
RX Multicast Packets         0
RX Broadcast Packets        279416
RX FCS Errors                0
RX Align Errors              0
RX Fragments                 0
RX Symbol errors             0
RX Unsupported opcodes       0
RX Out of Range Length       0
RX False Carrier Errors      0
RX Undersize Packets         0
RX Oversize Packets          0
RX Jabbers                    0
RX 1519-1522 Good Vlan frms 0
RX MTU Exceed Counter        0
RX Control Frame Counter     0
RX Pause Frame Counter       0
RX Byte Counter              958929187
Statistics for port 1 connected to device FPC1:
TX Packets 64 Octets         5109146
TX Packets 65-127 Octets     2779473
TX Packets 128-255 Octets    2441286
TX Packets 256-511 Octets   173102
TX Packets 512-1023 Octets  1547504
TX Packets 1024-1518 Octets 7190581

```

TX Packets 1519-2047 Octets	0
TX Packets 2048-4095 Octets	0
TX Packets 4096-9216 Octets	0
TX 1519-1522 Good Vlan frms	0
TX Octets	19241092
TX Multicast Packets	14
TX Broadcast Packets	1673369
TX Single Collision frames	0
TX Mult. Collision frames	0
TX Late Collisions	0
TX Excessive Collisions	0
TX Collision frames	0
TX PAUSEMAC Ctrl Frames	0
TX MAC ctrl frames	0
TX Frame deferred Xtns	0
TX Frame excessive deferl	0
TX Oversize Packets	0
TX Jabbers	0
TX FCS Error Counter	0
TX Fragment Counter	0
TX Byte Counter	4213380187
RX Packets 64 Octets	865914
RX Packets 65-127 Octets	26612151
RX Packets 128-255 Octets	1090153
RX Packets 256-511 Octets	25126
RX Packets 512-1023 Octets	101158
RX Packets 1024-1518 Octets	78092
RX Packets 1519-2047 Octets	0
RX Packets 2048-4095 Octets	0
RX Packets 4096-9216 Octets	0
RX Octets	28772594
RX Multicast Packets	0
RX Broadcast Packets	285669
RX FCS Errors	0
RX Align Errors	0
RX Fragments	0
RX Symbol errors	0
RX Unsupported opcodes	0
RX Out of Range Length	0
RX False Carrier Errors	0
RX Undersize Packets	0
RX Oversize Packets	0
RX Jabbers	0
RX 1519-1522 Good Vlan frms	0
RX MTU Exceed Counter	0
RX Control Frame Counter	0
RX Pause Frame Counter	0
RX Byte Counter	2327283837

Link is down on GE port 2 connected to device: FPC3

Link is down on GE port 3 connected to device: FPC2

Link is down on GE port 4 connected to device: FPC5

Link is down on GE port 5 connected to device: FPC4

Link is down on GE port 6 connected to device: FPC6

Link is down on GE port 7 connected to device: FPC7

Statistics for port 8 connected to device FPC8:

TX Packets 64 Octets	5341094
TX Packets 65-127 Octets	2625310
TX Packets 128-255 Octets	3315158
TX Packets 256-511 Octets	174805
TX Packets 512-1023 Octets	976908
TX Packets 1024-1518 Octets	7181498
TX Packets 1519-2047 Octets	0
TX Packets 2048-4095 Octets	0
TX Packets 4096-9216 Octets	0
TX 1519-1522 Good Vlan frms	0
TX Octets	19614773
TX Multicast Packets	14
TX Broadcast Packets	1673831
TX Single Collision frames	0
TX Mult. Collision frames	0
TX Late Collisions	0
TX Excessive Collisions	0
TX Collision frames	0
TX PAUSEMAC Ctrl Frames	0
TX MAC ctrl frames	0
TX Frame deferred Xms	0
TX Frame excessive deferl	0
TX Oversize Packets	0
TX Jabbers	0
TX FCS Error Counter	0
TX Fragment Counter	0
TX Byte Counter	3946762991
RX Packets 64 Octets	955509
RX Packets 65-127 Octets	27568588
RX Packets 128-255 Octets	1460936
RX Packets 256-511 Octets	153248
RX Packets 512-1023 Octets	2856206
RX Packets 1024-1518 Octets	76419
RX Packets 1519-2047 Octets	0
RX Packets 2048-4095 Octets	0
RX Packets 4096-9216 Octets	0
RX Octets	33070906
RX Multicast Packets	0
RX Broadcast Packets	285183
RX FCS Errors	0
RX Align Errors	0
RX Fragments	0
RX Symbol errors	0
RX Unsupported opcodes	0
RX Out of Range Length	0
RX False Carrier Errors	0
RX Undersize Packets	0
RX Oversize Packets	0
RX Jabbers	0
RX 1519-1522 Good Vlan frms	0
RX MTU Exceed Counter	0
RX Control Frame Counter	0
RX Pause Frame Counter	0
RX Byte Counter	4256093824

Statistics for port 9 connected to device FPC9:

TX Packets 64 Octets	5237213
TX Packets 65-127 Octets	3268775
TX Packets 128-255 Octets	2320476
TX Packets 256-511 Octets	1789844

TX Packets 512-1023 Octets	501022
TX Packets 1024-1518 Octets	7800455
TX Packets 1519-2047 Octets	0
TX Packets 2048-4095 Octets	0
TX Packets 4096-9216 Octets	0
TX 1519-1522 Good Vlan frms	0
TX Octets	20917785
TX Multicast Packets	14
TX Broadcast Packets	1673368
TX Single Collision frames	0
TX Mult. Collision frames	0
TX Late Collisions	0
TX Excessive Collisions	0
TX Collision frames	0
TX PAUSEMAC Ctrl Frames	0
TX MAC ctrl frames	0
TX Frame deferred Xms	0
TX Frame excessive deferl	0
TX Oversize Packets	0
TX Jabbers	0
TX FCS Error Counter	0
TX Fragment Counter	0
TX Byte Counter	747012161
RX Packets 64 Octets	1036527
RX Packets 65-127 Octets	27590367
RX Packets 128-255 Octets	1590059
RX Packets 256-511 Octets	328257
RX Packets 512-1023 Octets	75975
RX Packets 1024-1518 Octets	73556
RX Packets 1519-2047 Octets	0
RX Packets 2048-4095 Octets	0
RX Packets 4096-9216 Octets	0
RX Octets	30694741
RX Multicast Packets	0
RX Broadcast Packets	285586
RX FCS Errors	0
RX Align Errors	0
RX Fragments	0
RX Symbol errors	0
RX Unsupported opcodes	0
RX Out of Range Length	0
RX False Carrier Errors	0
RX Undersize Packets	0
RX Oversize Packets	0
RX Jabbers	0
RX 1519-1522 Good Vlan frms	0
RX MTU Exceed Counter	0
RX Control Frame Counter	0
RX Pause Frame Counter	0
RX Byte Counter	2727836941

Statistics for port 20 connected to device Other RE-GigE:

TX Packets 64 Octets	1682540
TX Packets 65-127 Octets	3454
TX Packets 128-255 Octets	659
TX Packets 256-511 Octets	0
TX Packets 512-1023 Octets	1
TX Packets 1024-1518 Octets	0
TX Packets 1519-2047 Octets	0
TX Packets 2048-4095 Octets	0
TX Packets 4096-9216 Octets	0

```

TX 1519-1522 Good Vlan frms 0
TX Octets 1686654
TX Multicast Packets 6
TX Broadcast Packets 1673798
TX Single Collision frames 0
TX Mult. Collision frames 0
TX Late Collisions 0
TX Excessive Collisions 0
TX Collision frames 0
TX PAUSEMAC Ctrl Frames 0
TX MAC ctrl frames 0
TX Frame deferred Xmsns 0
TX Frame excessive deferl 0
TX Oversize Packets 0
TX Jabbers 0
TX FCS Error Counter 0
TX Fragment Counter 0
TX Byte Counter 108042476
RX Packets 64 Octets 710214
RX Packets 65-127 Octets 35785510
RX Packets 128-255 Octets 4616
RX Packets 256-511 Octets 232
RX Packets 512-1023 Octets 565
RX Packets 1024-1518 Octets 28798
RX Packets 1519-2047 Octets 0
RX Packets 2048-4095 Octets 0
RX Packets 4096-9216 Octets 0
RX Octets 36529935
RX Multicast Packets 8
RX Broadcast Packets 285546
RX FCS Errors 0
RX Align Errors 0
RX Fragments 0
RX Symbol errors 0
RX Unsupported opcodes 0
RX Out of Range Length 0
RX False Carrier Errors 0
RX Undersize Packets 0
RX Oversize Packets 0
RX Jabbers 0
RX 1519-1522 Good Vlan frms 0
RX MTU Exceed Counter 0
RX Control Frame Counter 0
RX Pause Frame Counter 0
RX Byte Counter 2676440958

```

Statistics for port 21 connected to device RE-GigE:

```

TX Packets 64 Octets 4805310
TX Packets 65-127 Octets 143798628
TX Packets 128-255 Octets 5532385
TX Packets 256-511 Octets 671059
TX Packets 512-1023 Octets 7684123
TX Packets 1024-1518 Octets 344021
TX Packets 1519-2047 Octets 0
TX Packets 2048-4095 Octets 0
TX Packets 4096-9216 Octets 0
TX 1519-1522 Good Vlan frms 0
TX Octets 162835526
TX Multicast Packets 8
TX Broadcast Packets 1673409
TX Single Collision frames 0

```

TX Mult. Collision frames	0
TX Late Collisions	0
TX Excessive Collisions	0
TX Collision frames	0
TX PAUSEMAC Ctrl Frames	0
TX MAC ctrl frames	0
TX Frame deferred Xms	0
TX Frame excessive deferl	0
TX Oversize Packets	0
TX Jabbers	0
TX FCS Error Counter	0
TX Fragment Counter	0
TX Byte Counter	105857355
RX Packets 64 Octets	14537137
RX Packets 65-127 Octets	11445505
RX Packets 128-255 Octets	8161767
RX Packets 256-511 Octets	2257944
RX Packets 512-1023 Octets	3277807
RX Packets 1024-1518 Octets	29373209
RX Packets 1519-2047 Octets	0
RX Packets 2048-4095 Octets	0
RX Packets 4096-9216 Octets	0
RX Octets	69053369
RX Multicast Packets	6
RX Broadcast Packets	285935
RX FCS Errors	0
RX Align Errors	0
RX Fragments	0
RX Symbol errors	0
RX Unsupported opcodes	0
RX Out of Range Length	0
RX False Carrier Errors	0
RX Undersize Packets	0
RX Oversize Packets	0
RX Jabbers	0
RX 1519-1522 Good Vlan frms	0
RX MTU Exceed Counter	0
RX Control Frame Counter	0
RX Pause Frame Counter	0
RX Byte Counter	2980410755

Link is down on GE port 22 connected to device: Debug-GigE

Statistics for port 23 connected to device SPMB:

TX Packets 64 Octets	1885878
TX Packets 65-127 Octets	138845
TX Packets 128-255 Octets	18
TX Packets 256-511 Octets	1
TX Packets 512-1023 Octets	2
TX Packets 1024-1518 Octets	16391
TX Packets 1519-2047 Octets	0
TX Packets 2048-4095 Octets	0
TX Packets 4096-9216 Octets	0
TX 1519-1522 Good Vlan frms	0
TX Octets	2041135
TX Multicast Packets	14
TX Broadcast Packets	1707267
TX Single Collision frames	0
TX Mult. Collision frames	0
TX Late Collisions	0
TX Excessive Collisions	0
TX Collision frames	0

```

TX PAUSEMAC Ctrl Frames      0
TX MAC ctrl frames          0
TX Frame deferred Xtns      0
TX Frame excessive deferl    0
TX Oversize Packets         0
TX Jabbers                  0
TX FCS Error Counter        0
TX Fragment Counter         0
TX Byte Counter             148066476
RX Packets 64 Octets        374994
RX Packets 65-127 Octets    183398
RX Packets 128-255 Octets   749
RX Packets 256-511 Octets   13658
RX Packets 512-1023 Octets  13421
RX Packets 1024-1518 Octets 9
RX Packets 1519-2047 Octets 0
RX Packets 2048-4095 Octets 0
RX Packets 4096-9216 Octets 0
RX Octets                   586229
RX Multicast Packets        0
RX Broadcast Packets        252034
RX FCS Errors               0
RX Align Errors             0
RX Fragments                0
RX Symbol errors            0
RX Unsupported opcodes      0
RX Out of Range Length      0
RX False Carrier Errors     0
RX Undersize Packets        0
RX Oversize Packets         0
RX Jabbers                  0
RX 1519-1522 Good Vlan frms 0
RX MTU Exceed Counter       0
RX Control Frame Counter    0
RX Pause Frame Counter      0
RX Byte Counter             51431942

```

Link is down on XE port 24 connected to device: SFP+ 0

Link is down on XE port 25 connected to device: SFP+ 1

Link is down on XE port 26 connected to device: RE-10GigE

Link is down on XE port 27 connected to device: Other RE-10GigE

show chassis ethernet-switch (MX2020 Router)

```

user@host > show chassis ethernet-switch
Displaying summary for switch 0
Link is good on GE port 0 connected to device: FPC0
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 1 connected to device: FPC1
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

```

Link is good on GE port 2 connected to device: FPC3
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 3 connected to device: FPC2
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 4 connected to device: FPC5
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 5 connected to device: FPC4
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 6 connected to device: FPC6
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 7 connected to device: FPC7
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 8 connected to device: FPC8
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 9 connected to device: FPC9
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 10 connected to device: FPC10
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled

Flow Control RX is Disabled

Link is good on GE port 11 connected to device: FPC11
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 12 connected to device: FPC13
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 13 connected to device: FPC12
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 14 connected to device: FPC14
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 15 connected to device: FPC15
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 16 connected to device: FPC17
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 17 connected to device: FPC16
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 18 connected to device: FPC18
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 19 connected to device: FPC19
Speed is 1000Mb
Duplex is full

```
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled
```

```
Link is good on GE port 20 connected to device: Other RE-GigE
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled
```

```
Link is good on GE port 21 connected to device: RE-GigE
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled
```

```
Link is down on GE port 22 connected to device: Debug-GigE
```

```
Link is good on GE port 23 connected to device: SPMB
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled
```

```
Link is down on XE port 24 connected to device: SFP+ 0
```

```
Link is down on XE port 25 connected to device: SFP+ 1
```

```
Link is down on XE port 26 connected to device: RE-10GigE
```

```
Link is down on XE port 27 connected to device: Other RE-10GigE
```

show chassis
ethernet-switch

```
user@host > show chassis ethernet-switch statistics
Displaying port statistics for switch 0
Statistics for port 0 connected to device FPC0:
```


statistics (MX2020 Router)

TX Packets 64 Octets	1468564
TX Packets 65-127 Octets	153896
TX Packets 128-255 Octets	237
TX Packets 256-511 Octets	286
TX Packets 512-1023 Octets	599
TX Packets 1024-1518 Octets	22803
TX Packets 1519-2047 Octets	0
TX Packets 2048-4095 Octets	0
TX Packets 4096-9216 Octets	0
TX 1519-1522 Good Vlan frms	0
TX Octets	1646385
TX Multicast Packets	6
TX Broadcast Packets	970939
TX Single Collision frames	0
TX Mult. Collision frames	0
TX Late Collisions	0
TX Excessive Collisions	0
TX Collision frames	0
TX PAUSEMAC Ctrl Frames	0
TX MAC ctrl frames	0
TX Frame deferred Xtns	0
TX Frame excessive deferl	0
TX Oversize Packets	0
TX Jabbers	0
TX FCS Error Counter	0
TX Fragment Counter	0
TX Byte Counter	130470290
RX Packets 64 Octets	180266
RX Packets 65-127 Octets	519030
RX Packets 128-255 Octets	1390
RX Packets 256-511 Octets	42857
RX Packets 512-1023 Octets	3482
RX Packets 1024-1518 Octets	8147
RX Packets 1519-2047 Octets	0
RX Packets 2048-4095 Octets	0
RX Packets 4096-9216 Octets	0
RX Octets	755172
RX Multicast Packets	0
RX Broadcast Packets	42822
RX FCS Errors	0
RX Align Errors	0
RX Fragments	0
RX Symbol errors	0
RX Unsupported opcodes	0
RX Out of Range Length	0
RX False Carrier Errors	0
RX Undersize Packets	0
RX Oversize Packets	0
RX Jabbers	0
RX 1519-1522 Good Vlan frms	0
RX MTU Exceed Counter	0
RX Control Frame Counter	0
RX Pause Frame Counter	0
RX Byte Counter	75374021

Statistics for port 1 connected to device FPC1:

TX Packets 64 Octets	1493739
TX Packets 65-127 Octets	126996
TX Packets 128-255 Octets	241
TX Packets 256-511 Octets	283
TX Packets 512-1023 Octets	604
TX Packets 1024-1518 Octets	33687

```
TX Packets 1519-2047 Octets 0
TX Packets 2048-4095 Octets 0
TX Packets 4096-9216 Octets 0
TX 1519-1522 Good Vlan frms 0
TX Octets 1655550
TX Multicast Packets 6
TX Broadcast Packets 969032
TX Single Collision frames 0
TX Mult. Collision frames 0
TX Late Collisions 0
TX Excessive Collisions 0
TX Collision frames 0
TX PAUSEMAC Ctrl Frames 0
TX MAC ctrl frames 0
TX Frame deferred Xtns 0
TX Frame excessive deferl 0
TX Oversize Packets 0
TX Jabbers 0
TX FCS Error Counter 0
TX Fragment Counter 0
TX Byte Counter 141832690
RX Packets 64 Octets 155655
RX Packets 65-127 Octets 545561
RX Packets 128-255 Octets 1394
RX Packets 256-511 Octets 42811
RX Packets 512-1023 Octets 3514
RX Packets 1024-1518 Octets 8171
RX Packets 1519-2047 Octets 0
RX Packets 2048-4095 Octets 0
RX Packets 4096-9216 Octets 0
RX Octets 757106
RX Multicast Packets 0
RX Broadcast Packets 44509
RX FCS Errors 0
RX Align Errors 0
RX Fragments 0
RX Symbol errors 0
RX Unsupported opcodes 0
RX Out of Range Length 0
RX False Carrier Errors 0
RX Undersize Packets 0
RX Oversize Packets 0
RX Jabbers 0
RX 1519-1522 Good Vlan frms 0
RX MTU Exceed Counter 0
RX Control Frame Counter 0
RX Pause Frame Counter 0
RX Byte Counter 75691392
Statistics for port 2 connected to device FPC3:
TX Packets 64 Octets 1465749
TX Packets 65-127 Octets 152849
TX Packets 128-255 Octets 238
TX Packets 256-511 Octets 289
TX Packets 512-1023 Octets 602
TX Packets 1024-1518 Octets 38903
TX Packets 1519-2047 Octets 0
TX Packets 2048-4095 Octets 0
TX Packets 4096-9216 Octets 0
TX 1519-1522 Good Vlan frms 0
TX Octets 1658630
TX Multicast Packets 6
```

```

TX Broadcast Packets          968873
TX Single Collision frames    0
TX Mult. Collision frames    0
TX Late Collisions           0
TX Excessive Collisions      0
TX Collision frames          0
TX PAUSEMAC Ctrl Frames      0
TX MAC ctrl frames          0
TX Frame deferred Xtns       0
TX Frame excessive deferl    0
TX Oversize Packets          0
TX Jabbers                   0
TX FCS Error Counter         0
TX Fragment Counter          0
TX Byte Counter              147427010
RX Packets 64 Octets         181636
RX Packets 65-127 Octets     517526
RX Packets 128-255 Octets    1405
RX Packets 256-511 Octets    42806
RX Packets 512-1023 Octets   3515
RX Packets 1024-1518 Octets  8168
RX Packets 1519-2047 Octets  0
RX Packets 2048-4095 Octets  0
RX Packets 4096-9216 Octets  0
RX Octets                    755056
RX Multicast Packets         0
RX Broadcast Packets         44490
RX FCS Errors                0
RX Align Errors              0
RX Fragments                 0
RX Symbol errors             0
RX Unsupported opcodes       0
RX Out of Range Length       0
RX False Carrier Errors      0
RX Undersize Packets         0
RX Oversize Packets          0
RX Jabbers                   0
RX 1519-1522 Good Vlan frms 0
RX MTU Exceed Counter        0
RX Control Frame Counter      0
RX Pause Frame Counter        0
RX Byte Counter              75381869
Statistics for port 3 connected to device FPC2:
TX Packets 64 Octets         1473828
TX Packets 65-127 Octets     145643
TX Packets 128-255 Octets    253
TX Packets 256-511 Octets    285
TX Packets 512-1023 Octets   612
TX Packets 1024-1518 Octets  26603
TX Packets 1519-2047 Octets  0
TX Packets 2048-4095 Octets  0
TX Packets 4096-9216 Octets  0
TX 1519-1522 Good Vlan frms 0
TX Octets                    1647224
TX Multicast Packets         6
TX Broadcast Packets         968925
TX Single Collision frames    0
TX Mult. Collision frames    0
TX Late Collisions           0
TX Excessive Collisions      0
TX Collision frames          0

```

TX PAUSEMAC Ctrl Frames	0
TX MAC ctrl frames	0
TX Frame deferred Xms	0
TX Frame excessive deferl	0
TX Oversize Packets	0
TX Jabbers	0
TX FCS Error Counter	0
TX Fragment Counter	0
TX Byte Counter	134293832
RX Packets 64 Octets	174230
RX Packets 65-127 Octets	525756
RX Packets 128-255 Octets	1404
RX Packets 256-511 Octets	42815
RX Packets 512-1023 Octets	3530
RX Packets 1024-1518 Octets	8176
RX Packets 1519-2047 Octets	0
RX Packets 2048-4095 Octets	0
RX Packets 4096-9216 Octets	0
RX Octets	755911
RX Multicast Packets	0
RX Broadcast Packets	44499
RX FCS Errors	0
RX Align Errors	0
RX Fragments	0
RX Symbol errors	0
RX Unsupported opcodes	0
RX Out of Range Length	0
RX False Carrier Errors	0
RX Undersize Packets	0
RX Oversize Packets	0
RX Jabbers	0
RX 1519-1522 Good Vlan frms	0
RX MTU Exceed Counter	0
RX Control Frame Counter	0
RX Pause Frame Counter	0
RX Byte Counter	75517355

Statistics for port 4 connected to device FPC5:

TX Packets 64 Octets	1466664
TX Packets 65-127 Octets	151155
TX Packets 128-255 Octets	238
TX Packets 256-511 Octets	277
TX Packets 512-1023 Octets	615
TX Packets 1024-1518 Octets	54674
TX Packets 1519-2047 Octets	0
TX Packets 2048-4095 Octets	0
TX Packets 4096-9216 Octets	0
TX 1519-1522 Good Vlan frms	0
TX Octets	1673623
TX Multicast Packets	6
TX Broadcast Packets	968610
TX Single Collision frames	0
TX Mult. Collision frames	0
TX Late Collisions	0
TX Excessive Collisions	0
TX Collision frames	0
TX PAUSEMAC Ctrl Frames	0
TX MAC ctrl frames	0
TX Frame deferred Xms	0
TX Frame excessive deferl	0
TX Oversize Packets	0
TX Jabbers	0

TX FCS Error Counter	0
TX Fragment Counter	0
TX Byte Counter	164247790
RX Packets 64 Octets	180006
RX Packets 65-127 Octets	518217
RX Packets 128-255 Octets	1406
RX Packets 256-511 Octets	42787
RX Packets 512-1023 Octets	3515
RX Packets 1024-1518 Octets	8164
RX Packets 1519-2047 Octets	0
RX Packets 2048-4095 Octets	0
RX Packets 4096-9216 Octets	0
RX Octets	754095
RX Multicast Packets	0
RX Broadcast Packets	44457
RX FCS Errors	0
RX Align Errors	0
RX Fragments	0
RX Symbol errors	0
RX Unsupported opcodes	0
RX Out of Range Length	0
RX False Carrier Errors	0
RX Undersize Packets	0
RX Oversize Packets	0
RX Jabbers	0
RX 1519-1522 Good Vlan frms	0
RX MTU Exceed Counter	0
RX Control Frame Counter	0
RX Pause Frame Counter	0
RX Byte Counter	75311970

Statistics for port 5 connected to device FPC4:

TX Packets 64 Octets	1464770
TX Packets 65-127 Octets	154498
TX Packets 128-255 Octets	225
TX Packets 256-511 Octets	280
TX Packets 512-1023 Octets	637
TX Packets 1024-1518 Octets	26355
TX Packets 1519-2047 Octets	0
TX Packets 2048-4095 Octets	0
TX Packets 4096-9216 Octets	0
TX 1519-1522 Good Vlan frms	0
TX Octets	1646765
TX Multicast Packets	6
TX Broadcast Packets	968730
TX Single Collision frames	0
TX Mult. Collision frames	0
TX Late Collisions	0
TX Excessive Collisions	0
TX Collision frames	0
TX PAUSEMAC Ctrl Frames	0
TX MAC ctrl frames	0
TX Frame deferred Xms	0
TX Frame excessive deferl	0
TX Oversize Packets	0
TX Jabbers	0
TX FCS Error Counter	0
TX Fragment Counter	0
TX Byte Counter	134058606
RX Packets 64 Octets	169269
RX Packets 65-127 Octets	515285
RX Packets 128-255 Octets	1527

```
RX Packets 256-511 Octets    42804
RX Packets 512-1023 Octets   3521
RX Packets 1024-1518 Octets  9142
RX Packets 1519-2047 Octets  0
RX Packets 2048-4095 Octets  0
RX Packets 4096-9216 Octets  0
RX Octets                    741548
RX Multicast Packets         0
RX Broadcast Packets         44470
RX FCS Errors                0
RX Align Errors              0
RX Fragments                 0
RX Symbol errors             0
RX Unsupported opcodes       0
RX Out of Range Length       0
RX False Carrier Errors      0
RX Undersize Packets         0
RX Oversize Packets          0
RX Jabbers                   0
RX 1519-1522 Good Vlan frms 0
RX MTU Exceed Counter        0
RX Control Frame Counter     0
RX Pause Frame Counter       0
RX Byte Counter              75498393
Statistics for port 6 connected to device FPC6:
TX Packets 64 Octets         1475260
TX Packets 65-127 Octets     143324
TX Packets 128-255 Octets    260
TX Packets 256-511 Octets    274
TX Packets 512-1023 Octets   603
TX Packets 1024-1518 Octets  40631
TX Packets 1519-2047 Octets  0
TX Packets 2048-4095 Octets  0
TX Packets 4096-9216 Octets  0
TX 1519-1522 Good Vlan frms 0
TX Octets                    1660352
TX Multicast Packets         6
TX Broadcast Packets         968466
TX Single Collision frames   0
TX Mult. Collision frames    0
TX Late Collisions           0
TX Excessive Collisions      0
TX Collision frames          0
TX PAUSEMAC Ctrl Frames     0
TX MAC ctrl frames           0
TX Frame deferred Xtns       0
TX Frame excessive deferl    0
TX Oversize Packets          0
TX Jabbers                   0
TX FCS Error Counter         0
TX Fragment Counter          0
TX Byte Counter              149212764
RX Packets 64 Octets         172275
RX Packets 65-127 Octets     526519
RX Packets 128-255 Octets    1394
RX Packets 256-511 Octets    42777
RX Packets 512-1023 Octets   3514
RX Packets 1024-1518 Octets  8161
RX Packets 1519-2047 Octets  0
RX Packets 2048-4095 Octets  0
RX Packets 4096-9216 Octets  0
```

```

RX Octets                                754640
RX Multicast Packets                     0
RX Broadcast Packets                     44443
RX FCS Errors                           0
RX Align Errors                         0
RX Fragments                           0
RX Symbol errors                        0
RX Unsupported opcodes                   0
RX Out of Range Length                   0
RX False Carrier Errors                  0
RX Undersize Packets                    0
RX Oversize Packets                     0
RX Jabbers                             0
RX 1519-1522 Good Vlan frms             0
RX MTU Exceed Counter                   0
RX Control Frame Counter                 0
RX Pause Frame Counter                   0
RX Byte Counter                         75386517
Statistics for port 7 connected to device FPC7:
TX Packets 64 Octets                     1472361
TX Packets 65-127 Octets                 145646
TX Packets 128-255 Octets                251
TX Packets 256-511 Octets                250
TX Packets 512-1023 Octets               580
TX Packets 1024-1518 Octets              49530
TX Packets 1519-2047 Octets              0
TX Packets 2048-4095 Octets              0
TX Packets 4096-9216 Octets              0
TX 1519-1522 Good Vlan frms             0
TX Octets                               1668618
TX Multicast Packets                     6
TX Broadcast Packets                     968317
TX Single Collision frames               0
TX Mult. Collision frames                0
TX Late Collisions                      0
TX Excessive Collisions                  0
TX Collision frames                      0
TX PAUSEMAC Ctrl Frames                  0
TX MAC ctrl frames                       0
TX Frame deferred Xtns                   0
TX Frame excessive deferl                0
TX Oversize Packets                     0
TX Jabbers                             0
TX FCS Error Counter                    0
TX Fragment Counter                     0
TX Byte Counter                         158689814
RX Packets 64 Octets                     174618
RX Packets 65-127 Octets                 523421
RX Packets 128-255 Octets                1393
RX Packets 256-511 Octets                42764
RX Packets 512-1023 Octets               3514
RX Packets 1024-1518 Octets              8158
RX Packets 1519-2047 Octets              0
RX Packets 2048-4095 Octets              0
RX Packets 4096-9216 Octets              0
RX Octets                               753868
RX Multicast Packets                     0
RX Broadcast Packets                     44429
RX FCS Errors                           0
RX Align Errors                         0
RX Fragments                           0

```

```
RX Symbol errors          0
RX Unsupported opcodes    0
RX Out of Range Length    0
RX False Carrier Errors   0
RX Undersize Packets      0
RX Oversize Packets       0
RX Jabbers                0
RX 1519-1522 Good Vlan frms 0
RX MTU Exceed Counter     0
RX Control Frame Counter  0
RX Pause Frame Counter    0
RX Byte Counter           75309863
Statistics for port 8 connected to device FPC8:
...
```

**show chassis
ethernet-switch**

```
user@ host > show chassis ethernet-switch
Displaying summary for switch 0
Link is good on GE port 0 connected to device: FPC0
```


(MX2020 Router with
MPC4E)

Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is down on GE port 1 connected to device: FPC1

Link is down on GE port 2 connected to device: FPC3

Link is down on GE port 3 connected to device: FPC2

Link is down on GE port 4 connected to device: FPC5

Link is down on GE port 5 connected to device: FPC4

Link is down on GE port 6 connected to device: FPC6

Link is down on GE port 7 connected to device: FPC7

Link is down on GE port 8 connected to device: FPC8

Link is good on GE port 9 connected to device: FPC9

Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 10 connected to device: FPC10

Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is down on GE port 11 connected to device: FPC11

Link is down on GE port 12 connected to device: FPC13

Link is down on GE port 13 connected to device: FPC12

Link is good on GE port 14 connected to device: FPC14

Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is down on GE port 15 connected to device: FPC15

Link is down on GE port 16 connected to device: FPC17

Link is down on GE port 17 connected to device: FPC16

Link is down on GE port 18 connected to device: FPC18

Link is good on GE port 19 connected to device: FPC19

Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled

```
Flow Control TX is Disabled
Flow Control RX is Disabled
```

```
Link is good on GE port 20 connected to device: Other RE-GigE
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled
```

```
Link is good on GE port 21 connected to device: RE-GigE
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled
```

```
Link is down on GE port 22 connected to device: Debug-GigE
```

```
Link is good on GE port 23 connected to device: SPMB
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled
```

```
Link is down on XE port 24 connected to device: SFP+ 0
```

```
Link is down on XE port 25 connected to device: SFP+ 1
```

```
Link is down on XE port 26 connected to device: RE-10GigE
```

```
Link is down on XE port 27 connected to device: Other RE-10GigE
```

show chassis ethernet-switch (TX Matrix Router)

```
user@host> show chassis ethernet-switch
scc-re0:
```

```
-----
Link is good on FE port 4 connected to device: LCC0
Speed is 100 MB
Duplex is full
Autonegotiate is Enabled
```

```
Link is good on FE port 6 connected to device: LCC2
Speed is 100 MB
Duplex is full
Autonegotiate is Enabled
```

```
Link is good on FE port 8 connected to device: SPMB
Speed is 100 MB
Duplex is full
Autonegotiate is Enabled
```

```
lcc0-re0:
```

```
-----
Link is good on FE port 1 connected to device: FPC1
Speed is 100 MB
Duplex is full
Autonegotiate is Enabled
```

```
Link is good on FE port 2 connected to device: FPC2
Speed is 100 MB
```

```

Duplex is full
Autonegotiate is Enabled

Link is good on FE port 8 connected to device: SPMB
Speed is 100 MB
Duplex is full
Autonegotiate is Enabled

Link is good on FE port 10 connected to device: SCC
Speed is 100 MB
Duplex is full
Autonegotiate is Enabled

```

```
1cc2-re0:
```

```

-----
Link is good on FE port 0 connected to device: FPC0
Speed is 100 MB
Duplex is full
Autonegotiate is Enabled

Link is good on FE port 1 connected to device: FPC1
Speed is 100 MB
Duplex is full
Autonegotiate is Enabled

Link is good on FE port 2 connected to device: FPC2
Speed is 100 MB
Duplex is full
Autonegotiate is Enabled

Link is good on FE port 8 connected to device: SPMB
Speed is 100 MB
Duplex is full
Autonegotiate is Enabled

Link is good on FE port 10 connected to device: SCC
Speed is 100 MB
Duplex is full
Autonegotiate is Enabled

```

show chassis ethernet-switch errors

```

user@host> show chassis ethernet-switch errors
Accumulated error counts for port 0 connected to device FPC0:
MLT3          2
Lock          0
Xmit          0
ESD           0
False carrier  2
Disconnects    0
FX mode       0
Accumulated error counts for port 1 connected to device FPC1:
MLT3          2
Lock          0
Xmit          0
ESD           0
False carrier  2
Disconnects    0
FX mode       0
Accumulated error counts for port 2 connected to device FPC2:
MLT3          2
Lock          0
Xmit          0

```

```
ESD          0
False carrier 3
Disconnects   0
FX mode       0
Accumulated error counts for port 3 connected to device FPC3:
MLT3         0
Lock         0
Xmit         0
ESD          0
False carrier 0
Disconnects   0
Accumulated error counts for port 4 connected to device Nothing:
MLT3         0
Lock         0
Xmit         0
ESD          0
False carrier 0
Disconnects   0
FX mode       0
...
```

**show chassis
ethernet-switch
statistics**

```
user@host> show chassis ethernet-switch statistics
Statistics for port 0 connected to device FPC0:
TX Unicast packets      68113
TX Multicast packets     0
TX Broadcast packets    20851
TX Late collisions       0
TX Excessive collisions  0
TX Dropped packets      0

RX Unicast packets      67410
RX Multicast packets     0
RX Broadcast packets    20852
RX FCS Errors           0
RX Alignment Errors     0
RX Dropped Packets      0
RX Fragments            0
RX Symbol Errors        0

Statistics for port 1 connected to device FPC1:
TX Unicast packets      66496
TX Multicast packets     0
TX Broadcast packets    20080
TX Late collisions       0
TX Excessive collisions  0
TX Dropped packets      0

RX Unicast packets      66037
RX Multicast packets     0
RX Broadcast packets    20080
RX FCS Errors           0
RX Alignment Errors     0
RX Dropped Packets      0
RX Fragments            0
RX Symbol Errors        0

Statistics for port 2 connected to device FPC2:
TX Unicast packets      64206
TX Multicast packets     0
TX Broadcast packets    21183
TX Late collisions       0
```

```
TX Excessive collisions      0
TX Dropped packets          0

RX Unicast packets          63671
RX Multicast packets         0
RX Broadcast packets        21183
RX FCS Errors                0
RX Alignment Errors          0
RX Dropped Packets           0
RX Fragments                 0
RX Symbol Errors             0
Statistics for port 3 connected to device FPC3:
...
```

show chassis
ethernet-switch errors

```
user@host> show chassis ethernet-switch errors
sfc0-re0:
-----
```

(TX Matrix Plus Router)

Displaying error for switch 0

Displaying error for switch 1

Accumulated error counts for port 0 connected to device LCC0:

MLT3	0
Lock	0
Xmit	0
ESD	0
False carrier	0
Disconnects	0
FX mode	0

lcc0-re0:

Displaying error for switch 0

Accumulated error counts for port 6 connected to device FPC0:

MLT3	0
Lock	0
Xmit	0
ESD	0
False carrier	5
Disconnects	0
FX mode	0

Accumulated error counts for port 7 connected to device FPC1:

MLT3	0
Lock	0
Xmit	0
ESD	0
False carrier	7
Disconnects	0
FX mode	0

Accumulated error counts for port 19 connected to device Other RE:

MLT3	0
Lock	0
Xmit	0
ESD	0
False carrier	0
Disconnects	0
FX mode	0

Accumulated error counts for port 20 connected to device SFC0:

MLT3	0
Lock	0
Xmit	0
ESD	0
False carrier	0
Disconnects	0
FX mode	0

**show chassis
ethernet-switch sfc**

user@host> show chassis ethernet-switch errors switch sfc

sfc0-re0:

errors (TX Matrix Plus Router)

```

Displaying error for switch 1
Accumulated error counts for port 0 connected to device LCC0:
  MLT3          0
  Lock          0
  Xmit          0
  ESD           0
  False carrier 0
  Disconnects   0
  FX mode       0
Accumulated error counts for port 2 connected to device LCC1:
  MLT3          0
  Lock          0
  Xmit          0
  ESD           0
  False carrier 0
  Disconnects   0
  FX mode       0
Accumulated error counts for port 4 connected to device LCC2:
  MLT3          0
  Lock          0
  Xmit          0
  ESD           0
  False carrier 0
  Disconnects   0
  FX mode       0
Accumulated error counts for port 6 connected to device LCC3:
  MLT3          0
  Lock          0
  Xmit          0
  ESD           0
  False carrier 0
  Disconnects   0
  FX mode       0

```

```
lcc0-re0:
```

```
-----
error: command is not valid on the t1600
```

```
lcc1-re0:
```

```
-----
error: command is not valid on the t1600
```

```
lcc2-re0:
```

```
-----
error: command is not valid on the t1600
```

```
lcc3-re0:
```

```
-----
error: command is not valid on the t1600
```

show chassis ethernet-switch

```

user@host> show chassis ethernet-switch statistics
sfc0-re0:
-----

```

statistics (TX Matrix Plus Router)

Displaying port statistics for switch 0
Statistics for port 1 connected to device 1GSW:

TX Packets 64 Octets	5183577
TX Packets 65-127 Octets	67820
TX Packets 128-255 Octets	772
TX Packets 256-511 Octets	136
TX Packets 512-1023 Octets	68
TX Packets 1024-1518 Octets	10881
TX Packets 1519-2047 Octets	0
TX Packets 2048-4095 Octets	0
TX Packets 4096-9216 Octets	0
TX Packets 9217-16383 Octets	0
TX Octets	5263254
TX Multicast Packets	16
TX Broadcast Packets	723403
TX PAUSEMAC Ctrl Frames	0
TX Oversize Packets	0
TX FCS Error Counter	0
TX Fragment Counter	0
TX Byte Counter	349922253
TX Packet OK Counter	5263254
TX Pause Packet Counter	0
TX Unicast Counter	4539835
RX Packets 64 Octets	6513629
RX Packets 65-127 Octets	88761
RX Packets 128-255 Octets	6382
RX Packets 256-511 Octets	22027
RX Packets 512-1023 Octets	4319
RX Packets 1024-1518 Octets	49922
RX Packets 1519-2047 Octets	0
RX Packets 2048-4095 Octets	0
RX Packets 4096-9216 Octets	0
RX Packets 9217-16383 Octets	0
RX Octets	6685040
RX Multicast Packets	4
RX Broadcast Packets	2137376
RX FCS Errors	0
RX Fragments	0
RX MAC Control Packets	0
RX Out of Range Length	0
RX Undersize Packets	0
RX Oversize Packets	0
RX Jabbers	0
RX Control Frame Counter	0
RX Pause Frame Counter	0
RX Byte Counter	509224602
RX Unicast Frame Count	4547660
RX Packet OK Count	6685040

Statistics for port 9 connected to device RE1:

TX Packets 64 Octets	2500318
TX Packets 65-127 Octets	443
TX Packets 128-255 Octets	0
TX Packets 256-511 Octets	0
TX Packets 512-1023 Octets	0
TX Packets 1024-1518 Octets	0
TX Packets 1519-2047 Octets	0
TX Packets 2048-4095 Octets	0
TX Packets 4096-9216 Octets	0
TX Packets 9217-16383 Octets	0
TX Octets	2500761
TX Multicast Packets	4


```

TX Broadcast Packets          2500757
TX PAUSEMAC Ctrl Frames      0
TX Oversize Packets          0
TX FCS Error Counter         0
TX Fragment Counter          0
TX Byte Counter              160049670
TX Packet OK Counter         0
TX Pause Packet Counter      0
TX Unicast Counter           0
RX Packets 64 Octets         701191
RX Packets 65-127 Octets     5882
RX Packets 128-255 Octets    2
RX Packets 256-511 Octets    0
RX Packets 512-1023 Octets   17965
RX Packets 1024-1518 Octets  7
RX Packets 1519-2047 Octets  0
RX Packets 2048-4095 Octets  0
RX Packets 4096-9216 Octets  0
RX Packets 9217-16383 Octets 0
RX Octets                    725047
RX Multicast Packets         8
RX Broadcast Packets         2500757
RX FCS Errors                0
RX Fragments                 0
RX MAC Control Packets       0
RX Out of Range Length       0
RX Undersize Packets         0
RX Oversize Packets          0
RX Jabbers                   0
RX Control Frame Counter     0
RX Pause Frame Counter       0
RX Byte Counter              62402656
RX Unicast Frame Count       0
RX Packet OK Count           0
Statistics for port 17 connected to device RE0:
TX Packets 64 Octets         7214818
TX Packets 65-127 Octets     94640
TX Packets 128-255 Octets    6384
TX Packets 256-511 Octets    22027
TX Packets 512-1023 Octets   22284
TX Packets 1024-1518 Octets  49929
TX Packets 1519-2047 Octets  0
TX Packets 2048-4095 Octets  0
TX Packets 4096-9216 Octets  0
TX Packets 9217-16383 Octets 0
TX Octets                    7410082
TX Multicast Packets         12
TX Broadcast Packets         2497247
TX PAUSEMAC Ctrl Frames      0
TX Oversize Packets          0
TX FCS Error Counter         0
TX Fragment Counter          0
TX Byte Counter              571626932
TX Packet OK Counter         0
TX Pause Packet Counter      0
TX Unicast Counter           0
RX Packets 64 Octets         4823701
RX Packets 65-127 Octets     67812
RX Packets 128-255 Octets    772
RX Packets 256-511 Octets    136
RX Packets 512-1023 Octets   68

```

```
RX Packets 1024-1518 Octets 10881
RX Packets 1519-2047 Octets 0
RX Packets 2048-4095 Octets 0
RX Packets 4096-9216 Octets 0
RX Packets 9217-16383 Octets 0
RX Octets 4903370
RX Multicast Packets 8
RX Broadcast Packets 2497247
RX FCS Errors 0
RX Fragments 0
RX MAC Control Packets 0
RX Out of Range Length 0
RX Undersize Packets 0
RX Oversize Packets 0
RX Jabbers 0
RX Control Frame Counter 0
RX Pause Frame Counter 0
RX Byte Counter 326889517
RX Unicast Frame Count 0
RX Packet OK Count 0
```

Displaying port statistics for switch 1
Statistics for port 0 connected to device LCC0:

```
TX Packets 64 Octets 5053443
TX Packets 65-127 Octets 59737
TX Packets 128-255 Octets 768
TX Packets 256-511 Octets 87
TX Packets 512-1023 Octets 68
TX Packets 1024-1518 Octets 85
TX Packets 1519-2047 Octets 0
TX Packets 2048-4095 Octets 0
TX Packets 4096-9216 Octets 0
TX 1519-1522 Good Vlan frms 0
TX Octets 5114188
TX Multicast Packets 16
TX Broadcast Packets 1125742
TX Single Collision frames 0
TX Mult. Collision frames 0
TX Late Collisions 0
TX Excessive Collisions 0
TX Collision frames 0
TX PAUSEMAC Ctrl Frames 0
TX MAC ctrl frames 0
TX Frame deferred Xmsns 0
TX Frame excessive deferl 0
TX Oversize Packets 0
TX Jabbers 0
TX FCS Error Counter 0
TX Fragment Counter 0
TX Byte Counter 329291449
RX Packets 64 Octets 5640175
RX Packets 65-127 Octets 79875
RX Packets 128-255 Octets 6338
RX Packets 256-511 Octets 165
RX Packets 512-1023 Octets 4317
RX Packets 1024-1518 Octets 10
RX Packets 1519-2047 Octets 0
RX Packets 2048-4095 Octets 0
RX Packets 4096-9216 Octets 0
RX Octets 5730880
RX Multicast Packets 4
```

```

RX Broadcast Packets      1735007
RX FCS Errors             0
RX Align Errors           0
RX Fragments              0
RX Symbol errors          0
RX Unsupported opcodes    0
RX Out of Range Length    0
RX False Carrier Errors   0
RX Undersize Packets      0
RX Oversize Packets       0
RX Jabbers                0
RX 1519-1522 Good Vlan frms 0
RX MTU Exceed Counter     0
RX Control Frame Counter  0
RX Pause Frame Counter    0
RX Byte Counter           371282850
Statistics for port 18 connected to device SPMB:
TX Packets 64 Octets      2990326
TX Packets 65-127 Octets  8572
TX Packets 128-255 Octets 4
TX Packets 256-511 Octets 49
TX Packets 512-1023 Octets 0
TX Packets 1024-1518 Octets 10793
TX Packets 1519-2047 Octets 0
TX Packets 2048-4095 Octets 0
TX Packets 4096-9216 Octets 0
TX 1519-1522 Good Vlan frms 0
TX Octets                 3009744
TX Multicast Packets      20
TX Broadcast Packets      2458322
TX Single Collision frames 0
TX Mult. Collision frames 0
TX Late Collisions        0
TX Excessive Collisions   0
TX Collision frames       0
TX PAUSEMAC Ctrl Frames   0
TX MAC ctrl frames        0
TX Frame deferred Xmsns   0
TX Frame excessive deferl 0
TX Oversize Packets       0
TX Jabbers                0
TX FCS Error Counter      0
TX Fragment Counter       0
TX Byte Counter           203712524
RX Packets 64 Octets      873454
RX Packets 65-127 Octets  8886
RX Packets 128-255 Octets 44
RX Packets 256-511 Octets 21862
RX Packets 512-1023 Octets 2
RX Packets 1024-1518 Octets 49912
RX Packets 1519-2047 Octets 0
RX Packets 2048-4095 Octets 0
RX Packets 4096-9216 Octets 0
RX Octets                 954160
RX Multicast Packets      0
RX Broadcast Packets      402369
RX FCS Errors             0
RX Align Errors           0
RX Fragments              0
RX Symbol errors          0
RX Unsupported opcodes    0

```

```
RX Out of Range Length      0
RX False Carrier Errors     0
RX Undersize Packets        0
RX Oversize Packets         0
RX Jabbers                  0
RX 1519-1522 Good Vlan frms 0
RX MTU Exceed Counter       0
RX Control Frame Counter    0
RX Pause Frame Counter      0
RX Byte Counter             137941752
```

...

show chassis ethernet-switch (T4000 Router)

```
user@host> show chassis ethernet-switch
Displaying summary for switch 0
Link is good on GE port 6 connected to device: FPC0
  Speed is 100Mb
  Duplex is full
  Autonegotiate is Enabled
  False carrier sense count = 04

Link is good on GE port 9 connected to device: FPC3
  Speed is 100Mb
  Duplex is full
  Autonegotiate is Enabled
  False carrier sense count = 03

Link is good on GE port 11 connected to device: FPC5
  Speed is 100Mb
  Duplex is full
  Autonegotiate is Enabled
  False carrier sense count = 03

Link is good on GE port 12 connected to device: FPC6
  Speed is 100Mb
  Duplex is full
  Autonegotiate is Enabled
  False carrier sense count = 03

Link is good on GE port 14 connected to device: SPMB
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled

Link is good on GE port 18 connected to device: RE
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Disabled

Link is good on GE port 19 connected to device: Other RE
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
```

show chassis ethernet-switch errors (T4000 Router)

```
user@host> show chassis ethernet-switch errors
Displaying error for switch 0
Accumulated error counts for port 6 connected to device FPC0:
  MLT3      0
  Lock      0
  Xmit      0
```

```

ESD          0
False carrier 4
Disconnects   0
FX mode       0
Accumulated error counts for port 9 connected to device FPC3:
MLT3         0
Lock         0
Xmit         0
ESD          0
False carrier 3
Disconnects   0
FX mode       0
Accumulated error counts for port 11 connected to device FPC5:
MLT3         0
Lock         0
Xmit         0
ESD          0
False carrier 3
Disconnects   0
FX mode       0
Accumulated error counts for port 12 connected to device FPC6:
MLT3         0
Lock         0
Xmit         0
ESD          0
False carrier 3
Disconnects   0
FX mode       0
Accumulated error counts for port 19 connected to device Other RE:
MLT3         0
Lock         0
Xmit         0
ESD          0
False carrier 0
Disconnects   0
FX mode       0

```

**show chassis
ethernet-switch**

```

user@host> show chassis ethernet-switch
Displaying summary for switch 0
Link is good on XE port 2 connected to device: SPMB

```

**(PTX5000 Packet
Transport Router)**

Speed is 1000Mb
Duplex is full
Autonegotiate is Disabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on XE port 11 connected to device: FPC7
Speed is 1000Mb
Duplex is full
Autonegotiate is Disabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on XE port 12 connected to device: FPC6
Speed is 1000Mb
Duplex is full
Autonegotiate is Disabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on XE port 13 connected to device: FPC5
Speed is 1000Mb
Duplex is full
Autonegotiate is Disabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on XE port 15 connected to device: FPC3
Speed is 1000Mb
Duplex is full
Autonegotiate is Disabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on XE port 16 connected to device: FPC2
Speed is 1000Mb
Duplex is full
Autonegotiate is Disabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on XE port 18 connected to device: FPC0
Speed is 1000Mb
Duplex is full
Autonegotiate is Disabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on XE port 19 connected to device: OTHER RE
Speed is 1000Mb
Duplex is full
Autonegotiate is Disabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on XE port 20 connected to device: RE
Speed is 1000Mb
Duplex is full
Autonegotiate is Disabled
Flow Control TX is Disabled
Flow Control RX is Disabled

**show chassis
ethernet-switch
statistics (PTX5000**

```
user@host> show chassis ethernet-switch statistics
Displaying port statistics for switch 0
Statistics for port 2 connected to device SPMB:
TX Packets 64 Octets          10942
```

Packet Transport
Router)

TX Packets 65-127 Octets	843
TX Packets 128-255 Octets	2
TX Packets 256-511 Octets	2
TX Packets 512-1023 Octets	0
TX Packets 1024-1518 Octets	6862
TX Packets 1519-2047 Octets	0
TX Packets 2048-4095 Octets	0
TX Packets 4096-9216 Octets	0
TX Packets 9217-16383 Octets	0
TX Octets	18651
TX Multicast Packets	6
TX Broadcast Packets	10331
TX PAUSEMAC Ctrl Frames	0
TX Oversize Packets	0
TX FCS Error Counter	0
TX Fragment Counter	0
TX Byte Counter	8105166
TX Packet OK Counter	0
TX Pause Packet Counter	0
TX Unicast Counter	0
RX Packets 64 Octets	8679
RX Packets 65-127 Octets	2364
RX Packets 128-255 Octets	531
RX Packets 256-511 Octets	112
RX Packets 512-1023 Octets	26
RX Packets 1024-1518 Octets	8
RX Packets 1519-2047 Octets	0
RX Packets 2048-4095 Octets	0
RX Packets 4096-9216 Octets	0
RX Packets 9217-16383 Octets	0
RX Octets	11720
RX Multicast Packets	0
RX Broadcast Packets	10331
RX FCS Errors	0
RX Fragments	0
RX MAC Control Packets	0
RX Out of Range Length	0
RX Undersize Packets	0
RX Oversize Packets	0
RX Jabbers	0
RX Control Frame Counter	0
RX Pause Frame Counter	0
RX Byte Counter	938105
RX Unicast Frame Count	0
RX Packet OK Count	0

Statistics for port 11 connected to device FPC7:

TX Packets 64 Octets	14492
TX Packets 65-127 Octets	3542
TX Packets 128-255 Octets	6
TX Packets 256-511 Octets	45
TX Packets 512-1023 Octets	60

Continued...

Statistics for port 18 connected to device FPC0:

TX Packets 64 Octets	15212
TX Packets 65-127 Octets	3810
TX Packets 128-255 Octets	6
TX Packets 256-511 Octets	43
TX Packets 512-1023 Octets	66
TX Packets 1024-1518 Octets	169


```

TX Packets 1519-2047 Octets  0
TX Packets 2048-4095 Octets  0
TX Packets 4096-9216 Octets  0
TX Packets 9217-16383 Octets  0
TX Octets 19306
TX Multicast Packets 0
TX Broadcast Packets 10886
TX PAUSEMAC Ctrl Frames 0
TX Oversize Packets 0
TX FCS Error Counter 0
TX Fragment Counter 0
TX Byte Counter 1569412
TX Packet OK Counter 0
TX Pause Packet Counter 0
TX Unicast Counter 0
RX Packets 64 Octets 17994
RX Packets 65-127 Octets 8006
RX Packets 128-255 Octets 230
RX Packets 256-511 Octets 19
RX Packets 512-1023 Octets 53
RX Packets 1024-1518 Octets 11
RX Packets 1519-2047 Octets 0
RX Packets 2048-4095 Octets 0
RX Packets 4096-9216 Octets 0
RX Packets 9217-16383 Octets 0
RX Octets 26313
RX Multicast Packets 0
RX Broadcast Packets 10886
RX FCS Errors 0
RX Fragments 0
RX MAC Control Packets 0
RX Out of Range Length 0
RX Undersize Packets 0
RX Oversize Packets 0
RX Jabbers 0
RX Control Frame Counter 2
RX Pause Frame Counter 2
RX Byte Counter 1836287
RX Unicast Frame Count 0
RX Packet OK Count 0
Statistics for port 19 connected to device OTHER RE:
TX Packets 64 Octets 10234
TX Packets 65-127 Octets 162
TX Packets 128-255 Octets 0
TX Packets 256-511 Octets 0
TX Packets 512-1023 Octets 0
TX Packets 1024-1518 Octets 0
TX Packets 1519-2047 Octets 0
TX Packets 2048-4095 Octets 0
TX Packets 4096-9216 Octets 0
TX Packets 9217-16383 Octets 0
TX Octets 10396
TX Multicast Packets 8
TX Broadcast Packets 10317
TX PAUSEMAC Ctrl Frames 0
TX Oversize Packets 0
TX FCS Error Counter 0
TX Fragment Counter 0
TX Byte Counter 666260
TX Packet OK Counter 0
TX Pause Packet Counter 0

```

```
TX Unicast Counter          0
RX Packets 64 Octets        4073
RX Packets 65-127 Octets    325
RX Packets 128-255 Octets   1
RX Packets 256-511 Octets   0
RX Packets 512-1023 Octets  0
RX Packets 1024-1518 Octets 72
RX Packets 1519-2047 Octets 0
RX Packets 2048-4095 Octets 0
RX Packets 4096-9216 Octets 0
RX Packets 9217-16383 Octets 0
RX Octets                    4471
RX Multicast Packets        0
RX Broadcast Packets        10317
RX FCS Errors               0
RX Fragments                0
RX MAC Control Packets      0
RX Out of Range Length      0
RX Undersize Packets        0
RX Oversize Packets         0
RX Jabbers                  0
RX Control Frame Counter    0
RX Pause Frame Counter      0
RX Byte Counter             387333
RX Unicast Frame Count      0
RX Packet OK Count          0
Statistics for port 20 connected to device RE:
TX Packets 64 Octets        658856
TX Packets 65-127 Octets    45535
TX Packets 128-255 Octets   1900
TX Packets 256-511 Octets   532
TX Packets 512-1023 Octets  372
TX Packets 1024-1518 Octets 191
TX Packets 1519-2047 Octets 0
TX Packets 2048-4095 Octets 0
TX Packets 4096-9216 Octets 0
TX Packets 9217-16383 Octets 0
TX Octets                    707386
TX Multicast Packets        0
TX Broadcast Packets        10421
TX PAUSEMAC Ctrl Frames    0
TX Oversize Packets        0
TX FCS Error Counter       0
TX Fragment Counter        0
TX Byte Counter            46608676
TX Packet OK Counter        0
TX Pause Packet Counter     0
TX Unicast Counter          0
RX Packets 64 Octets        27394
RX Packets 65-127 Octets    20271
RX Packets 128-255 Octets   78
RX Packets 256-511 Octets   215
RX Packets 512-1023 Octets  269
RX Packets 1024-1518 Octets 253370
RX Packets 1519-2047 Octets 0
RX Packets 2048-4095 Octets 0
RX Packets 4096-9216 Octets 0
RX Packets 9217-16383 Octets 0
RX Octets                    301597
RX Multicast Packets        8
RX Broadcast Packets        10421
```

RX FCS Errors	0
RX Fragments	0
RX MAC Control Packets	0
RX Out of Range Length	0
RX Undersize Packets	0
RX Oversize Packets	0
RX Jabbers	0
RX Control Frame Counter	0
RX Pause Frame Counter	0
RX Byte Counter	275043436
RX Unicast Frame Count	0
RX Packet OK Count	0

Continued ...

show chassis
ethernet-switch
port-state (PTX5000
Packet Transport
Router)

user@host> show chassis ethernet-switch port-state

Displaying port state for switch 0

Port	: 02
Target	: SPMB

Error reading port 2 connected to device: SPMB

show chassis fan

Syntax	show chassis fan
Syntax (ACX4000 Series Router)	show chassis fan
Syntax (MX Series Router)	show chassis fan <all-members> <local> <member <i>member-id</i> >
Syntax (T Series Routers)	show chassis fan
Syntax (MX104, MX2010, and MX2020 3D Universal Edge Router)	show chassis fan
Syntax (QFabric Systems)	show chassis fan <interconnect-device <i>name</i> >
Syntax (TX Matrix Router)	show chassis fan <lcc <i>number</i> | scc>
Syntax (TX Matrix Plus Router)	show chassis fan <lcc <i>number</i> | sfc <i>number</i> >
Release Information	<p>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.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 11.4 for EX Series switches.</p> <p>Command introduced in Junos OS Release 12.3 for PTX5000 Packet Transport Routers.</p> <p>Command introduced in Junos OS Release 12.1 for T4000 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 12.3 for ACX Series Routers.</p> <p>Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.</p>
Description	(T Series routers, TX Matrix routers, TX Matrix Plus routers, M120 routers, M320 routers, MX104, MX2010 routers, MX2020 routers, MX Series 3D Universal Edge Routers, QFX3008-I Interconnect devices, EX Series switches, and PTX Series Packet Transport Routers only) Show information about the fan tray and fans.
Options	<p>all-members—(MX Series routers only) (Optional) Display information about the fan tray and fans for all members of the Virtual Chassis configuration.</p> <p>local—(MX Series routers only) (Optional) Display information about the fan tray and fans for the local Virtual Chassis member.</p>

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 791](#)
- [show chassis fan \(QFabric Systems\) on page 791](#)
- [show chassis fan \(EX Series Switches\) on page 792](#)
- [show chassis fan \(T320 Router\) on page 793](#)
- [show chassis fan \(T640 Router\) on page 793](#)
- [show chassis fan \(T1600 Router\) on page 793](#)
- [show chassis fan \(T4000 Core Router\) on page 794](#)
- [show chassis fan \(TX Matrix Router\) on page 794](#)
- [show chassis fan \(TX Matrix Plus Router\) on page 795](#)
- [show chassis fan \(TX Matrix Plus Router with 3D SIBs\) on page 796](#)
- [show chassis fan \(PTX5000 Packet Transport Router\) on page 798](#)
- [show chassis fan \(MX104 Router\) on page 799](#)
- [show chassis fan \(MX2010 Router\) on page 799](#)
- [show chassis fan \(MX2020 Router\) on page 799](#)

[show chassis fan \(ACX4000 Router\) on page 800](#)

Output Fields [Table 53 on page 790](#) lists the output fields for the **show chassis fan** command. Output fields are listed in the approximate order in which they appear.

Table 53: show chassis fan Output Fields

Field Name	Field Description
Item	Fan item identifier.
Status	Status of the fan: <ul style="list-style-type: none">• OK—Fan is running properly and within the normal range.• Check—Fan is in Check state because of some fault or alarm condition.
RPM	(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).
% RPM	(MX2010 routers, MX2020 routers, and PTX Series Packet Transport Routers only) Percentage of the fan speed being used.
Measurement	(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">• Spinning at high speed• Spinning at intermediate speed• Spinning at normal speed• Spinning at low speed (except EX Series switches) (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

1cc0-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	

lcc0-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

```

```
lcc2-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 fabric destinations

Syntax	show chassis fabric destinations
Syntax (MX240, MX480, MX960, MX2010 and MX2020 3D Universal Edge Routers)	show chassis fabric destinations fpc < <i>fpc-slot-number</i> >
Release Information	Command introduced in Junos OS Release 12.1 for MX240, MX480, and MX960 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.
Description	Display the state of fabric destinations for all FPCs.
Options	<p>none—Display information about the fabric destinations of all FPCs.</p> <p>fpc-slot-number—(Optional) Display information about the specified FPC. For MX2020 routers, replace fpc-slot-number with a value from 0 through 19. For MX2010 routers, replace fpc-slot-number with a value from 0 through 9.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show chassis fabric redundancy-mode on page 926 • Configuring Redundancy Fabric Mode for Active Control Boards on MX Series Routers on page 235 • Corrective Actions for Fabric Failures on MX Series Routers on page 229 • Fabric Management on MPC4E Overview on page 16
List of Sample Output	<p>show chassis fabric destinations fpc 1 (MX240 Router) on page 803</p> <p>show chassis fabric destinations fpc 2 (MX480 Router) on page 803</p> <p>show chassis fabric destinations fpc 4 (MX480 Router with MPC4E) on page 804</p> <p>show chassis fabric destinations (MX960 Router) on page 805</p> <p>show chassis fabric destinations fpc 1 (MX2020 Router) on page 806</p> <p>show chassis fabric destinations fpc 14 (MX2020 Router with MPC4E) on page 807</p> <p>show chassis fabric destinations (MX2010 Router) on page 808</p>
Output Fields	Table 54 on page 801 lists the output fields for the show chassis fabric destinations command. Output fields are listed in the approximate order in which they appear.

Table 54: show chassis fabric destinations Output Fields

Field Name	Field Description
Fabric destinations state	<p>Indicates the state of the fabric destinations:</p> <ul style="list-style-type: none"> • 0—Destination is non-existent.

Table 54: show chassis fabric destinations Output Fields (*continued*)

Field Name	Field Description
	<ul style="list-style-type: none">• 2—Destination is enabled.• 3—Destination is disabled.• 6—Destination is in erroneous state and is disabled.
Flexible PIC Concentrator (FPC) number	Source FPC number.
Packet Forwarding Engine number	Source Packet Forwarding Engine number.
Plane number	Source plane number.

Sample Output

show chassis fabric destinations fpc 1 (MX240 Router)

In the output, the values followed by the plane number denote multiple quadruples. The first quadruple specifies FPC1, the second quadruple specifies FPC2 and so on. Each quadruple specifies the states of the fabric plane to the Packet Forwarding Engines.

```
user@host> show chassis fabric destinations fpc 1
```

```
Fabric destinations state:
  0: non-existent
  2: enabled
  3: disabled
  6: dest-err and disabled
```

```
FPC 1
PFE 0
Plane 0  0000 3300 3333
Plane 1  0000 2200 2222
Plane 2  0000 2200 2222
Plane 3  0000 2200 2222
Plane 4  0000 2200 2222
Plane 5  0000 3300 3333
Plane 6  0000 3300 3333
Plane 7  0000 3300 3333
PFE 1
Plane 0  0000 3300 3333
Plane 1  0000 2200 2222
Plane 2  0000 2200 2222
Plane 3  0000 2200 2222
Plane 4  0000 2200 2222
Plane 5  0000 3300 3333
Plane 6  0000 3300 3333
Plane 7  0000 3300 3333
```

show chassis fabric destinations fpc 2 (MX480 Router)

```
user@host> show chassis fabric destinations fpc 2
```

```
Fabric destinations state:
  0: non-existent
  2: enabled
  3: disabled
  6: dest-err and disabled
```

```
FPC 2
PFE 0
Plane 0  0000 3300 3333
Plane 1  0000 2200 2222
Plane 2  0000 2200 2222
Plane 3  0000 2200 2222
Plane 4  0000 2200 2222
Plane 5  0000 3300 3333
Plane 6  0000 3300 3333
Plane 7  0000 3300 3333
PFE 1
Plane 0  0000 3300 3333
Plane 1  0000 2200 2222
Plane 2  0000 2200 2222
Plane 3  0000 2200 2222
Plane 4  0000 2200 2222
Plane 5  0000 3300 3333
```

```
Plane 6  0000 3300 3333
Plane 7  0000 3300 3333
PFE 2
Plane 0  0000 3300 3333
Plane 1  0000 2200 2222
Plane 2  0000 2200 2222
Plane 3  0000 2200 2222
Plane 4  0000 2200 2222
Plane 5  0000 3300 3333
Plane 6  0000 3300 3333
Plane 7  0000 3300 3333
PFE 3
Plane 0  0000 3300 3333
Plane 1  0000 2200 2222
Plane 2  0000 2200 2222
Plane 3  0000 2200 2222
Plane 4  0000 2200 2222
Plane 5  0000 3300 3333
Plane 6  0000 3300 3333
Plane 7  0000 3300 3333
```

**show chassis fabric
destinations fpc 4**

```
user@host > show chassis fabric destinations fpc 4
Fabric destinations state:
0: non-existent
```

(MX480 Router with
MPC4E)

2: enabled
3: disabled
6: dest-err and disabled

```
FPC 4
PFE 0
Plane 0  2200 2222 0000    2000 2200 0000
Plane 1  2200 2222 0000    2000 2200 0000
Plane 2  2200 2222 0000    2000 2200 0000
Plane 3  2200 2222 0000    2000 2200 0000
Plane 4  3300 3333 0000    3000 3300 0000
Plane 5  3300 3333 0000    3000 3300 0000
Plane 6  3300 3333 0000    3000 3300 0000
Plane 7  3300 3333 0000    3000 3300 0000
PFE 1
Plane 0  2200 2222 0000    2000 2200 0000
Plane 1  2200 2222 0000    2000 2200 0000
Plane 2  2200 2222 0000    2000 2200 0000
Plane 3  2200 2222 0000    2000 2200 0000
Plane 4  3300 3333 0000    3000 3300 0000
Plane 5  3300 3333 0000    3000 3300 0000
Plane 6  3300 3333 0000    3000 3300 0000
Plane 7  3300 3333 0000    3000 3300 0000
```

show chassis fabric
destinations (MX960
Router)

user@host> show chassis fabric destinations

```
Fabric destinations state:
0: non-existent
2: enabled
3: disabled
6: dest-err and disabled
```

```
FPC 1
PFE 0
Plane 0  0000 3300 3333
Plane 1  0000 2200 2222
Plane 2  0000 2200 2222
Plane 3  0000 2200 2222
Plane 4  0000 2200 2222
Plane 5  0000 3300 3333
Plane 6  0000 3300 3333
Plane 7  0000 3300 3333
PFE 1
Plane 0  0000 3300 3333
Plane 1  0000 2200 2222
Plane 2  0000 2200 2222
Plane 3  0000 2200 2222
Plane 4  0000 2200 2222
Plane 5  0000 3300 3333
Plane 6  0000 3300 3333
Plane 7  0000 3300 3333
FPC 2
PFE 0
Plane 0  0000 3300 3333
Plane 1  0000 2200 2222
Plane 2  0000 2200 2222
Plane 3  0000 2200 2222
Plane 4  0000 2200 2222
Plane 5  0000 3300 3333
Plane 6  0000 3300 3333
Plane 7  0000 3300 3333
```

```

PFE 1
Plane 0  0000 3300 3333
Plane 1  0000 2200 2222
Plane 2  0000 2200 2222
Plane 3  0000 2200 2222
Plane 4  0000 2200 2222
Plane 5  0000 3300 3333
Plane 6  0000 3300 3333
Plane 7  0000 3300 3333
PFE 2
Plane 0  0000 3300 3333
Plane 1  0000 2200 2222
Plane 2  0000 2200 2222
Plane 3  0000 2200 2222
Plane 4  0000 2200 2222
Plane 5  0000 3300 3333
Plane 6  0000 3300 3333
Plane 7  0000 3300 3333
PFE 3
Plane 0  0000 3300 3333
Plane 1  0000 2200 2222
Plane 2  0000 2200 2222
Plane 3  0000 2200 2222
Plane 4  0000 2200 2222
Plane 5  0000 3300 3333
Plane 6  0000 3300 3333
Plane 7  0000 3300 3333

```

show chassis fabric destinations fpc 1 (MX2020 Router)

```

user@host> show chassis fabric destinations fpc 1
Fabric destinations state:
0: non-existent
2: enabled
3: disabled
6: dest-err and disabled

```

```

FPC 1
PFE 0
Plane 0  3333 3333 3333  3333 3333 3333  3333 3333 3333  3333 3333 3333
3333 3333 3333  3333 3333 3333  3333 3333 3333
Plane 1  2222 2222 2222  2222 2222 2222  2222 2222 2222  2222 2222 2222
2222 2222 2222  2222 2222 2222  2222 2222 2222
Plane 2  2222 2222 2222  2222 2222 2222  2222 2222 2222  2222 2222 2222
2222 2222 2222  2222 2222 2222  2222 2222 2222
Plane 3  2222 2222 2222  2222 2222 2222  2222 2222 2222  2222 2222 2222
2222 2222 2222  2222 2222 2222  2222 2222 2222
Plane 4  2222 2222 2222  2222 2222 2222  2222 2222 2222  2222 2222 2222
2222 2222 2222  2222 2222 2222  2222 2222 2222
Plane 5  2222 2222 2222  2222 2222 2222  2222 2222 2222  2222 2222 2222
2222 2222 2222  2222 2222 2222  2222 2222 2222
Plane 6  2222 2222 2222  2222 2222 2222  2222 2222 2222  2222 2222 2222
2222 2222 2222  2222 2222 2222  2222 2222 2222
Plane 7  2222 2222 2222  2222 2222 2222  2222 2222 2222  2222 2222 2222
2222 2222 2222  2222 2222 2222  2222 2222 2222
PFE 1
Plane 0  3333 3333 3333  3333 3333 3333  3333 3333 3333  3333 3333 3333
3333 3333 3333  3333 3333 3333  3333 3333 3333
Plane 1  2222 2222 2222  2222 2222 2222  2222 2222 2222  2222 2222 2222
2222 2222 2222  2222 2222 2222  2222 2222 2222
Plane 2  2222 2222 2222  2222 2222 2222  2222 2222 2222  2222 2222 2222
2222 2222 2222  2222 2222 2222  2222 2222 2222

```

```

Plane 3  2222 2222 2222  2222 2222 2222  2222 2222 2222
2222 2222 2222  2222 2222 2222 2222  2222 2222
Plane 4  2222 2222 2222  2222 2222 2222  2222 2222 2222
2222 2222 2222  2222 2222 2222 2222  2222 2222
Plane 5  2222 2222 2222  2222 2222 2222  2222 2222 2222
2222 2222 2222  2222 2222 2222 2222  2222 2222
Plane 6  2222 2222 2222  2222 2222 2222  2222 2222 2222
2222 2222 2222  2222 2222 2222 2222  2222 2222
Plane 7  2222 2222 2222  2222 2222 2222  2222 2222 2222
2222 2222 2222  2222 2222 2222 2222  2222 2222
PFE 2
Plane 0  3333 3333 3333  3333 3333 3333  3333 3333 3333
3333 3333 3333  3333 3333 3333 3333  3333 3333
Plane 1  2222 2222 2222  2222 2222 2222  2222 2222 2222
2222 2222 2222  2222 2222 2222 2222  2222 2222
Plane 2  2222 2222 2222  2222 2222 2222  2222 2222 2222
2222 2222 2222  2222 2222 2222 2222  2222 2222
Plane 3  2222 2222 2222  2222 2222 2222  2222 2222 2222
2222 2222 2222  2222 2222 2222 2222  2222 2222
Plane 4  2222 2222 2222  2222 2222 2222  2222 2222 2222
2222 2222 2222  2222 2222 2222 2222  2222 2222
Plane 5  2222 2222 2222  2222 2222 2222  2222 2222 2222
2222 2222 2222  2222 2222 2222 2222  2222 2222
Plane 6  2222 2222 2222  2222 2222 2222  2222 2222 2222
2222 2222 2222  2222 2222 2222 2222  2222 2222
Plane 7  2222 2222 2222  2222 2222 2222  2222 2222 2222
2222 2222 2222  2222 2222 2222 2222  2222 2222
PFE 3
Plane 0  3333 3333 3333  3333 3333 3333  3333 3333 3333
3333 3333 3333  3333 3333 3333 3333  3333 3333
Plane 1  2222 2222 2222  2222 2222 2222  2222 2222 2222
2222 2222 2222  2222 2222 2222 2222  2222 2222
Plane 2  2222 2222 2222  2222 2222 2222  2222 2222 2222
2222 2222 2222  2222 2222 2222 2222  2222 2222
Plane 3  2222 2222 2222  2222 2222 2222  2222 2222 2222
2222 2222 2222  2222 2222 2222 2222  2222 2222
Plane 4  2222 2222 2222  2222 2222 2222  2222 2222 2222
2222 2222 2222  2222 2222 2222 2222  2222 2222
Plane 5  2222 2222 2222  2222 2222 2222  2222 2222 2222
2222 2222 2222  2222 2222 2222 2222  2222 2222
Plane 6  2222 2222 2222  2222 2222 2222  2222 2222 2222
2222 2222 2222  2222 2222 2222 2222  2222 2222
Plane 7  2222 2222 2222  2222 2222 2222  2222 2222 2222
2222 2222 2222  2222 2222 2222 2222  2222 2222

```

**show chassis fabric
destinations fpc 14**

```

user@ host > show chassis fabric destinations fpc 14
Fabric destinations state:
0: non-existent

```

(MX2020 Router with MPC4E)

2: enabled
 3: disabled
 6: dest-err and disabled

FPC 14**PFE 0**

Plane 0	2200 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
	2200 0000 0000 0000 0000 2222
Plane 1	2200 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
	2200 0000 0000 0000 0000 2222
Plane 2	2200 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
	2200 0000 0000 0000 0000 2222
Plane 3	2200 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
	2200 0000 0000 0000 0000 2222
Plane 4	2200 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
	2200 0000 0000 0000 0000 2222
Plane 5	2200 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
	2200 0000 0000 0000 0000 2222
Plane 6	2200 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
	2200 0000 0000 0000 0000 2222
Plane 7	2200 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
	2200 0000 0000 0000 0000 2222

PFE 1

Plane 0	2200 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
	2200 0000 0000 0000 0000 2222
Plane 1	2200 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
	2200 0000 0000 0000 0000 2222
Plane 2	2200 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
	2200 0000 0000 0000 0000 2222
Plane 3	2200 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
	2200 0000 0000 0000 0000 2222
Plane 4	2200 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
	2200 0000 0000 0000 0000 2222
Plane 5	2200 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
	2200 0000 0000 0000 0000 2222
Plane 6	2200 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
	2200 0000 0000 0000 0000 2222
Plane 7	2200 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
	2200 0000 0000 0000 0000 2222

show chassis fabric destinations (MX2010 Router)**user@host> show chassis fabric destinations**

Fabric destinations state:

0: non-existent
 2: enabled
 3: disabled
 6: dest-err and disabled

FPC 0**PFE 0**

Plane 0	2200 2000 2200 2222 2000 2200 2222 2200 2000 2200
Plane 1	2200 2000 2200 2222 2000 2200 2222 2200 2000 2200
Plane 2	2200 2000 2200 2222 2000 2200 2222 2200 2000 2200
Plane 3	3300 3000 3300 3333 3000 3300 3333 3300 3000 3300
Plane 4	2200 2000 2200 2222 2000 2200 2222 2200 2000 2200
Plane 5	2200 2000 2200 2222 2000 2200 2222 2200 2000 2200
Plane 6	2200 2000 2200 2222 2000 2200 2222 2200 2000 2200
Plane 7	2200 2000 2200 2222 2000 2200 2222 2200 2000 2200

PFE 1

Plane 0	2200 2000 2200 2222 2000 2200 2222 2200 2000 2200
Plane 1	2200 2000 2200 2222 2000 2200 2222 2200 2000 2200
Plane 2	2200 2000 2200 2222 2000 2200 2222 2200 2000 2200

FPC 3										
PFE 0										
Plane 0	2200	2000	2200	2222	2000	2200	2222	2200	2000	2200
Plane 1	2200	2000	2200	2222	2000	2200	2222	2200	2000	2200
Plane 2	2200	2000	2200	2222	2000	2200	2222	2200	2000	2200
Plane 3	3300	3000	3300	3333	3000	3300	3333	3300	3000	3300
Plane 4	2200	2000	2200	2222	2000	2200	2222	2200	2000	2200
Plane 5	2200	2000	2200	2222	2000	2200	2222	2200	2000	2200
Plane 6	2200	2000	2200	2222	2000	2200	2222	2200	2000	2200
Plane 7	2200	2000	2200	2222	2000	2200	2222	2200	2000	2200
PFE 1										
Plane 0	2200	2000	2200	2222	2000	2200	2222	2200	2000	2200
Plane 1	2200	2000	2200	2222	2000	2200	2222	2200	2000	2200
Plane 2	2200	2000	2200	2222	2000	2200	2222	2200	2000	2200
Plane 3	3300	3000	3300	3333	3000	3300	3333	3300	3000	3300
Plane 4	2200	2000	2200	2222	2000	2200	2222	2200	2000	2200
Plane 5	2200	2000	2200	2222	2000	2200	2222	2200	2000	2200
Plane 6	2200	2000	2200	2222	2000	2200	2222	2200	2000	2200
Plane 7	2200	2000	2200	2222	2000	2200	2222	2200	2000	2200
PFE 2										
Plane 0	2200	2000	2200	2222	2000	2200	2222	2200	2000	2200
Plane 1	2200	2000	2200	2222	2000	2200	2222	2200	2000	2200
Plane 2	2200	2000	2200	2222	2000	2200	2222	2200	2000	2200
Plane 3	3300	3000	3300	3333	3000	3300	3333	3300	3000	3300
Plane 4	2200	2000	2200	2222	2000	2200	2222	2200	2000	2200
Plane 5	2200	2000	2200	2222	2000	2200	2222	2200	2000	2200

Copyright © 2013, Juniper Networks, Inc.

[illegible]

Plane 5	2200	2000	2200	2222	2000	2200	2222	2200	2000	2200
Plane 6	2200	2000	2200	2222	2000	2200	2222	2200	2000	2200
Plane 7	2200	2000	2200	2222	2000	2200	2222	2200	2000	2200

show chassis fabric feb

Syntax	show chassis fabric feb
Release Information	Command introduced in Junos OS Release 8.0.
Description	(M120 router only) Display the state of the electrical and optical switching fabric links between the Forwarding Engine Boards (FEBs) and the fabric planes, as interpreted by the FEB.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show chassis fabric feb on page 813
Output Fields	Table 55 on page 813 lists the output fields for the show chassis fabric feb command.

Table 55: show chassis fabric feb Output Fields

Field Name	Field Description
Fabric management FEB state	State of the switching fabric link between each FEB and fabric plane: desalination error, disabled, enabled, link error, link ok, or unused.

Sample Output

```

user@host> show chassis fabric feb
Fabric management      FEB state
FEB 0                  Plane 0: Plane enabled
                       Plane 1: Plane enabled
                       Plane 2: Plane enabled
                       Plane 3: Plane enabled

FEB 4                  Plane 0: Plane enabled
                       Plane 1: Plane enabled
                       Plane 2: Plane enabled
                       Plane 3: Plane enabled

```

show chassis fabric errors

Syntax	show chassis fabric errors <autoheal> <fpc slot-number lcc number> <sib (slot | f13 sib-slot | f2s sib-slot/sib-f2s-slot-number | lcc number)>
Syntax (PTX Series Packet Transport Routers)	show chassis fabric errors (autoheal | fpc slot-number | sib sib-slot)
Release Information	Command introduced in Junos OS Release 10.0. Command introduced in Junos OS Release 12.1X48 for the PTX Series Packet Transport Routers.
Description	Display the first ten and last ten fabric errors for the FPC or Switch Interface Boards (SIBs).



NOTE: This command can only be issued on a master Routing Engine.

- Options**
- autoheal**—(TX Matrix Plus routers and PTX Series Packet Transport Routers only) Show an error log of the first 100 autoheal actions taken on the system.
 - fpc slot-number**—Show error log of the first ten and last ten errors for the specified FPC. (PTX5000 Packet Transport Routers only)—Replace **slot-number** with a value from 0 through 7.

(TX Matrix Plus routers only)—Replace **fpc slot-number** with the following values depending on the LCC configuration:
 - On a TX Matrix Plus router with the TXP-T1600 configuration, if you specify the number of a T1600 LCC by using the **lcc number** option (the recommended method), replace **fpc slot-number** with a value from 0 through 7. Otherwise, use a value from 0 through 31.
 - On a TX Matrix Plus router with the TXP-T1600-3D, TXP-T4000-3D, or TXP-Mixed-LCC-3D configuration, if you specify the number of a T1600 or T4000 LCC by using the **lcc number** option (the recommended method), replace **fpc slot-number** with a value from 0 through 7. Otherwise, use a value from 0 through 63.
 - **lcc number**—Show error log of the first ten and last ten errors for the specified FPC on a specific network device (line-card chassis) that is part of the routing matrix.

Replace **lcc 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.

If you specify the number of the network device by using only 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 fabric errors fpc 1 lcc 1
user@host> show chassis fabric errors fpc 9
```

sib—Show error log of the first ten and last ten errors for the specified SIB. This option has the following suboptions:

- (TX Matrix Plus routers only) **sib-slot**—Specify a value ranging from 0 through 4.
- (PTX Series Packet Transport Routers) **sib-slot**—Specify a value ranging from 0 through 8.
- **f13 sib-slot**—(Optional) Show SIB F13 errors. Specify a valid SIB value number: 0, 1, 3, 4, 6, 7, 8, 9, 11, or 12.
- **f2s sib-slot/sib-f2s-slot-number**—(Optional) Show SIB F2S errors. Replace **sib-slot** with a value from 0 through 4, followed by a **sib-f2s-slot-number** value 0, 2, 4 or 6.
- **lcc number**—(Optional) Show error log of the first ten and last ten SIB errors for the specified network device (line-card chassis).

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.



NOTE: The `lcc number` suboption is mandatory when using the following format for the command: `show chassis fabric errors sib lcc number sib slot-number`. For instance, issuing `show chassis fabric errors sib lcc 2 3` displays errors detected on LCC 2, SIB 3.

This suboption is not required when the `f13` or `f2s` suboptions are used with the `sib slot-number` option.

Required Privilege Level view

List of Sample Output

- [show chassis fabric errors \(F13 SIB Errors on a TX Matrix Plus Router\) on page 817](#)
- [show chassis fabric errors \(F2S SIB Errors on a TX Matrix Plus Router\) on page 817](#)
- [show chassis fabric errors \(SIB Errors Specific to an LCC Connected to a TX Matrix Plus Router\) on page 817](#)
- [show chassis fabric errors \(FPC Errors Specific to an LCC Connected to a TX Matrix Plus Router\) on page 817](#)
- [show chassis fabric errors \(SIB Errors Specific to an LCC Connected to a TX Matrix Plus Router with 3D SIBs\) on page 818](#)
- [show chassis fabric errors fpc or sib \(PTX Series Packet Transport Routers\) on page 818](#)
- [show chassis fabric errors autoheal \(PTX Series Packet Transport Routers\) on page 818](#)
- [show chassis fabric errors autoheal \(TX Matrix Plus Router with 3D SIBs\) on page 818](#)

Output Fields [Table 56 on page 816](#) lists the output fields for the `show chassis fabric errors` command. Output fields are listed in the approximate order in which they appear.

Table 56: show chassis fabric errors Output Fields

Field Name	Field Description
Time	Time the error was logged. (TX Matrix Plus routers and PTX Series Packet Transport Routers only) For the <code>autoheal</code> option, shows the timestamp when autoheal was attempted on a SIB that was in fault state.
Error log of first 10 errors	List of the first ten errors.
Error log of last 10 errors	List of the last ten errors.

Table 56: show chassis fabric errors Output Fields (*continued*)

Field Name	Field Description
Error log of first 100 errors	Indicates the autoheal action taken on the SIB. The following actions can occur: <ul style="list-style-type: none"> • Req—A SIB autoheal request was made on a faulty SIB. • Action—Autohealing (taking the SIB offline and then online) is initiated. • Denied—Autohealing (taking the SIB offline and then online) is denied because the SIB went to a fault state before the autoheal configuration period completed. • Set info—Setting information to force skipping autoheal on the SIB so that no further attempts to autoheal the faulty SIB are made. • Clear info—If a user takes a SIB offline and then online, then the autoheal information of the SIB is cleared. If the SIB goes to a fault state, autoheal is attempted on the SIB.
fpc slot number	(PTX5000 Packet Transport Router only)—Range is 0 through 7.
sib slot number	(PTX Series Packet Transport Routers only)—Range is 0 through 8.
lcc number	Not supported on PTX Series Packet Transport Routers.

Sample Output

show chassis fabric errors (F13 SIB Errors on a TX Matrix Plus Router)

```
user@host> show chassis fabric errors sib f13 11
```

```
Time                               Error log of first 10 errors
2009-10-06 02:21:17 PDT           LOS on Cable-D(1,0)
```

show chassis fabric errors (F2S SIB Errors on a TX Matrix Plus Router)

```
user@host> show chassis fabric errors sib f2s 0/0
```

```
Time                               Error log of first 10 errors
2009-10-06 13:51:42 PDT           Cell drop errors on CLOS F2 SF 0 Port 0 link
```

show chassis fabric errors (SIB Errors Specific to an LCC Connected to a TX Matrix Plus Router)

```
user@host> show chassis fabric errors sib 1 lcc 0
lcc0-re0:
```

```
-----
```

```
Time                               Error log of first 10 errors
2009-10-06 02:23:16 PDT           Cell drop errors on FPC7_T link
2009-10-06 02:23:16 PDT           Cell drop errors on FPC7_B link
```

show chassis fabric errors (FPC Errors)

```
user@host> show chassis fabric errors fpc 5 lcc 0
```

**Specific to an LCC
Connected to a TX
Matrix Plus Router)**

```
lcc0-re0:
-----
Time                               Error log of first 10 errors
2009-10-06 13:56:59 PDT           PFE_T has link error on plane 1
```

**show chassis fabric
errors (SIB Errors
Specific to an LCC
Connected to a TX
Matrix Plus Router with
3D SIBs)**

```
user@host> show chassis fabric errors sib 1 lcc 0
lcc0-re0:
-----
Time                               Error log of first 10 errors
2013-02-11 04:46:42 PST           CRC errors on XC link SIB01_XF3#11,0
```

**show chassis fabric
errors fpc or sib (PTX
Series Packet
Transport Routers)**

```
user@host> show chassis fabric errors fpc 1
Time                               Error log of first 10 errors
2012-01-06 16:27:03 PST           Link errs on PFE 2, SIB 0, Plane 0

user@host> show chassis fabric errors sib 1
Time                               Error log of first 10 errors
2012-01-06 15:34:33 PST           Link errs on PFE 0, FPC 0, Plane 2
```

**show chassis fabric
errors autoheal (PTX
Series Packet
Transport Routers)**

```
user@host> show chassis fabric errors autoheal
```

**show chassis fabric
errors autoheal (TX
Matrix Plus Router with
3D SIBs)**

```
user@host> show chassis fabric errors autoheal
Time                               Error log of first 100 errors
2013-03-25 00:16:10 PDT           Req: Plane 3 F13 8 Cbl 4 (tx) LCC0-SIB3 Cbl 4 (rx)
2013-03-25 00:16:12 PDT           Action: Plane 3 F13 8 Cbl 4 (autohealing)
2013-03-25 00:17:24 PDT           Req: Plane 3 F13 8 Cbl 4 (tx) LCC0-SIB3 Cbl 4 (rx)
2013-03-25 00:17:24 PDT           Denied: Plane 3 F13 8 Cbl 4 (time < configured)
2013-03-25 00:17:24 PDT           Set info: Plane 3 F13 8 Cbl 4 (skip autoheal)
2013-03-25 01:20:17 PDT           Clear info: Plane 3
```

show chassis fabric fpcs

Syntax	show chassis fabric fpcs <lcc <i>number</i> >
Syntax (MX Series Routers)	show chassis fabric fpcs <all-members> <local> <member <i>member-id</i> >
Syntax (MX2010 and MX2020 3D Universal Edge Routers)	show chassis fabric fpcs
Syntax (T4000 Core Router)	show chassis fabric fpcs
Syntax (PTX Series Packet Transport Routers)	show chassis fabric fpcs <slot <i>fpc-slot</i> >
Syntax (TX Matrix Plus Router)	show chassis fabric fpcs <lcc <i>number</i> >
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.4 for EX Series switches. Command introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport 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.
Description	(M320, MX Series, and T Series routers, EX8200 switches, and PTX Series Packet Transport Routers only) Display the state of the electrical switch fabric links between the Flexible PIC Concentrators (FPCs) and the Switch Interface Boards (SIBs).
Options	<p>none—Display the switch fabric link state. On a TX Matrix router, display the switching fabric link states for the FPCs in all T640 routers connected to the TX Matrix router. On a TX Matrix Plus router, display the switching fabric link states for the FPCs in all routers connected to the TX Matrix Plus router.</p> <p>all-members—(MX Series routers only) (Optional) Display the switching fabric link states for the FPCs in all members of the Virtual Chassis configuration.</p> <p>lcc <i>number</i>—(TX Matrix router and TX Matrix Plus router only) (Optional) On a TX Matrix router, display the switch fabric link state for the FPCs in the specified T640 router (line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, display the switch fabric link state for the FPCs in the specified router (line-card chassis) that is connected to the TX Matrix Plus router. Replace <i>number</i> with a following value depending on the LCC configurations:</p>

- From **0** through **3** on a T640 router on the routing matrix with TX Matirx routers.
- From **0** through **3** on a T1600 router on the routing matrix with TX Matirx Plus routers.
- From **0** through **7** on a T1600 router in a routing matrix with TX Matrix Plus router with 3D SIBs.
- **0, 2, 4, 6** on a T4000 router in a routing matrix with TX Matrix Plus router with 3D SIBs.

local—(MX Series routers only) (Optional) Display the switching fabric link states for the FPCs in the local Virtual Chassis member.

member *member-id*—(MX Series routers only) (Optional) Display the switching fabric link states for the FPCs in the specified member of the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

slot *fpc-slot*—(PTX Series Packet Transport Routers only) (Optional) Display the fabric state of the specified FPC slot. If no value is provided, display the status of all FPCs.

Required Privilege Level view

List of Sample Output

[show chassis fabric fpcs \(M320 Router\) on page 822](#)
[show chassis fabric fpcs \(MX240 Router\) on page 822](#)
[show chassis fabric fpcs \(MX480 Router\) on page 822](#)
[show chassis fabric fpcs \(MX960 Router\) on page 823](#)
[show chassis fabric fpcs \(MX240 with AS MLC Modular Carrier Card\) on page 825](#)
[show chassis fabric fpcs \(MX480 with AS MLC Modular Carrier Card\) on page 825](#)
[show chassis fabric fpcs \(MX480 Router with MPC4E\) on page 826](#)
[show chassis fabric fpcs \(MX960 with AS MLC Modular Carrier Card on page 828](#)
[show chassis fabric fpcs \(MX2010 Router\) on page 830](#)
[show chassis fabric fpcs \(MX2020 Router\) on page 833](#)
[show chassis fabric fpcs \(MX2020 Router with MPC4E\) on page 836](#)
[show chassis fabric fpcs \(T320 Router\) on page 838](#)
[show chassis fabric fpcs \(T640 Router\) on page 838](#)
[show chassis fabric fpcs \(TX Matrix Router\) on page 838](#)
[show chassis fabric fpcs \(TX Matrix Router with 3D SIBs\) on page 840](#)
[show chassis fabric fpcs lcc \(TX Matrix Router with 3D SIBs\) on page 843](#)
[show chassis fabric fpcs \(T1600 Router\) on page 843](#)
[show chassis fabric fpcs \(T4000 Core Router\) on page 845](#)
[show chassis fabric fpcs \(TX Matrix Plus Router\) on page 846](#)
[show chassis fabric fpcs lcc \(TX Matrix Plus Router\) on page 853](#)
[show chassis fabric fpcs \(EX8200 Switch\) on page 854](#)
[show chassis fabric fpcs \(PTX Series Packet Transport Routers\) on page 855](#)

Output Fields [Table 57 on page 821](#) lists the output fields for the **show chassis fabric fpcs** command. Output fields are listed in the approximate order in which they appear.

Table 57: show chassis fabric fpcs Output Fields

Field Name	Field Description
Fabric management FPC state	<p>Switching fabric link (link from SIB to FPC) state for each FPC:</p> <ul style="list-style-type: none"> • Unused—FPC is not present. (On MX240 and MX480 routers with AS- MLC modular carrier card or MPC4E only) the fabric plane from the pair that share physical links (1 and 5, and 3 and 7) is inactive. • Destination error on PFEs <i>list of PFE numbers</i>—Destination errors to the listed Packet Forwarding Engines. Indicates that the link is not carrying traffic to the listed Packet Forwarding Engines. <p>NOTE: In Junos OS Release 9.6 and later, the list of Packet Forwarding Engines with destination errors is displayed in the output.</p> <p>In Junos OS Releases before 9.6, the output only indicates that there are destination errors. However, the list of Packet Forwarding Engines with destination errors is not displayed.</p> <ul style="list-style-type: none"> • Links ok—Link between the spare SIB and FPC is eligible to carry traffic. • Link error—Link between the SIB and FPC has CRC errors. However, the link is still eligible to carry traffic. • Plane disabled—Fabric plane has been disabled for the following reasons: <ul style="list-style-type: none"> • Destination errors have exceeded the thresholds. • Run-time link errors have exceeded the thresholds. • Initialization time link errors detected, and link training was unsuccessful. • Plane Disabled, Links Error (PTX Series Packet Transport Routers only)—The plane is disabled because of link errors detected at the FPC RX. • Plane Disabled, Links Down (PTX Series Packet Transport Routers only)—The plane is disabled because of link errors detected at the SIB RX. • Plane enabled—Link between the active SIB and FPC is eligible to carry traffic. <p>NOTE: On the Enhanced MX SCB with MPC, a maximum of 4 planes are operational and running. On all the other SCBs with MPC, all the planes are operational and running.</p> <ul style="list-style-type: none"> • Plane Enabled, Links OK (PTX Series Packet Transport Routers only)—The FPC CCL RX link is eligible to carry traffic. • Plane Enabled, Links OK (TX Matrix and TX Matrix Plus routers only)—The FPC HSL RX link is eligible to carry traffic.

Sample Output

show chassis fabric fpcs (M320 Router)

```
user@host> show chassis fabric fpcs
Fabric management FPC state:
FPC #2
  PFE #1
    SIB #0      Plane enabled
    SIB #1      Plane enabled
    SIB #2      Plane enabled
    SIB #3      Plane enabled
```

show chassis fabric fpcs (MX240 Router)

```
user@host> show chassis fabric fpcs
Fabric management FPC state:
FPC 2
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
    Plane 6: Links ok
    Plane 7: Links ok
  PFE #1
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
    Plane 6: Links ok
    Plane 7: Links ok
  PFE #2
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
    Plane 6: Links ok
    Plane 7: Links ok
  PFE #3
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
    Plane 6: Links ok
    Plane 7: Links ok
```

show chassis fabric fpcs (MX480 Router)

```
user@host> show chassis fabric fpcs
FPC 0
```

```

PFE #0
  Plane 0: Plane enabled
  Plane 1: Plane enabled
  Plane 2: Plane enabled
  Plane 3: Plane enabled
  Plane 4: Links ok
  Plane 5: Links ok
  Plane 6: Links ok
  Plane 7: Links ok
PFE #1
  Plane 0: Plane enabled
  Plane 1: Plane enabled
  Plane 2: Plane enabled
  Plane 3: Plane enabled
  Plane 4: Links ok
  Plane 5: Links ok
  Plane 6: Links ok
  Plane 7: Links ok
PFE #2
  Plane 0: Plane enabled
  Plane 1: Plane enabled
  Plane 2: Plane enabled
  Plane 3: Plane enabled
  Plane 4: Links ok
  Plane 5: Links ok
  Plane 6: Links ok
  Plane 7: Links ok
PFE #3
  Plane 0: Plane enabled
  Plane 1: Plane enabled
  Plane 2: Plane enabled
  Plane 3: Plane enabled
  Plane 4: Links ok
  Plane 5: Links ok
  Plane 6: Links ok
  Plane 7: Links ok
FPC 1
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
  PFE #1
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled

```

**show chassis fabric
fpcs (MX960 Router)**

```

user@host> show chassis fabric fpcs
FPC 0
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled

```

```
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Links ok
Plane 5: Links ok
PFE #1
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Links ok
Plane 5: Links ok
PFE #2
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Links ok
Plane 5: Links ok
PFE #3
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Links ok
Plane 5: Links ok
FPC 1
PFE #0
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
PFE #1
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
FPC 2
PFE #0
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Links ok
Plane 5: Links ok
PFE #1
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Links ok
Plane 5: Links ok
PFE #2
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Links ok
```


...

**show chassis fabric
fpcs (MX240 with AS
MLC Modular Carrier
Card)**

In the following output, FPC 1 is the AS MLC modular carrier card (AS MCC).

```
user@host>show chassis fabric fpcs
FPC 1
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Unused
    Plane 6: Plane enabled
    Plane 7: Unused
FPC 2
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
```

**show chassis fabric
fpcs (MX480 with AS**

In the following output, FPC 5 is the AS MLC modular carrier card (AS MCC).

```
user@host>show chassis fabric fpcs
```

MLC Modular Carrier Card)

```
FPC 2
PFE #0
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled

FPC 4
PFE #0
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Links ok
Plane 5: Links ok
Plane 6: Links ok
Plane 7: Links ok

PFE #2
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Links ok
Plane 5: Links ok
Plane 6: Links ok
Plane 7: Links ok

FPC 5
PFE #0
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Unused
Plane 6: Plane enabled
Plane 7: Unused
```

**show chassis fabric
fpcs (MX480 Router
with MPC4E)**

In the following output, **FPC4** is the MPC4E (MPC4E-3D-32XGE-SFPP) card.

```
user@host > show chassis fabric fpcs
Fabric management FPC state:
FPC 0
PFE #0
Plane 0: Links ok
Plane 1: Links ok
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Links ok
Plane 6: Plane enabled
Plane 7: Links ok

PFE #1
Plane 0: Links ok
Plane 1: Links ok
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Links ok
```

```
Plane 6: Plane enabled
Plane 7: Links ok
FPC 1
  PFE #0
    Plane 0: Links ok
    Plane 1: Links ok
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Links ok
    Plane 6: Plane enabled
    Plane 7: Links ok
  PFE #1
    Plane 0: Links ok
    Plane 1: Links ok
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Links ok
    Plane 6: Plane enabled
    Plane 7: Links ok
  PFE #2
    Plane 0: Links ok
    Plane 1: Links ok
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Links ok
    Plane 6: Plane enabled
    Plane 7: Links ok
  PFE #3
    Plane 0: Links ok
    Plane 1: Links ok
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Links ok
    Plane 6: Plane enabled
FPC 3
  PFE #0
    Plane 0: Links ok
    Plane 1: Links ok
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Links ok
    Plane 6: Plane enabled
    Plane 7: Links ok
FPC 4
  PFE #0
    Plane 0: Links ok
    Plane 1: Links ok
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Unused
    Plane 6: Plane enabled
    Plane 7: Unused
  PFE #1
    Plane 0: Links ok
```

```
Plane 1: Links ok
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Unused
Plane 6: Plane enabled
Plane 7: Unused
```

**show chassis fabric
fpcs (MX960 with AS**

In the following output, FPC 5 is the AS MLC modular carrier card (AS MCC).

```
user@host>show chassis fabric fpcs
```

MLC Modular Carrier
Card

```

Fabric management FPC state:
FPC 0
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
  PFE #1
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
FPC 1
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
FPC 4
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
  PFE #1
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
  PFE #2
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
  PFE #3
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
FPC 5
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok

```

```
FPC 8
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
  PFE #1
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
  PFE #2
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
  PFE #3
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
```

show chassis fabric fpcs (MX2010 Router)

```
user@host> show chassis fabric fpcs
Fabric management FPC state:
FPC 0
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
  PFE #1
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
FPC 1
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
```

```
FPC 2
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
  PFE #1
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
FPC 3
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
  PFE #1
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
  PFE #2
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
  PFE #3
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
FPC 4
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
```

```
Plane 3: Plane disabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
FPC 5
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
  PFE #1
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
FPC 6
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
  PFE #1
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
  PFE #2
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
  PFE #3
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
```



```

FPC 7
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
  PFE #1
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
FPC 8
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
FPC 9
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
  PFE #1
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled

```

**show chassis fabric
fpcs (MX2020 Router)**

```

user@host> show chassis fabric fpcs
Fabric management FPC state:
FPC 0
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled

```

PFE #1
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled

PFE #2
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled

PFE #3
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled

FPC 1

PFE #0
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled

PFE #1
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled

PFE #2
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled

PFE #3
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled

```
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
FPC 2
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
  PFE #1
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
  PFE #2
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
  PFE #3
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
FPC 3
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
  PFE #1
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
  PFE #2
    Plane 0: Plane enabled
```

```
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
PFE #3
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
FPC 4
...
```

**show chassis fabric
fpcs (MX2020 Router
with MPC4E)**

```
user@host > show chassis fabric fpcs
Fabric management FPC state:
FPC 0
PFE #0
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
PFE #1
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
FPC 9
PFE #0
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
PFE #1
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
FPC 10
PFE #0
```

```
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
FPC 14
PFE #0
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
PFE #1
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
FPC 19
PFE #0
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
PFE #1
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
PFE #2
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
PFE #3
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
```

```

Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled

```

show chassis fabric fpcs (T320 Router)

```

user@host> show chassis fabric fpcs
FPC #3
  PFE #1
    SIB #0
      Links ok
    SIB #1
      Plane enabled
    SIB #2
      Plane enabled
FPC #5
  PFE #1
    SIB #0
      Links ok
    SIB #1
      Plane enabled
    SIB #2
      Plane enabled
FPC #7
  PFE #1
    SIB #0
      Links ok
    SIB #1
      Plane enabled
    SIB #2
      Plane enabled

```

show chassis fabric fpcs (T640 Router)

```

user@host> show chassis fabric fpcs
Fabric management FPC state:

FPC #2
  PFE #1
    SIB #0
      Links ok
    SIB #1
      Plane enabled
    SIB #2
      Plane enabled
    SIB #3
      Plane enabled
    SIB #4
      Plane enabled
FPC #3
  PFE #1
    SIB #2
      Plane enabled
    SIB #3
      Link error
      Destination error on PFes
      8   9  10  11  12  13  14  15  16  17  18  19  20  21
      0   1   2   3   4   5   6   7
    SIB #4
      Destination error on PFes
      8   9  10  11  12  13  14  15  16  17  18  19  20  21
      0   1   2   3   4   5   6   7
...

user@host> show chassis fabric fpcs

```

show chassis fabric
fpcs (TX Matrix
Router)

```

1cc0-re0:
-----
Fabric management FPC state:
FPC #0
  PFE #1
    SIB #0
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
FPC #2
  PFE #1
    SIB #0
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
FPC #3
  PFE #1
    SIB #2
      Plane enabled
    SIB #3
      Link error
      Destination error on PFES
      8   9   10  11  12  13  14  15  16  17  18  19  20  21
    SIB #4
      Destination error on PFES
      8   9   10  11  12  13  14  15  16  17  18  19  20  21
...
FPC #4
  PFE #0
    SIB #4 Links ok
  PFE #1
    SIB #4 Links ok
FPC #5
  PFE #1
    SIB #4 Links ok
FPC #6
  PFE #1
    SIB #4 Links ok

1cc2-re0:
-----
Fabric management FPC state:
FPC #0
  PFE #1
    SIB #4 Links ok
FPC #1
  PFE #1
    SIB #4 Links ok
FPC #2
  PFE #0
    SIB #4 Links ok
  PFE #1
    SIB #4 Links ok
FPC #4

```

```
PFE #0
  SIB #4 Links ok
PFE #1
  SIB #4 Links ok
FPC #5
  PFE #1
    SIB #4 Links ok
```

**show chassis fabric
fpcs (TX Matrix Router
with 3D SIBs)**

```
user@host> show chassis fabric fpcs
lcc0-re0:
```

Fabric management FPC state:

```
FPC #0
  PFE #0
    SIB #0
      Links ok
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
  PFE #1
    SIB #0
      Links ok
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
FPC #3
  PFE #0
    SIB #0
      Links ok
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
  PFE #1
    SIB #0
      Links ok
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
FPC #4
  PFE #0
    SIB #0
```



```

SIB #1 Links ok
SIB #2 Links ok
SIB #3 Links ok
SIB #4 Links ok
PFE #1
SIB #0 Links ok
SIB #1 Links ok
SIB #2 Links ok
SIB #3 Links ok
SIB #4 Links ok
FPC #5
PFE #0
SIB #0 Links ok
SIB #1 Links ok
SIB #2 Links ok
SIB #3 Links ok
SIB #4 Links ok
PFE #1
SIB #0 Links ok
SIB #1 Links ok
SIB #2 Links ok
SIB #3 Links ok
SIB #4 Links ok
FPC #6
PFE #0
SIB #0 Links ok
SIB #1 Links ok
SIB #2 Links ok
SIB #3 Links ok
SIB #4 Links ok
PFE #1
SIB #0 Links ok
SIB #1 Links ok
SIB #2
```

```

        SIB #3      Links ok
        SIB #4      Links ok
        SIB #4      Links ok

lcc2-re0:
-----

lcc4-re0:
-----
Fabric management FPC state:
FPC #2
  PFE #0
    SIB #0
      Links ok
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
  PFE #1
    SIB #0
      Links ok
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
FPC #3
  PFE #0
    SIB #0
      Links ok
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
  PFE #1
    SIB #0
      Links ok
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok

lcc6-re0:
-----
```

**show chassis fabric
fpcs lcc (TX Matrix
Router with 3D SIBs)**

```
user@host> show chassis fabric fpcs lcc 4
lcc4-re0:
```

```
-----
Fabric management FPC state:
```

```
FPC #2
```

```
  PFE #0
```

```
    SIB #0
```

```
      Links ok
```

```
    SIB #1
```

```
      Links ok
```

```
    SIB #2
```

```
      Links ok
```

```
    SIB #3
```

```
      Links ok
```

```
    SIB #4
```

```
      Links ok
```

```
  PFE #1
```

```
    SIB #0
```

```
      Links ok
```

```
    SIB #1
```

```
      Links ok
```

```
    SIB #2
```

```
      Links ok
```

```
    SIB #3
```

```
      Links ok
```

```
    SIB #4
```

```
      Links ok
```

```
FPC #3
```

```
  PFE #0
```

```
    SIB #0
```

```
      Links ok
```

```
    SIB #1
```

```
      Links ok
```

```
    SIB #2
```

```
      Links ok
```

```
    SIB #3
```

```
      Links ok
```

```
    SIB #4
```

```
      Links ok
```

```
  PFE #1
```

```
    SIB #0
```

```
      Links ok
```

```
    SIB #1
```

```
      Links ok
```

```
    SIB #2
```

```
      Links ok
```

```
    SIB #3
```

```
      Links ok
```

```
    SIB #4
```

```
      Links ok
```

**show chassis fabric
fpcs (T1600 Router)**

```
user@host> show chassis fabric fpcs
```

```
Fabric management FPC state:
```

```
FPC #0
```

```
  PFE #0
```

```
    SIB #0
```

```
      Links ok
```

```
    SIB #1
```

```
      Plane enabled
```

```
    SIB #2
```

```

        Plane enabled
    SIB #3
        Plane enabled
    SIB #4
        Plane enabled
PFE #1
    SIB #0
        Links ok
    SIB #1
        Plane enabled
    SIB #2
        Plane enabled
    SIB #3
        Plane enabled
    SIB #4
        Plane enabled
FPC #1
    PFE #0
        SIB #0
            Links ok
        SIB #1
            Plane enabled
        SIB #2
            Plane enabled
        SIB #3
            Plane enabled
        SIB #4
            Plane enabled
    PFE #1
        SIB #0
            Links ok
        SIB #1
            Plane enabled
        SIB #2
            Plane enabled
        SIB #3
            Plane enabled
        SIB #4
            Plane enabled
FPC #2
    PFE #0
        SIB #0
            Links ok
        SIB #1
            Plane enabled
        SIB #2
            Plane enabled
        SIB #3
            Plane enabled
        SIB #4
            Plane enabled
FPC #4
    PFE #0
        SIB #0
            Links ok
        SIB #1
            Plane enabled
        SIB #2
            Plane enabled
        SIB #3
            Plane enabled
```

```

SIB #4
Plane enabled
PFE #1
SIB #0
Links ok
SIB #1
Plane enabled
SIB #2
Plane enabled
SIB #3
Plane enabled
SIB #4
Plane enabled
FPC #3
PFE #1
SIB #2
Plane enabled
SIB #3
Link error
Destination error on PFEs
8 9 10 11 12 13 14 15 16 17 18 19 20 21
SIB #4
Destination error on PFEs
8 9 10 11 12 13 14 15 16 17 18 19 20 21

```

show chassis fabric
fpcs (T4000 Core
Router)

Fabric management FPC state:

```

FPC #2
PFE #0
SIB #0
Links ok
SIB #1
Plane enabled
SIB #2
Plane enabled
SIB #3
Plane enabled
SIB #4
Plane enabled
FPC #3
PFE #0
SIB #0
Links ok
SIB #1
Plane enabled
SIB #2
Plane enabled
SIB #3
Plane enabled
SIB #4
Plane enabled
FPC #5
PFE #0
SIB #0
Links ok
SIB #1
Plane enabled
SIB #2
Plane enabled
SIB #3
Plane enabled
SIB #4

```

```

        Plane enabled
PFE #1
  SIB #0
    Links ok
  SIB #1
    Plane enabled
  SIB #2
    Plane enabled
  SIB #3
    Plane enabled
  SIB #4
    Plane enabled
FPC #6
PFE #0
  SIB #0
    Links ok
  SIB #1
    Plane enabled
  SIB #2
    Plane enabled
  SIB #3
    Plane enabled
  SIB #4
    Plane enabled
PFE #1
  SIB #0
    Links ok
  SIB #1
    Plane enabled
  SIB #2
    Plane enabled
  SIB #3
    Plane enabled
  SIB #4
    Plane enabled
```

**show chassis fabric
fpcs (TX Matrix Plus
Router)**

```
user@host> show chassis fabric fpcs
1cc0-re0:
```

```
-----
Fabric management FPC state:
```

```
FPC #0
PFE #1
  SIB #0
    Unused
  SIB #1
    Links ok
  SIB #2
    Links ok
  SIB #3
    Links ok
  SIB #4
    Links ok
FPC #2
PFE #0
  SIB #0
    Unused
  SIB #1
    Links ok
  SIB #2
    Links ok
  SIB #3
```

```

        Links ok
    SIB #4
        Links ok
PFE #1
    SIB #0
        Unused
    SIB #1
        Links ok
    SIB #2
        Links ok
    SIB #3
        Links ok
    SIB #4
        Links ok
FPC #3
    PFE #1
        SIB #2
            Plane enabled
        SIB #3
            Link error
            Destination error on PFes
            8   9   10  11  12  13  14  15  16  17  18  19  20  21
            0   1   2   3   4   5   6   7
    SIB #4
            Destination error on PFes
            8   9   10  11  12  13  14  15  16  17  18  19  20  21
            0   1   2   3   4   5   6   7
FPC #4
    PFE #0
        SIB #0
            Unused
        SIB #1
            Links ok
        SIB #2
            Links ok
        SIB #3
            Links ok
        SIB #4
            Links ok
    PFE #1
        SIB #0
            Unused
        SIB #1
            Links ok
        SIB #2
            Links ok
        SIB #3
            Links ok
        SIB #4
            Links ok
FPC #6
    PFE #0
        SIB #0
            Unused
        SIB #1
            Links ok
        SIB #2
            Links ok
        SIB #3
            Links ok
        SIB #4
            Links ok
    PFE #1

```

```
SIB #0
    Unused
SIB #1
    Links ok
SIB #2
    Links ok
SIB #3
    Links ok
SIB #4
    Links ok
FPC #7
  PFE #0
    SIB #0
      Unused
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
```

lcc1-re0:

Fabric management FPC state:

```
FPC #2
  PFE #0
    SIB #0
      Links ok
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
  PFE #1
    SIB #0
      Links ok
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
FPC #4
  PFE #0
    SIB #0
      Links ok
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
```



```

PFE #1
  SIB #0
    Links ok
  SIB #1
    Links ok
  SIB #2
    Links ok
  SIB #3
    Destination error on PFES      1      8      9     29     40     65     72     73
                                     93    104
  SIB #4
    Links ok
FPC #6
  PFE #0
    SIB #0
      Links ok
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
  PFE #1
    SIB #0
      Links ok
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
FPC #7
  PFE #0
    SIB #0
      Links ok
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok

lcc2-re0:
-----
Fabric management FPC state:
FPC #0
  PFE #0
    SIB #0
      Links ok
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3

```

```

SIB #4 Links ok
SIB #4 Links ok
PFE #1
SIB #0 Links ok
SIB #1 Links ok
SIB #2 Links ok
SIB #3 Links ok
SIB #4 Links ok
FPC #2
PFE #0
SIB #0 Links ok
SIB #1 Links ok
SIB #2 Links ok
SIB #3 Links ok
SIB #4 Links ok
PFE #1
SIB #0 Links ok
SIB #1 Links ok
SIB #2 Links ok
SIB #3 Links ok
SIB #4 Links ok
FPC #4
PFE #0
SIB #0 Links ok
SIB #1 Links ok
SIB #2 Links ok
SIB #3 Links ok
SIB #4 Links ok
FPC #5
PFE #0
SIB #0 Links ok
SIB #1 Links ok
SIB #2 Links ok
SIB #3 Links ok
SIB #4 Links ok
```

```

PFE #1
  SIB #0
    Links ok
  SIB #1
    Links ok
  SIB #2
    Links ok
  SIB #3
    Links ok
  SIB #4
    Links ok
FPC #6
  PFE #0
    SIB #0
      Links ok
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
  PFE #1
    SIB #0
      Links ok
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
FPC #7
  PFE #0
    SIB #0
      Links ok
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok

```

```
lcc3-re0:
```

```
-----
Fabric management FPC state:
```

```

FPC #0
  PFE #0
    SIB #0
      Links ok
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4

```

```

                                Links ok
PFE #1
  SIB #0
                                Links ok
  SIB #1
                                Links ok
  SIB #2
                                Links ok
  SIB #3
                                Links ok
  SIB #4
                                Links ok
FPC #2
PFE #0
  SIB #0
                                Links ok
  SIB #1
                                Links ok
  SIB #2
                                Links ok
  SIB #3
                                Links ok
  SIB #4
                                Links ok
PFE #1
  SIB #0
                                Links ok
  SIB #1
                                Links ok
  SIB #2
                                Links ok
  SIB #3
                                Links ok
  SIB #4
                                Links ok
FPC #4
PFE #0
  SIB #0
                                Links ok
  SIB #1
                                Links ok
  SIB #2
                                Links ok
  SIB #3
                                Links ok
  SIB #4
                                Links ok
PFE #1
  SIB #0
                                Links ok
  SIB #1
                                Links ok
  SIB #2
                                Links ok
  SIB #3
                                Links ok
  SIB #4
                                Links ok
FPC #5
PFE #0
  SIB #0
```

```

SIB #1 Links ok
SIB #2 Links ok
SIB #3 Links ok
SIB #4 Links ok
PFE #1
SIB #0 Links ok
SIB #1 Links ok
SIB #2 Links ok
SIB #3 Links ok
SIB #4 Links ok
FPC #6
PFE #0
SIB #0 Links ok
SIB #1 Links ok
SIB #2 Links ok
SIB #3 Links ok
SIB #4 Links ok
PFE #1
SIB #0 Links ok
SIB #1 Links ok
SIB #2 Links ok
SIB #3 Links ok
SIB #4 Links ok
FPC #7
PFE #0
SIB #0 Links ok
SIB #1 Links ok
SIB #2 Links ok
SIB #3 Links ok
SIB #4 Links ok

```

**show chassis fabric
fpcs lcc (TX Matrix
Plus Router)**

```

user@host> show chassis fabric fpcs lcc 0
lcc0-re1:
-----
Fabric management FPC state:
FPC #3

```

```

PFE #1
  SIB #2
    Plane enabled
  SIB #3
    Link error
    Destination error on PFes      0   1   2   3   4   5   6   7
      8   9  10  11  12  13  14  15  16  17  18  19  20  21
  SIB #4
    Destination error on PFes      0   1   2   3   4   5   6   7
      8   9  10  11  12  13  14  15  16  17  18  19  20  21
FPC #4
  PFE #0
    SIB #0 Links ok
    SIB #1 Links ok
    SIB #2 Links ok
    SIB #3 Links ok
    SIB #4 Links ok
  PFE #1
    SIB #0 Links ok
    SIB #1 Links ok
    SIB #2 Links ok
    SIB #3 Links ok
    SIB #4 Links ok
FPC #6
  PFE #0
    SIB #0 Links ok
    SIB #1 Links ok
    SIB #2 Links ok
    SIB #3 Links ok
    SIB #4 Links ok
  PFE #1
    SIB #0 Links ok
    SIB #1 Links ok
    SIB #2 Links ok
    SIB #3 Links ok
    SIB #4 Links ok
FPC #7
  PFE #0
    SIB #0 Links ok
    SIB #1 Links ok
    SIB #2 Links ok
    SIB #3 Links ok
    SIB #4 Links ok

```

show chassis fabric fpcs (EX8200 Switch)

```

user@host> show chassis fabric fpcs
Fabric management FPC state
FPC 6
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
    Plane 6: Links ok
    Plane 7: Links ok
    Plane 8: Plane enabled
    Plane 9: Plane enabled
    Plane 10: Plane enabled
    Plane 11: Plane enabled
  PFE #1

```

```

Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Links ok
Plane 5: Links ok
Plane 6: Links ok
Plane 7: Links ok
Plane 8: Plane enabled
Plane 9: Plane enabled
Plane 10: Plane enabled
Plane 11: Plane enabled
FPC 7
PFE #0
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Links ok
Plane 5: Links ok
Plane 6: Links ok
Plane 7: Links ok
Plane 8: Plane enabled
Plane 9: Plane enabled
Plane 10: Plane enabled
Plane 11: Plane enabled
PFE #1
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Links ok
Plane 5: Links ok
Plane 6: Links ok
Plane 7: Links ok
Plane 8: Plane enabled
Plane 9: Plane enabled
Plane 10: Plane enabled
Plane 11: Plane enabled

```

**show chassis fabric
fpcs (PTX Series**

```

user@host> show chassis fabric fpcs slot 0
Fabric management FPC state:
FPC #0

```

**Packet Transport
Routers)**

PFE #0

SIB0_Fcore0	(plane 0)	Plane Enabled, Links OK
SIB0_Fcore1	(plane 1)	Plane Enabled, Links OK
SIB1_Fcore0	(plane 2)	Plane Disabled, Links Down
SIB1_Fcore1	(plane 3)	Plane Enabled, Links OK
SIB2_Fcore0	(plane 4)	Plane Enabled, Links OK
SIB2_Fcore1	(plane 5)	Plane Enabled, Links OK
SIB3_Fcore0	(plane 6)	Plane Enabled, Links OK
SIB3_Fcore1	(plane 7)	Plane Enabled, Links OK
SIB5_Fcore0	(plane 10)	Plane Enabled, Links OK
SIB5_Fcore1	(plane 11)	Plane Enabled, Links OK
SIB6_Fcore0	(plane 12)	Plane Enabled, Links OK
SIB6_Fcore1	(plane 13)	Plane Enabled, Links OK
SIB7_Fcore0	(plane 14)	Plane Enabled, Links OK
SIB7_Fcore1	(plane 15)	Plane Enabled, Links OK
SIB8_Fcore0	(plane 16)	Plane Enabled, Links OK
SIB8_Fcore1	(plane 17)	Plane Enabled, Links OK

show chassis fabric map

Syntax	show chassis fabric map plane <plane-number>
Syntax (MX Series Router)	show chassis fabric map <all-members> <local> <member member-id> <plane plane-number>
Release Information	Command introduced in Junos OS Release 8.0. Command introduced in Junos OS Release 9.4 for EX Series switches.
Description	(M120 and MX Series routers and EX8200 switches only) On the M120 router, display the state of the switching fabric map for connections from the Forwarding Engine Boards (FEBs) to the ports on the fabric planes, as interpreted by the fabric plane. On the MX Series router and the EX8200 switch, display the state of the switching fabric map for connections from each Packet Forwarding Engine on the Dense Port Concentrators (DPCs) to the ports on the fabric planes, as interpreted by the fabric plane. For information about the meaning of “fabric plane”, “DPCs”, and “SIBs” on the switches, see <i>EX Series Switches Hardware and CLI Terminology Mapping</i> .
Options	<p>none—Display the switching fabric map state for the M120 or MX Series router or EX8200 switch.</p> <p>all-members—(MX Series routers only) (Optional) Display the switching fabric map state for all the members of the Virtual Chassis configuration.</p> <p>local—(MX Series routers only) (Optional) Display the switching fabric map state for the local Virtual Chassis member.</p> <p>member member-id—(MX Series routers only) (Optional) Display the switching fabric map state for the specified member of the Virtual Chassis configuration. Replace the <i>member-id</i> with a value of 0 or 1.</p> <p>plane plane-number—(Optional) Display the state of the fabric link for the specified plane number.</p> <ul style="list-style-type: none"> For the M120 router, replace <i>plane-number</i> with a value from 0 through 3. For the MX480 and MX240 routers, replace <i>plane-number</i> with a value from 0 through 7. For the MX960 router, replace <i>plane-number</i> with a value from 0 through 5. For the EX8208 switch, replace <i>plane-number</i> with a value from 0 through 11. For the EX8216 switch, replace <i>plane-number</i> with a value from 0 through 7.
Required Privilege Level	view

List of Sample Output [show chassis fabric map \(M120 Router\) on page 859](#)
 [show chassis fabric map \(MX Series Routers\) on page 859](#)
 [show chassis fabric map plane 1 \(EX8200 Switch\) on page 862](#)

Output Fields [Table 58 on page 858](#) lists the output fields for the **show chassis fabric map** command. Output fields are listed in the approximate order in which they appear.

Table 58: show chassis fabric map Output Fields

Field Name	Field Description
in-links	Fabric map for receive side links.
out-links	Fabric map for transmit side links.
state	State of the fabric link: <ul style="list-style-type: none">• RESET—Link between SIB and FPC/DPC is powered down on purpose. This is done in all non-dual PFE based boards.• UP—Link between SIB and FPC/DPC is up and running.• DOWN—Link between SIB and FPC/DPC is powered down.• FAULT—SIB is in alarmed state where the SIB's plane is not operational for the following reasons:<ul style="list-style-type: none">• On-board F-chip is not operational.• Fiber optic connector faults.• FPC connector faults.• SIB midplane connector faults.

Sample Output

show chassis fabric map (M120 Router)

```
user@host> show chassis fabric map
FEB0->CB0F0_00 up CB0F0_08->FEB7 Down

FEB1->CB0F0_01 Down CB0F0_09->FEB6 Down

FEB6->CB0F0_02 Down CB0F0_10->FEB1 Down

FEB2->CB0F0_03 Down CB0F0_11->FEB0 up

FEB3->CB0F0_04 Down CB0F0_12->FEB3 Down

FEB4->CB0F0_05 up CB0F0_13->FEB2 Down

FEB7->CB0F0_06 Down CB0F0_14->FEB5 Down

FEB5->CB0F0_07 Down CB0F0_15->FEB4 up:
```

show chassis fabric map (MX Series Routers)

```
user@host> show chassis fabric map
DPC4PFE0->CB0F0_00_0 up CB0F0_00_0->DPC4PFE0 up
DPC4PFE1->CB0F0_00_1 up CB0F0_00_1->DPC4PFE1 up
DPC4PFE2->CB0F0_00_2 up CB0F0_00_2->DPC4PFE2 up
DPC4PFE3->CB0F0_00_3 up CB0F0_00_3->DPC4PFE3 up
DPC7PFE0->CB0F0_01_0 Down CB0F0_01_0->DPC7PFE0 Down
DPC7PFE1->CB0F0_01_1 Down CB0F0_01_1->DPC7PFE1 Down
DPC7PFE2->CB0F0_01_2 Down CB0F0_01_2->DPC7PFE2 Down
DPC7PFE3->CB0F0_01_3 Down CB0F0_01_3->DPC7PFE3 Down
DPC3PFE0->CB0F0_03_0 Down CB0F0_03_0->DPC3PFE0 Down
DPC3PFE1->CB0F0_03_1 Down CB0F0_03_1->DPC3PFE1 Down
DPC3PFE2->CB0F0_03_2 Down CB0F0_03_2->DPC3PFE2 Down
DPC3PFE3->CB0F0_03_3 Down CB0F0_03_3->DPC3PFE3 Down
DPC8PFE0->CB0F0_05_0 Down CB0F0_05_0->DPC8PFE0 Down
DPC8PFE1->CB0F0_05_1 Down CB0F0_05_1->DPC8PFE1 Down
DPC8PFE2->CB0F0_05_2 Down CB0F0_05_2->DPC8PFE2 Down
DPC8PFE3->CB0F0_05_3 Down CB0F0_05_3->DPC8PFE3 Down
DPC1PFE0->CB0F0_06_0 Down CB0F0_06_0->DPC1PFE0 Down
DPC1PFE1->CB0F0_06_1 Down CB0F0_06_1->DPC1PFE1 Down
DPC1PFE2->CB0F0_06_2 Down CB0F0_06_2->DPC1PFE2 Down
DPC1PFE3->CB0F0_06_3 Down CB0F0_06_3->DPC1PFE3 Down
DPC10PFE0->CB0F0_07_0 Down CB0F0_07_0->DPC10PFE0 Down
DPC10PFE1->CB0F0_07_1 Down CB0F0_07_1->DPC10PFE1 Down
DPC10PFE2->CB0F0_07_2 Down CB0F0_07_2->DPC10PFE2 Down
DPC10PFE3->CB0F0_07_3 Down CB0F0_07_3->DPC10PFE3 Down
DPC11PFE0->CB0F0_08_0 Down CB0F0_08_0->DPC11PFE0 Down
DPC11PFE1->CB0F0_08_1 Down CB0F0_08_1->DPC11PFE1 Down
DPC11PFE2->CB0F0_08_2 Down CB0F0_08_2->DPC11PFE2 Down
DPC11PFE3->CB0F0_08_3 Down CB0F0_08_3->DPC11PFE3 Down
DPC0PFE0->CB0F0_09_0 Down CB0F0_09_0->DPC0PFE0 Down
DPC0PFE1->CB0F0_09_1 Down CB0F0_09_1->DPC0PFE1 Down
DPC0PFE2->CB0F0_09_2 Down CB0F0_09_2->DPC0PFE2 Down
DPC0PFE3->CB0F0_09_3 Down CB0F0_09_3->DPC0PFE3 Down
DPC9PFE0->CB0F0_11_0 Down CB0F0_11_0->DPC9PFE0 Down
DPC9PFE1->CB0F0_11_1 Down CB0F0_11_1->DPC9PFE1 Down
DPC9PFE2->CB0F0_11_2 Down CB0F0_11_2->DPC9PFE2 Down
DPC9PFE3->CB0F0_11_3 Down CB0F0_11_3->DPC9PFE3 Down
DPC2PFE0->CB0F0_13_0 up CB0F0_13_0->DPC2PFE0 up
DPC2PFE1->CB0F0_13_1 up CB0F0_13_1->DPC2PFE1 up
DPC2PFE2->CB0F0_13_2 up CB0F0_13_2->DPC2PFE2 up
```

DPC2PFE3->CB0F0_13_3	up	CB0F0_13_3->DPC2PFE3	up
DPC6PFE0->CB0F0_14_0	Down	CB0F0_14_0->DPC6PFE0	Down
DPC6PFE1->CB0F0_14_1	Down	CB0F0_14_1->DPC6PFE1	Down
DPC6PFE2->CB0F0_14_2	Down	CB0F0_14_2->DPC6PFE2	Down
DPC6PFE3->CB0F0_14_3	Down	CB0F0_14_3->DPC6PFE3	Down
DPC5PFE0->CB0F0_15_0	Down	CB0F0_15_0->DPC5PFE0	Down
DPC5PFE1->CB0F0_15_1	Down	CB0F0_15_1->DPC5PFE1	Down
DPC5PFE2->CB0F0_15_2	Down	CB0F0_15_2->DPC5PFE2	Down
DPC5PFE3->CB0F0_15_3	Down	CB0F0_15_3->DPC5PFE3	Down
DPC4PFE0->CB0F1_00_0	up	CB0F1_00_0->DPC4PFE0	up
DPC4PFE1->CB0F1_00_1	up	CB0F1_00_1->DPC4PFE1	up
DPC4PFE2->CB0F1_00_2	up	CB0F1_00_2->DPC4PFE2	up
DPC4PFE3->CB0F1_00_3	up	CB0F1_00_3->DPC4PFE3	up
DPC7PFE0->CB0F1_01_0	Down	CB0F1_01_0->DPC7PFE0	Down
DPC7PFE1->CB0F1_01_1	Down	CB0F1_01_1->DPC7PFE1	Down
DPC7PFE2->CB0F1_01_2	Down	CB0F1_01_2->DPC7PFE2	Down
DPC7PFE3->CB0F1_01_3	Down	CB0F1_01_3->DPC7PFE3	Down
DPC3PFE0->CB0F1_03_0	Down	CB0F1_03_0->DPC3PFE0	Down
DPC3PFE1->CB0F1_03_1	Down	CB0F1_03_1->DPC3PFE1	Down
DPC3PFE2->CB0F1_03_2	Down	CB0F1_03_2->DPC3PFE2	Down
DPC3PFE3->CB0F1_03_3	Down	CB0F1_03_3->DPC3PFE3	Down
DPC8PFE0->CB0F1_05_0	Down	CB0F1_05_0->DPC8PFE0	Down
DPC8PFE1->CB0F1_05_1	Down	CB0F1_05_1->DPC8PFE1	Down
DPC8PFE2->CB0F1_05_2	Down	CB0F1_05_2->DPC8PFE2	Down
DPC8PFE3->CB0F1_05_3	Down	CB0F1_05_3->DPC8PFE3	Down
DPC1PFE0->CB0F1_06_0	Down	CB0F1_06_0->DPC1PFE0	Down
DPC1PFE1->CB0F1_06_1	Down	CB0F1_06_1->DPC1PFE1	Down
DPC1PFE2->CB0F1_06_2	Down	CB0F1_06_2->DPC1PFE2	Down
DPC1PFE3->CB0F1_06_3	Down	CB0F1_06_3->DPC1PFE3	Down
DPC10PFE0->CB0F1_07_0	Down	CB0F1_07_0->DPC10PFE0	Down
DPC10PFE1->CB0F1_07_1	Down	CB0F1_07_1->DPC10PFE1	Down
DPC10PFE2->CB0F1_07_2	Down	CB0F1_07_2->DPC10PFE2	Down
DPC10PFE3->CB0F1_07_3	Down	CB0F1_07_3->DPC10PFE3	Down
DPC11PFE0->CB0F1_08_0	Down	CB0F1_08_0->DPC11PFE0	Down
DPC11PFE1->CB0F1_08_1	Down	CB0F1_08_1->DPC11PFE1	Down
DPC11PFE2->CB0F1_08_2	Down	CB0F1_08_2->DPC11PFE2	Down
DPC11PFE3->CB0F1_08_3	Down	CB0F1_08_3->DPC11PFE3	Down
DPC0PFE0->CB0F1_09_0	Down	CB0F1_09_0->DPC0PFE0	Down
DPC0PFE1->CB0F1_09_1	Down	CB0F1_09_1->DPC0PFE1	Down
DPC0PFE2->CB0F1_09_2	Down	CB0F1_09_2->DPC0PFE2	Down
DPC0PFE3->CB0F1_09_3	Down	CB0F1_09_3->DPC0PFE3	Down
DPC9PFE0->CB0F1_11_0	Down	CB0F1_11_0->DPC9PFE0	Down
DPC9PFE1->CB0F1_11_1	Down	CB0F1_11_1->DPC9PFE1	Down
DPC9PFE2->CB0F1_11_2	Down	CB0F1_11_2->DPC9PFE2	Down
DPC9PFE3->CB0F1_11_3	Down	CB0F1_11_3->DPC9PFE3	Down
DPC2PFE0->CB0F1_13_0	up	CB0F1_13_0->DPC2PFE0	up
DPC2PFE1->CB0F1_13_1	up	CB0F1_13_1->DPC2PFE1	up
DPC2PFE2->CB0F1_13_2	up	CB0F1_13_2->DPC2PFE2	up
DPC2PFE3->CB0F1_13_3	up	CB0F1_13_3->DPC2PFE3	up
DPC6PFE0->CB0F1_14_0	Down	CB0F1_14_0->DPC6PFE0	Down
DPC6PFE1->CB0F1_14_1	Down	CB0F1_14_1->DPC6PFE1	Down
DPC6PFE2->CB0F1_14_2	Down	CB0F1_14_2->DPC6PFE2	Down
DPC6PFE3->CB0F1_14_3	Down	CB0F1_14_3->DPC6PFE3	Down
DPC5PFE0->CB0F1_15_0	Down	CB0F1_15_0->DPC5PFE0	Down
DPC5PFE1->CB0F1_15_1	Down	CB0F1_15_1->DPC5PFE1	Down
DPC5PFE2->CB0F1_15_2	Down	CB0F1_15_2->DPC5PFE2	Down
DPC5PFE3->CB0F1_15_3	Down	CB0F1_15_3->DPC5PFE3	Down
DPC4PFE0->CB1F0_00_0	up	CB1F0_00_0->DPC4PFE0	up
DPC4PFE1->CB1F0_00_1	up	CB1F0_00_1->DPC4PFE1	up
DPC4PFE2->CB1F0_00_2	up	CB1F0_00_2->DPC4PFE2	up
DPC4PFE3->CB1F0_00_3	up	CB1F0_00_3->DPC4PFE3	up

DPC7PFE0->CB1F0_01_0	Down	CB1F0_01_0->DPC7PFE0	Down
DPC7PFE1->CB1F0_01_1	Down	CB1F0_01_1->DPC7PFE1	Down
DPC7PFE2->CB1F0_01_2	Down	CB1F0_01_2->DPC7PFE2	Down
DPC7PFE3->CB1F0_01_3	Down	CB1F0_01_3->DPC7PFE3	Down
DPC3PFE0->CB1F0_03_0	Down	CB1F0_03_0->DPC3PFE0	Down
DPC3PFE1->CB1F0_03_1	Down	CB1F0_03_1->DPC3PFE1	Down
DPC3PFE2->CB1F0_03_2	Down	CB1F0_03_2->DPC3PFE2	Down
DPC3PFE3->CB1F0_03_3	Down	CB1F0_03_3->DPC3PFE3	Down
DPC8PFE0->CB1F0_05_0	Down	CB1F0_05_0->DPC8PFE0	Down
DPC8PFE1->CB1F0_05_1	Down	CB1F0_05_1->DPC8PFE1	Down
DPC8PFE2->CB1F0_05_2	Down	CB1F0_05_2->DPC8PFE2	Down
DPC8PFE3->CB1F0_05_3	Down	CB1F0_05_3->DPC8PFE3	Down
DPC1PFE0->CB1F0_06_0	Down	CB1F0_06_0->DPC1PFE0	Down
DPC1PFE1->CB1F0_06_1	Down	CB1F0_06_1->DPC1PFE1	Down
DPC1PFE2->CB1F0_06_2	Down	CB1F0_06_2->DPC1PFE2	Down
DPC1PFE3->CB1F0_06_3	Down	CB1F0_06_3->DPC1PFE3	Down
DPC10PFE0->CB1F0_07_0	Down	CB1F0_07_0->DPC10PFE0	Down
DPC10PFE1->CB1F0_07_1	Down	CB1F0_07_1->DPC10PFE1	Down
DPC10PFE2->CB1F0_07_2	Down	CB1F0_07_2->DPC10PFE2	Down
DPC10PFE3->CB1F0_07_3	Down	CB1F0_07_3->DPC10PFE3	Down
DPC11PFE0->CB1F0_08_0	Down	CB1F0_08_0->DPC11PFE0	Down
DPC11PFE1->CB1F0_08_1	Down	CB1F0_08_1->DPC11PFE1	Down
DPC11PFE2->CB1F0_08_2	Down	CB1F0_08_2->DPC11PFE2	Down
DPC11PFE3->CB1F0_08_3	Down	CB1F0_08_3->DPC11PFE3	Down
DPC0PFE0->CB1F0_09_0	Down	CB1F0_09_0->DPC0PFE0	Down
DPC0PFE1->CB1F0_09_1	Down	CB1F0_09_1->DPC0PFE1	Down
DPC0PFE2->CB1F0_09_2	Down	CB1F0_09_2->DPC0PFE2	Down
DPC0PFE3->CB1F0_09_3	Down	CB1F0_09_3->DPC0PFE3	Down
DPC9PFE0->CB1F0_11_0	Down	CB1F0_11_0->DPC9PFE0	Down
DPC9PFE1->CB1F0_11_1	Down	CB1F0_11_1->DPC9PFE1	Down
DPC9PFE2->CB1F0_11_2	Down	CB1F0_11_2->DPC9PFE2	Down
DPC9PFE3->CB1F0_11_3	Down	CB1F0_11_3->DPC9PFE3	Down
DPC2PFE0->CB1F0_13_0	up	CB1F0_13_0->DPC2PFE0	up
DPC2PFE1->CB1F0_13_1	up	CB1F0_13_1->DPC2PFE1	up
DPC2PFE2->CB1F0_13_2	up	CB1F0_13_2->DPC2PFE2	up
DPC2PFE3->CB1F0_13_3	up	CB1F0_13_3->DPC2PFE3	up
DPC6PFE0->CB1F0_14_0	Down	CB1F0_14_0->DPC6PFE0	Down
DPC6PFE1->CB1F0_14_1	Down	CB1F0_14_1->DPC6PFE1	Down
DPC6PFE2->CB1F0_14_2	Down	CB1F0_14_2->DPC6PFE2	Down
DPC6PFE3->CB1F0_14_3	Down	CB1F0_14_3->DPC6PFE3	Down
DPC5PFE0->CB1F0_15_0	Down	CB1F0_15_0->DPC5PFE0	Down
DPC5PFE1->CB1F0_15_1	Down	CB1F0_15_1->DPC5PFE1	Down
DPC5PFE2->CB1F0_15_2	Down	CB1F0_15_2->DPC5PFE2	Down
DPC5PFE3->CB1F0_15_3	Down	CB1F0_15_3->DPC5PFE3	Down
DPC4PFE0->CB1F1_00_0	up	CB1F1_00_0->DPC4PFE0	up
DPC4PFE1->CB1F1_00_1	up	CB1F1_00_1->DPC4PFE1	up
DPC4PFE2->CB1F1_00_2	up	CB1F1_00_2->DPC4PFE2	up
DPC4PFE3->CB1F1_00_3	up	CB1F1_00_3->DPC4PFE3	up
DPC7PFE0->CB1F1_01_0	Down	CB1F1_01_0->DPC7PFE0	Down
DPC7PFE1->CB1F1_01_1	Down	CB1F1_01_1->DPC7PFE1	Down
DPC7PFE2->CB1F1_01_2	Down	CB1F1_01_2->DPC7PFE2	Down
DPC7PFE3->CB1F1_01_3	Down	CB1F1_01_3->DPC7PFE3	Down
DPC3PFE0->CB1F1_03_0	Down	CB1F1_03_0->DPC3PFE0	Down
DPC3PFE1->CB1F1_03_1	Down	CB1F1_03_1->DPC3PFE1	Down
DPC3PFE2->CB1F1_03_2	Down	CB1F1_03_2->DPC3PFE2	Down
DPC3PFE3->CB1F1_03_3	Down	CB1F1_03_3->DPC3PFE3	Down
DPC8PFE0->CB1F1_05_0	Down	CB1F1_05_0->DPC8PFE0	Down
DPC8PFE1->CB1F1_05_1	Down	CB1F1_05_1->DPC8PFE1	Down
DPC8PFE2->CB1F1_05_2	Down	CB1F1_05_2->DPC8PFE2	Down
DPC8PFE3->CB1F1_05_3	Down	CB1F1_05_3->DPC8PFE3	Down
DPC1PFE0->CB1F1_06_0	Down	CB1F1_06_0->DPC1PFE0	Down

DPC1PFE1->CB1F1_06_1	Down	CB1F1_06_1->DPC1PFE1	Down
DPC1PFE2->CB1F1_06_2	Down	CB1F1_06_2->DPC1PFE2	Down
DPC1PFE3->CB1F1_06_3	Down	CB1F1_06_3->DPC1PFE3	Down
DPC10PFE0->CB1F1_07_0	Down	CB1F1_07_0->DPC10PFE0	Down
DPC10PFE1->CB1F1_07_1	Down	CB1F1_07_1->DPC10PFE1	Down
DPC10PFE2->CB1F1_07_2	Down	CB1F1_07_2->DPC10PFE2	Down
DPC10PFE3->CB1F1_07_3	Down	CB1F1_07_3->DPC10PFE3	Down
DPC11PFE0->CB1F1_08_0	Down	CB1F1_08_0->DPC11PFE0	Down
DPC11PFE1->CB1F1_08_1	Down	CB1F1_08_1->DPC11PFE1	Down
DPC11PFE2->CB1F1_08_2	Down	CB1F1_08_2->DPC11PFE2	Down
DPC11PFE3->CB1F1_08_3	Down	CB1F1_08_3->DPC11PFE3	Down
DPC0PFE0->CB1F1_09_0	Down	CB1F1_09_0->DPC0PFE0	Down
DPC0PFE1->CB1F1_09_1	Down	CB1F1_09_1->DPC0PFE1	Down
DPC0PFE2->CB1F1_09_2	Down	CB1F1_09_2->DPC0PFE2	Down
DPC0PFE3->CB1F1_09_3	Down	CB1F1_09_3->DPC0PFE3	Down
DPC9PFE0->CB1F1_11_0	Down	CB1F1_11_0->DPC9PFE0	Down
DPC9PFE1->CB1F1_11_1	Down	CB1F1_11_1->DPC9PFE1	Down
DPC9PFE2->CB1F1_11_2	Down	CB1F1_11_2->DPC9PFE2	Down
DPC9PFE3->CB1F1_11_3	Down	CB1F1_11_3->DPC9PFE3	Down
DPC2PFE0->CB1F1_13_0	up	CB1F1_13_0->DPC2PFE0	up
DPC2PFE1->CB1F1_13_1	up	CB1F1_13_1->DPC2PFE1	up
DPC2PFE2->CB1F1_13_2	up	CB1F1_13_2->DPC2PFE2	up
DPC2PFE3->CB1F1_13_3	up	CB1F1_13_3->DPC2PFE3	up
DPC6PFE0->CB1F1_14_0	Down	CB1F1_14_0->DPC6PFE0	Down
DPC6PFE1->CB1F1_14_1	Down	CB1F1_14_1->DPC6PFE1	Down
DPC6PFE2->CB1F1_14_2	Down	CB1F1_14_2->DPC6PFE2	Down
DPC6PFE3->CB1F1_14_3	Down	CB1F1_14_3->DPC6PFE3	Down
DPC5PFE0->CB1F1_15_0	Down	CB1F1_15_0->DPC5PFE0	Down
DPC5PFE1->CB1F1_15_1	Down	CB1F1_15_1->DPC5PFE1	Down
DPC5PFE2->CB1F1_15_2	Down	CB1F1_15_2->DPC5PFE2	Down
DPC5PFE3->CB1F1_15_3	Down	CB1F1_15_3->DPC5PFE3	Down
plane 4 is not up			
plane 5 is not up			

show chassis fabric map plane 1 (EX8200 Switch)

```

user@host> show chassis fabric map plane 1
regress@tp-grande01> show chassis fabric map plane 1
DPC6PFE0->CB0F0_00_0    Down    CB0F0_00_0->DPC6PFE0    Down
DPC6PFE1->CB0F0_00_1    Down    CB0F0_00_1->DPC6PFE1    Down
DPC6PFE2->CB0F0_00_2    Down    CB0F0_00_2->DPC6PFE2    Down
DPC6PFE3->CB0F0_00_3    Down    CB0F0_00_3->DPC6PFE3    Down
DPC0PFE0->CB0F0_01_0    Down    CB0F0_01_0->DPC0PFE0    Down
DPC0PFE1->CB0F0_01_1    Down    CB0F0_01_1->DPC0PFE1    Down
DPC0PFE2->CB0F0_01_2    Down    CB0F0_01_2->DPC0PFE2    Down
DPC0PFE3->CB0F0_01_3    Down    CB0F0_01_3->DPC0PFE3    Down
DPC5PFE0->CB0F0_02_0    Down    CB0F0_02_0->DPC5PFE0    Down
DPC5PFE1->CB0F0_02_1    Down    CB0F0_02_1->DPC5PFE1    Down
DPC5PFE2->CB0F0_02_2    Down    CB0F0_02_2->DPC5PFE2    Down
DPC5PFE3->CB0F0_02_3    Down    CB0F0_02_3->DPC5PFE3    Down
DPC3PFE0->CB0F0_03_0    Down    CB0F0_03_0->DPC3PFE0    Down
DPC3PFE1->CB0F0_03_1    Down    CB0F0_03_1->DPC3PFE1    Down
DPC3PFE2->CB0F0_03_2    Down    CB0F0_03_2->DPC3PFE2    Down
DPC3PFE3->CB0F0_03_3    Down    CB0F0_03_3->DPC3PFE3    Down
DPC4PFE0->CB0F0_04_0    Down    CB0F0_04_0->DPC4PFE0    Down
DPC4PFE1->CB0F0_04_1    Down    CB0F0_04_1->DPC4PFE1    Down
DPC4PFE2->CB0F0_04_2    Down    CB0F0_04_2->DPC4PFE2    Down
DPC4PFE3->CB0F0_04_3    Down    CB0F0_04_3->DPC4PFE3    Down
DPC2PFE0->CB0F0_05_0    Down    CB0F0_05_0->DPC2PFE0    Down
DPC2PFE1->CB0F0_05_1    Down    CB0F0_05_1->DPC2PFE1    Down
DPC2PFE2->CB0F0_05_2    Down    CB0F0_05_2->DPC2PFE2    Down
DPC2PFE3->CB0F0_05_3    Down    CB0F0_05_3->DPC2PFE3    Down
DPC7PFE0->CB0F0_06_0    Down    CB0F0_06_0->DPC7PFE0    Down

```

DPC7PFE1->CB0F0_06_1	Down	CB0F0_06_1->DPC7PFE1	Down
DPC7PFE2->CB0F0_06_2	Down	CB0F0_06_2->DPC7PFE2	Down
DPC7PFE3->CB0F0_06_3	Down	CB0F0_06_3->DPC7PFE3	Down
DPC1PFE0->CB0F0_07_0	Down	CB0F0_07_0->DPC1PFE0	Down
DPC1PFE1->CB0F0_07_1	Down	CB0F0_07_1->DPC1PFE1	Down
DPC1PFE2->CB0F0_07_2	Down	CB0F0_07_2->DPC1PFE2	Down
DPC1PFE3->CB0F0_07_3	Down	CB0F0_07_3->DPC1PFE3	Down
DPC0PFE0->CB0F0_08_0	Down	CB0F0_08_0->DPC0PFE0	Down
DPC0PFE1->CB0F0_08_1	Down	CB0F0_08_1->DPC0PFE1	Down
DPC0PFE2->CB0F0_08_2	Down	CB0F0_08_2->DPC0PFE2	Down
DPC0PFE3->CB0F0_08_3	Down	CB0F0_08_3->DPC0PFE3	Down
DPC7PFE0->CB0F0_09_0	Down	CB0F0_09_0->DPC7PFE0	Down
DPC7PFE1->CB0F0_09_1	Down	CB0F0_09_1->DPC7PFE1	Down
DPC7PFE2->CB0F0_09_2	Down	CB0F0_09_2->DPC7PFE2	Down
DPC7PFE3->CB0F0_09_3	Down	CB0F0_09_3->DPC7PFE3	Down
DPC1PFE0->CB0F0_10_0	Down	CB0F0_10_0->DPC1PFE0	Down
DPC1PFE1->CB0F0_10_1	Down	CB0F0_10_1->DPC1PFE1	Down
DPC1PFE2->CB0F0_10_2	Down	CB0F0_10_2->DPC1PFE2	Down
DPC1PFE3->CB0F0_10_3	Down	CB0F0_10_3->DPC1PFE3	Down
DPC4PFE0->CB0F0_11_0	Down	CB0F0_11_0->DPC4PFE0	Down
DPC4PFE1->CB0F0_11_1	Down	CB0F0_11_1->DPC4PFE1	Down
DPC4PFE2->CB0F0_11_2	Down	CB0F0_11_2->DPC4PFE2	Down
DPC4PFE3->CB0F0_11_3	Down	CB0F0_11_3->DPC4PFE3	Down
DPC2PFE0->CB0F0_12_0	Down	CB0F0_12_0->DPC2PFE0	Down
DPC2PFE1->CB0F0_12_1	Down	CB0F0_12_1->DPC2PFE1	Down
DPC2PFE2->CB0F0_12_2	Down	CB0F0_12_2->DPC2PFE2	Down
DPC2PFE3->CB0F0_12_3	Down	CB0F0_12_3->DPC2PFE3	Down
DPC5PFE0->CB0F0_13_0	Down	CB0F0_13_0->DPC5PFE0	Down
DPC5PFE1->CB0F0_13_1	Down	CB0F0_13_1->DPC5PFE1	Down
DPC5PFE2->CB0F0_13_2	Down	CB0F0_13_2->DPC5PFE2	Down
DPC5PFE3->CB0F0_13_3	Down	CB0F0_13_3->DPC5PFE3	Down
DPC3PFE0->CB0F0_14_0	Down	CB0F0_14_0->DPC3PFE0	Down
DPC3PFE1->CB0F0_14_1	Down	CB0F0_14_1->DPC3PFE1	Down
DPC3PFE2->CB0F0_14_2	Down	CB0F0_14_2->DPC3PFE2	Down
DPC3PFE3->CB0F0_14_3	Down	CB0F0_14_3->DPC3PFE3	Down
DPC6PFE0->CB0F0_15_0	Down	CB0F0_15_0->DPC6PFE0	Down
DPC6PFE1->CB0F0_15_1	Down	CB0F0_15_1->DPC6PFE1	Down
DPC6PFE2->CB0F0_15_2	Down	CB0F0_15_2->DPC6PFE2	Down
DPC6PFE3->CB0F0_15_3	Down	CB0F0_15_3->DPC6PFE3	Down

show chassis fabric optics

Syntax (TX Matrix Plus Router with 3D SIBs)	<code>show chassis fabric optics</code> <code><sib-slot></code> <code><lcc number | sfc number></code> <code><brief | detail></code>
Release Information	Command introduced in Junos OS Release 13.1 for the TX Matrix Plus router with 3D SIBs.
Description	(TX Matrix Plus routers with 3D SIBs only) Display information about the optical ports on the TX Matrix Plus router (or the switch-fabric chassis (SFC)) and on the T1600 or T4000 line-card chassis (LCCs) connected to it in a routing matrix.
Options	<p>none—Display brief information about the optical ports on the SFC and LCCs in the routing matrix.</p> <p>sib-number—(Optional) Display information about the optical ports for the specified SIB number.</p> <p>lcc number—(Optional) Display information about the optical ports for the specified T1600 or T4000 LCC that is connected to a TX Matrix Plus router with 3D SIBs. Replace number with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none">• From 0 through 7 on a T1600 router connected to a TX Matrix Plus router with 3D SIBs.• 0, 2, 4, or 6 on a T4000 router connected to a TX Matrix Plus router with 3D SIBs. <p>sfc number—(Optional) Display information about the optical ports for the specified SFC number. Replace number with 0.</p> <p>brief—(Optional) Display brief information about the optical ports.</p> <p>detail—(Optional) Display detailed information about the optical ports.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• <i>Overview of a Routing Matrix with a TX Matrix Plus Router</i>
List of Sample Output	show chassis fabric optics (TX Matrix Plus Router with 3D SIBs) on page 866 show chassis fabric optics (TX Matrix Plus Router with 3D SIBs) on page 870 show chassis fabric optics sfc (TX Matrix Plus Router with 3D SIBs) on page 871 show chassis fabric optics lcc (TX Matrix Plus Router with 3D SIBs) on page 874
Output Fields	Table 59 on page 865 lists the output fields for the show chassis fabric optics command. Output fields are listed in the approximate order in which they appear.

Table 59: show chassis fabric optics Output Fields

Field Name	Field Description
Port	Indicates port number.
Cable state	<p>Indicates the cable state:</p> <ul style="list-style-type: none"> • CABLE_CONNECTED—Cable is connected properly and is in an operable state. • CABLE_LOOPBACK—A loopback cable is connected to the port. • CABLE_NOT_CONNECTED—The optical port is not connected with any cable or all the channels are powered off on the remote side. • CABLE_MIS_CONNECTED—Cable is connected to an incorrect optical port. • CABLE_CONNECTED_WITH_ERROR—Cable is connected to the optical port, but indicates a cable issue. Refer to the optical cable fault alarms to identify the cable issue. • CABLE_NOT_SUPPORTED—The connected optics module is not supported. • CABLE_MODULE_ABSENT—No optics module is connected. • CABLE_MODULE_FAULT—The connected optics module has an irrecoverable fault. To recover from this error, you need to replace the optics module. • CABLE_ELEC_LOOPBACK—An electrical loopback module is connected to the optics port. <p>NOTE: Only electrical loopback modules from ELPEUS are supported.</p> <ul style="list-style-type: none"> • CABLE_ERROR—Cable cannot be detected, probably because the SIB is not online yet.
Module Type	Indicates module type.

Sample Output

show chassis fabric
optics (TX Matrix Plus
Router with 3D SIBs)

```
user@host> show chassis fabric optics
sfc0-re0:
```

```
-----
Port      Cable state      Module Type
sfc0-f13sib0:
0          MODULE_ABSENT    No Module
1          MODULE_ABSENT    No Module
2          CABLE_CONNECTED  CXP Module
3          CABLE_CONNECTED  CXP Module
4          MODULE_ABSENT    No Module
5          MODULE_ABSENT    No Module
6          MODULE_ABSENT    No Module
7          MODULE_ABSENT    No Module
8          CABLE_CONNECTED  CXP Module
9          MODULE_ABSENT    No Module
10         MODULE_ABSENT    No Module
11         MODULE_ABSENT    No Module
12         MODULE_ABSENT    No Module
13         MODULE_ABSENT    No Module
14         MODULE_ABSENT    No Module
15         MODULE_ABSENT    No Module
sfc0-f13sib1:
0          MODULE_ABSENT    No Module
1          MODULE_ABSENT    No Module
2          MODULE_ABSENT    No Module
3          MODULE_ABSENT    No Module
4          CABLE_CONNECTED  CXP Module
5          CABLE_CONNECTED  CXP Module
6          MODULE_ABSENT    No Module
7          MODULE_ABSENT    No Module
8          MODULE_ABSENT    No Module
9          CABLE_CONNECTED  CXP Module
10         MODULE_ABSENT    No Module
11         MODULE_ABSENT    No Module
12         MODULE_ABSENT    No Module
13         MODULE_ABSENT    No Module
14         MODULE_ABSENT    No Module
15         CABLE_CONNECTED  CXP Module
sfc0-f13sib2: SIB slot invalid
sfc0-f13sib3:
0          MODULE_ABSENT    No Module
1          MODULE_ABSENT    No Module
2          CABLE_CONNECTED  CXP Module
3          CABLE_CONNECTED  CXP Module
4          MODULE_ABSENT    No Module
5          MODULE_ABSENT    No Module
6          MODULE_ABSENT    No Module
7          MODULE_ABSENT    No Module
8          CABLE_CONNECTED  CXP Module
9          MODULE_ABSENT    No Module
10         MODULE_ABSENT    No Module
11         MODULE_ABSENT    No Module
12         MODULE_ABSENT    No Module
13         MODULE_ABSENT    No Module
14         MODULE_ABSENT    No Module
15         MODULE_ABSENT    No Module
sfc0-f13sib4:
0          MODULE_ABSENT    No Module
```

```

1      MODULE_ABSENT      No Module
2      MODULE_ABSENT      No Module
3      MODULE_ABSENT      No Module
4      CABLE_CONNECTED    CXP Module
5      CABLE_CONNECTED    CXP Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
8      MODULE_ABSENT      No Module
9      CABLE_CONNECTED    CXP Module
10     MODULE_ABSENT      No Module
11     MODULE_ABSENT      No Module
12     MODULE_ABSENT      No Module
13     MODULE_ABSENT      No Module
14     MODULE_ABSENT      No Module
15     CABLE_CONNECTED    CXP Module
sfc0-f13sib5: SIB slot invalid
sfc0-f13sib6:
0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      CABLE_CONNECTED    CXP Module
3      CABLE_CONNECTED    CXP Module
4      MODULE_ABSENT      No Module
5      MODULE_ABSENT      No Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
8      CABLE_CONNECTED    CXP Module
9      MODULE_ABSENT      No Module
10     MODULE_ABSENT      No Module
11     MODULE_ABSENT      No Module
12     MODULE_ABSENT      No Module
13     MODULE_ABSENT      No Module
14     MODULE_ABSENT      No Module
15     MODULE_ABSENT      No Module
sfc0-f13sib7:
0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      MODULE_ABSENT      No Module
3      MODULE_ABSENT      No Module
4      CABLE_CONNECTED    CXP Module
5      CABLE_CONNECTED    CXP Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
8      MODULE_ABSENT      No Module
9      CABLE_CONNECTED    CXP Module
10     MODULE_ABSENT      No Module
11     MODULE_ABSENT      No Module
12     MODULE_ABSENT      No Module
13     MODULE_ABSENT      No Module
14     MODULE_ABSENT      No Module
15     CABLE_CONNECTED    CXP Module
sfc0-f13sib8:
0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      CABLE_CONNECTED    CXP Module
3      CABLE_CONNECTED    CXP Module
4      MODULE_ABSENT      No Module
5      MODULE_ABSENT      No Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
8      CABLE_CONNECTED    CXP Module
9      MODULE_ABSENT      No Module

```

```

10      MODULE_ABSENT      No Module
11      MODULE_ABSENT      No Module
12      MODULE_ABSENT      No Module
13      MODULE_ABSENT      No Module
14      MODULE_ABSENT      No Module
15      MODULE_ABSENT      No Module
sfc0-f13sib9:
0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      MODULE_ABSENT      No Module
3      MODULE_ABSENT      No Module
4      CABLE_CONNECTED    CXP Module
5      CABLE_CONNECTED    CXP Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
8      MODULE_ABSENT      No Module
9      CABLE_CONNECTED    CXP Module
10     MODULE_ABSENT      No Module
11     MODULE_ABSENT      No Module
12     MODULE_ABSENT      No Module
13     MODULE_ABSENT      No Module
14     MODULE_ABSENT      No Module
15     CABLE_CONNECTED    CXP Module
sfc0-f13sib10: SIB slot invalid
sfc0-f13sib11: SIB slot empty
sfc0-f13sib12: SIB slot empty
sfc0-f13sib13: SIB slot invalid
sfc0-f13sib14: SIB slot invalid
sfc0-f13sib15: SIB slot invalid

```

lcc0-re0:

```

-----
Port      Cable state      Module Type
lcc0-sib0:
0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      CABLE_CONNECTED    CXP Module
3      CABLE_CONNECTED    CXP Module
4      MODULE_ABSENT      No Module
5      MODULE_ABSENT      No Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
lcc0-sib1:
0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      CABLE_CONNECTED    CXP Module
3      CABLE_CONNECTED    CXP Module
4      MODULE_ABSENT      No Module
5      MODULE_ABSENT      No Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
lcc0-sib2:
0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      CABLE_CONNECTED    CXP Module
3      CABLE_CONNECTED    CXP Module
4      MODULE_ABSENT      No Module
5      MODULE_ABSENT      No Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
lcc0-sib3:

```

```

0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      CABLE_CONNECTED    CXP Module
3      CABLE_CONNECTED    CXP Module
4      MODULE_ABSENT      No Module
5      MODULE_ABSENT      No Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
lcc0-sib4: SIB slot empty

```

```
lcc4-re0:
```

```

-----
Port      Cable state      Module Type
lcc4-sib0:
0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      MODULE_ABSENT      No Module
3      MODULE_ABSENT      No Module
4      CABLE_CONNECTED    CXP Module
5      CABLE_CONNECTED    CXP Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
lcc4-sib1:
0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      MODULE_ABSENT      No Module
3      MODULE_ABSENT      No Module
4      CABLE_CONNECTED    CXP Module
5      CABLE_CONNECTED    CXP Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
lcc4-sib2:
0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      MODULE_ABSENT      No Module
3      MODULE_ABSENT      No Module
4      CABLE_CONNECTED    CXP Module
5      CABLE_CONNECTED    CXP Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
lcc4-sib3:
0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      MODULE_ABSENT      No Module
3      MODULE_ABSENT      No Module
4      CABLE_CONNECTED    CXP Module
5      CABLE_CONNECTED    CXP Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
lcc4-sib4: SIB slot empty

```

```
lcc7-re0:
```

```

-----
Port      Cable state      Module Type
lcc7-sib0:
0      CABLE_CONNECTED    CXP Module
1      MODULE_ABSENT      No Module
2      MODULE_ABSENT      No Module
3      MODULE_ABSENT      No Module
4      MODULE_ABSENT      No Module
5      MODULE_ABSENT      No Module

```

```

6          CABLE_CONNECTED      CXP Module
7          MODULE_ABSENT        No Module
lcc7-sib1:
0          CABLE_CONNECTED      CXP Module
1          MODULE_ABSENT        No Module
2          MODULE_ABSENT        No Module
3          MODULE_ABSENT        No Module
4          MODULE_ABSENT        No Module
5          MODULE_ABSENT        No Module
6          CABLE_CONNECTED      CXP Module
7          MODULE_ABSENT        No Module
lcc7-sib2:
0          CABLE_CONNECTED      CXP Module
1          MODULE_ABSENT        No Module
2          MODULE_ABSENT        No Module
3          MODULE_ABSENT        No Module
4          MODULE_ABSENT        No Module
5          MODULE_ABSENT        No Module
6          CABLE_CONNECTED      CXP Module
7          MODULE_ABSENT        No Module
lcc7-sib3:
0          CABLE_CONNECTED      CXP Module
1          MODULE_ABSENT        No Module
2          MODULE_ABSENT        No Module
3          MODULE_ABSENT        No Module
4          MODULE_ABSENT        No Module
5          MODULE_ABSENT        No Module
6          CABLE_CONNECTED      CXP Module
7          MODULE_ABSENT        No Module
lcc7-sib4: SIB slot empty

```

show chassis fabric optics (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis fabric optics 0
```

```
sfc0-re0:
```

```

-----
Port      Cable state      Module Type
sfc0-f13sib0:
0          MODULE_ABSENT        No Module
1          MODULE_ABSENT        No Module
2          CABLE_CONNECTED      CXP Module
3          CABLE_CONNECTED      CXP Module
4          MODULE_ABSENT        No Module
5          MODULE_ABSENT        No Module
6          MODULE_ABSENT        No Module
7          MODULE_ABSENT        No Module
8          CABLE_CONNECTED      CXP Module
9          MODULE_ABSENT        No Module
10         MODULE_ABSENT        No Module
11         MODULE_ABSENT        No Module
12         MODULE_ABSENT        No Module
13         MODULE_ABSENT        No Module
14         MODULE_ABSENT        No Module
15         MODULE_ABSENT        No Module

```

```
lcc0-re0:
```

```

-----
Port      Cable state      Module Type
lcc0-sib0:
0          MODULE_ABSENT        No Module
1          MODULE_ABSENT        No Module
2          CABLE_CONNECTED      CXP Module
3          CABLE_CONNECTED      CXP Module

```

```

4      MODULE_ABSENT      No Module
5      MODULE_ABSENT      No Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module

```

```
lcc4-re0:
```

```

-----
Port      Cable state      Module Type
lcc4-sib0:
0          MODULE_ABSENT    No Module
1          MODULE_ABSENT    No Module
2          MODULE_ABSENT    No Module
3          MODULE_ABSENT    No Module
4          CABLE_CONNECTED  CXP Module
5          CABLE_CONNECTED  CXP Module
6          MODULE_ABSENT    No Module
7          MODULE_ABSENT    No Module

```

```
lcc7-re0:
```

```

-----
Port      Cable state      Module Type
lcc7-sib0:
0          CABLE_CONNECTED  CXP Module
1          MODULE_ABSENT    No Module
2          MODULE_ABSENT    No Module
3          MODULE_ABSENT    No Module
4          MODULE_ABSENT    No Module
5          MODULE_ABSENT    No Module
6          CABLE_CONNECTED  CXP Module
7          MODULE_ABSENT    No Module

```

**show chassis fabric
optics sfc (TX Matrix)**

```

user@host> show chassis fabric optics sfc 0
sfc0-re0:
-----

```

Plus Router with 3D
SIBs)

Port	Cable state	Module Type
sfc0-f13sib0:		
0	MODULE_ABSENT	No Module
1	MODULE_ABSENT	No Module
2	CABLE_CONNECTED	CXP Module
3	CABLE_CONNECTED	CXP Module
4	MODULE_ABSENT	No Module
5	MODULE_ABSENT	No Module
6	MODULE_ABSENT	No Module
7	MODULE_ABSENT	No Module
8	CABLE_CONNECTED	CXP Module
9	MODULE_ABSENT	No Module
10	MODULE_ABSENT	No Module
11	MODULE_ABSENT	No Module
12	MODULE_ABSENT	No Module
13	MODULE_ABSENT	No Module
14	MODULE_ABSENT	No Module
15	MODULE_ABSENT	No Module
sfc0-f13sib1:		
0	MODULE_ABSENT	No Module
1	MODULE_ABSENT	No Module
2	MODULE_ABSENT	No Module
3	MODULE_ABSENT	No Module
4	CABLE_CONNECTED	CXP Module
5	CABLE_CONNECTED	CXP Module
6	MODULE_ABSENT	No Module
7	MODULE_ABSENT	No Module
8	MODULE_ABSENT	No Module
9	CABLE_CONNECTED	CXP Module
10	MODULE_ABSENT	No Module
11	MODULE_ABSENT	No Module
12	MODULE_ABSENT	No Module
13	MODULE_ABSENT	No Module
14	MODULE_ABSENT	No Module
15	CABLE_CONNECTED	CXP Module
sfc0-f13sib2: SIB slot invalid		
sfc0-f13sib3:		
0	MODULE_ABSENT	No Module
1	MODULE_ABSENT	No Module
2	CABLE_CONNECTED	CXP Module
3	CABLE_CONNECTED	CXP Module
4	MODULE_ABSENT	No Module
5	MODULE_ABSENT	No Module
6	MODULE_ABSENT	No Module
7	MODULE_ABSENT	No Module
8	CABLE_CONNECTED	CXP Module
9	MODULE_ABSENT	No Module
10	MODULE_ABSENT	No Module
11	MODULE_ABSENT	No Module
12	MODULE_ABSENT	No Module
13	MODULE_ABSENT	No Module
14	MODULE_ABSENT	No Module
15	MODULE_ABSENT	No Module
sfc0-f13sib4:		
sfc0-f13sib4:		
0	MODULE_ABSENT	No Module
1	MODULE_ABSENT	No Module
2	MODULE_ABSENT	No Module
3	MODULE_ABSENT	No Module
4	CABLE_CONNECTED	CXP Module
5	CABLE_CONNECTED	CXP Module


```

6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
8      MODULE_ABSENT      No Module
9      CABLE_CONNECTED    CXP Module
10     MODULE_ABSENT      No Module
11     MODULE_ABSENT      No Module
12     MODULE_ABSENT      No Module
13     MODULE_ABSENT      No Module
14     MODULE_ABSENT      No Module
15     CABLE_CONNECTED    CXP Module
sfc0-f13sib5: SIB slot invalid
sfc0-f13sib6:
0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      CABLE_CONNECTED    CXP Module
3      CABLE_CONNECTED    CXP Module
4      MODULE_ABSENT      No Module
5      MODULE_ABSENT      No Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
8      CABLE_CONNECTED    CXP Module
9      MODULE_ABSENT      No Module
10     MODULE_ABSENT      No Module
11     MODULE_ABSENT      No Module
12     MODULE_ABSENT      No Module
13     MODULE_ABSENT      No Module
14     MODULE_ABSENT      No Module
15     MODULE_ABSENT      No Module
sfc0-f13sib7:
0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      MODULE_ABSENT      No Module
3      MODULE_ABSENT      No Module
4      CABLE_CONNECTED    CXP Module
5      CABLE_CONNECTED    CXP Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
8      MODULE_ABSENT      No Module
9      CABLE_CONNECTED    CXP Module
10     MODULE_ABSENT      No Module
11     MODULE_ABSENT      No Module
12     MODULE_ABSENT      No Module
13     MODULE_ABSENT      No Module
14     MODULE_ABSENT      No Module
15     CABLE_CONNECTED    CXP Module
sfc0-f13sib8:
0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      CABLE_CONNECTED    CXP Module
3      CABLE_CONNECTED    CXP Module
4      MODULE_ABSENT      No Module
5      MODULE_ABSENT      No Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
8      CABLE_CONNECTED    CXP Module
9      MODULE_ABSENT      No Module
10     MODULE_ABSENT      No Module
11     MODULE_ABSENT      No Module
12     MODULE_ABSENT      No Module
13     MODULE_ABSENT      No Module
14     MODULE_ABSENT      No Module

```

```
15      MODULE_ABSENT      No Module
sfc0-f13sib9:
0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      MODULE_ABSENT      No Module
3      MODULE_ABSENT      No Module
4      CABLE_CONNECTED     CXP Module
5      CABLE_CONNECTED     CXP Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
8      MODULE_ABSENT      No Module
9      CABLE_CONNECTED     CXP Module
10     MODULE_ABSENT      No Module
11     MODULE_ABSENT      No Module
12     MODULE_ABSENT      No Module
13     MODULE_ABSENT      No Module
14     MODULE_ABSENT      No Module
15     CABLE_CONNECTED     CXP Module
sfc0-f13sib10: SIB slot invalid
sfc0-f13sib11: SIB slot empty
sfc0-f13sib12: SIB slot empty
sfc0-f13sib13: SIB slot invalid
sfc0-f13sib14: SIB slot invalid
sfc0-f13sib15: SIB slot invalid
```

**show chassis fabric
optics lcc (TX Matrix)**

```
user@host> show chassis fabric topology lcc 7
lcc7-re0:
```

Plus Router with 3D SIBs)

Port	Cable state	Module Type
1cc7-sib0:		
0	CABLE_CONNECTED	CXP Module
1	MODULE_ABSENT	No Module
2	MODULE_ABSENT	No Module
3	MODULE_ABSENT	No Module
4	MODULE_ABSENT	No Module
5	MODULE_ABSENT	No Module
6	CABLE_CONNECTED	CXP Module
7	MODULE_ABSENT	No Module
1cc7-sib1:		
0	CABLE_CONNECTED	CXP Module
1	MODULE_ABSENT	No Module
2	MODULE_ABSENT	No Module
3	MODULE_ABSENT	No Module
4	MODULE_ABSENT	No Module
5	MODULE_ABSENT	No Module
6	CABLE_CONNECTED	CXP Module
7	MODULE_ABSENT	No Module
1cc7-sib2:		
0	CABLE_CONNECTED	CXP Module
1	MODULE_ABSENT	No Module
2	MODULE_ABSENT	No Module
3	MODULE_ABSENT	No Module
4	MODULE_ABSENT	No Module
5	MODULE_ABSENT	No Module
6	CABLE_CONNECTED	CXP Module
7	MODULE_ABSENT	No Module
1cc7-sib3:		
0	CABLE_CONNECTED	CXP Module
1	MODULE_ABSENT	No Module
2	MODULE_ABSENT	No Module
3	MODULE_ABSENT	No Module
4	MODULE_ABSENT	No Module
5	MODULE_ABSENT	No Module
6	CABLE_CONNECTED	CXP Module
7	MODULE_ABSENT	No Module
1cc7-sib4: SIB slot empty		

show chassis fabric plane

Syntax	show chassis fabric plane
Syntax (TX Matrix Plus Router)	show chassis fabric plane <detail | extensive | terse> <lcc <i>number</i> | sfc <i>number</i> >
Syntax (MX Series Routers)	show chassis fabric plane <detail | extensive | terse> <all-members> <local> <member <i>member-id</i> >
Syntax (MX2010 and MX2020 3D Universal Edge Routers)	show chassis fabric plane
Release Information	Command introduced in Junos OS Release 8.0. Command introduced in Junos OS Release 9.4 for EX Series switches. detail , extensive , lcc , sfc , and terse options introduced for the TX Matrix Plus router in Junos OS Release 9.6. 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.
Description	(TX Matrix Plus router, T4000, T1600, M120, and MX Series routers and EX8200 switches only) On the M120 router, display the state of all fabric plane connections to the Forwarding Engine Boards (FEBs). On MX Series routers, display the state of all fabric plane connections to the Dense Port Concentrators (DPCs) and Packet Forwarding Engines (PFEs) on the Flexible PIC Concentrators (FPCs). On the TX Matrix Plus router, and on T1600 or T4000 routers in a routing matrix, display the state of the fabric management plane and the logical planes on the switch-fabric chassis (SFC) and line-card chassis (LCC). On EX8200 switches, display the state of all fabric planes. This command can be used on the master Routing Engine only.
Options	none —(MX2010 and MX2020 Routers only) (Optional) Display the state of the fabric management plane. detail —(TX Matrix Plus routers, T1600 or T4000 routers in a routing matrix, and MX Series routers only) (Optional) Display detailed output for the fabric management plane. Show Switch Interface Board (SIB) states for the TXP-F13 SIB and the TXP-F2S SIB. extensive —(TX Matrix Plus routers, T1600 or T4000 routers in a routing matrix, and MX Series routers only) (Optional) Display extensive output for the fabric management plane. terse —(TX Matrix Plus routers and MX Series routers only) (Optional) Display terse output for the fabric management plane. all-members —(MX Series routers only) (Optional) Display the state of all fabric plane connections on all members of the Virtual Chassis configuration.

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 only) (Optional) Display the state of all fabric plane connections on the local Virtual Chassis member.

member *member-id*—(MX Series routers only) (Optional) Display the state of all fabric plane connections on the specified member of the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

sfc *number*—(TX Matrix Plus router only) (Optional) Show information about the TX Matrix Plus router (SFC). Replace *number* with 0.

Required Privilege Level

view

Related Documentation

- [request chassis fabric plane on page 445](#)
- [show chassis fabric plane-location on page 921](#)
- [Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

List of Sample Output

[show chassis fabric plane \(M120 Router\) on page 885](#)
[show chassis fabric plane \(MX240 Router\) on page 885](#)
[show chassis fabric plane \(MX480 Router\) on page 887](#)
[show chassis fabric plane \(MX960 Router\) on page 888](#)
[show chassis fabric plane \(MX240 with AS MLC Modular Carrier Card\) on page 888](#)
[show chassis fabric plane \(MX480 with AS MLC Modular Carrier Card\) on page 889](#)
[show chassis fabric plane \(MX480 Router with MPC4E\) on page 891](#)
[show chassis fabric plane \(MX960 with AS-MLC Modular Carrier Card\) on page 893](#)
[show chassis fabric plane \(MX2010 Router\) on page 895](#)
[show chassis fabric plane \(MX2020 Router\) on page 899](#)
[show chassis fabric plane \(MX2020 Router with MPC4E\) on page 904](#)
[show chassis fabric plane \(TX Matrix Plus Router\) on page 907](#)
[show chassis fabric plane \(TX Matrix Plus Router with 3D SIBs\) on page 907](#)
[show chassis fabric plane detail \(TX Matrix Plus Router\) on page 908](#)
[show chassis fabric plane extensive \(TX Matrix Plus Router \) on page 909](#)
[show chassis fabric plane extensive \(TX Matrix Plus Router with 3D SIBs\) on page 911](#)
[show chassis fabric plane terse \(TX Matrix Plus Router\) on page 913](#)

[show chassis fabric plane terse \(TX Matrix Plus Router with 3D SIBs\) on page 914](#)
[show chassis fabric plane lcc \(TX Matrix Plus Router\) on page 915](#)
[show chassis fabric plane lcc \(TX Matrix Plus Router with 3D SIBs\) on page 915](#)
[show chassis fabric plane sfc \(TX Matrix Plus Router\) on page 916](#)
[show chassis fabric plane sfc \(TX Matrix Plus Router with 3D SIBs\) on page 916](#)
[show chassis fabric plane \(T1600 Router\) on page 917](#)
[show chassis fabric plane extensive \(T1600 Router\) on page 917](#)
[show chassis fabric plane detail \(T1600 Router\) on page 919](#)
[show chassis fabric plane \(EX8200 Switch\) on page 920](#)

Output Fields Table 60 on page 878 lists the output fields for the **show chassis fabric plane** command. Output fields are listed in the approximate order in which they appear.

Table 60: show chassis fabric plane Output Fields

Field Name	Field Description	Level of output
Plane	(TX Matrix Plus, MX Series routers, M120 routers, and EX8200 switches only) Number of the plane.	none
Plane state	<p>(MX Series and M120 routers and EX8200 switches only) State of each plane:</p> <ul style="list-style-type: none"> • ACTIVE—SIB is operational and running. <p>NOTE: On the Enhanced MX SCB with MPCs, a maximum of 4 planes are operational and running. On all the other SCBs with MPCs, all the planes are operational and running.</p> <ul style="list-style-type: none"> • FAULTY— SIB is in alarmed state where the SIB's plane is not operational for the following reasons: <ul style="list-style-type: none"> • On-board fabric ASIC is not operational. • Fiber optic connector faults. • FPC connector faults. • SIB midplane connector faults. <p>(MX2010 and MX2020 Routers only) State of each plane:</p> <ul style="list-style-type: none"> • ACTIVE—SFB is operational and running. • OFFLINE— SFB is in offline. 	none
FEB	<p>(M120 routers only) FEB number and state of links to each FEB:</p> <ul style="list-style-type: none"> • Link error—Link between SIB and FPC is not operational. • Links ok—Link between SIB and FPC is active. • Unused—No FPC is present. 	none
FPC	(MX Series routers only) Slot number of each Dense Port Concentrator (DPC) or Flexible PIC Concentrator (FPC). An FPC occupies two DPC slots on an MX Series router. The interface corresponds to the lowest numbered DPC slot for which the FPC is installed.	none

Table 60: show chassis fabric plane Output Fields (*continued*)

Field Name	Field Description	Level of output
PFE	<p>(MX Series and M120 routers only) Slot number of each Packet Forwarding Engine and the state of the links to the DCP: Links ok, Link error, or Unused. Each DPC includes four Packet Forwarding Engines.</p> <ul style="list-style-type: none"> • Links ok: Link between SIB and FPC is active. • Link error: Link between SIB and FPC is not operational. • Unused: No FPC is present. <p>(On MX240 and MX480 routers with AS MLC modular carrier card and MPC4E only) Indicates that the link between the fabric plane and the hardware link on the modular carrier card or MPC4E is not operational.</p> <p>(MX2010 and MX2020 routers only) Slot number of each Packet Forwarding Engine and the state of the links to the DPC: Links ok, Link error, or Unused. Each DPC includes four Packet Forwarding Engines.</p> <ul style="list-style-type: none"> • Links ok: Link between SFB and FPC is active. • Link error: Link between SFB and FPC is not operational. • Unused: No FPC is present. 	none
State	<p>(TX Matrix Plus, and T1600 or T4000 routers in a routing matrix only)—State of the fabric plane:</p> <ul style="list-style-type: none"> • Online: Fabric plane is operational and running and links on the SIB are operational. • Offline: Fabric plane state is Offline because the plane does not have four or more F2S and one F13 online. • Empty: Fabric plane state is Empty if all SIBs in the plane are absent. • Spare: Fabric plane is redundant and can be operational if the operational fabric plane encounters an error. • Check: Fabric plane is in alarmed state due to the following reason and the cause of the error must be resolved: <ul style="list-style-type: none"> • One or more SIBs (belonging to the fabric plane) in the Online or Spare states has transitioned to the Check state. Check state of the SIB can be caused by link errors or destination errors. • Fault: Fabric plane is in alarmed state if one or more SIBs belonging to the plane are in the Fault state. A SIB can be in the Fault state because of the following reasons: <ul style="list-style-type: none"> • On-board fabric ASIC is not operational. • Fiber optic connector faults. • FPC connector faults. • SIB midplane connector faults. • Link errors have exceeded the threshold. 	none
Link Errors	<p>(TX Matrix Plus routers with 3D SIBs only) indicate the number of links which are marked faulty because the errors on them have crossed threshold.</p>	none

Table 60: show chassis fabric plane Output Fields (*continued*)

Field Name	Field Description	Level of output
Cable Errors	(TX Matrix Plus routers with 3D SIBs only) Indicate the number of mandatory cables that are not connected, or in up state for that plane	none
Destination Errors	(TX Matrix Plus routers with 3D SIBs only) Indicates the number of destinations that are not reachable on this plane.	none
Uptime	(TX Matrix Plus, and T1600 or T4000 routers in a routing matrix only)—Time the fabric plane has been up and running.	none

Fabric Management Plane State Output Fields for the show chassis fabric plane extensive Command on a TX Matrix Plus Router

PLANE <i>number</i>	<p>State of the fabric plane:</p> <ul style="list-style-type: none"> • Online: Fabric plane is operational and running and links on the SIB are operational. • Offline: Fabric plane state is Offline because the plane does not have 4 or more F2S and 1 F13 online. • Empty: Fabric plane state is Empty if all SIBs in the plane are absent. • Spare: Fabric plane is redundant and can be operational if the operational fabric plane encounters an error. • Check: Fabric plane is in alarmed state due to the following reasons and the cause of the error must be resolved: <ul style="list-style-type: none"> • One or more SIBs (belonging to the fabric plane) in the Online or Spare states has transitioned to the Check state. Check state of the SIB can be caused because of link errors or destination errors. • Fault: Fabric plane is in alarmed state if one or more SIBs belonging to the plane are in the Fault state. A SIB can be in the Fault state because of the following reasons: <ul style="list-style-type: none"> • On-board fabric ASIC is not operational. • Fiber optic connector faults. • FPC connector faults. • SIB midplane connector faults. • Link errors have exceeded the threshold. 	extensive
----------------------------	---	------------------

Table 60: show chassis fabric plane Output Fields (*continued*)

Field Name	Field Description	Level of output
SIB F13/F2S slot-number	<p>State of the TXP-F13 SIB or TXP-F2S SIB:</p> <ul style="list-style-type: none"> • Activating—Transitional state when the SIB is transitioning to the Online or Spare state. • Deactivating—Transitional state when the SIB is going offline. • Online—SIB is operational and running. • Offline—SIB is powered down. • Spare—SIB is redundant and will move to active state if one of the working SIBs fails to pass traffic. • Empty—No SIB is present. • Fault—SIB is in alarmed state because of the following reasons and the cause of the error must be resolved: <ul style="list-style-type: none"> • On-board fabric ASIC is not operational. • Fiber optic connector faults. • FPC connector faults. • SIB midplane connector faults. • Link errors have exceeded the threshold • Check—SIB is in alarmed state where the SIB is partially operational because of link or destination errors. Only a SIB that is Online or Spare can transition to the Check state. <p>NOTE: If a SIB is not inserted properly, the SIB cannot transition to the Online or Spare state, and therefore cannot transition to the Check state.</p>	extensive
SIB F13 slot-number Odd/Even	<p>State of the TXP-F13 SIB even and odd port connection optical links from the TX Matrix Plus router (SFC) to the router (LCC) in the routing matrix. The left four ports on the SFC are labeled Even and provide connections to one even-numbered LCC—LCC0 or LCC2. The right four ports on the SFC are labeled Odd and provide connections to one odd-numbered LCC—LCC1 or LCC3.</p>	extensive
LCC number, SIB slot-number	<p>State of the SIB on the LCC that is connected to the Even or Odd port on the TXP-F13 SIB faceplate:</p> <ul style="list-style-type: none"> • Links ok—Links between the TXP-F13 SIB on the SFC and the LCC are active. • Links error—One or more links between the TXP-F13 SIB on the SFC and the LCC, have experienced an error, but the affected links remain operational. • Unused—No SIB is present. 	extensive

Table 60: show chassis fabric plane Output Fields (*continued*)

Field Name	Field Description	Level of output
SG number Port number	State of the SG chip ports on the LCC: <ul style="list-style-type: none"> • Links ok—Link is active. • Link error—Link is operational with errors. • Link error crc saturated—CRC has exceeded the rate threshold and reached saturation without optical issues—that is, a cable has not been cut, removed, or otherwise experienced an error. • Link error crc saturated with optical errors—CRC has exceeded the rate threshold and reached saturation with optical issues—that is, a cable has been cut, removed, or otherwise experienced an error. • Unused—Port is not in use. 	extensive
SIB F2S slot-number	State of the intra-chassis links between the TXP-F2S and TXP-F13 SIBs.	extensive

Fabric Management SIB State Output Fields for the show chassis fabric plane extensive Command on a TX Matrix Plus Router

Table 60: show chassis fabric plane Output Fields (*continued*)

Field Name	Field Description	Level of output
SIB slot-number	<p>State of the SIBs on the T1600/T4000 router (LCC) in the routing matrix:</p> <ul style="list-style-type: none"> • Activating—Transitional state when the SIB is coming online. • Deactivating—Transitional state when the SIB is going offline. • Connected—SIBs on an LCC are connected and trained, but are either not online or are spare, because the plane on the the TX Matrix Plus router (SFC) is still offline. The LCC SIB transitions to the Connected state when the F13 SIB to which it connects is online but the SFC plane (to which the LCC SIB connects) is offline for some reason; for instance, when there are insufficient number of F2 SIBs in the plane. • Disconnected—If an F13 SIB on the TX Matrix Plus router (SFC) goes offline, then the SIBs on the LCCs connected to the F13 SIB get disconnected. On the TX Matrix Plus router with 3D SIBs, the LCC SIB is also disconnected if the F13 SIB is online, but none of the cables are connected or trained. The Disconnected state is valid only for SIBs on an LCC. An LCC SIB transitions to the Disconnected state when the F13 SIB to which it connects goes Offline, irrespective of the state of the SFC plane. SFC Error—If an F13 SIB on the TX Matrix Plus router (SFC) transitions to the Fault state (because of link errors, for instance), and if an LCC SIB connected to the F13 SIB comes online, the LCC SIB transitions to the SFC Error state. This state indicates that the F13 SIB to which the LCC SIB is connected has errors. <p>NOTE: The Connected, Disconnected, and SFC Error states are applicable only to the SIBs on an LCC.</p> <ul style="list-style-type: none"> • Online—SIB is operational and running. • Offline—SIB is powered down. • Spare—SIB is redundant and will move to active state if one of the working SIBs fails to pass traffic. • Empty—No SIB is present. • Fault—SIB is in alarmed state where the SIB's plane is not operational for the following reasons: <ul style="list-style-type: none"> • On-board fabric ASIC is not operational. • Fiber optic connector faults. • FPC connector faults. • SIB midplane connector faults. • Link errors have exceeded the threshold • Check—SIB is in alarmed state where the SIB is partially operational because of link or destination errors. Only a SIB that is Online or Spare can transition to the Check state. <p>NOTE: If a SIB is not inserted properly, the SIB cannot transition to the Online or Spare state, and therefore cannot transition to the Check state.</p>	extensive

Table 60: show chassis fabric plane Output Fields (*continued*)

Field Name	Field Description	Level of output
LCC SIB Link State	State of the LCC SIB link: <ul style="list-style-type: none">• Links ok—Link is active.• Links error—A link error has occurred, but the link remains operational.• Unused—SIB is not in use.	extensive
SG number Port number	State of the SG chip ports on the LCC: <ul style="list-style-type: none">• Links ok—Link is active.• Link error—Link is operational with errors.• Link error crc saturated—CRC has exceeded the rate threshold and reached saturation without optical issues—that is, a cable has not been cut, removed, or otherwise experienced an error.• Link error crc saturated with optical errors—CRC has exceeded the rate threshold and reached saturation with optical issues—that is, a cable has been cut, removed, or otherwise experienced an error.• Unused—Port is not in use.	extensive

Sample Output

show chassis fabric
plane (M120 Router)

```
user@host> show chassis fabric plane
Fabric management PLANE state
Plane 0
Plane state: ACTIVE
FEB 0: Links ok
FEB 1: Links ok
FEB 2: Links ok
FEB 3: Links ok
FEB 4: Links ok
FEB 5: Links ok
Plane 1
Plane state: ACTIVE
FEB 0: Links ok
FEB 1: Links ok
FEB 2: Links ok
FEB 3: Links ok
FEB 4: Links ok
FEB 5: Links ok
Plane 2
Plane state: ACTIVE
FEB 0: Links ok
FEB 1: Links ok
FEB 2: Links ok
FEB 3: Links ok
FEB 4: Links ok
FEB 5: Links ok
Plane 3
Plane state: ACTIVE
FEB 0: Links ok
FEB 1: Links ok
FEB 2: Links ok
FEB 3: Links ok
FEB 4: Links ok
FEB 5: Links ok
```

show chassis fabric
plane (MX240 Router)

```
user@host> show chassis fabric plane
Plane 0
Plane state: ACTIVE
  FPC 1
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
  FPC 2
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
Plane 1
Plane state: ACTIVE
  FPC 1
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
  FPC 2
    PFE 0 :Links ok
```

```

        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
Plane 2
  Plane state: ACTIVE
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 2
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 3
  Plane state: ACTIVE
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 2
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 4
  Plane state: SPARE
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 2
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 5
  Plane state: SPARE
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 2
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 6
  Plane state: SPARE
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 2
      PFE 0 :Links ok
      PFE 1 :Links ok
```

```

        PFE 2 :Links ok
        PFE 3 :Links ok
Plane 7
  Plane state: SPARE
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 2
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok

```

show chassis fabric plane (MX480 Router)

```

user@host> show chassis fabric plane
Fabric management PLANE state

```

```

Plane 0
  Plane state: ACTIVE
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 1
  Plane state: ACTIVE
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 2
  Plane state: ACTIVE
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 3
  Plane state: ACTIVE
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 4
  Plane state: SPARE
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 5
  Plane state: SPARE
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 6
  Plane state: SPARE

```

```
FPC 1
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
Plane 7
  Plane state: SPARE
  FPC 1
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
```

show chassis fabric plane (MX960 Router)

```
user@host> show chassis fabric plane
```

```
Plane 0
  Plane state: ACTIVE
  FPC 0
    PFE 0 :Links ok
  FPC 2
    PFE 0 :Links ok
    PFE 1 :Links ok
Plane 1
  Plane state: ACTIVE
  FPC 0
    PFE 0 :Links ok
  FPC 2
    PFE 0 :Links ok
    PFE 1 :Links ok
Plane 2
  Plane state: ACTIVE
  FPC 0
    PFE 0 :Links ok
  FPC 2
    PFE 0 :Links ok
    PFE 1 :Links ok
Plane 3
  Plane state: ACTIVE
  FPC 0
    PFE 0 :Links ok
  FPC 2
    PFE 0 :Links ok
    PFE 1 :Links ok
```

show chassis fabric plane (MX240 with AS

In the following output, FPC 1 is the AS MLC modular carrier card (AS MCC).

```
user@host>show chassis fabric plane
```


MLC Modular Carrier Card)

```

Fabric management PLANE state
Plane 0
  Plane state: ACTIVE
    FPC 1
      PFE 0 :Links ok
    FPC 2
      PFE 0 :Links ok
Plane 1
  Plane state: ACTIVE
  Plane state: ACTIVE
    FPC 1
      PFE 0 :Links ok
    FPC 2
      PFE 0 :Links ok
Plane 2
  Plane state: ACTIVE
    FPC 2
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 2 :Links ok
    FPC 5
      PFE 0 :Links ok
Plane 3
  Plane state: ACTIVE
  Plane state: ACTIVE
    FPC 1
      PFE 0 :Links ok
    FPC 2
      PFE 0 :Links ok
Plane 4
  Plane state: ACTIVE
  Plane state: ACTIVE
    FPC 1
      PFE 0 :Links ok
    FPC 2
      PFE 0 :Links ok
Plane 5
  Plane state: ACTIVE
    FPC 1
      PFE 0 :Unused
    FPC 2
      PFE 0 :Links ok
Plane 6
  Plane state: ACTIVE
    FPC 1
      PFE 0 :Links ok
    FPC 2
      PFE 0 :Links ok
Plane 7
  Plane state: ACTIVE
    FPC 1
      PFE 0 :Unused
    FPC 2
      PFE 0 :Links ok

```

show chassis fabric plane (MX480 with AS

In the following output, FPC 5 is the AS MLC modular carrier card (AS MCC).

```
user@host>show chassis fabric plane
```

MLC Modular Carrier Card)**Fabric management PLANE state****Plane 0**

Plane state: ACTIVE

FPC 2

PFE 0 :Links ok

FPC 4

PFE 0 :Links ok

PFE 2 :Links ok

FPC 5

PFE 0 :Links ok

Plane 1

Plane state: ACTIVE

FPC 2

PFE 0 :Links ok

FPC 4

PFE 0 :Links ok

PFE 2 :Links ok

FPC 5

PFE 0 :Links ok

Plane 2

Plane state: ACTIVE

FPC 2

PFE 0 :Links ok

FPC 4

PFE 0 :Links ok

PFE 2 :Links ok

FPC 5

PFE 0 :Links ok

Plane 3

Plane state: ACTIVE

FPC 2

PFE 0 :Links ok

FPC 4

PFE 0 :Links ok

PFE 2 :Links ok

FPC 5

PFE 0 :Links ok

Plane 4

Plane state: ACTIVE

FPC 2

PFE 0 :Links ok

FPC 4

PFE 0 :Links ok

PFE 2 :Links ok

FPC 5

PFE 0 :Links ok

Plane 5

Plane state: ACTIVE

FPC 2

PFE 0 :Links ok

FPC 4

PFE 0 :Links ok

PFE 2 :Links ok

FPC 5

PFE 0 :Unused

Plane 6

Plane state: ACTIVE

FPC 2

PFE 0 :Links ok

FPC 4

PFE 0 :Links ok

```

        PFE 2 :Links ok
    FPC 5
        PFE 0 :Links ok
Plane 7
    Plane state: ACTIVE
    FPC 2
        PFE 0 :Links ok
    FPC 4
        PFE 0 :Links ok
        PFE 2 :Links ok
    FPC 5
        PFE 0 :Unused

```

show chassis fabric plane (MX480 Router with MPC4E)

```

user@host > show chassis fabric plane
Fabric management PLANE state
Plane 0
    Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 3
        PFE 0 :Links ok
    FPC 4
        PFE 0 :Links ok
        PFE 1 :Links ok
Plane 1
    Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 3
        PFE 0 :Links ok
    FPC 4
        PFE 0 :Links ok
        PFE 1 :Links ok
Plane 2
    Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 3
        PFE 0 :Links ok
    FPC 4
        PFE 0 :Links ok
        PFE 1 :Links ok
Plane 3

```

```
Plane state: ACTIVE
  FPC 0
    PFE 0 :Links ok
    PFE 1 :Links ok
  FPC 1
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
  FPC 3
    PFE 0 :Links ok
  FPC 4
    PFE 0 :Links ok
    PFE 1 :Links ok
Plane 4
  Plane state: SPARE
    FPC 0
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 3
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 1 :Links ok
Plane 5
  Plane state: SPARE
    FPC 0
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 3
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 1 :Links ok
Plane 6
  Plane state: SPARE
    FPC 0
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 3
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 1 :Links ok
Plane 7
  Plane state: SPARE
```

```
FPC 0
  PFE 0 :Links ok
  PFE 1 :Links ok
FPC 1
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 3
  PFE 0 :Links ok
FPC 4
  PFE 0 :Links ok
  PFE 1 :Links ok
```

**show chassis fabric
plane (MX960 with**

In the following output, FPC 1 is a modular carrier card.

user@host>show chassis fabric plane

**AS-MLC Modular
Carrier Card)****Fabric management PLANE state****Plane 0**

Plane state: ACTIVE

FPC 0

PFE 0 :Links ok

PFE 1 :Links ok

FPC 1

PFE 0 :Links ok

FPC 4

PFE 0 :Links ok

PFE 1 :Links ok

PFE 2 :Links ok

PFE 3 :Links ok

FPC 5

PFE 0 :Links ok

FPC 8

PFE 0 :Links ok

PFE 1 :Links ok

PFE 2 :Links ok

PFE 3 :Links ok

Plane 1

Plane state: ACTIVE

FPC 0

PFE 0 :Links ok

PFE 1 :Links ok

FPC 1

PFE 0 :Links ok

FPC 4

PFE 0 :Links ok

PFE 1 :Links ok

PFE 2 :Links ok

PFE 3 :Links ok

FPC 5

PFE 0 :Links ok

FPC 8

PFE 0 :Links ok

PFE 1 :Links ok

PFE 2 :Links ok

PFE 3 :Links ok

Plane 2

Plane state: ACTIVE

FPC 0

PFE 0 :Links ok

PFE 1 :Links ok

FPC 1

PFE 0 :Links ok

FPC 4

PFE 0 :Links ok

PFE 1 :Links ok

PFE 2 :Links ok

PFE 3 :Links ok

FPC 5

PFE 0 :Links ok

FPC 8

PFE 0 :Links ok

PFE 1 :Links ok

PFE 2 :Links ok

PFE 3 :Links ok

Plane 3

Plane state: ACTIVE

FPC 0

```

        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 1
        PFE 0 :Links ok
    FPC 4
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 5
        PFE 0 :Links ok
    FPC 8
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
Plane 4
Plane state: SPARE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 1
        PFE 0 :Links ok
    FPC 4
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 5
        PFE 0 :Links ok
    FPC 8
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
Plane 5
Plane state: SPARE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 1
        PFE 0 :Links ok
    FPC 4
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 5
        PFE 0 :Links ok
    FPC 8
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok

```

**show chassis fabric
plane (MX2010
Router)**

```

user@host>show chassis fabric plane
Fabric management PLANE state
Plane 0
Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok

```

```
        PFE 1 :Links ok
FPC 1
        PFE 0 :Links ok
FPC 2
        PFE 0 :Links ok
        PFE 1 :Links ok
FPC 3
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
FPC 4
        PFE 0 :Links ok
FPC 5
        PFE 0 :Links ok
        PFE 1 :Links ok
FPC 6
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
FPC 7
        PFE 0 :Links ok
        PFE 1 :Links ok
FPC 8
        PFE 0 :Links ok
FPC 9
        PFE 0 :Links ok
        PFE 1 :Links ok
Plane 1
  Plane state: ACTIVE
    FPC 0
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 1
      PFE 0 :Links ok
    FPC 2
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 3
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 4
      PFE 0 :Links ok
    FPC 5
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 6
      PFE 0 :Links ok
    FPC 7
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 8
      PFE 0 :Links ok
    FPC 9
      PFE 0 :Links ok
```



```
        PFE 1 :Links ok
Plane 2
  Plane state: ACTIVE
    FPC 0
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 1
      PFE 0 :Links ok
    FPC 2
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 3
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 4
      PFE 0 :Links ok
    FPC 5
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 6
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 7
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 8
      PFE 0 :Links ok
    FPC 9
      PFE 0 :Links ok
      PFE 1 :Links ok
Plane 3
  Plane state: OFFLINE
Plane 4
  Plane state: ACTIVE
    FPC 0
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 1
      PFE 0 :Links ok
    FPC 2
      PFE 0 :Links ok
PFE 1 :Links ok
    FPC 3
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 4
      PFE 0 :Links ok
    FPC 5
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 6
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
```

```
FPC 7
  PFE 0 :Links ok
  PFE 1 :Links ok
FPC 8
  PFE 0 :Links ok
FPC 9
  PFE 0 :Links ok
  PFE 1 :Links ok
Plane 5
  Plane state: ACTIVE
    FPC 0
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 1
      PFE 0 :Links ok
    FPC 2
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 3
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 4
      PFE 0 :Links ok
    FPC 5
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 6
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 7
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 8
      PFE 0 :Links ok
    FPC 9
      PFE 0 :Links ok
  PFE 1 :Links ok
Plane 6
  Plane state: ACTIVE
    FPC 0
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 1
      PFE 0 :Links ok
    FPC 2
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 3
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 4
      PFE 0 :Links ok
    FPC 5
      PFE 0 :Links ok
      PFE 1 :Links ok
```

```

FPC 6
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 7
  PFE 0 :Links ok
  PFE 1 :Links ok
FPC 8
  PFE 0 :Links ok
FPC 9
  PFE 0 :Links ok
  PFE 1 :Links ok
Plane 7
  Plane state: ACTIVE
    FPC 0
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 1
      PFE 0 :Links ok
    FPC 2
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 3
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 4
      PFE 0 :Links ok
    FPC 5
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 6
      PFE 0 :Links ok
    PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 7
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 8
      PFE 0 :Links ok
    FPC 9
      PFE 0 :Links ok
      PFE 1 :Links ok

```

**show chassis fabric
plane (MX2020
Router)**

```

user@host>show chassis fabric plane
Fabric management PLANE state
Plane 0
  Plane state: ACTIVE
    FPC 0
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok

```

```
FPC 2
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 3
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 4
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 5
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 6
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 7
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 8
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 9
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 10
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 11
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 12
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 13
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 14
```

```

        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 15
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 16
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 17
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 18
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 19
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
Plane 1
  Plane state: ACTIVE
    FPC 0
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 2
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 3
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 5
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
```

```
FPC 6
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 7
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 8
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 9
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 10
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 11
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 12
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 13
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 14
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 15
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 16
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 17
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 18
```

```

        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 19
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
Plane 2
Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 2
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 3
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 4
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 5
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 6
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 7
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 8
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 9
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
```

```
FPC 10
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 11
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 12
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 13
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 14
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 15
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 16
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 17
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 18
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 19
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
Plane 3
...
```

**show chassis fabric
plane (MX2020 Router
with MPC4E)**

```
user@host > show chassis fabric plane
Fabric management PLANE state
Plane 0
  Plane state: ACTIVE
  FPC 0
    PFE 0 :Links ok
    PFE 1 :Links ok
  FPC 9
```



```

        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 10
        PFE 0 :Links ok
    FPC 14
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 19
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
Plane 1
  Plane state: ACTIVE
    FPC 0
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 9
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 10
      PFE 0 :Links ok
    FPC 14
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 19
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 2
  Plane state: ACTIVE
    FPC 0
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 9
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 10
      PFE 0 :Links ok
    FPC 14
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 19
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 3
  Plane state: ACTIVE
    FPC 0
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 9
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 10
      PFE 0 :Links ok
    FPC 14
      PFE 0 :Links ok
      PFE 1 :Links ok
```

```
FPC 19
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
Plane 4
  Plane state: ACTIVE
    FPC 0
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 9
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 10
      PFE 0 :Links ok
    FPC 14
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 19
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 5
  Plane state: ACTIVE
    FPC 0
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 9
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 10
      PFE 0 :Links ok
    FPC 14
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 19
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 6
  Plane state: ACTIVE
    FPC 0
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 9
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 10
      PFE 0 :Links ok
    FPC 14
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 19
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 7
  Plane state: ACTIVE
```

```

FPC 0
  PFE 0 :Links ok
  PFE 1 :Links ok
FPC 9
  PFE 0 :Links ok
  PFE 1 :Links ok
FPC 10
  PFE 0 :Links ok
FPC 14
  PFE 0 :Links ok
  PFE 1 :Links ok
FPC 19
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok

```

show chassis fabric plane (TX Matrix Plus Router)

```

user@host> show chassis fabric plane
sfc0-re0:

```

Plane	State	Link errors	Destination errors	Uptime
0	Spare	NONE	NONE	
1	Online	NONE	NONE	10 hours, 16 seconds
2	Online	NONE	NONE	10 hours, 13 seconds
3	Online	NONE	NONE	10 hours, 9 seconds
4	Online	NONE	NONE	10 hours, 7 seconds

```
lcc0-re0:
```

SIB	State	Link errors	Destination errors	Uptime
0	Spare	NONE	NONE	
1	Online	NONE	NONE	10 hours, 16 seconds
2	Online	NONE	NONE	10 hours, 13 seconds
3	Online	NONE	NONE	10 hours, 9 seconds
4	Online	NONE	NONE	10 hours, 7 seconds

```
lcc2-re0:
```

SIB	State	Link errors	Destination errors	Uptime
0	Spare	NONE	NONE	
1	Online	NONE	NONE	10 hours, 16 seconds
2	Online	NONE	NONE	10 hours, 12 seconds
3	Online	NONE	NONE	10 hours, 9 seconds
4	Online	NONE	NONE	10 hours, 7 seconds

show chassis fabric plane (TX Matrix Plus Router with 3D SIBs)

```

user@host> show chassis fabric plane
sfc0-re0:

```

Plane	State	Cable errors	Link errors	Destination errors	Uptime
0	Spare	NONE	NONE	NONE	
1	Online	NONE	NONE	NONE	5 hours, 11 minutes, 3 seconds
2	Online	NONE	NONE	NONE	8 hours, 4 minutes, 24 seconds
3	Online	NONE	NONE	NONE	8 hours, 3 minutes, 16 seconds
4	Online	NONE	NONE	NONE	8 hours, 2 minutes, 12 seconds

```
lcc2-re0:
```

SIB	State	Cable errors	Link errors	Destination errors	Uptime
0	Spare	NONE	NONE	NONE	
1	Online	NONE	NONE	NONE	5 hours, 11 minutes, 3 seconds
2	Online	NONE	NONE	NONE	8 hours, 4 minutes, 57 seconds
3	Online	NONE	NONE	NONE	8 hours, 3 minutes, 53 seconds
4	Online	NONE	NONE	NONE	8 hours, 2 minutes, 45 seconds

lcc4-re0:

SIB	State	Cable errors	Link errors	Destination errors	Uptime
0	Spare	NONE	NONE	NONE	
1	Online	NONE	NONE	NONE	5 hours, 11 minutes, 12 seconds
2	Online	NONE	NONE	NONE	8 hours, 4 minutes, 24 seconds
3	Online	NONE	NONE	NONE	8 hours, 3 minutes, 16 seconds
4	Online	NONE	NONE	NONE	8 hours, 2 minutes, 12 seconds

lcc5-re0:

SIB	State	Cable errors	Link errors	Destination errors	Uptime
0	Spare	NONE	NONE	NONE	
1	Online	NONE	NONE	NONE	5 hours, 11 minutes, 12 seconds
2	Online	NONE	NONE	NONE	8 hours, 4 minutes, 24 seconds
3	Online	NONE	NONE	NONE	8 hours, 3 minutes, 15 seconds
4	Online	NONE	NONE	NONE	8 hours, 2 minutes, 11 seconds

show chassis fabric plane detail (TX Matrix Plus Router)

user@host> show chassis fabric plane detail

sfc0-re0:

Fabric Management PLANE State:

PLANE 0: Spare

SIB F13 0 : Spare
 SIB F13 1 : Empty
 SIB F2S 0/0 : Spare
 SIB F2S 0/2 : Spare
 SIB F2S 0/4 : Spare
 SIB F2S 0/6 : Spare

PLANE 1: Online

SIB F13 3 : Online
 SIB F13 4 : Empty
 SIB F2S 1/0 : Online
 SIB F2S 1/2 : Online
 SIB F2S 1/4 : Online
 SIB F2S 1/6 : Online

PLANE 2: Online

SIB F13 6 : Online
 SIB F13 7 : Empty
 SIB F2S 2/0 : Online
 SIB F2S 2/2 : Online
 SIB F2S 2/4 : Online

```

    SIB F2S 2/6 :    Online
PLANE 3:    Online
    SIB F13 8   :    Online
    SIB F13 9   :    Online
    SIB F2S 3/0 :    Online
    SIB F2S 3/2 :    Online
    SIB F2S 3/4 :    Online
    SIB F2S 3/6 :    Online
PLANE 4:    Online
    SIB F13 11  :    Online
    SIB F13 12  :    Online
    SIB F2S 4/0 :    Online
    SIB F2S 4/2 :    Online
    SIB F2S 4/4 :    Online
    SIB F2S 4/6 :    Online

```

```
lcc0-re0:
```

```
-----
Fabric Management SIB State:
```

```

    SIB    0 :    Spare
    SIB    1 :    Online
    SIB    2 :    Online
    SIB    3 :    Online
    SIB    4 :    Online

```

```
lcc1-re0:
```

```
-----
Fabric Management SIB State:
```

```

    SIB    0 :    Spare
    SIB    1 :    Online
    SIB    2 :    Online
    SIB    3 :    Online
    SIB    4 :    Online

```

```
...
```

**show chassis fabric
plane extensive (TX
Matrix Plus Router)**

```
user@host> show chassis fabric plane extensive
```

```
sfc0-re0:
```

```
-----
Fabric Management PLANE State:
```

```
PLANE 0:    Spare
```

```

    SIB F13 0   :    Spare
    SIB F13 1   :    Empty
    SIB F2S 0/0 :    Spare
    SIB F2S 0/2 :    Spare
    SIB F2S 0/4 :    Spare
    SIB F2S 0/6 :    Spare

```

```
SIB F13 0 Even:
```

```
    LCC 0, SIB 0 : Links ok
```

```
    SG 0
```

```

        Port 0   : Links ok
        Port 1   : Links ok
        Port 2   : Links ok
        Port 3   : Links ok

```

```
    SG 1
```

```

        Port 0   : Links ok
        Port 1   : Links ok
        Port 2   : Links ok
        Port 3   : Links ok

```

```
    SG 2
```

```

        Port 0   : Links ok
        Port 1   : Links ok

```

```

        Port 2      : Links ok
        Port 3      : Links ok
    SG 3
        Port 0      : Links ok
        Port 1      : Links ok
        Port 2      : Links ok
        Port 3      : Links ok
SIB F13 0 Odd:
    LCC 1, SIB 0 : Links ok
    SG 0
        Port 0      : Links ok
        Port 1      : Links ok
        Port 2      : Links ok
        Port 3      : Links ok
    SG 1
        Port 0      : Links ok
        Port 1      : Links ok
        Port 2      : Links ok
        Port 3      : Links ok
    SG 2
        Port 0      : Links ok
        Port 1      : Links ok
        Port 2      : Links ok
        Port 3      : Links ok
    SG 3
        Port 0      : Links ok
        Port 1      : Links ok
        Port 2      : Links ok
        Port 3      : Links ok
SIB F2S 0/0: Links ok
SIB F2S 0/2: Links ok
SIB F2S 0/4: Links ok
SIB F2S 0/6: Links ok
SIB F13 1 Even:
    LCC 2, SIB 0 : Unused
    SG 0
        Port 0      : Unused
        Port 1      : Unused
        Port 2      : Unused
        Port 3      : Unused
    SG 1
        Port 0      : Unused
        Port 1      : Unused
        Port 2      : Unused
        Port 3      : Unused
    SG 2
        Port 0      : Unused
        Port 1      : Unused
        Port 2      : Unused
        Port 3      : Unused
    SG 3
        Port 0      : Unused
        Port 1      : Unused
        Port 2      : Unused
        Port 3      : Unused
SIB F13 1 Odd:
    LCC 3, SIB 0 : Unused
    SG 0
        Port 0      : Unused
        Port 1      : Unused
        Port 2      : Unused
```

```

        Port 3      : Unused
SG 1
        Port 0      : Unused
        Port 1      : Unused
        Port 2      : Unused
        Port 3      : Unused
SG 2
        Port 0      : Unused
        Port 1      : Unused
        Port 2      : Unused
        Port 3      : Unused
SG 3
        Port 0      : Unused
        Port 1      : Unused
        Port 2      : Unused
        Port 3      : Unused
SIB F2S 0/0: Unused
SIB F2S 0/2: Unused
SIB F2S 0/4: Unused
SIB F2S 0/6: Unused
PLANE 1:   Online
SIB F13 3   :   Online
SIB F13 4   :   Empty
SIB F2S 1/0 :   Online
SIB F2S 1/2 :   Online
SIB F2S 1/4 :   Online
SIB F2S 1/6 :   Online
SIB F13 3 Even:
...

```

**show chassis fabric
plane extensive (TX)**

```

user@host> show chassis fabric plane extensive
sfc0-re0:
-----

```

Matrix Plus Router with
3D SIBs)

Fabric Management PLANE State:

PLANE 0: Online

SIB F13 0 : Empty

SIB F13 1 : Online

SIB F2S 0/0 : Online

SIB F2S 0/2 : Online

SIB F2S 0/4 : Online

SIB F2S 0/6 : Online

SIB F13 0

LCC 0, SIB 0 : Unused

PFE 0 : Unused

PFE 1 : Unused

PFE 2 : Unused

PFE 3 : Unused

PFE 4 : Unused

PFE 5 : Unused

PFE 6 : Unused

PFE 7 : Unused

PFE 8 : Unused

PFE 9 : Unused

PFE 10 : Unused

PFE 11 : Unused

PFE 12 : Unused

PFE 13 : Unused

PFE 14 : Unused

PFE 15 : Unused

LCC 1, SIB 0 : Unused

PFE 0 : Unused

PFE 1 : Unused

PFE 2 : Unused

PFE 3 : Unused

PFE 4 : Unused

PFE 5 : Unused

PFE 6 : Unused

PFE 7 : Unused

PFE 8 : Unused

PFE 9 : Unused

PFE 10 : Unused

PFE 11 : Unused

PFE 12 : Unused

PFE 13 : Unused

PFE 14 : Unused

PFE 15 : Unused

LCC 2, SIB 0 : Unused

PFE 0 : Unused

PFE 1 : Unused

PFE 2 : Unused

PFE 3 : Unused

PFE 4 : Unused

PFE 5 : Unused

PFE 6 : Unused

PFE 7 : Unused

PFE 8 : Unused

PFE 9 : Unused

PFE 10 : Unused

...

lcc5-re0:

Fabric Management SIB State:

SIB 0 : Online

LCC SIB Link State : Links ok


```

PFE 0 : Links ok
PFE 1 : Links ok
PFE 2 : Links ok
PFE 3 : Links ok
PFE 4 : Links ok
PFE 5 : Links ok
PFE 6 : Links ok
PFE 7 : Links ok
PFE 8 : Links ok
PFE 9 : Links ok
PFE 10 : Links ok
PFE 11 : Links ok
PFE 12 : Links ok
PFE 13 : Links ok
PFE 14 : Links ok
PFE 15 : Links ok
FPC 1
  PFE 0 : Links ok
FPC 2
  PFE 0 : Links ok
FPC 3
  PFE 0 : Links ok
  PFE 1 : Links ok
FPC 4
  PFE 0 : Links ok
SIB 1 : Online
LCC SIB Link State : Links ok
PFE 0 : Links ok
PFE 1 : Links ok
PFE 2 : Links ok
PFE 3 : Links ok
PFE 4 : Links ok
PFE 5 : Links ok
PFE 6 : Links ok
PFE 7 : Links ok
PFE 8 : Links ok
PFE 9 : Links ok
PFE 10 : Links ok
PFE 11 : Links ok
PFE 12 : Links ok
PFE 13 : Links ok
PFE 14 : Links ok
PFE 15 : Links ok
FPC 1
  PFE 0 : Links ok
FPC 2
  PFE 0 : Links ok
FPC 3
  PFE 0 : Links ok
  PFE 1 : Links ok
FPC 4
  PFE 0 : Links ok

```

**show chassis fabric
plane terse (TX Matrix
Plus Router)**

user@host> show chassis fabric plane terse
sfc0-re0:

```

-----
Plane  State          Link errors  Destination errors  Uptime
0      Spare          NONE         NONE
1      Online         NONE         NONE         18 minutes, 37 seconds
2      Online         NONE         NONE         18 minutes, 36 seconds

```

3	Online	NONE	NONE	18 minutes, 33 seconds
4	Online	NONE	NONE	18 minutes, 31 seconds

lcc1-re0:

SIB	State	Link errors	Destination errors	Uptime
0	Spare	NONE	NONE	
1	Online	NONE	NONE	18 minutes, 37 seconds
2	Online	NONE	NONE	
3	Online	NONE	NONE	
4	Empty	NONE	NONE	

lcc2-re0:

SIB	State	Link errors	Destination errors	Uptime
0	Spare	NONE	NONE	
1	Online	NONE	NONE	18 minutes, 37 seconds
2	Online	NONE	NONE	18 minutes, 36 seconds
3	Online	NONE	NONE	18 minutes, 32 seconds
4	Online	NONE	NONE	18 minutes, 31 seconds

**show chassis fabric
plane terse (TX Matrix**

user@host> **show chassis fabric plane terse**
sfc0-re0:

Plus Router with 3D
SIBs)

Plane	State	Cable errors	Link errors	Destination errors	Uptime
0	Offline	NONE	NONE	NONE	1 day, 18 hours, 14 minutes, 26 seconds
1	Online	NONE	NONE	NONE	
2	Offline	NONE	NONE	NONE	
3	Offline	NONE	NONE	NONE	
4	Offline	NONE	NONE	NONE	

lcc2-re0:

SIB	State	Cable errors	Link errors	Destination errors	Uptime
0	Offline	NONE	NONE	NONE	1 day, 18 hours, 17 minutes
1	Online	NONE	NONE	NONE	
2	Offline	NONE	NONE	NONE	
3	Offline	NONE	NONE	NONE	
4	Offline	NONE	NONE	NONE	

lcc4-re0:

SIB	State	Cable errors	Link errors	Destination errors	Uptime
0	Offline	NONE	NONE	NONE	1 day, 18 hours, 14 minutes, 38 seconds
1	Online	NONE	NONE	NONE	
2	Offline	NONE	NONE	NONE	
3	Offline	NONE	NONE	NONE	
4	Offline	NONE	NONE	NONE	

lcc5-re0:

SIB	State	Cable errors	Link errors	Destination errors	Uptime
0	Offline	NONE	NONE	NONE	1 day, 18 hours, 14 minutes, 34 seconds
1	Online	NONE	NONE	NONE	
2	Offline	NONE	NONE	NONE	
3	Offline	NONE	NONE	NONE	
4	Offline	NONE	NONE	NONE	

show chassis fabric
plane lcc (TX Matrix
Plus Router)

user@host> show chassis fabric plane lcc 1

lcc1-re0:

SIB	State	Link errors	Destination errors	Uptime
0	Spare	NONE	NONE	25 minutes, 17 seconds
1	Online	NONE	NONE	
2	Disconnected	NONE	NONE	
3	Disconnected	NONE	NONE	
4	Empty	NONE	NONE	

show chassis fabric
plane lcc (TX Matrix

user@host> show chassis fabric plane lcc 2

lcc2-re0:

Plus Router with 3D SIBs)

SIB	State	Cable errors	Link errors	Destination errors	Uptime
0	Offline	NONE	NONE	NONE	1 day, 18 hours, 16 minutes, 44 seconds
1	Online	NONE	NONE	NONE	
2	Offline	NONE	NONE	NONE	
3	Offline	NONE	NONE	NONE	
4	Offline	NONE	NONE	NONE	

show chassis fabric plane sfc (TX Matrix Plus Router)

```
user@host> show chassis fabric plane sfc 0
sfc0-re0:
```

```
-----
```

Plane	State	Link errors	Destination errors	Uptime
0	Spare	NONE	NONE	27 minutes, 7 seconds
1	Online	NONE	NONE	
2	Online	NONE	NONE	
3	Online	NONE	NONE	
4	Online	NONE	NONE	

show chassis fabric plane sfc (TX Matrix

```
user@host> show chassis fabric plane sfc 0
sfc0-re0:
```

```
-----
```

Plus Router with 3D SIBs)

Plane	State	Cable errors	Link errors	Destination errors	Uptime
0	Offline	NONE	NONE	NONE	1 day, 18 hours, 14 minutes, 20 seconds
1	Online	NONE	NONE	NONE	
2	Offline	NONE	NONE	NONE	
3	Offline	NONE	NONE	NONE	
4	Offline	NONE	NONE	NONE	

show chassis fabric plane (T1600 Router)

```
user@host> show chassis fabric plane
Plane State Uptime
0 Online 15 hours, 42 minutes, 9 seconds
1 Online 15 hours, 42 minutes, 9 seconds
2 Fault
3 Online 15 hours, 42 minutes, 9 seconds
4 Online 15 hours, 42 minutes, 9 seconds
```

show chassis fabric plane extensive (T1600 Router)

```
user@host> show chassis fabric plane extensive
Fabric Management PLANE State:
PLANE 0: Online
  ST-SIB-L 0: Links ok
    SG 0
      Port 0 : Links ok
      Port 1 : Links ok
      Port 2 : Links ok
      Port 3 : Links ok
    SG 1
      Port 0 : Links ok
      Port 1 : Links ok
      Port 2 : Links ok
      Port 3 : Links ok
    SG 2
      Port 0 : Links ok
      Port 1 : Links ok
      Port 2 : Links ok
      Port 3 : Links ok
    SG 3
      Port 0 : Links ok
      Port 1 : Links ok
      Port 2 : Links ok
      Port 3 : Links ok
  ST-SIB-L 0
    FPC 4
      PFE 0: Links ok
      PFE 1: Links ok
    FPC 6
      PFE 0: Links ok
      PFE 1: Links ok
    FPC 7
      PFE 0: Links ok
  PLANE 1: Online
    ST-SIB-L 1: Links ok
      SG 0
        Port 0 : Links ok
        Port 1 : Links ok
        Port 2 : Links ok
        Port 3 : Links ok
      SG 1
        Port 0 : Links ok
        Port 1 : Links ok
        Port 2 : Links ok
```

```

    Port 3      : Links ok
SG 2
    Port 0      : Links ok
    Port 1      : Links ok
    Port 2      : Links ok
    Port 3      : Links ok
SG 3
    Port 0      : Links ok
    Port 1      : Links ok
    Port 2      : Links ok
    Port 3      : Links ok
ST-SIB-L 1
    FPC 4
        PFE 0: Links ok
        PFE 1: Links ok
    FPC 6
        PFE 0: Links ok
        PFE 1: Links ok
    FPC 7
        PFE 0: Links ok
PLANE 2:      Online
ST-SIB-L 2: Links ok
SG 0
    Port 0      : Links ok
    Port 1      : Links ok
    Port 2      : Links ok
    Port 3      : Links ok
SG 1
    Port 0      : Links ok
    Port 1      : Links ok
    Port 2      : Links ok
    Port 3      : Links ok
SG 2
    Port 0      : Links ok
    Port 1      : Links ok
    Port 2      : Links ok
    Port 3      : Links ok
SG 3
    Port 0      : Links ok
    Port 1      : Links ok
    Port 2      : Links ok
    Port 3      : Links ok
ST-SIB-L 2
    FPC 4
        PFE 0: Links ok
        PFE 1: Links ok
    FPC 6
        PFE 0: Links ok
        PFE 1: Links ok
    FPC 7
        PFE 0: Links ok
PLANE 3:      Spare
ST-SIB-L 3: Links ok
SG 0
    Port 0      : Links ok
    Port 1      : Links ok
    Port 2      : Links ok
    Port 3      : Links ok
SG 1
    Port 0      : Links ok
    Port 1      : Links ok
```

```

        Port 2    : Links ok
        Port 3    : Links ok
    SG 2
        Port 0    : Links ok
        Port 1    : Links ok
        Port 2    : Links ok
        Port 3    : Links ok
    SG 3
        Port 0    : Links ok
        Port 1    : Links ok
        Port 2    : Links ok
        Port 3    : Links ok
    ST-SIB-L 3
        FPC 4
            PFE 0: Links ok
            PFE 1: Links ok
        FPC 6
            PFE 0: Links ok
            PFE 1: Links ok
        FPC 7
            PFE 0: Links ok
    PLANE 4:    Online
    ST-SIB-L 4: Links ok
    SG 0
        Port 0    : Links ok
        Port 1    : Links ok
        Port 2    : Links ok
        Port 3    : Links ok
    SG 1
        Port 0    : Links ok
        Port 1    : Links ok
        Port 2    : Links ok
        Port 3    : Links ok
    SG 2
        Port 0    : Links ok
        Port 1    : Links ok
        Port 2    : Links ok
        Port 3    : Links ok
    SG 3
        Port 0    : Links ok
        Port 1    : Links ok
        Port 2    : Links ok
        Port 3    : Links ok
    ST-SIB-L 4
        FPC 4
            PFE 0: Links ok
            PFE 1: Links ok
        FPC 6
            PFE 0: Links ok
            PFE 1: Links ok
        FPC 7
            PFE 0: Links ok

```

**show chassis fabric
plane detail (T1600
Router)**

```

user@host> show chassis fabric plane detail
Fabric Management PLANE State:
PLANE 0:    Online
PLANE 1:    Online
PLANE 2:    Online
PLANE 3:    Spare
PLANE 4:    Online

```

**show chassis fabric
plane (EX8200
Switch)**

```
user@host> show chassis fabric plane
Fabric management PLANE state
Plane 0
  Plane state: ACTIVE
Plane 1
  Plane state: ACTIVE
Plane 2
  Plane state: ACTIVE
Plane 3
  Plane state: ACTIVE
Plane 4
  Plane state: SPARE
Plane 5
  Plane state: SPARE
Plane 6
  Plane state: SPARE
Plane 7
  Plane state: SPARE
Plane 8
  Plane state: ACTIVE
Plane 9
  Plane state: ACTIVE
Plane 10
  Plane state: ACTIVE
Plane 11
  Plane state: ACTIVE
```


show chassis fabric plane-location

Syntax	show chassis fabric plane-location
Syntax (MX Series Routers)	show chassis fabric plane-location <all-members> <local> <member <i>member-id</i> >
Syntax (MX2010 3D Universal Edge Routers)	show chassis fabric plane-location
Syntax (MX2020 3D Universal Edge Routers)	show chassis fabric plane-location
Syntax (TX Matrix Plus Router)	show chassis fabric plane-location
Release Information	<p>Command introduced in Junos OS Release 8.0.</p> <p>Command introduced in Junos OS Release 9.4 for EX Series switches.</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>
Description	<p>(M120, MX Series routers, and EX8200 switches only) Display the Control Board (CB) location of each plane. This command can be used on the master Routing Engine or the backup Routing Engine. For information about the meaning of “CBs” and “fabric plane” on the switches, see <i>EX Series Switches Hardware and CLI Terminology Mapping</i>.</p> <p>(TX Matrix Plus routers only) Display the SIB location of each fabric plane.</p> <p>(PTX Series Packet Transport Routers only) Display the fabric plane location of each SIB.</p> <p>(MX2010 and MX2020 Routers only) Display the fabric plane location of each Switch Fabric Board (SFB).</p>
Options	<p>all-members—(MX Series routers only) (Optional) Display the CB location of each fabric plane on the Routing Engines in all member routers in the Virtual Chassis configuration.</p> <p>local—(MX Series routers only) (Optional) Display the CB location of each fabric plane on the Routing Engines in the local Virtual Chassis member.</p> <p>member <i>member-id</i>—(MX Series routers only) (Optional) Display the CB location of each fabric plane on the Routing Engines in the specified member in the Virtual Chassis configuration. Replace <i>member-id</i> with a value of 0 or 1.</p>

Required Privilege Level view

List of Sample Output

- [show chassis fabric plane-location \(M120 Router\) on page 923](#)
- [show chassis fabric plane-location \(MX240 and MX480 Routers\) on page 923](#)
- [show chassis fabric plane-location \(MX960 Router\) on page 924](#)
- [show chassis fabric plane-location \(MX2010 Router\) on page 924](#)
- [show chassis fabric plane-location \(MX2020 Router\) on page 924](#)
- [show chassis fabric plane-location \(TX Matrix Plus Router\) on page 924](#)
- [show chassis fabric plane-location \(TX Matrix Plus Router with 3D SIBs\) on page 924](#)
- [show chassis fabric plane-location \(EX8200 Switch\) on page 925](#)
- [show chassis fabric plane-location \(PTX Series Packet Transport Routers\) on page 925](#)

Output Fields [Table 61 on page 922](#) lists the output fields for the **show chassis fabric plane-location** command. Output fields are listed in the approximate order in which they appear.

Table 61: show chassis fabric plane-location Output Fields

Field Name	Field Description
Plane <i>n</i>	Plane number. (PTX Series Packet Transport Routers only) Plane numbers associated with the SIB. (MX2010 and MX2020 Routers only) Plane numbers associated with the SFB.
Control Board <i>n</i>	Control board number.
SFC ABS-SIB-F13	(TX Matrix Plus routers only) Switch Interface Board (SIB) slot number on the F13 SIB.
SFC ABS-SIB-F2S	(TX Matrix Plus routers only) SIB slot number on the F2S SIB.
LCC ST-SIB-L	(TX Matrix Plus routers only) Line-card chassis (LCC) SIB slot number.
SFC SIB F13	(TX Matrix Plus routers with 3D SIBs only) Switch Interface Board (SIB) slot number on the F13 SIB.
SFC SIB F2S	(TX Matrix Plus routers with 3D SIBs only) SIB slot number on the F2S SIB.
LCC SIB	(TX Matrix Plus routers with 3D SIBs only) Line-card chassis (LCC) SIB slot number.
SIB	(PTX Series Packet Transport Routers only) SIB number.
Switch Fabric Board <i>n</i>	(MX2010 and MX2020 Routers only) SFB number.

Sample Output

`show chassis fabric
plane-location (M120
Router)`

```
user@host> show chassis fabric plane-location
-----Fabric Plane Locations-----
Plane 0                               Control Board 0
Plane 1                               Control Board 0
Plane 2                               Control Board 1
Plane 3                               Control Board 1
```

`show chassis fabric
plane-location`

```
user@host> show chassis fabric plane-location
-----Fabric Plane Locations-----
Plane 0                               Control Board 0
```

(MX240 and MX480 Routers)

Plane 1	Control Board 0
Plane 2	Control Board 0
Plane 3	Control Board 0
Plane 4	Control Board 1
Plane 5	Control Board 1
Plane 6	Control Board 1
Plane 7	Control Board 1

show chassis fabric plane-location (MX960 Router)

```
user@host> show chassis fabric plane-location
-----Fabric Plane Locations-----
Plane 0          Control Board 0
Plane 1          Control Board 0
Plane 2          Control Board 1
Plane 3          Control Board 1
Plane 4          Control Board 2
Plane 5          Control Board 2
```

show chassis fabric plane-location (MX2010 Router)

```
user@host> show chassis fabric plane-location
-----Fabric Plane Locations-----
Plane 0          Switch Fabric Board 0
Plane 1          Switch Fabric Board 1
Plane 2          Switch Fabric Board 2
Plane 3          Switch Fabric Board 3
Plane 4          Switch Fabric Board 4
Plane 5          Switch Fabric Board 5
Plane 6          Switch Fabric Board 6
Plane 7          Switch Fabric Board 7
```

show chassis fabric plane-location (MX2020 Router)

```
user@host> show chassis fabric plane-location
-----Fabric Plane Locations-----
Plane 0          Switch Fabric Board 0
Plane 1          Switch Fabric Board 1
Plane 2          Switch Fabric Board 2
Plane 3          Switch Fabric Board 3
Plane 4          Switch Fabric Board 4
Plane 5          Switch Fabric Board 5
Plane 6          Switch Fabric Board 6
Plane 7          Switch Fabric Board 7
```

show chassis fabric plane-location (TX Matrix Plus Router)

```
user@host> show chassis fabric plane-location
Fabric Plane Locations :
Plane      SFC ABS-SIB-F13      SFC ABS-SIB-F2      LCC ST-SIB-L
0          0, 1          0/0, 0/2, 0/4, 0/6      0
1          3, 4          1/0, 1/2, 1/4, 1/6      1
2          6, 7          2/0, 2/2, 2/4, 2/6      2
3          8, 9          3/0, 3/2, 3/4, 3/6      3
4          11, 12         4/0, 4/2, 4/4, 4/6      4
```

show chassis fabric plane-location (TX

```
user@host> show chassis fabric plane-location
sfc0-re0
-----
```

Matrix Plus Router with 3D SIBs)

-----Fabric Plane Locations-----							
Plane	SFC	SIB	F13	SFC	SIB F2	LCC	SIB
0		0, 1		0/0, 0/2, 0/4, 0/6		0	
1		3, 4		1/0, 1/2, 1/4, 1/6		1	
2		6, 7		2/0, 2/2, 2/4, 2/6		2	
3		8, 9		3/0, 3/2, 3/4, 3/6		3	
4		11, 12		4/0, 4/2, 4/4, 4/6		4	

show chassis fabric plane-location (EX8200 Switch)

```
user@host> show chassis fabric plane-location
-----Fabric Plane Locations-----
Plane 0          Control Board 0
Plane 1          Control Board 0
Plane 2          Control Board 0
Plane 3          Control Board 0
Plane 4          Control Board 1
Plane 5          Control Board 1
Plane 6          Control Board 1
Plane 7          Control Board 1
Plane 8          Control Board 2
Plane 9          Control Board 2
Plane 10         Control Board 2
Plane 11         Control Board 2
```

show chassis fabric plane-location (PTX Series Packet Transport Routers)

```
user@host> show chassis fabric plane-location
-----Fabric Plane Locations-----
SIB      Planes
0         0    1
1         2    3
2         4    5
3         6    7
4         8    9
5        10   11
6        12   13
7        14   15
8        16   17
```

show chassis fabric redundancy-mode

Syntax	show chassis fabric redundancy-mode
Release Information	Command introduced in Junos OS Release 12.2.
Description	(MX240, MX480, and MX960 routers only) Display whether redundancy mode is configured for active control boards to enable increased fabric bandwidth usage.
Options	This command has no options.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• Detection and Corrective Actions of FPCs with Degraded Fabric on MX Series Routers on page 232• Detection and Recovery of Fabric-Related Failures Caused by Traffic Black Holes on MX Series Routers on page 226• Corrective Actions for Fabric Failures on MX Series Routers on page 229• redundancy-mode on page 396• Configuring Redundancy Fabric Mode for Active Control Boards on MX Series Routers on page 235
List of Sample Output	show chassis fabric redundancy-mode on page 926
Output Fields	Table 62 on page 926 lists the output fields for the show chassis fabric redundancy-mode command. Output fields are listed in the approximate order in which they appear.

Table 62: show chassis fabric redundancy mode Output Fields

Field name	Field Description
Fabric redundancy mode	Currently configured mode of the fabric

Sample Output

```
show chassis fabric redundancy-mode      user@host> show chassis fabric redundancy-mode
Fabric redundancy mode: Redundant Fabric
```

show chassis fabric reachability

Syntax	show chassis fabric reachability <detail>
Release Information	Command introduced before Junos OS Release 11.4. Command introduced in Junos OS Release 12.1 for MX240, MX840, and MX960 routers. Command introduced in Junos OS Release 12.1X48R4 for PTX Series Packet Transport Routers.
Description	(M320, MX240, MX480, MX960, and T Series routers only) Display the current state of fabric destination reachability. Additionally, display the details of the automated actions taken by the system to stop blackholing and attempt healing, and the final resolution of the actions.
Options	none —Display the state of fabric destination reachability for M320, MX240, MX480, MX960, T640, and T1600 routers, based on periodic reachability checks. Display the system's action phase sequences to stop blackholing and attempt healing, and the final resolution. detail —(Optional) Display the details of the actions carried out by the system in the different action phases and the final resolution.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show chassis fabric unreachable-destinations on page 969
List of Sample Output	show chassis fabric reachability on page 932 show chassis fabric reachability detail on page 932 show chassis fabric reachability (PTX5000 system) on page 933
Output Fields	The table lists the output fields for the show chassis fabric reachability command. Output fields are listed in the approximate order in which they appear.

Table 63: show chassis fabric reachability Output Fields

Field Name	Field Description	Level of Output
Fabric reachability status	Display the reachability status of the fabric. <ul style="list-style-type: none"> • Enabled destinations transitioned to unreachable, Fabric down action in progress—Some enabled destinations that were originally reachable have become unreachable. The system is trying to stop the fabric down condition and attempt healing. • Enabled destinations reachable—The enabled destinations are reachable. • Unreachable destinations healed—The unreachable destinations are healed and are reachable. • Unreachable destinations removed—The unreachable destinations are removed. • Unreachable destinations present—Unreachable destinations are present in the system. • Unreachable destinations present due to FPC restart disable configuration—Unreachable destinations are present as a result of user configuration set to disable FPC restart. 	All levels
Unreachable destinations	Number of FPCs that have unreachable destinations.	All levels
Detected on	Date and time when unreachable destinations are detected.	All levels
Reason	Reason for the destination turning unreachable. <ul style="list-style-type: none"> • Single FPC error—A single bad FPC is not reachable over the fabric. • Fabric plane error—Multiple FPCs are not able to forward traffic over the fabric planes. 	All levels
Fabric reachability action	Action taken to handle the unreachable destination. <ul style="list-style-type: none"> • Plane Action—The healing is attempted only for the fabric planes. • SIB Action—(PTX Series router only) The healing is attempted only for the SIBs. • Plane and FPC Action—The healing is attempted both for the fabric planes and the FPCs. • SIB and FPC Action—(PTX Series router only) The healing is attempted both for the SIBs and the FPCs. • FPC Action—The healing is attempted only for the bad FPCs. 	All levels
Acting on	Current action is being performed on: <ul style="list-style-type: none"> • Single FPC error—The current operation is for healing the single bad FPC. • Fabric Plane error—The current operation is for healing the fabric planes. 	All levels

Table 63: show chassis fabric reachability Output Fields (*continued*)

Field Name	Field Description	Level of Output
Initial phase	Starting phase for the healing action. <ul style="list-style-type: none"> • Plane restart—The fabric planes are restarted. • SIB restart—(PTX Series router only) The SIBs are restarted. • Plane and FPC restart—Both the fabric planes and affected FPCs are restarted. • SIB and FPC restart—(PTX Series router only) SIBs and affected FPCs are restarted. 	All levels
Current phase	Current phase for the healing action. <ul style="list-style-type: none"> • Plane restart—The fabric planes are restarted. • SIB restart—(PTX Series router only) The SIBs are restarted. • Plane and FPC restart—Both the fabric planes and affected FPCs are restarted. • SIB and FPC restart—(PTX Series router only) Both the SIBs and affected FPCs are restarted. • FPC offline—The FPCs are turned offline because the previously mentioned healing processes have failed. 	All levels
Action started	Date and time when the system fabric down healing attempt is started.	All levels
Plane restart phase	The status of the plane restart phase. <ul style="list-style-type: none"> • Completed—The plane restart phase is completed. • In progress—The plane restart phase is in progress. 	detail
Phase started	Date and time when the plane restart phase is started.	detail
Planes restarted	List of plane numbers restarted by the system.	detail
Planes timed out	List of plane numbers that have timed out waiting to be restarted by the system.	detail
Planes being offlined / onlined	Planes that are turned offline or turned online by the system, with date and time.	detail
Phase completed	Date and time when the plane restart phase is completed.	detail
Plane and FPC Restart Phase	Status of the plane and FPC restart phase. <ul style="list-style-type: none"> • Completed—The plane and FPC restart phase is completed. • In progress—The plane and FPC restart phase is in progress. 	detail
Phase started	Date and time when the plane and FPC restart phase is started.	detail
FPC Offline Started	Date and time when the FPC offline action is started.	detail
Offlined FPCs	List of FPCs that are turned offline by the system.	detail

Table 63: show chassis fabric reachability Output Fields (*continued*)

Field Name	Field Description	Level of Output
FPCs timed out	List of FPCs that have timed out waiting to be turned offline by the system.	detail
FPC being offlined	FPC that is being turned offline by the system, with date and time.	detail
FPC Offline completed	Date and time when the FPC offline action is completed.	detail
Plane restarting started	Date and time when the plane restart action is started.	detail
Planes restarted	List of planes restarted by the system.	detail
Planes being offlined / onlined	Planes that are currently being turned offline or turned online by the system, with date and time.	detail
Plane restarting completed	Date and time when the plane restarting action is completed.	detail
FPC online started	Date and time when FPC online action is started.	detail
Onlined FPCs	List of FPCs that are turned online by the system.	detail
FPCs timed out	FPCs that have timed out waiting to be turned online by the system.	detail
FPC being onlined	FPC that is being turned online by the system, with date and time.	detail
FPC Online completed	Date and time when the action of turning the FPCs online is completed.	detail
Phase Completed	Date and time when the plane and FPC restart phase is completed.	detail
Phase started	Date and time when the plane and FPC restart phase is started.	detail
FPC restart time	Date and time when the FPC restart action is started.	detail
FPC restarted	FPC that is restarted by the system, with date and time.	detail
Phase Completed	Date and time when the plane and FPC restart phase is completed.	detail
FPC Offline Phase	Status of the FPC offline phase. <ul style="list-style-type: none"> • Completed— The FPC offline phase is completed. • In progress—The FPC offline phase is currently in progress. 	detail
Phase started	Date and time when the FPC offline phase is started.	detail
FPC Offline started	Date and time when the FPC offline action is started.	detail
Offlined FPCs	List of FPCs turned offline by the system.	detail
FPCs timed out	List of FPCs that have timed out waiting to be turned offline by the system.	detail

Table 63: show chassis fabric reachability Output Fields (*continued*)

Field Name	Field Description	Level of Output
FPC being offlined	FPC that is being turned offline by the system, with date and time.	detail
FPC Offline completed	Date and time when the FPC offline action is completed.	detail
Phase Completed	Date and time when the FPC offline phase is completed.	detail
Action Completed	Date and time when the system fabric down healing attempt is completed.	All levels
Fabric reachability resolution	<p>Status after the healing actions are performed.</p> <ul style="list-style-type: none"> • Unreachable destinations healed after <i>phase name</i>—The unreachable destinations are healed after the healing actions are performed. The phase name indicates the last healing phase. • Unreachable destinations removed by FPCs <i>FPC number</i> offline—The unreachable destinations are removed by turning the FPCs offline. • Unreachable destinations present on FPC/PFE <i>FPC/PFE number</i>—The unreachable destinations are present on the FPCs or Packet Forwarding Engines and need to be acted upon. 	All levels

Sample Output

show chassis fabric reachability

```

user@host> show chassis fabric reachability
Fabric reachability status: Unreachable destinations removed

Fabric reachability detection:
  Unreachable destinations      : Present on 3 FPCs
  Detected on                  : 2010-11-22 15:19:45 PST
  Reason                       : Fabric plane error

Fabric reachability action:
  Fabric reachability action    : FPC action
  Acting on                    : Fabric plane error
  Initial phase                 : Plane restart
  Current phase                 : FPC offline is completed
  Action started                : 2010-11-22 15:08:05 PST
  Action completed              : 2010-11-22 15:19:45 PST

Fabric reachability resolution: Unreachable destinations removed by FPCs 2, 3, 5

offline

```

show chassis fabric reachability detail

```

user@host> show chassis fabric reachability detail
Fabric reachability status: Unreachable destinations removed
Fabric reachability detection:
  Unreachable destinations      : Present on 3 FPCs
  Detected on                  : 2010-11-15 15:50:32 PST
  Reason                       : Fabric plane error

Fabric reachability action:
  Fabric reachability action    : FPC action
  Acting on                    : Fabric plane error
  Initial phase                 : Plane restart
  Current phase                 : FPC offline is completed
  Action started                : 2010-11-15 15:41:47 PST
    Plane restart phase        : Completed
      Phase started            : 2010-11-15 15:41:47 PST
        Planes restarted       : 0, 1, 2, 3, 4, 0
      Phase completed          : 2010-11-15 15:42:14 PST
    Plane and FPC Restart Phase : Completed
      Phase started            : 2010-11-15 15:45:52 PST
        FPC Offline Started    : 2010-11-15 15:45:52 PST
          Offlined FPCs       : 2, 3, 5, 7
        FPC Offline completed  : 2010-11-15 15:45:52 PST
          Plane restarting started : 2010-11-15 15:45:52 PST
            Planes restarted   : 0, 1, 2, 3, 4, 0
          Plane restarting completed : 2010-11-15 15:46:11 PST
            FPC online started  : 2010-11-15 15:46:11 PST
              Onlined FPCs    : 2, 3, 5, 7
            FPC online completed : 2010-11-15 15:46:50 PST
              Phase completed   : 2010-11-15 15:46:50 PST
        FPC offline phase      : Completed
          Phase started         : 2010-11-15 15:50:32 PST
            FPC offline started : 2010-11-15 15:50:32 PST
              Offlined FPCs    : 2, 3, 5
            FPC offline completed : 2010-11-15 15:50:32 PST
              Phase completed   : 2010-11-15 15:50:32 PST
          Action completed      : 2010-11-15 15:50:32 PST

```

Fabric reachability resolution: Unreachable destinations removed by FPCs 2, 3, 5
offline

**show chassis fabric
reachability (PTX5000
system)**

user@host> **show chassis fabric reachability**

Fabric reachability status: Enabled destinations transitioned to unreachable,
Fabric down action in progress

Fabric reachability detection:

Unreachable destinations	: Present on 5 FPCs
Detected on	: 2012-11-14 15:53:00 PST
Reason	: Fabric plane error

Fabric reachability action:

Fabric reachability action	: SIB action
Acting on	: Fabric plane error
Initial phase	: SIB restart
Current phase	: SIB restart is in progress
Action started	: 2012-11-14 15:53:00 PST

show chassis fabric sibs

Syntax	<code>show chassis fabric sibs</code> <code><fcc number | scc></code>
Release Information	Command introduced before Junos OS Release 7.4.
Description	<p>(TX Matrix routers only) Display the state of the electrical and optical switch fabric link between the SIBs in the TX Matrix router (TX-SIBs) and the SIBs in the T640 routers (T640 LCC SIBs).</p> <p>(M320, T640, T1600, and T4000 routers) Display the state of the electrical switch fabric link between the SIBs and the FPCs.</p>
Options	<p>none—(TX Matrix routers only) Display the state of the electrical and optical switch fabric link between the SIBs in the TX Matrix router (TX-SIBs) and the SIBs in the T640 routers (T640 LCC SIBs).</p> <p>(M320, T640, T1600, and T4000 routers) Display the state of the electrical switch fabric link between the SIBs and the FPCs.</p> <p>fcc number—(Optional) Display the switching fabric link state for the T640 SIBs on a specified T640 router (line-card chassis) connected to a TX Matrix router.</p> <p>scc—(Optional) Display the switching fabric link state for the TX-SIBs on the TX Matrix router (switch-card chassis).</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• request chassis sib on page 477• show chassis sibs on page 1229• <i>Monitoring the SIBs</i>• <i>Redundant SIBs Overview</i>
List of Sample Output	<p>show chassis fabric sibs (M320 Router) on page 936</p> <p>show chassis fabric sibs (T640 Router) on page 936</p> <p>show chassis fabric sibs (T1600 Router) on page 937</p> <p>show chassis fabric sibs (T4000 Core Router) on page 939</p> <p>show chassis fabric sibs (TX Matrix Router) on page 940</p> <p>show chassis fabric sibs fcc (TX Matrix Router) on page 942</p> <p>show chassis fabric sibs scc (TX Matrix Router) on page 943</p>
Output Fields	<p>Table 64 on page 935 lists the output fields for the show chassis fabric sibs command. Output fields are listed in the approximate order in which they appear.</p>

Table 64: show chassis fabric sibs Output Fields

Field Name	Field Description
Fabric management SIB state	<p>Switching fabric link (link from FPC to SIB) state for each SIB:</p> <ul style="list-style-type: none"> • Unused—SIB is not present. • Links ok—Link between the SIB and the FPC is active. • Link error—Link between the SIB and the FPC is not operational.
Plane state	<p>Possible plane state of the M320 SIB, TX-SIB or T640 SIB:</p> <ul style="list-style-type: none"> • S_ACTIVE—Links on the SIB are operational, and the fabric plane (SIB) is operational and running. • S_SPARE—Links on the SIB are operational and the fabric plane (SIB) is redundant and can be operational if any of the fabric planes in the S_ACTIVE state encounters an error. <p>NOTE: If the plane is unusable by any of the Packet Forwarding Engines, the command output displays an additional string, plane has link errors on # pfes, where, # indicates the total number of links (both from SIB to FPC, and from FPC to SIB) having link errors (detected either during initialization time or runtime) in this particular plane. This does not count links having destination errors.</p> <ul style="list-style-type: none"> • S_EMPTY—No links are present on the SIB, and the fabric plane (SIB) is powered down. • S_ACTIVATING—Links on the SIB are coming online; this is a transitional state. • S_DEACTIVATING—Links on the SIB are going offline; this is a transitional state. • S_FAULTING—Links on the SIB are being marked faulty, and the fabric plane (SIB) is not operational. • S_FAULT—Links on the SIB are in an alarmed state, and the fabric plane (SIB) is not operational for the following reasons: <ul style="list-style-type: none"> • On-board F-chip is not operational. • Fiber optic connector faults. • FPC connector faults.

Sample Output

show chassis fabric sibs (M320 Router)

```
user@host> show chassis fabric sibs
Fabric management SIB state:
SIB #0
  plane state: S_ACTIVE
  FPC #0
    PFE #1 : Links ok
  FPC #1
    PFE #1 : Links ok
  FPC #2
    PFE #1 : Links ok
  FPC #3
    PFE #1 : Links ok
SIB #1
  plane state: S_ACTIVE
  FPC #0
    PFE #1 : Links ok
  FPC #1
    PFE #1 : Links ok
  FPC #2
    PFE #1 : Links ok
  FPC #3
    PFE #1 : Links ok
SIB #2
  plane state: S_ACTIVE
  FPC #0
    PFE #1 : Links ok
  FPC #1
    PFE #1 : Links ok
  FPC #2
    PFE #1 : Links ok
  FPC #3
    PFE #1 : Links ok
SIB #3
  plane state: S_ACTIVE
  FPC #0
    PFE #1 : Links ok
  FPC #1
    PFE #1 : Links ok
  FPC #2
    PFE #1 : Links ok
  FPC #3
    PFE #1 : Links ok
```

show chassis fabric sibs (T640 Router)

```
user@host> show chassis fabric sibs
Fabric management SIB state:
SIB #0
  plane state: S_SPARE
  FPC #0
    PFE #1 : Links ok
  FPC #2
    PFE #1 : Links ok
  FPC #3
    PFE #0 : Links ok
    PFE #1 : Links ok
SIB #1
  plane state: S_ACTIVE
  FPC #0
```



```

        PFE #1 : Links ok
FPC #2
        PFE #1 : Links ok
FPC #3
        PFE #0 : Links ok
        PFE #1 : Links ok
SIB #2
plane state: S_ACTIVE
FPC #0
        PFE #1 : Links ok
FPC #2
        PFE #1 : Links ok
FPC #3
        PFE #0 : Links ok
        PFE #1 : Links ok
SIB #3
plane state: S_ACTIVE
FPC #0
        PFE #1 : Links ok
FPC #2
        PFE #1 : Links ok
FPC #3
        PFE #0 : Links ok
        PFE #1 : Links ok
SIB #4
plane state: S_ACTIVE
FPC #0
        PFE #1 : Links ok
FPC #2
        PFE #1 : Links ok
FPC #3
        PFE #0 : Links ok
        PFE #1 : Links ok

```

show chassis fabric sibs (T1600 Router)

```

user@host> show chassis fabric sibs
SIB #0
plane state: S_SPARE
FPC #0
        PFE #0 : Links ok
        PFE #1 : Links ok
FPC #1
        PFE #0 : Links ok
        PFE #1 : Links ok
FPC #2
        PFE #0 : Links ok
FPC #4
        PFE #0 : Links ok
        PFE #1 : Links ok
FPC #5
        PFE #0 : Links ok
FPC #6
        PFE #0 : Links ok
        PFE #1 : Links ok
FPC #7
        PFE #0 : Links ok
        PFE #1 : Links ok
SIB #1
plane state: S_ACTIVE , plane has link errors on 2 pfes
FPC #0
        PFE #0 : Links ok
        PFE #1 : Links ok

```

```
FPC #1
  PFE #0 : Links ok
  PFE #1 : Links ok
FPC #3
  PFE #0 : Links ok
  PFE #1 : Links ok
FPC #4
  PFE #0 : Links ok
  PFE #1 : Links ok
FPC #5
  PFE #0 : Links ok
  PFE #1 : Links ok
FPC #7
  PFE #0 : Links ok
  PFE #1 : Links okSIB #2
plane state: S_ACTIVE
SIB #2
  plane state: S_ACTIVE
FPC #0
  PFE #0 : Links ok
  PFE #1 : Links ok
FPC #1
  PFE #0 : Links ok
  PFE #1 : Links ok
FPC #2
  PFE #0 : Links ok
FPC #4
  PFE #0 : Links ok
  PFE #1 : Links ok
FPC #5
  PFE #0 : Links ok
FPC #6
  PFE #0 : Links ok
  PFE #1 : Links ok
FPC #7
  PFE #0 : Links ok
  PFE #1 : Links ok
SIB #3
  plane state: S_ACTIVE
  FPC #0
    PFE #0 : Links ok
    PFE #1 : Links ok
  FPC #1
    PFE #0 : Links ok
    PFE #1 : Links ok
  FPC #2
    PFE #0 : Links ok
  FPC #4
    PFE #0 : Links ok
    PFE #1 : Links ok
  FPC #5
    PFE #0 : Links ok
  FPC #6
    PFE #0 : Links ok
    PFE #1 : Links ok
  FPC #7
    PFE #0 : Links ok
    PFE #1 : Links ok
SIB #4
  plane state: S_ACTIVE
  FPC #0
```

```

        PFE #0 : Links ok
        PFE #1 : Links ok
FPC #1
        PFE #0 : Links ok
        PFE #1 : Links ok
FPC #2
        PFE #0 : Links ok
FPC #4
        PFE #0 : Links ok
        PFE #1 : Links ok
FPC #5
        PFE #0 : Links ok
FPC #6
        PFE #0 : Links ok
        PFE #1 : Links ok
FPC #7
        PFE #0 : Links ok
        PFE #1 : Links ok

```

show chassis fabric sibs (T4000 Core Router)

```

user@host> show chassis fabric sibs
Fabric management SIB state:
SIB #0
  plane state: S_SPARE
  FPC #2
    PFE #0 : Links ok
  FPC #3
    PFE #0 : Links ok
  FPC #5
    PFE #0 : Links ok
    PFE #1 : Links ok
  FPC #6
    PFE #0 : Links ok
    PFE #1 : Links ok
SIB #1
  plane state: S_ACTIVE
  FPC #2
    PFE #0 : Links ok
  FPC #3
    PFE #0 : Links ok
  FPC #5
    PFE #0 : Links ok
    PFE #1 : Links ok
  FPC #6
    PFE #0 : Links ok
    PFE #1 : Links ok
SIB #2
  plane state: S_ACTIVE
  FPC #2
    PFE #0 : Links ok
  FPC #3
    PFE #0 : Links ok
  FPC #5
    PFE #0 : Links ok
    PFE #1 : Links ok
  FPC #6
    PFE #0 : Links ok
    PFE #1 : Links ok
SIB #3
  plane state: S_ACTIVE
  FPC #2
    PFE #0 : Links ok

```

```
FPC #3
  PFE #0 : Links ok
FPC #5
  PFE #0 : Links ok
  PFE #1 : Links ok
FPC #6
  PFE #0 : Links ok
  PFE #1 : Links ok
SIB #4
  plane state: S_ACTIVE
FPC #2
  PFE #0 : Links ok
FPC #3
  PFE #0 : Links ok
FPC #5
  PFE #0 : Links ok
  PFE #1 : Links ok
FPC #6
  PFE #0 : Links ok
  PFE #1 : Links ok
```

show chassis fabric sibs (TX Matrix Router)

```
user@host> show chassis fabric sibs
scc-re0:
```

```
-----
Fabric management SIB state:
SIB #1
  plane state: S_ACTIVE , plane has link errors on 2 pfes
FPC #0
  PFE #0 : Links ok
  PFE #1 : Links ok
FPC #1
  PFE #0 : Links ok
  PFE #1 : Links ok
FPC #3
  PFE #0 : Links ok
  PFE #1 : Links ok
FPC #4
  PFE #0 : Links ok
  PFE #1 : Links ok
FPC #5
  PFE #0 : Links ok
  PFE #1 : Links ok
FPC #7
  PFE #0 : Links ok
  PFE #1 : Links ok
SIB #2
  plane state: S_ACTIVE
  LCC #0 : Links ok
  LCC #1 : Links ok
SIB #3
  plane state: S_ACTIVE
  LCC #0 : Links ok
  LCC #1 : Links ok
SIB #4
  plane state: S_ACTIVE
  LCC #0 : Links ok
  LCC #1 : Links ok
```

```
lcc0-re0:
```

```
-----
Fabric management SIB state:
```

```
SIB #1
plane state: S_ACTIVE
FPC #0
    PFE #0 : Links ok
    PFE #1 : Links ok
FPC #1
    PFE #1 : Links ok
FPC #2
    PFE #0 : Links ok
    PFE #1 : Links ok
FPC #3
    PFE #1 : Links ok
FPC #4
    PFE #1 : Links ok
FPC #5
    PFE #0 : Links ok
FPC #6
    PFE #1 : Links ok
FPC #7
    PFE #1 : Links ok
SCC      : Links ok
SIB #2
plane state: S_ACTIVE
FPC #0
    PFE #0 : Links ok
    PFE #1 : Links ok
FPC #1
    PFE #1 : Links ok
FPC #2
    PFE #0 : Links ok
    PFE #1 : Links ok
FPC #3
    PFE #1 : Links ok
FPC #4
    PFE #1 : Links ok
FPC #5
    PFE #0 : Links ok
FPC #6
    PFE #1 : Links ok
FPC #7
    PFE #1 : Links ok
SCC      : Links ok
SIB #3
plane state: S_ACTIVE
FPC #0
    PFE #0 : Links ok
    PFE #1 : Links ok
FPC #1
    PFE #1 : Links ok
FPC #2
    PFE #0 : Links ok
    PFE #1 : Links ok
FPC #3
    PFE #1 : Links ok
FPC #4
    PFE #1 : Links ok
FPC #5
    PFE #0 : Links ok
FPC #6
    PFE #1 : Links ok
FPC #7
```

```
        PFE #1 : Links ok
    SCC      : Links ok
SIB #4
plane state: S_ACTIVE
FPC #0
    PFE #0 : Links ok
    PFE #1 : Links ok
FPC #1
    PFE #1 : Links ok
FPC #2
    PFE #0 : Links ok
    PFE #1 : Links ok
FPC #3
    PFE #1 : Links ok
FPC #4
    PFE #1 : Links ok
FPC #5
    PFE #0 : Links ok
FPC #6
    PFE #1 : Links ok
FPC #7
    PFE #1 : Links ok
    SCC      : Links o
```

show chassis fabric sibs lcc (TX Matrix Router)

```
user@host> show chassis fabric sibs lcc 0
lcc1-re0:
```

Fabric management SIB state:

```
SIB #1
plane state: S_ACTIVE
FPC #0
    PFE #0 : Links ok
FPC #2
    PFE #1 : Links ok
FPC #4
    PFE #0 : Links ok
FPC #5
    PFE #1 : Links ok
FPC #7
    PFE #0 : Links ok
    SCC      : Links ok
SIB #2
plane state: S_ACTIVE
FPC #0
    PFE #0 : Links ok
FPC #2
    PFE #1 : Links ok
FPC #4
    PFE #0 : Links ok
FPC #5
    PFE #1 : Links ok
FPC #7
    PFE #0 : Links ok
    SCC      : Links ok
SIB #3
plane state: S_ACTIVE
FPC #0
    PFE #0 : Links ok
FPC #2
    PFE #1 : Links ok
FPC #4
```

```

        PFE #0 : Links ok
FPC #5
        PFE #1 : Links ok
FPC #7
        PFE #0 : Links ok
SCC      : Links ok
SIB #4
plane state: S_ACTIVE
FPC #0
        PFE #0 : Links ok
FPC #2
        PFE #1 : Links ok
FPC #4
        PFE #0 : Links ok
FPC #5
        PFE #1 : Links ok
FPC #7
        PFE #0 : Links ok
SCC      : Links ok

```

show chassis fabric sibs scc (TX Matrix Router)

```

user@host> show chassis fabric sibs scc
scc-re0:

```

```

-----
Fabric management SIB state:
SIB #1
plane state: S_ACTIVE
LCC #0      : Links ok
LCC #1      : Links ok
SIB #2
plane state: S_ACTIVE
LCC #0      : Links ok
LCC #1      : Links ok
SIB #3
plane state: S_ACTIVE
LCC #0      : Links ok
LCC #1      : Links ok
SIB #4
plane state: S_ACTIVE
LCC #0      : Links ok
LCC #1      : Links ok

```

show chassis fabric topology

Syntax	show chassis fabric topology <fcc <i>number</i> | scc> <sib-slot>
Syntax (TX Matrix Router)	show chassis fabric topology <fcc <i>number</i> | scc> <sib-slot>
Syntax (TX Matrix Plus Router)	show chassis fabric topology <fcc <i>number</i> | sfc <i>number</i> > <sib-slot>
Syntax (T4000 Core Router)	show chassis fabric topology <sib-slot>
Syntax (PTX Series Packet Transport Routers)	show chassis fabric topology
Release Information	Command introduced before Junos OS Release 7.4. sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6. Command introduced in Junos OS Release 12.1 for PTX Series Packet Transport Routers.
Description	<p>(TX Matrix routers only) Display the state of the switching fabric topology for the Switch Interface Board (SIB) connection between the TX Matrix router and the T640 routers.</p> <p>(TX Matrix Plus routers only) Display the state of the switching fabric topology for the SIB connection between the TX Matrix Plus router and the connected routers.</p> <p>(T320, T640, T1600, and T4000 routers only) Display the state of the switching fabric topology for the connection between the Switch Interface Board (SIB) and the FPCs.</p> <p>(PTX Series Packet Transport Routers only) Display the input-output link topology.</p>
Options	<p>none—(TX Matrix routers only) Display the state of the switching fabric topology for the Switch Interface Board (SIB) connection between the TX Matrix router and the T640 routers.</p> <p>(TX Matrix Plus routers only) Display the state of the switching fabric topology for the SIB connection between the TX Matrix Plus router and the connected routers.</p> <p>(T320, T640, T1600, and T4000 routers only) Display the state of the switching fabric topology for the connection between the Switch Interface Board (SIB) and the FPCs.</p> <p>fcc <i>number</i>—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display the fabric topology state for a specified T640 router (line-card chassis) that is connected to a TX Matrix router. On a TX Matrix Plus router, display the fabric topology state for a specified router (line-card chassis) 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.

scc—(TX Matrix routers only) (Optional) Display the fabric topology state for the TX Matrix router (or switch-card chassis).

sfc number—(TX Matrix Plus routers only) (Optional) Display the fabric topology for the switch-fabric chassis. Replace *number* with 0.

sib-slot—(Optional) Display the fabric topology state for a specified SIB slot. Replace *sib-slot* with a value from 0 through 4. On a TX Matrix Plus router, replace *sib-slot* with a value from 0 through 15.

Required Privilege Level view

Related Documentation • [Layer 2 Wholesale Network Topology Overview](#)

List of Sample Output [show chassis fabric topology scc \(TX Matrix Router\) on page 949](#)
[show chassis fabric topology lcc on page 951](#)
[show chassis fabric topology \(TX Matrix Plus Router\) on page 952](#)
[show chassis fabric topology sfc \(TX Matrix Plus Router\) on page 953](#)
[show chassis fabric topology lcc \(TX Matrix Plus Router\) on page 954](#)
[show chassis fabric topology \(T4000 Core Router\) on page 955](#)
[show chassis fabric topology lcc \(TX Matrix Plus Router with 3D SIBs\) on page 956](#)
[show chassis fabric topology sfc \(TX Matrix Plus Router with 3D SIBs\) on page 958](#)
[show chassis fabric topology \(PTX Series Packet Transport Routers\) on page 963](#)

Output Fields [Table 65 on page 945](#) lists the output fields for the **show chassis fabric topology** command. Output fields are listed in the approximate order in which they appear.

Table 65: show chassis fabric topology Output Fields

Field Name	Field Description
in-links	Fabric topology for receive side links.
out-links	Fabric topology for transmit side links.

Table 65: show chassis fabric topology Output Fields (*continued*)

Field Name	Field Description
state	<p>State of the fabric link:</p> <ul style="list-style-type: none"> • RESET—Link between the SIB and the FPC/DPC is powered down on purpose. This is done in all non-dual Packet Forwarding Engine–based boards. • UP—Link between the SIB and the FPC/DCP is up and running. • DOWN—Link between the SIB and the FPC/DCP is powered down. • FAULT—The SIB is in the alarmed state, in which the SIB's plane is not operational for one or more of the following reasons: <ul style="list-style-type: none"> • On-board F-chip is not operational. • Fiber-optic connector faults. • FPC connector faults. • SIB midplane connector faults. <p>NOTE: The following state descriptions are applicable only to PTX Series Packet Transport Routers.</p> <ul style="list-style-type: none"> • OK—The link between the SIB and the FPC is operational. • Down—The link between the SIB and the FPC is powered down. • Error—The CCL link between the SIB and FPC is not operational for one or more of the following reasons: <ul style="list-style-type: none"> • FPC midplane connector failure. • SIB midplane connector failure. • CCL link CRC error.

Table 65: show chassis fabric topology Output Fields (*continued*)

Out-Links: and In-Links (TX Matrix Plus router only)	<p>State of the links from the F13 SIB to the LCC or vice-versa. Out-Links indicate Tx links. In-Links indicate an Rx link. The following additional fields are displayed for each SIB:</p> <ul style="list-style-type: none"> • VCSEL Status—Optical (VCSEL channel) link status for the corresponding electrical (HSL2) link. The states include: <ul style="list-style-type: none"> • OK—Optical signal power is good. • Error—Internal error. • LOS—Loss of Signal detected. • High Cur—The Tx Bias-current is higher than threshold on this channel. This is applicable only to Tx Channels. • Low Cur—The Tx Bias-current is lower than threshold on this channel. This is applicable only to Tx Channels. • HSL2 Channel—HSL2 is the electrical link used to connect ASICs to the in-link and out-link. The channel number corresponds to the link and varies based on the ASIC or configuration.
--	---

- **HSL2 Status** —The status of the HSL2 Channel. Includes the following states:
 - **Up**—Channel is up.
 - **Down**—Channel is down.
 - **Reset**—Channel has been reset.
 - **Fault**—Channel has faults.

The following is a sample output with description of the fields displayed in the output for Out-Links:

Out-Links:

=====

SF_30_13_FB_A(21,09) -> FPC7_B_SG(3,3,6)_FB_A(18,09) OK 203 Up

- **SF_30_13**—Name of the ASIC, with Fabric F1 or F3 mode. In this case, 3 is the F3 direction and is used in the Tx path and 0 identifies the serial link on the SF chip (in this case, link goes to sf-3 chip number 0). You can also have F1 mode and Rx path instead.
- **FB_A (21, 09)**—Fiber bundle A, with VCSEL unit number 21 within the SIB, and channel number 9 within the unit number.
- **FPC7_B_SG(3,3,6)**—FPC 7, with bottom Packet Forwarding Engine (T for top PFE and B for bottom PFE), SG ASIC, with number 3 and port number 3, with HSL2 link number with the SIB as 6.
- **FB_A(18, 09)**—Fiber Bundle, with VCSEL unit number 18 within the SIB, and VCSEL channel number 9 within the unit number.

The following is a sample output with description of the fields displayed in the output for In-Links:

In-Links:

=====

FPC0_T_SG(0,0,0)_FB_D(04,11) -> SF_10_00_FB_D(01,11) OK 0 Up

- **FPC0**—FPC 0.
- **T**—Top Packet Forwarding Engine.
- **SG (0, 0, 0)**—SG ASIC with port number 0 and link 0.
- **FB_D (04,11)**—Fiber Bundle D with VCSEL 4, channel 11.
- **SF_10**—Indicates F1 mode chip number 0 and Rx path.
- **SF_10_00_FB_D(01,11)**—Indicates F1 mode chip number 0 and Rx path with port 0, fiber bundle D, with VCSEL 1, channel 11.

Table 65: show chassis fabric topology Output Fields (*continued*)

Out-links and In-links (TX Matrix Plus router with 3D SIBs only)	State of the links from the F13 SIB to the SFC/LCC or vice-versa. Out-Links indicate Tx links. In-Links indicate an Rx link. The following additional fields are displayed for each SIB:			
	<ul style="list-style-type: none"> Description of the fields displayed in the output for In-links and Out-links for SFC: 			

	In-links	State	Out-links	State

	CXP0_Evn->F13_SIB0_XF2,04_0	Up	F13_SIB0_XF2,04_0->CXP0_Evn	Up
<ul style="list-style-type: none"> CXP0_Evn—CXP optics with type of port bits such as even or odd. In this case, it indicates CXP optics with even port bit number 0. F13_SIB0—Name of the SFC data plane SIB with the SIB number. In this case, it indicates F13 SIB with number 0. XF2,04_0—Name of the ASIC with port and subchannel number. In this case, it Indicates XF2 chip with port number 4 and subchannel number 0. 				
<ul style="list-style-type: none"> Description of the fields displayed in the output for In-links and Out-links for LCC: 				

	In-links	State	Out-links	
State				

	CXP0_Evn->LCC_SIB0_XF3,10_0	Up	LCC_SIB0_XF3,10_0->CXP0_Evn	Up
<ul style="list-style-type: none"> CXP0_Evn—CXP optics with the type of port bits such as even or odd. In this case, it indicates CXP optics with even port bit number 0. LCC_SIB0—LCC SIB number. In this case, it indicates LCC SIB with number 0. XF3,10_0—Name of the ASIC with port and subchannel number. In this case, it Indicates XF3 with port number 10 and subchannel number 0. 				

Sample Output

show chassis fabric
topology scc (TX
Matrix Router)

```
user@host> show chassis fabric topology scc
scc-re1:
```

```
-----
fchip (mode)
in-links      state  out-links      state
-----

Sib #0 :
-----
SIB0_F0 (F2 ):
LCC0_SIB-L0_F0,03->SIB-S0_F0,00  UP      SIB-S0_F0,00->LCC0_SIB-L0_F1,00  UP
LCC1_SIB-L0_F0,03->SIB-S0_F0,01  UP      SIB-S0_F0,01->LCC1_SIB-L0_F1,08  UP
LCC2_SIB-L0_F0,03->SIB-S0_F0,02  RESET   SIB-S0_F0,02->LCC2_SIB-L0_F1,08  UP
LCC3_SIB-L0_F0,03->SIB-S0_F0,03  RESET   SIB-S0_F0,03->LCC3_SIB-L0_F1,00  UP
LCC0_SIB-L0_F0,02->SIB-S0_F0,04  UP      SIB-S0_F0,04->LCC0_SIB-L0_F1,01  UP
LCC1_SIB-L0_F0,02->SIB-S0_F0,05  UP      SIB-S0_F0,05->LCC1_SIB-L0_F1,09  UP
LCC2_SIB-L0_F0,02->SIB-S0_F0,06  RESET   SIB-S0_F0,06->LCC2_SIB-L0_F1,09  UP
LCC3_SIB-L0_F0,02->SIB-S0_F0,07  RESET   SIB-S0_F0,07->LCC3_SIB-L0_F1,01  UP
LCC0_SIB-L0_F0,07->SIB-S0_F0,08  UP      SIB-S0_F0,08->LCC0_SIB-L0_F1,04  UP
LCC1_SIB-L0_F0,07->SIB-S0_F0,09  UP      SIB-S0_F0,09->LCC1_SIB-L0_F1,12  UP
LCC2_SIB-L0_F0,07->SIB-S0_F0,10  RESET   SIB-S0_F0,10->LCC2_SIB-L0_F1,12  UP
LCC3_SIB-L0_F0,07->SIB-S0_F0,11  RESET   SIB-S0_F0,11->LCC3_SIB-L0_F1,04  UP
LCC0_SIB-L0_F0,06->SIB-S0_F0,12  UP      SIB-S0_F0,12->LCC0_SIB-L0_F1,05  UP
LCC1_SIB-L0_F0,06->SIB-S0_F0,13  UP      SIB-S0_F0,13->LCC1_SIB-L0_F1,13  UP
LCC2_SIB-L0_F0,06->SIB-S0_F0,14  RESET   SIB-S0_F0,14->LCC2_SIB-L0_F1,13  UP
LCC3_SIB-L0_F0,06->SIB-S0_F0,15  RESET   SIB-S0_F0,15->LCC3_SIB-L0_F1,05  UP
SIB0_F1 (F2 ):
LCC0_SIB-L0_F0,11->SIB-S0_F1,00  UP      SIB-S0_F1,00->LCC0_SIB-L0_F1,08  UP
LCC1_SIB-L0_F0,11->SIB-S0_F1,01  UP      SIB-S0_F1,01->LCC1_SIB-L0_F1,00  UP
LCC2_SIB-L0_F0,11->SIB-S0_F1,02  RESET   SIB-S0_F1,02->LCC2_SIB-L0_F1,00  UP
LCC3_SIB-L0_F0,11->SIB-S0_F1,03  RESET   SIB-S0_F1,03->LCC3_SIB-L0_F1,08  UP
LCC0_SIB-L0_F0,10->SIB-S0_F1,04  UP      SIB-S0_F1,04->LCC0_SIB-L0_F1,09  UP
LCC1_SIB-L0_F0,10->SIB-S0_F1,05  UP      SIB-S0_F1,05->LCC1_SIB-L0_F1,01  UP
LCC2_SIB-L0_F0,10->SIB-S0_F1,06  RESET   SIB-S0_F1,06->LCC2_SIB-L0_F1,01  UP
LCC3_SIB-L0_F0,10->SIB-S0_F1,07  RESET   SIB-S0_F1,07->LCC3_SIB-L0_F1,09  UP
LCC0_SIB-L0_F0,15->SIB-S0_F1,08  UP      SIB-S0_F1,08->LCC0_SIB-L0_F1,12  UP
LCC1_SIB-L0_F0,15->SIB-S0_F1,09  UP      SIB-S0_F1,09->LCC1_SIB-L0_F1,04  UP
LCC2_SIB-L0_F0,15->SIB-S0_F1,10  RESET   SIB-S0_F1,10->LCC2_SIB-L0_F1,04  UP
LCC3_SIB-L0_F0,15->SIB-S0_F1,11  RESET   SIB-S0_F1,11->LCC3_SIB-L0_F1,12  UP
LCC0_SIB-L0_F0,14->SIB-S0_F1,12  UP      SIB-S0_F1,12->LCC0_SIB-L0_F1,13  UP
LCC1_SIB-L0_F0,14->SIB-S0_F1,13  UP      SIB-S0_F1,13->LCC1_SIB-L0_F1,05  UP
LCC2_SIB-L0_F0,14->SIB-S0_F1,14  RESET   SIB-S0_F1,14->LCC2_SIB-L0_F1,05  UP
LCC3_SIB-L0_F0,14->SIB-S0_F1,15  RESET   SIB-S0_F1,15->LCC3_SIB-L0_F1,13  UP
SIB0_F2 (F2 ):
LCC3_SIB-L0_F0,13->SIB-S0_F2,00  RESET   SIB-S0_F2,00->LCC3_SIB-L0_F1,14  UP
LCC2_SIB-L0_F0,13->SIB-S0_F2,01  RESET   SIB-S0_F2,01->LCC2_SIB-L0_F1,06  UP
LCC1_SIB-L0_F0,13->SIB-S0_F2,02  UP      SIB-S0_F2,02->LCC1_SIB-L0_F1,06  UP
LCC0_SIB-L0_F0,13->SIB-S0_F2,03  UP      SIB-S0_F2,03->LCC0_SIB-L0_F1,14  UP
LCC3_SIB-L0_F0,12->SIB-S0_F2,04  RESET   SIB-S0_F2,04->LCC3_SIB-L0_F1,15  UP
LCC2_SIB-L0_F0,12->SIB-S0_F2,05  RESET   SIB-S0_F2,05->LCC2_SIB-L0_F1,07  UP
LCC1_SIB-L0_F0,12->SIB-S0_F2,06  UP      SIB-S0_F2,06->LCC1_SIB-L0_F1,07  UP
LCC0_SIB-L0_F0,12->SIB-S0_F2,07  UP      SIB-S0_F2,07->LCC0_SIB-L0_F1,15  UP
LCC3_SIB-L0_F0,09->SIB-S0_F2,08  RESET   SIB-S0_F2,08->LCC3_SIB-L0_F1,10  UP
UP
```

LCC2_SIB-L0_F0,09->SIB-S0_F2,09	RESET	SIB-S0_F2,09->LCC2_SIB-L0_F1,02	
UP			
LCC1_SIB-L0_F0,09->SIB-S0_F2,10	UP	SIB-S0_F2,10->LCC1_SIB-L0_F1,02	UP
LCC0_SIB-L0_F0,09->SIB-S0_F2,11	UP	SIB-S0_F2,11->LCC0_SIB-L0_F1,10	UP
LCC3_SIB-L0_F0,08->SIB-S0_F2,12	RESET	SIB-S0_F2,12->LCC3_SIB-L0_F1,11	
UP			
LCC2_SIB-L0_F0,08->SIB-S0_F2,13	RESET	SIB-S0_F2,13->LCC2_SIB-L0_F1,03	
UP			
LCC1_SIB-L0_F0,08->SIB-S0_F2,14	UP	SIB-S0_F2,14->LCC1_SIB-L0_F1,03	UP
LCC0_SIB-L0_F0,08->SIB-S0_F2,15	UP	SIB-S0_F2,15->LCC0_SIB-L0_F1,11	UP
SIB0_F3 (F2):			
LCC3_SIB-L0_F0,05->SIB-S0_F3,00	RESET	SIB-S0_F3,00->LCC3_SIB-L0_F1,06	
UP			
LCC2_SIB-L0_F0,05->SIB-S0_F3,01	RESET	SIB-S0_F3,01->LCC2_SIB-L0_F1,14	
UP			
LCC1_SIB-L0_F0,05->SIB-S0_F3,02	UP	SIB-S0_F3,02->LCC1_SIB-L0_F1,14	UP
LCC0_SIB-L0_F0,05->SIB-S0_F3,03	UP	SIB-S0_F3,03->LCC0_SIB-L0_F1,06	UP
LCC3_SIB-L0_F0,04->SIB-S0_F3,04	RESET	SIB-S0_F3,04->LCC3_SIB-L0_F1,07	
UP			
LCC2_SIB-L0_F0,04->SIB-S0_F3,05	RESET	SIB-S0_F3,05->LCC2_SIB-L0_F1,15	
UP			
LCC1_SIB-L0_F0,04->SIB-S0_F3,06	UP	SIB-S0_F3,06->LCC1_SIB-L0_F1,15	UP
LCC0_SIB-L0_F0,04->SIB-S0_F3,07	UP	SIB-S0_F3,07->LCC0_SIB-L0_F1,07	UP
LCC3_SIB-L0_F0,01->SIB-S0_F3,08	RESET	SIB-S0_F3,08->LCC3_SIB-L0_F1,02	
UP			
LCC2_SIB-L0_F0,01->SIB-S0_F3,09	RESET	SIB-S0_F3,09->LCC2_SIB-L0_F1,10	
UP			
LCC1_SIB-L0_F0,01->SIB-S0_F3,10	UP	SIB-S0_F3,10->LCC1_SIB-L0_F1,10	UP
LCC0_SIB-L0_F0,01->SIB-S0_F3,11	UP	SIB-S0_F3,11->LCC0_SIB-L0_F1,02	UP
LCC3_SIB-L0_F0,00->SIB-S0_F3,12	RESET	SIB-S0_F3,12->LCC3_SIB-L0_F1,03	
UP			
LCC2_SIB-L0_F0,00->SIB-S0_F3,13	RESET	SIB-S0_F3,13->LCC2_SIB-L0_F1,11	
UP			
LCC1_SIB-L0_F0,00->SIB-S0_F3,14	UP	SIB-S0_F3,14->LCC1_SIB-L0_F1,11	UP
LCC0_SIB-L0_F0,00->SIB-S0_F3,15	UP	SIB-S0_F3,15->LCC0_SIB-L0_F1,03	UP
Sib #1 :			

SIB1_F0 (F2):			
LCC0_SIB-L1_F0,03->SIB-S1_F0,00	RESET	SIB-S1_F0,00->LCC0_SIB-L1_F1,00	UP
LCC1_SIB-L1_F0,03->SIB-S1_F0,01	RESET	SIB-S1_F0,01->LCC1_SIB-L1_F1,08	UP
LCC2_SIB-L1_F0,03->SIB-S1_F0,02	RESET	SIB-S1_F0,02->LCC2_SIB-L1_F1,08	UP
LCC3_SIB-L1_F0,03->SIB-S1_F0,03	RESET	SIB-S1_F0,03->LCC3_SIB-L1_F1,00	UP
LCC0_SIB-L1_F0,02->SIB-S1_F0,04	RESET	SIB-S1_F0,04->LCC0_SIB-L1_F1,01	UP
LCC1_SIB-L1_F0,02->SIB-S1_F0,05	RESET	SIB-S1_F0,05->LCC1_SIB-L1_F1,09	UP
LCC2_SIB-L1_F0,02->SIB-S1_F0,06	RESET	SIB-S1_F0,06->LCC2_SIB-L1_F1,09	UP
LCC3_SIB-L1_F0,02->SIB-S1_F0,07	RESET	SIB-S1_F0,07->LCC3_SIB-L1_F1,01	UP
LCC0_SIB-L1_F0,07->SIB-S1_F0,08	RESET	SIB-S1_F0,08->LCC0_SIB-L1_F1,04	UP
LCC1_SIB-L1_F0,07->SIB-S1_F0,09	RESET	SIB-S1_F0,09->LCC1_SIB-L1_F1,12	UP
LCC2_SIB-L1_F0,07->SIB-S1_F0,10	RESET	SIB-S1_F0,10->LCC2_SIB-L1_F1,12	UP
LCC3_SIB-L1_F0,07->SIB-S1_F0,11	RESET	SIB-S1_F0,11->LCC3_SIB-L1_F1,04	UP
LCC0_SIB-L1_F0,06->SIB-S1_F0,12	RESET	SIB-S1_F0,12->LCC0_SIB-L1_F1,05	UP
LCC1_SIB-L1_F0,06->SIB-S1_F0,13	RESET	SIB-S1_F0,13->LCC1_SIB-L1_F1,13	UP
LCC2_SIB-L1_F0,06->SIB-S1_F0,14	RESET	SIB-S1_F0,14->LCC2_SIB-L1_F1,13	UP
LCC3_SIB-L1_F0,06->SIB-S1_F0,15	RESET	SIB-S1_F0,15->LCC3_SIB-L1_F1,05	UP
SIB1_F1 (F2):			
LCC0_SIB-L1_F0,11->SIB-S1_F1,00	RESET	SIB-S1_F1,00->LCC0_SIB-L1_F1,08	UP
LCC1_SIB-L1_F0,11->SIB-S1_F1,01	RESET	SIB-S1_F1,01->LCC1_SIB-L1_F1,00	UP
LCC2_SIB-L1_F0,11->SIB-S1_F1,02	RESET	SIB-S1_F1,02->LCC2_SIB-L1_F1,00	UP
LCC3_SIB-L1_F0,11->SIB-S1_F1,03	RESET	SIB-S1_F1,03->LCC3_SIB-L1_F1,08	UP
LCC0_SIB-L1_F0,10->SIB-S1_F1,04	RESET	SIB-S1_F1,04->LCC0_SIB-L1_F1,09	UP
LCC1_SIB-L1_F0,10->SIB-S1_F1,05	RESET	SIB-S1_F1,05->LCC1_SIB-L1_F1,01	UP

```

LCC2_SIB-L1_F0,10->SIB-S1_F1,06 RESET      SIB-S1_F1,06->LCC2_SIB-L1_F1,01 UP
LCC3_SIB-L1_F0,10->SIB-S1_F1,07 RESET      SIB-S1_F1,07->LCC3_SIB-L1_F1,09 UP
LCC0_SIB-L1_F0,15->SIB-S1_F1,08 RESET      SIB-S1_F1,08->LCC0_SIB-L1_F1,12 UP
LCC1_SIB-L1_F0,15->SIB-S1_F1,09 RESET      SIB-S1_F1,09->LCC1_SIB-L1_F1,04 UP
LCC2_SIB-L1_F0,15->SIB-S1_F1,10 RESET      SIB-S1_F1,10->LCC2_SIB-L1_F1,04 UP
LCC3_SIB-L1_F0,15->SIB-S1_F1,11 RESET      -S1_F1,11->LCC3_SIB-L1_F1,12,05 UP
LCC0_SIB-L1_F0,14->SIB-S1_F1,12 RESET      SIB-S1_F1,12->LCC0_SIB-L1_F1,13 UP
LCC1_SIB-L1_F0,14->SIB-S1_F1,13 RESET      SIB-S1_F1,13->LCC1_SIB-L1_F1,05 UP
LCC2_SIB-L1_F0,14->SIB-S1_F1,14 RESET      SIB-S1_F1,14->LCC2_SIB-L1_F1,05 UP

```

show chassis fabric
topology lcc

user@host> show chassis fabric topology lcc 0
lcc0-re0:

```

-----
      fchip (mode)
in-links      state      out-links      state
-----
Sib #2 :
-----
SIB2_F0 (F1 ):
FPC0_T->SIB-L2_F0,00 DOWN      SIB-L2_F0,00->SIB-S2_F3,15 DOWN
FPC0_B->SIB-L2_F0,01 UP        SIB-L2_F0,01->SIB-S2_F3,11 DOWN
FPC1_T->SIB-L2_F0,02 DOWN      SIB-L2_F0,02->SIB-S2_F0,04 DOWN
FPC1_B->SIB-L2_F0,03 DOWN      SIB-L2_F0,03->SIB-S2_F0,00 DOWN
FPC2_T->SIB-L2_F0,04 DOWN      SIB-L2_F0,04->SIB-S2_F3,07 DOWN
FPC2_B->SIB-L2_F0,05 DOWN      SIB-L2_F0,05->SIB-S2_F3,03 DOWN
FPC3_T->SIB-L2_F0,06 DOWN      SIB-L2_F0,06->SIB-S2_F0,12 DOWN
FPC3_B->SIB-L2_F0,07 DOWN      SIB-L2_F0,07->SIB-S2_F0,08 DOWN
FPC4_T->SIB-L2_F0,08 DOWN      SIB-L2_F0,08->SIB-S2_F2,15 DOWN
FPC4_B->SIB-L2_F0,09 DOWN      SIB-L2_F0,09->SIB-S2_F2,11 DOWN
FPC5_T->SIB-L2_F0,10 DOWN      SIB-L2_F0,10->SIB-S2_F1,04 DOWN
FPC5_B->SIB-L2_F0,11 DOWN      SIB-L2_F0,11->SIB-S2_F1,00 DOWN
FPC6_T->SIB-L2_F0,12 DOWN      SIB-L2_F0,12->SIB-S2_F2,07 DOWN
FPC6_B->SIB-L2_F0,13 UP        SIB-L2_F0,13->SIB-S2_F2,03 DOWN
FPC7_T->SIB-L2_F0,14 DOWN      SIB-L2_F0,14->SIB-S2_F1,12 DOWN
FPC7_B->SIB-L2_F0,15 DOWN      SIB-L2_F0,15->SIB-S2_F1,08 DOWN
SIB2_F1 (F3 ):
SIB-S2_F0,00->SIB-L2_F1,00 UP      SIB-L2_F1,00->FPC7_B DOWN
SIB-S2_F0,04->SIB-L2_F1,01 UP      SIB-L2_F1,01->FPC7_T DOWN
SIB-S2_F3,11->SIB-L2_F1,02 UP      SIB-L2_F1,02->FPC6_B DOWN
SIB-S2_F3,15->SIB-L2_F1,03 UP      SIB-L2_F1,03->FPC6_T DOWN
SIB-S2_F0,08->SIB-L2_F1,04 UP      SIB-L2_F1,04->FPC5_B DOWN
SIB-S2_F0,12->SIB-L2_F1,05 UP      SIB-L2_F1,05->FPC5_T DOWN
SIB-S2_F3,03->SIB-L2_F1,06 UP      SIB-L2_F1,06->FPC4_B DOWN
SIB-S2_F3,07->SIB-L2_F1,07 UP      SIB-L2_F1,07->FPC4_T DOWN
SIB-S2_F1,00->SIB-L2_F1,08 UP      SIB-L2_F1,08->FPC3_B DOWN
SIB-S2_F1,04->SIB-L2_F1,09 UP      SIB-L2_F1,09->FPC3_T DOWN
SIB-S2_F2,11->SIB-L2_F1,10 UP      SIB-L2_F1,10->FPC2_B DOWN
SIB-S2_F2,15->SIB-L2_F1,11 UP      SIB-L2_F1,11->FPC2_T DOWN
SIB-S2_F1,08->SIB-L2_F1,12 UP      SIB-L2_F1,12->FPC1_B DOWN
SIB-S2_F1,12->SIB-L2_F1,13 UP      SIB-L2_F1,13->FPC1_T DOWN
SIB-S2_F2,03->SIB-L2_F1,14 UP      SIB-L2_F1,14->FPC0_B DOWN
SIB-S2_F2,07->SIB-L2_F1,15 UP      SIB-L2_F1,15->FPC0_T DOWN
Sib #4 :
-----
SIB4_F0 (F1 ):
FPC0_T->SIB-L4_F0,00 RESET      SIB-L4_F0,00->SIB-S4_F3,15 UP
FPC0_B->SIB-L4_F0,01 UP        SIB-L4_F0,01->SIB-S4_F3,11 UP
FPC1_T->SIB-L4_F0,02 RESET      SIB-L4_F0,02->SIB-S4_F0,04 UP
FPC1_B->SIB-L4_F0,03 RESET      SIB-L4_F0,03->SIB-S4_F0,00 UP
FPC2_T->SIB-L4_F0,04 RESET      SIB-L4_F0,04->SIB-S4_F3,07 UP
FPC2_B->SIB-L4_F0,05 RESET      SIB-L4_F0,05->SIB-S4_F3,03 UP

```

```

FPC3_T->SIB-L4_F0,06    RESET    SIB-L4_F0,06->SIB-S4_F0,12 UP
FPC3_B->SIB-L4_F0,07    RESET    SIB-L4_F0,07->SIB-S4_F0,08 UP
FPC4_T->SIB-L4_F0,08    RESET    SIB-L4_F0,08->SIB-S4_F2,15 UP
FPC4_B->SIB-L4_F0,09    RESET    SIB-L4_F0,09->SIB-S4_F2,11 UP
FPC5_T->SIB-L4_F0,10    RESET    SIB-L4_F0,10->SIB-S4_F1,04 UP
FPC5_B->SIB-L4_F0,11    RESET    SIB-L4_F0,11->SIB-S4_F1,00 UP
FPC6_T->SIB-L4_F0,12    RESET    SIB-L4_F0,12->SIB-S4_F2,07 UP
FPC6_B->SIB-L4_F0,13    UP       SIB-L4_F0,13->SIB-S4_F2,03 UP
FPC7_T->SIB-L4_F0,14    RESET    SIB-L4_F0,14->SIB-S4_F1,12 UP
FPC7_B->SIB-L4_F0,15    RESET    SIB-L4_F0,15->SIB-S4_F1,08 UP
SIB4_F1 (F3 ):
SIB-S4_F0,00->SIB-L4_F1,00 UP    SIB-L4_F1,00->FPC7_B      UP
SIB-S4_F0,04->SIB-L4_F1,01 UP    SIB-L4_F1,01->FPC7_T      UP
SIB-S4_F3,11->SIB-L4_F1,02 UP    SIB-L4_F1,02->FPC6_B      UP
SIB-S4_F3,15->SIB-L4_F1,03 UP    SIB-L4_F1,03->FPC6_T      UP
SIB-S4_F0,08->SIB-L4_F1,04 UP    SIB-L4_F1,04->FPC5_B      UP
SIB-S4_F0,12->SIB-L4_F1,05 UP    SIB-L4_F1,05->FPC5_T      UP
SIB-S4_F3,03->SIB-L4_F1,06 UP    SIB-L4_F1,06->FPC4_B      UP
SIB-S4_F3,07->SIB-L4_F1,07 UP    SIB-L4_F1,07->FPC4_T      UP
SIB-S4_F1,00->SIB-L4_F1,08 UP    SIB-L4_F1,08->FPC3_B      UP
SIB-S4_F1,04->SIB-L4_F1,09 UP    SIB-L4_F1,09->FPC3_T      UP
SIB-S4_F2,11->SIB-L4_F1,10 UP    SIB-L4_F1,10->FPC2_B      UP
SIB-S4_F2,15->SIB-L4_F1,11 UP    SIB-L4_F1,11->FPC2_T      UP
SIB-S4_F1,08->SIB-L4_F1,12 UP    SIB-L4_F1,12->FPC1_B      UP
SIB-S4_F1,12->SIB-L4_F1,13 UP    SIB-L4_F1,13->FPC1_T      UP
SIB-S4_F2,03->SIB-L4_F1,14 UP    SIB-L4_F1,14->FPC0_B      UP
SIB-S4_F2,07->SIB-L4_F1,15 UP    SIB-L4_F1,15->FPC0_T      UP

```

show chassis fabric topology (TX Matrix Plus Router)

```

user@host> show chassis fabric topology
sfc0-re0:

```

```

F13_SIB0

```

```

Out-Links:

```

```

SFC0_F13_SIB00    -> LCC00_ST_SIB_L00          VCSEL   HSL2   HSL2
                  Status      Channel Status
=====
SF_30_00_FB_D(04,11) -> FPC0_T_SG(0,0,0)_FB_D(01,11)    OK       112    Up
SF_30_00_FB_D(04,10) -> FPC0_T_SG(0,0,1)_FB_D(01,10)    OK       112    Up
SF_30_00_FB_D(04,09) -> FPC0_T_SG(0,0,2)_FB_D(01,09)    OK       112    Up
SF_30_00_FB_D(04,08) -> FPC0_T_SG(0,0,3)_FB_D(01,08)    OK       112    Up
SF_30_00_FB_D(04,07) -> FPC0_T_SG(0,0,4)_FB_D(01,07)    OK       112    Up
SF_30_00_FB_D(04,06) -> FPC0_T_SG(0,0,5)_FB_D(01,06)    OK       112    Up
SF_30_00_FB_D(04,05) -> FPC0_T_SG(0,0,6)_FB_D(01,05)    OK       112    Up
SF_30_00_FB_D(04,04) -> FPC0_T_SG(0,0,7)_FB_D(01,04)    OK       112    Up
SF_30_01_FB_B(16,11) -> FPC4_T_SG(2,0,0)_FB_B(13,11)    OK       119    Up
SF_30_01_FB_B(16,10) -> FPC4_T_SG(2,0,1)_FB_B(13,10)    OK       119    Up
SF_30_01_FB_B(16,09) -> FPC4_T_SG(2,0,2)_FB_B(13,09)    OK       119    Up
SF_30_01_FB_B(16,08) -> FPC4_T_SG(2,0,3)_FB_B(13,08)    OK       119    Up
SF_30_01_FB_B(16,07) -> FPC4_T_SG(2,0,4)_FB_B(13,07)    OK       119    Up
SF_30_01_FB_B(16,06) -> FPC4_T_SG(2,0,5)_FB_B(13,06)    OK       119    Up
SF_30_01_FB_B(16,05) -> FPC4_T_SG(2,0,6)_FB_B(13,05)    OK       119    Up
SF_30_01_FB_B(16,04) -> FPC4_T_SG(2,0,7)_FB_B(13,04)    OK       119    Up
SF_30_02_FB_D(05,08) -> FPC1_T_SG(0,2,0)_FB_D(02,08)    OK       126    Up
SF_30_02_FB_D(05,07) -> FPC1_T_SG(0,2,1)_FB_D(02,07)    OK       126    Up
SF_30_02_FB_D(05,06) -> FPC1_T_SG(0,2,2)_FB_D(02,06)    OK       126    Up
SF_30_02_FB_D(05,05) -> FPC1_T_SG(0,2,3)_FB_D(02,05)    OK       126    Up
SF_30_02_FB_D(05,03) -> FPC1_T_SG(0,2,4)_FB_D(02,03)    OK       126    Up

```



```

SF_30_02_FB_D(05,02) -> FPC1_T_SG(0,2,5)_FB_D(02,02)    OK      126    Up
SF_30_02_FB_D(05,01) -> FPC1_T_SG(0,2,6)_FB_D(02,01)    OK      126    Up
SF_30_02_FB_D(05,00) -> FPC1_T_SG(0,2,7)_FB_D(02,00)    OK      126    Up
SF_30_03_FB_B(17,08) -> FPC5_T_SG(2,2,0)_FB_B(14,08)    OK      133    Up
SF_30_03_FB_B(17,07) -> FPC5_T_SG(2,2,1)_FB_B(14,07)    OK      133    Up
SF_30_03_FB_B(17,06) -> FPC5_T_SG(2,2,2)_FB_B(14,06)    OK      133    Up
SF_30_03_FB_B(17,05) -> FPC5_T_SG(2,2,3)_FB_B(14,05)    OK      133    Up
SF_30_03_FB_B(17,03) -> FPC5_T_SG(2,2,4)_FB_B(14,03)    OK      133    Up
SF_30_03_FB_B(17,02) -> FPC5_T_SG(2,2,5)_FB_B(14,02)    OK      133    Up
SF_30_03_FB_B(17,01) -> FPC5_T_SG(2,2,6)_FB_B(14,01)    OK      133    Up
SF_30_03_FB_B(17,00) -> FPC5_T_SG(2,2,7)_FB_B(14,00)    OK      133    Up
SF_30_04_FB_C(10,11) -> FPC2_T_SG(1,0,0)_FB_C(07,11)    OK      140    Up
SF_30_04_FB_C(10,10) -> FPC2_T_SG(1,0,1)_FB_C(07,10)    OK      140    Up
SF_30_04_FB_C(10,09) -> FPC2_T_SG(1,0,2)_FB_C(07,09)    OK      140    Up
SF_30_04_FB_C(10,08) -> FPC2_T_SG(1,0,3)_FB_C(07,08)    OK      140    Up
SF_30_04_FB_C(10,07) -> FPC2_T_SG(1,0,4)_FB_C(07,07)    OK      140    Up
SF_30_04_FB_C(10,06) -> FPC2_T_SG(1,0,5)_FB_C(07,06)    OK      140    Up
SF_30_04_FB_C(10,05) -> FPC2_T_SG(1,0,6)_FB_C(07,05)    OK      140    Up
SF_30_04_FB_C(10,04) -> FPC2_T_SG(1,0,7)_FB_C(07,04)    OK      140    Up
SF_30_05_FB_A(22,11) -> FPC6_T_SG(3,0,0)_FB_A(19,11)    OK      147    Up
SF_30_05_FB_A(22,10) -> FPC6_T_SG(3,0,1)_FB_A(19,10)    OK      147    Up
SF_30_05_FB_A(22,09) -> FPC6_T_SG(3,0,2)_FB_A(19,09)    OK      147    Up
SF_30_05_FB_A(22,08) -> FPC6_T_SG(3,0,3)_FB_A(19,08)    OK      147    Up
SF_30_05_FB_A(22,07) -> FPC6_T_SG(3,0,4)_FB_A(19,07)    OK      147    Up
SF_30_05_FB_A(22,06) -> FPC6_T_SG(3,0,5)_FB_A(19,06)    OK      147    Up
SF_30_05_FB_A(22,05) -> FPC6_T_SG(3,0,6)_FB_A(19,05)    OK      147    Up
SF_30_05_FB_A(22,04) -> FPC6_T_SG(3,0,7)_FB_A(19,04)    OK      147    Up
SF_30_06_FB_C(11,08) -> FPC3_T_SG(1,2,0)_FB_C(08,08)    OK      154    Up
SF_30_06_FB_C(11,07) -> FPC3_T_SG(1,2,1)_FB_C(08,07)    OK      154    Up
SF_30_06_FB_C(11,06) -> FPC3_T_SG(1,2,2)_FB_C(08,06)    OK      154    Up
SF_30_06_FB_C(11,05) -> FPC3_T_SG(1,2,3)_FB_C(08,05)    OK      154    Up
SF_30_06_FB_C(11,03) -> FPC3_T_SG(1,2,4)_FB_C(08,03)    OK      154    Up
SF_30_06_FB_C(11,02) -> FPC3_T_SG(1,2,5)_FB_C(08,02)    OK      154    Up
SF_30_06_FB_C(11,01) -> FPC3_T_SG(1,2,6)_FB_C(08,01)    OK      154    Up
SF_30_06_FB_C(11,00) -> FPC3_T_SG(1,2,7)_FB_C(08,00)    OK      154    Up
...

```

show chassis fabric
topology sfc (TX
Matrix Plus Router)

```

user@host> show chassis fabric topology sfc 0
sfc0-re0:

```

```

-----
F13_SIB0

```

```

=====

```

```

Out-Links:

```

```

=====

```

SFC0_F13_SIB_00	-> LCC00_ST_SIB_L00	VCSEL Status	HSL2 Channel	HSL2 Status
SF_30_00_FB_D(04,11)	-> FPC0_T_SG(0,0,0)_FB_D(01,11)	OK	112	Up
SF_30_00_FB_D(04,10)	-> FPC0_T_SG(0,0,1)_FB_D(01,10)	OK	112	Up
SF_30_00_FB_D(04,09)	-> FPC0_T_SG(0,0,2)_FB_D(01,09)	OK	112	Up
SF_30_00_FB_D(04,08)	-> FPC0_T_SG(0,0,3)_FB_D(01,08)	OK	112	Up
SF_30_00_FB_D(04,07)	-> FPC0_T_SG(0,0,4)_FB_D(01,07)	OK	112	Up
SF_30_00_FB_D(04,06)	-> FPC0_T_SG(0,0,5)_FB_D(01,06)	OK	112	Up
SF_30_00_FB_D(04,05)	-> FPC0_T_SG(0,0,6)_FB_D(01,05)	OK	112	Up
SF_30_00_FB_D(04,04)	-> FPC0_T_SG(0,0,7)_FB_D(01,04)	OK	112	Up
SF_30_01_FB_B(16,11)	-> FPC4_T_SG(2,0,0)_FB_B(13,11)	OK	119	Up
SF_30_01_FB_B(16,10)	-> FPC4_T_SG(2,0,1)_FB_B(13,10)	OK	119	Up
SF_30_01_FB_B(16,09)	-> FPC4_T_SG(2,0,2)_FB_B(13,09)	OK	119	Up
SF_30_01_FB_B(16,08)	-> FPC4_T_SG(2,0,3)_FB_B(13,08)	OK	119	Up

```

SF_30_01_FB_B(16,07) -> FPC4_T_SG(2,0,4)_FB_B(13,07)    OK      119    Up
SF_30_01_FB_B(16,06) -> FPC4_T_SG(2,0,5)_FB_B(13,06)    OK      119    Up
SF_30_01_FB_B(16,05) -> FPC4_T_SG(2,0,6)_FB_B(13,05)    OK      119    Up
SF_30_01_FB_B(16,04) -> FPC4_T_SG(2,0,7)_FB_B(13,04)    OK      119    Up
SF_30_02_FB_D(05,08) -> FPC1_T_SG(0,2,0)_FB_D(02,08)    OK      126    Up
SF_30_02_FB_D(05,07) -> FPC1_T_SG(0,2,1)_FB_D(02,07)    OK      126    Up
SF_30_02_FB_D(05,06) -> FPC1_T_SG(0,2,2)_FB_D(02,06)    OK      126    Up
SF_30_02_FB_D(05,05) -> FPC1_T_SG(0,2,3)_FB_D(02,05)    OK      126    Up
SF_30_02_FB_D(05,03) -> FPC1_T_SG(0,2,4)_FB_D(02,03)    OK      126    Up
SF_30_02_FB_D(05,02) -> FPC1_T_SG(0,2,5)_FB_D(02,02)    OK      126    Up
SF_30_02_FB_D(05,01) -> FPC1_T_SG(0,2,6)_FB_D(02,01)    OK      126    Up
SF_30_02_FB_D(05,00) -> FPC1_T_SG(0,2,7)_FB_D(02,00)    OK      126    Up
SF_30_03_FB_B(17,08) -> FPC5_T_SG(2,2,0)_FB_B(14,08)    OK      133    Up
SF_30_03_FB_B(17,07) -> FPC5_T_SG(2,2,1)_FB_B(14,07)    OK      133    Up
SF_30_03_FB_B(17,06) -> FPC5_T_SG(2,2,2)_FB_B(14,06)    OK      133    Up
SF_30_03_FB_B(17,05) -> FPC5_T_SG(2,2,3)_FB_B(14,05)    OK      133    Up
SF_30_03_FB_B(17,03) -> FPC5_T_SG(2,2,4)_FB_B(14,03)    OK      133    Up
SF_30_03_FB_B(17,02) -> FPC5_T_SG(2,2,5)_FB_B(14,02)    OK      133    Up
SF_30_03_FB_B(17,01) -> FPC5_T_SG(2,2,6)_FB_B(14,01)    OK      133    Up
SF_30_03_FB_B(17,00) -> FPC5_T_SG(2,2,7)_FB_B(14,00)    OK      133    Up
SF_30_04_FB_C(10,11) -> FPC2_T_SG(1,0,0)_FB_C(07,11)    OK      140    Up
SF_30_04_FB_C(10,10) -> FPC2_T_SG(1,0,1)_FB_C(07,10)    OK      140    Up
SF_30_04_FB_C(10,09) -> FPC2_T_SG(1,0,2)_FB_C(07,09)    OK      140    Up
SF_30_04_FB_C(10,08) -> FPC2_T_SG(1,0,3)_FB_C(07,08)    OK      140    Up
SF_30_04_FB_C(10,07) -> FPC2_T_SG(1,0,4)_FB_C(07,07)    OK      140    Up
SF_30_04_FB_C(10,06) -> FPC2_T_SG(1,0,5)_FB_C(07,06)    OK      140    Up
SF_30_04_FB_C(10,05) -> FPC2_T_SG(1,0,6)_FB_C(07,05)    OK      140    Up
SF_30_04_FB_C(10,04) -> FPC2_T_SG(1,0,7)_FB_C(07,04)    OK      140    Up
SF_30_05_FB_A(22,11) -> FPC6_T_SG(3,0,0)_FB_A(19,11)    OK      147    Up
SF_30_05_FB_A(22,10) -> FPC6_T_SG(3,0,1)_FB_A(19,10)    OK      147    Up
SF_30_05_FB_A(22,09) -> FPC6_T_SG(3,0,2)_FB_A(19,09)    OK      147    Up
SF_30_05_FB_A(22,08) -> FPC6_T_SG(3,0,3)_FB_A(19,08)    OK      147    Up
SF_30_05_FB_A(22,07) -> FPC6_T_SG(3,0,4)_FB_A(19,07)    OK      147    Up
SF_30_05_FB_A(22,06) -> FPC6_T_SG(3,0,5)_FB_A(19,06)    OK      147    Up
SF_30_05_FB_A(22,05) -> FPC6_T_SG(3,0,6)_FB_A(19,05)    OK      147    Up
SF_30_05_FB_A(22,04) -> FPC6_T_SG(3,0,7)_FB_A(19,04)    OK      147    Up
SF_30_06_FB_C(11,08) -> FPC3_T_SG(1,2,0)_FB_C(08,08)    OK      154    Up
SF_30_06_FB_C(11,07) -> FPC3_T_SG(1,2,1)_FB_C(08,07)    OK      154    Up
SF_30_06_FB_C(11,06) -> FPC3_T_SG(1,2,2)_FB_C(08,06)    OK      154    Up
SF_30_06_FB_C(11,05) -> FPC3_T_SG(1,2,3)_FB_C(08,05)    OK      154    Up
SF_30_06_FB_C(11,03) -> FPC3_T_SG(1,2,4)_FB_C(08,03)    OK      154    Up
SF_30_06_FB_C(11,02) -> FPC3_T_SG(1,2,5)_FB_C(08,02)    OK      154    Up
SF_30_06_FB_C(11,01) -> FPC3_T_SG(1,2,6)_FB_C(08,01)    OK      154    Up
SF_30_06_FB_C(11,00) -> FPC3_T_SG(1,2,7)_FB_C(08,00)    OK      154    Up
...

```

show chassis fabric
topology lcc (TX Matrix
Plus Router)

```

user@host> show chassis fabric topology lcc 0
lcc0-re0:
-----

```

SIB0

=====

Out-Links:

=====

LCC00_ST_SIB_L00	-> SFC0_F13_SIB_00	VCSEL Status	HSL2 Channel	HSL2 Status
FPC0_T_SG(0,0,0)_FB_D(04,11)	-> SF_10_00_FB_D(01,11)	OK	12	Up
FPC0_T_SG(0,0,1)_FB_D(04,10)	-> SF_10_00_FB_D(01,10)	OK	12	Up
FPC0_T_SG(0,0,2)_FB_D(04,09)	-> SF_10_00_FB_D(01,09)	OK	12	Up

```

FPC0_T_SG(0,0,3)_FB_D(04,08) -> SF_10_00_FB_D(01,08)    OK      12      Up
FPC0_T_SG(0,0,4)_FB_D(04,07) -> SF_10_00_FB_D(01,07)    OK      12      Up
FPC0_T_SG(0,0,5)_FB_D(04,06) -> SF_10_00_FB_D(01,06)    OK      12      Up
FPC0_T_SG(0,0,6)_FB_D(04,05) -> SF_10_00_FB_D(01,05)    OK      12      Up
FPC0_T_SG(0,0,7)_FB_D(04,04) -> SF_10_00_FB_D(01,04)    OK      12      Up
FPC0_B_SG(0,1,0)_FB_D(03,07) -> SF_10_10_FB_D(00,07)    OK      15      Up
FPC0_B_SG(0,1,1)_FB_D(03,06) -> SF_10_10_FB_D(00,06)    OK      15      Up
FPC0_B_SG(0,1,2)_FB_D(03,05) -> SF_10_10_FB_D(00,05)    OK      15      Up
FPC0_B_SG(0,1,3)_FB_D(03,04) -> SF_10_10_FB_D(00,04)    OK      15      Up
FPC0_B_SG(0,1,4)_FB_D(03,03) -> SF_10_10_FB_D(00,03)    OK      15      Up
FPC0_B_SG(0,1,5)_FB_D(03,02) -> SF_10_10_FB_D(00,02)    OK      15      Up
FPC0_B_SG(0,1,6)_FB_D(03,01) -> SF_10_10_FB_D(00,01)    OK      15      Up
FPC0_B_SG(0,1,7)_FB_D(03,00) -> SF_10_10_FB_D(00,00)    OK      15      Up
FPC1_T_SG(0,2,0)_FB_D(05,08) -> SF_10_02_FB_D(02,08)    OK      18      Up
FPC1_T_SG(0,2,1)_FB_D(05,07) -> SF_10_02_FB_D(02,07)    OK      18      Up
FPC1_T_SG(0,2,2)_FB_D(05,06) -> SF_10_02_FB_D(02,06)    OK      18      Up
FPC1_T_SG(0,2,3)_FB_D(05,05) -> SF_10_02_FB_D(02,05)    OK      18      Up
FPC1_T_SG(0,2,4)_FB_D(05,03) -> SF_10_02_FB_D(02,03)    OK      18      Up
FPC1_T_SG(0,2,5)_FB_D(05,02) -> SF_10_02_FB_D(02,02)    OK      18      Up
FPC1_T_SG(0,2,6)_FB_D(05,01) -> SF_10_02_FB_D(02,01)    OK      18      Up
FPC1_T_SG(0,2,7)_FB_D(05,00) -> SF_10_02_FB_D(02,00)    OK      18      Up
FPC1_B_SG(0,3,0)_FB_D(04,03) -> SF_10_11_FB_D(01,03)    OK      21      Up
FPC1_B_SG(0,3,1)_FB_D(04,02) -> SF_10_11_FB_D(01,02)    OK      21      Up
FPC1_B_SG(0,3,2)_FB_D(04,01) -> SF_10_11_FB_D(01,01)    OK      21      Up
FPC1_B_SG(0,3,3)_FB_D(04,00) -> SF_10_11_FB_D(01,00)    OK      21      Up
FPC1_B_SG(0,3,4)_FB_D(03,11) -> SF_10_11_FB_D(00,11)    OK      21      Up
FPC1_B_SG(0,3,5)_FB_D(03,10) -> SF_10_11_FB_D(00,10)    OK      21      Up
FPC1_B_SG(0,3,6)_FB_D(03,09) -> SF_10_11_FB_D(00,09)    OK      21      Up
FPC1_B_SG(0,3,7)_FB_D(03,08) -> SF_10_11_FB_D(00,08)    OK      21      Up
FPC2_T_SG(1,0,0)_FB_C(10,11) -> SF_10_04_FB_C(07,11)    OK      12      Up
FPC2_T_SG(1,0,1)_FB_C(10,10) -> SF_10_04_FB_C(07,10)    OK      12      Up
FPC2_T_SG(1,0,2)_FB_C(10,09) -> SF_10_04_FB_C(07,09)    OK      12      Up
FPC2_T_SG(1,0,3)_FB_C(10,08) -> SF_10_04_FB_C(07,08)    OK      12      Up
FPC2_T_SG(1,0,4)_FB_C(10,07) -> SF_10_04_FB_C(07,07)    OK      12      Up
FPC2_T_SG(1,0,5)_FB_C(10,06) -> SF_10_04_FB_C(07,06)    OK      12      Up
FPC2_T_SG(1,0,6)_FB_C(10,05) -> SF_10_04_FB_C(07,05)    OK      12      Up
FPC2_T_SG(1,0,7)_FB_C(10,04) -> SF_10_04_FB_C(07,04)    OK      12      Up
FPC2_B_SG(1,1,0)_FB_C(09,07) -> SF_10_14_FB_C(06,07)    OK      15      Up
FPC2_B_SG(1,1,1)_FB_C(09,06) -> SF_10_14_FB_C(06,06)    OK      15      Up
FPC2_B_SG(1,1,2)_FB_C(09,05) -> SF_10_14_FB_C(06,05)    OK      15      Up
FPC2_B_SG(1,1,3)_FB_C(09,04) -> SF_10_14_FB_C(06,04)    OK      15      Up
FPC2_B_SG(1,1,4)_FB_C(09,03) -> SF_10_14_FB_C(06,03)    OK      15      Up
FPC2_B_SG(1,1,5)_FB_C(09,02) -> SF_10_14_FB_C(06,02)    OK      15      Up
FPC2_B_SG(1,1,6)_FB_C(09,01) -> SF_10_14_FB_C(06,01)    OK      15      Up
FPC2_B_SG(1,1,7)_FB_C(09,00) -> SF_10_14_FB_C(06,00)    OK      15      Up
FPC3_T_SG(1,2,0)_FB_C(11,08) -> SF_10_06_FB_C(08,08)    OK      18      Up
FPC3_T_SG(1,2,1)_FB_C(11,07) -> SF_10_06_FB_C(08,07)    OK      18      Up
FPC3_T_SG(1,2,2)_FB_C(11,06) -> SF_10_06_FB_C(08,06)    OK      18      Up
FPC3_T_SG(1,2,3)_FB_C(11,05) -> SF_10_06_FB_C(08,05)    OK      18      Up
FPC3_T_SG(1,2,4)_FB_C(11,03) -> SF_10_06_FB_C(08,03)    OK      18      Up
FPC3_T_SG(1,2,5)_FB_C(11,02) -> SF_10_06_FB_C(08,02)    OK      18      Up
FPC3_T_SG(1,2,6)_FB_C(11,01) -> SF_10_06_FB_C(08,01)    OK      18      Up
...

```

show chassis fabric
topology (T4000 Core
Router)

```

user@host> show chassis fabric topology 0
fchip (mode)

```

In-links	State	Out-links	State
----------	-------	-----------	-------

SIB0 :

Onboard Links

SIB0_XF1,14_0->SIB0_XF,00_0	Up	SIB0_XF,00_0->SIB0_XF1,14_0	Up
SIB0_XF,00_0->SIB0_XF1,14_0	Up	SIB0_XF1,14_0->SIB0_XF,00_0	Up
SIB0_XF1,13_0->SIB0_XF,01_0	Up	SIB0_XF,01_0->SIB0_XF1,13_0	Up
SIB0_XF,01_0->SIB0_XF1,13_0	Up	SIB0_XF1,13_0->SIB0_XF,01_0	Up
SIB0_XF1,12_0->SIB0_XF,02_0	Up	SIB0_XF,02_0->SIB0_XF1,12_0	Up
SIB0_XF,02_0->SIB0_XF1,12_0	Up	SIB0_XF1,12_0->SIB0_XF,02_0	Up
SIB0_XF1,11_0->SIB0_XF,03_0	Up	SIB0_XF,03_0->SIB0_XF1,11_0	Up
SIB0_XF,03_0->SIB0_XF1,11_0	Up	SIB0_XF1,11_0->SIB0_XF,03_0	Up
SIB0_XF1,10_0->SIB0_XF,04_0	Up	SIB0_XF,04_0->SIB0_XF1,10_0	Up
SIB0_XF,04_0->SIB0_XF1,10_0	Up	SIB0_XF1,10_0->SIB0_XF,04_0	Up
SIB0_XF1,09_0->SIB0_XF,05_0	Up	SIB0_XF,05_0->SIB0_XF1,09_0	Up
SIB0_XF,05_0->SIB0_XF1,09_0	Up	SIB0_XF1,09_0->SIB0_XF,05_0	Up
SIB0_XF2,14_0->SIB0_XF,06_0	Up	SIB0_XF,06_0->SIB0_XF2,14_0	Up
SIB0_XF,06_0->SIB0_XF2,14_0	Up	SIB0_XF2,14_0->SIB0_XF,06_0	Up
SIB0_XF2,13_0->SIB0_XF,07_0	Up	SIB0_XF,07_0->SIB0_XF2,13_0	Up
SIB0_XF,07_0->SIB0_XF2,13_0	Up	SIB0_XF2,13_0->SIB0_XF,07_0	Up
SIB0_XF2,12_0->SIB0_XF,08_0	Up	SIB0_XF,08_0->SIB0_XF2,12_0	Up
SIB0_XF,08_0->SIB0_XF2,12_0	Up	SIB0_XF2,12_0->SIB0_XF,08_0	Up
SIB0_XF2,11_0->SIB0_XF,09_0	Up	SIB0_XF,09_0->SIB0_XF2,11_0	Up
SIB0_XF,09_0->SIB0_XF2,11_0	Up	SIB0_XF2,11_0->SIB0_XF,09_0	Up
SIB0_XF2,10_0->SIB0_XF,10_0	Up	SIB0_XF,10_0->SIB0_XF2,10_0	Up
SIB0_XF,10_0->SIB0_XF2,10_0	Up	SIB0_XF2,10_0->SIB0_XF,10_0	Up
SIB0_XF2,09_0->SIB0_XF,11_0	Up	SIB0_XF,11_0->SIB0_XF2,09_0	Up
SIB0_XF,11_0->SIB0_XF2,09_0	Up	SIB0_XF2,09_0->SIB0_XF,11_0	Up
SIB0_XF3,13_0->SIB0_XF,12_0	Up	SIB0_XF,12_0->SIB0_XF3,13_0	Up
SIB0_XF,12_0->SIB0_XF3,13_0	Up	SIB0_XF3,13_0->SIB0_XF,12_0	Up
SIB0_XF3,12_0->SIB0_XF,13_0	Up	SIB0_XF,13_0->SIB0_XF3,12_0	Up
SIB0_XF,13_0->SIB0_XF3,12_0	Up	SIB0_XF3,12_0->SIB0_XF,13_0	Up
SIB0_XF3,11_0->SIB0_XF,14_0	Up	SIB0_XF,14_0->SIB0_XF3,11_0	Up
SIB0_XF,14_0->SIB0_XF3,11_0	Up	SIB0_XF3,11_0->SIB0_XF,14_0	Up
SIB0_XF3,10_0->SIB0_XF,15_0	Up	SIB0_XF,15_0->SIB0_XF3,10_0	Up
SIB0_XF,15_0->SIB0_XF3,10_0	Up	SIB0_XF3,10_0->SIB0_XF,15_0	Up

PFE Links

FPC2PFE0->SIB0_XF1,05_0	Up	SIB0_XF1,05_0->FPC2PFE0	Up
FPC3PFE0->SIB0_XF2,15_0	Up	SIB0_XF2,15_0->FPC3PFE0	Up
FPC5PFE0->SIB0_XF2,05_0	Up	SIB0_XF2,05_0->FPC5PFE0	Up
FPC5PFE1->SIB0_XF2,07_0	Up	SIB0_XF2,07_0->FPC5PFE1	Up
FPC6PFE0->SIB0_XF3,01_0	Up	SIB0_XF3,01_0->FPC6PFE0	Up
FPC6PFE0->SIB0_XF3,01_1	Up	SIB0_XF3,01_1->FPC6PFE0	Up
FPC6PFE0->SIB0_XF3,02_0	Up	SIB0_XF3,02_0->FPC6PFE0	Up
FPC6PFE1->SIB0_XF3,03_0	Up	SIB0_XF3,03_0->FPC6PFE1	Up
FPC6PFE1->SIB0_XF3,03_1	Up	SIB0_XF3,03_1->FPC6PFE1	Up
FPC6PFE1->SIB0_XF3,02_1	Up	SIB0_XF3,02_1->FPC6PFE1	Up

show chassis fabric
topology lcc (TX Matrix)

user@host> show chassis fabric topology lcc 6
lcc6-re0:

Plus Router with 3D
SIBs)

fchip (mode)				
In-links	State	Out-links	State	

SIB0 :				

CXP0_Evn->LCC_SIB0_XF3,10_0	Up	LCC_SIB0_XF3,10_0->CXP0_Evn	Up	
CXP0_Odd->LCC_SIB0_XF3,11_0	Up	LCC_SIB0_XF3,11_0->CXP0_Odd	Up	
CXP1_Evn->LCC_SIB0_XF3,12_0	Up	LCC_SIB0_XF3,12_0->CXP1_Evn	Up	
CXP1_Odd->LCC_SIB0_XF3,13_0	Up	LCC_SIB0_XF3,13_0->CXP1_Odd	Up	
CXP2_Evn->LCC_SIB0_XF2,09_0	Up	LCC_SIB0_XF2,09_0->CXP2_Evn	Up	
CXP2_Odd->LCC_SIB0_XF2,10_0	Up	LCC_SIB0_XF2,10_0->CXP2_Odd	Up	
CXP3_Evn->LCC_SIB0_XF2,11_0	Up	LCC_SIB0_XF2,11_0->CXP3_Evn	Up	
CXP3_Odd->LCC_SIB0_XF2,12_0	Up	LCC_SIB0_XF2,12_0->CXP3_Odd	Up	
CXP4_Evn->LCC_SIB0_XF2,13_0	Up	LCC_SIB0_XF2,13_0->CXP4_Evn	Up	
CXP4_Odd->LCC_SIB0_XF1,09_0	Up	LCC_SIB0_XF1,09_0->CXP4_Odd	Up	
CXP5_Evn->LCC_SIB0_XF2,14_0	Up	LCC_SIB0_XF2,14_0->CXP5_Evn	Up	
CXP5_Odd->LCC_SIB0_XF1,10_0	Up	LCC_SIB0_XF1,10_0->CXP5_Odd	Up	
CXP6_Evn->LCC_SIB0_XF1,11_0	Up	LCC_SIB0_XF1,11_0->CXP6_Evn	Up	
CXP6_Odd->LCC_SIB0_XF1,12_0	Up	LCC_SIB0_XF1,12_0->CXP6_Odd	Up	
CXP7_Evn->LCC_SIB0_XF1,13_0	Up	LCC_SIB0_XF1,13_0->CXP7_Evn	Up	
CXP7_Odd->LCC_SIB0_XF1,14_0	Up	LCC_SIB0_XF1,14_0->CXP7_Odd	Up	
SIB1 :				

SIB2 :				

CXP0_Evn->LCC_SIB2_XF3,10_0	Up	LCC_SIB2_XF3,10_0->CXP0_Evn	Up	
CXP0_Odd->LCC_SIB2_XF3,11_0	Up	LCC_SIB2_XF3,11_0->CXP0_Odd	Up	
CXP1_Evn->LCC_SIB2_XF3,12_0	Up	LCC_SIB2_XF3,12_0->CXP1_Evn	Up	
CXP1_Odd->LCC_SIB2_XF3,13_0	Up	LCC_SIB2_XF3,13_0->CXP1_Odd	Up	
CXP2_Evn->LCC_SIB2_XF2,09_0	Up	LCC_SIB2_XF2,09_0->CXP2_Evn	Up	
CXP2_Odd->LCC_SIB2_XF2,10_0	Up	LCC_SIB2_XF2,10_0->CXP2_Odd	Up	
CXP3_Evn->LCC_SIB2_XF2,11_0	Up	LCC_SIB2_XF2,11_0->CXP3_Evn	Up	
CXP3_Odd->LCC_SIB2_XF2,12_0	Up	LCC_SIB2_XF2,12_0->CXP3_Odd	Up	
CXP4_Evn->LCC_SIB2_XF2,13_0	Up	LCC_SIB2_XF2,13_0->CXP4_Evn	Up	
CXP4_Odd->LCC_SIB2_XF1,09_0	Up	LCC_SIB2_XF1,09_0->CXP4_Odd	Up	
CXP5_Evn->LCC_SIB2_XF2,14_0	Up	LCC_SIB2_XF2,14_0->CXP5_Evn	Up	
CXP5_Odd->LCC_SIB2_XF1,10_0	Up	LCC_SIB2_XF1,10_0->CXP5_Odd	Up	
CXP6_Evn->LCC_SIB2_XF1,11_0	Up	LCC_SIB2_XF1,11_0->CXP6_Evn	Up	
CXP6_Odd->LCC_SIB2_XF1,12_0	Up	LCC_SIB2_XF1,12_0->CXP6_Odd	Up	
CXP7_Evn->LCC_SIB2_XF1,13_0	Up	LCC_SIB2_XF1,13_0->CXP7_Evn	Up	
CXP7_Odd->LCC_SIB2_XF1,14_0	Up	LCC_SIB2_XF1,14_0->CXP7_Odd	Up	
SIB3 :				

CXP0_Evn->LCC_SIB3_XF3,10_0	Up	LCC_SIB3_XF3,10_0->CXP0_Evn	Up	
CXP0_Odd->LCC_SIB3_XF3,11_0	Up	LCC_SIB3_XF3,11_0->CXP0_Odd	Up	
CXP1_Evn->LCC_SIB3_XF3,12_0	Up	LCC_SIB3_XF3,12_0->CXP1_Evn	Up	
CXP1_Odd->LCC_SIB3_XF3,13_0	Up	LCC_SIB3_XF3,13_0->CXP1_Odd	Up	
CXP2_Evn->LCC_SIB3_XF2,09_0	Up	LCC_SIB3_XF2,09_0->CXP2_Evn	Up	
CXP2_Odd->LCC_SIB3_XF2,10_0	Up	LCC_SIB3_XF2,10_0->CXP2_Odd	Up	
CXP3_Evn->LCC_SIB3_XF2,11_0	Up	LCC_SIB3_XF2,11_0->CXP3_Evn	Up	
CXP3_Odd->LCC_SIB3_XF2,12_0	Up	LCC_SIB3_XF2,12_0->CXP3_Odd	Up	
CXP4_Evn->LCC_SIB3_XF2,13_0	Up	LCC_SIB3_XF2,13_0->CXP4_Evn	Up	
CXP4_Odd->LCC_SIB3_XF1,09_0	Up	LCC_SIB3_XF1,09_0->CXP4_Odd	Up	
CXP5_Evn->LCC_SIB3_XF2,14_0	Up	LCC_SIB3_XF2,14_0->CXP5_Evn	Up	
CXP5_Odd->LCC_SIB3_XF1,10_0	Up	LCC_SIB3_XF1,10_0->CXP5_Odd	Up	
CXP6_Evn->LCC_SIB3_XF1,11_0	Up	LCC_SIB3_XF1,11_0->CXP6_Evn	Up	
CXP6_Odd->LCC_SIB3_XF1,12_0	Up	LCC_SIB3_XF1,12_0->CXP6_Odd	Up	
CXP7_Evn->LCC_SIB3_XF1,13_0	Up	LCC_SIB3_XF1,13_0->CXP7_Evn	Up	
CXP7_Odd->LCC_SIB3_XF1,14_0	Up	LCC_SIB3_XF1,14_0->CXP7_Odd	Up	
SIB4 :				

CXP0_Evn->LCC_SIB4_XF3,10_0	Up	LCC_SIB4_XF3,10_0->CXP0_Evn	Up
CXP0_Odd->LCC_SIB4_XF3,11_0	Up	LCC_SIB4_XF3,11_0->CXP0_Odd	Up
CXP1_Evn->LCC_SIB4_XF3,12_0	Up	LCC_SIB4_XF3,12_0->CXP1_Evn	Up
CXP1_Odd->LCC_SIB4_XF3,13_0	Up	LCC_SIB4_XF3,13_0->CXP1_Odd	Up
CXP2_Evn->LCC_SIB4_XF2,09_0	Up	LCC_SIB4_XF2,09_0->CXP2_Evn	Up
CXP2_Odd->LCC_SIB4_XF2,10_0	Up	LCC_SIB4_XF2,10_0->CXP2_Odd	Up
CXP3_Evn->LCC_SIB4_XF2,11_0	Up	LCC_SIB4_XF2,11_0->CXP3_Evn	Up
CXP3_Odd->LCC_SIB4_XF2,12_0	Up	LCC_SIB4_XF2,12_0->CXP3_Odd	Up
CXP4_Evn->LCC_SIB4_XF2,13_0	Up	LCC_SIB4_XF2,13_0->CXP4_Evn	Up
CXP4_Odd->LCC_SIB4_XF1,09_0	Up	LCC_SIB4_XF1,09_0->CXP4_Odd	Up
CXP5_Evn->LCC_SIB4_XF2,14_0	Up	LCC_SIB4_XF2,14_0->CXP5_Evn	Up
CXP5_Odd->LCC_SIB4_XF1,10_0	Up	LCC_SIB4_XF1,10_0->CXP5_Odd	Up
CXP6_Evn->LCC_SIB4_XF1,11_0	Up	LCC_SIB4_XF1,11_0->CXP6_Evn	Up
CXP6_Odd->LCC_SIB4_XF1,12_0	Up	LCC_SIB4_XF1,12_0->CXP6_Odd	Up
CXP7_Evn->LCC_SIB4_XF1,13_0	Up	LCC_SIB4_XF1,13_0->CXP7_Evn	Up
CXP7_Odd->LCC_SIB4_XF1,14_0	Up	LCC_SIB4_XF1,14_0->CXP7_Odd	Up

show chassis fabric
topology sfc (TX

```
user@host> show chassis fabric topology sfc 0
sfc0-re0:
```

Matrix Plus Router with
3D SIBs)

fchip (mode)	In-links	State	Out-links	State
F13_SIB0 :				

CXP0_Evn->F13_SIB0_XF2,04_0	Up	F13_SIB0_XF2,04_0->CXP0_Evn	Up	
CXP0_Odd->F13_SIB0_XF2,03_0	Up	F13_SIB0_XF2,03_0->CXP0_Odd	Up	
CXP1_Evn->F13_SIB0_XF2,06_0	Up	F13_SIB0_XF2,06_0->CXP1_Evn	Up	
CXP1_Odd->F13_SIB0_XF2,05_0	Up	F13_SIB0_XF2,05_0->CXP1_Odd	Up	
CXP2_Evn->F13_SIB0_XF2,08_0	Up	F13_SIB0_XF2,08_0->CXP2_Evn	Up	
CXP2_Odd->F13_SIB0_XF2,07_0	Up	F13_SIB0_XF2,07_0->CXP2_Odd	Up	
CXP3_Evn->F13_SIB0_XF2,10_0	Up	F13_SIB0_XF2,10_0->CXP3_Evn	Up	
CXP3_Odd->F13_SIB0_XF2,09_0	Up	F13_SIB0_XF2,09_0->CXP3_Odd	Up	
CXP4_Evn->F13_SIB0_XF0,04_0	Up	F13_SIB0_XF0,04_0->CXP4_Evn	Up	
CXP4_Odd->F13_SIB0_XF0,03_0	Up	F13_SIB0_XF0,03_0->CXP4_Odd	Up	
CXP5_Evn->F13_SIB0_XF0,06_0	Up	F13_SIB0_XF0,06_0->CXP5_Evn	Up	
CXP5_Odd->F13_SIB0_XF0,05_0	Up	F13_SIB0_XF0,05_0->CXP5_Odd	Up	
CXP6_Evn->F13_SIB0_XF0,08_0	Up	F13_SIB0_XF0,08_0->CXP6_Evn	Up	
CXP6_Odd->F13_SIB0_XF0,07_0	Up	F13_SIB0_XF0,07_0->CXP6_Odd	Up	
CXP7_Evn->F13_SIB0_XF0,10_0	Up	F13_SIB0_XF0,10_0->CXP7_Evn	Up	
CXP7_Odd->F13_SIB0_XF0,09_0	Up	F13_SIB0_XF0,09_0->CXP7_Odd	Up	
CXP8_Evn->F13_SIB0_XF3,04_0	Up	F13_SIB0_XF3,04_0->CXP8_Evn	Up	
CXP8_Odd->F13_SIB0_XF3,03_0	Up	F13_SIB0_XF3,03_0->CXP8_Odd	Up	
CXP9_Evn->F13_SIB0_XF3,06_0	Up	F13_SIB0_XF3,06_0->CXP9_Evn	Up	
CXP9_Odd->F13_SIB0_XF3,05_0	Up	F13_SIB0_XF3,05_0->CXP9_Odd	Up	
CXP10_Evn->F13_SIB0_XF3,08_0	Up	F13_SIB0_XF3,08_0->CXP10_Evn	Up	
CXP10_Odd->F13_SIB0_XF3,07_0	Up	F13_SIB0_XF3,07_0->CXP10_Odd	Up	
CXP11_Evn->F13_SIB0_XF3,10_0	Up	F13_SIB0_XF3,10_0->CXP11_Evn	Up	
CXP11_Odd->F13_SIB0_XF3,09_0	Up	F13_SIB0_XF3,09_0->CXP11_Odd	Up	
CXP12_Evn->F13_SIB0_XF1,04_0	Up	F13_SIB0_XF1,04_0->CXP12_Evn	Up	
CXP12_Odd->F13_SIB0_XF1,03_0	Up	F13_SIB0_XF1,03_0->CXP12_Odd	Up	
CXP13_Evn->F13_SIB0_XF1,06_0	Up	F13_SIB0_XF1,06_0->CXP13_Evn	Up	
CXP13_Odd->F13_SIB0_XF1,05_0	Up	F13_SIB0_XF1,05_0->CXP13_Odd	Up	
CXP14_Evn->F13_SIB0_XF1,08_0	Up	F13_SIB0_XF1,08_0->CXP14_Evn	Up	
CXP14_Odd->F13_SIB0_XF1,07_0	Up	F13_SIB0_XF1,07_0->CXP14_Odd	Up	
CXP15_Evn->F13_SIB0_XF1,10_0	Up	F13_SIB0_XF1,10_0->CXP15_Evn	Up	
CXP15_Odd->F13_SIB0_XF1,09_0	Up	F13_SIB0_XF1,09_0->CXP15_Odd	Up	
F13_SIB0_XF4,00_0->F13_SIB0_XF2,02_0	Up	F13_SIB0_XF2,02_0->F13_SIB0_XF4,00_0	Up	
F13_SIB0_XF4,01_0->F13_SIB0_XF2,01_0	Up	F13_SIB0_XF2,01_0->F13_SIB0_XF4,01_0	Up	
F13_SIB0_XF4,02_0->F13_SIB0_XF2,00_0	Up	F13_SIB0_XF2,00_0->F13_SIB0_XF4,02_0	Up	
F13_SIB0_XF4,03_0->F13_SIB0_XF2,15_0	Up	F13_SIB0_XF2,15_0->F13_SIB0_XF4,03_0	Up	
F13_SIB0_XF4,04_0->F13_SIB0_XF2,14_0	Up	F13_SIB0_XF2,14_0->F13_SIB0_XF4,04_0	Up	
F13_SIB0_XF4,05_0->F13_SIB0_XF2,13_0	Up	F13_SIB0_XF2,13_0->F13_SIB0_XF4,05_0	Up	
F13_SIB0_XF4,06_0->F13_SIB0_XF2,12_0	Up	F13_SIB0_XF2,12_0->F13_SIB0_XF4,06_0	Up	
F13_SIB0_XF4,07_0->F13_SIB0_XF2,11_0	Up	F13_SIB0_XF2,11_0->F13_SIB0_XF4,07_0	Up	
F13_SIB0_XF4,08_0->F13_SIB0_XF0,02_0	Up	F13_SIB0_XF0,02_0->F13_SIB0_XF4,08_0	Up	
F13_SIB0_XF4,09_0->F13_SIB0_XF0,01_0	Up	F13_SIB0_XF0,01_0->F13_SIB0_XF4,09_0	Up	
F13_SIB0_XF4,10_0->F13_SIB0_XF0,00_0	Up	F13_SIB0_XF0,00_0->F13_SIB0_XF4,10_0	Up	
F13_SIB0_XF4,11_0->F13_SIB0_XF0,15_0	Up	F13_SIB0_XF0,15_0->F13_SIB0_XF4,11_0	Up	

F13_SIB0_XF4,12_0->F13_SIB0_XF0,14_0 Up F13_SIB0_XF0,14_0->F13_SIB0_XF4,12_0 Up
F13_SIB0_XF4,13_0->F13_SIB0_XF0,13_0 Up F13_SIB0_XF0,13_0->F13_SIB0_XF4,13_0 Up
F13_SIB0_XF4,14_0->F13_SIB0_XF0,12_0 Up F13_SIB0_XF0,12_0->F13_SIB0_XF4,14_0 Up
F13_SIB0_XF4,15_0->F13_SIB0_XF0,11_0 Up F13_SIB0_XF0,11_0->F13_SIB0_XF4,15_0 Up
F13_SIB0_XF6,08_0->F13_SIB0_XF3,02_0 Up F13_SIB0_XF3,02_0->F13_SIB0_XF6,08_0 Up
F13_SIB0_XF6,09_0->F13_SIB0_XF3,01_0 Up F13_SIB0_XF3,01_0->F13_SIB0_XF6,09_0 Up
F13_SIB0_XF6,10_0->F13_SIB0_XF3,00_0 Up F13_SIB0_XF3,00_0->F13_SIB0_XF6,10_0 Up
F13_SIB0_XF6,11_0->F13_SIB0_XF3,15_0 Up F13_SIB0_XF3,15_0->F13_SIB0_XF6,11_0 Up
F13_SIB0_XF6,12_0->F13_SIB0_XF3,14_0 Up F13_SIB0_XF3,14_0->F13_SIB0_XF6,12_0 Up
F13_SIB0_XF6,13_0->F13_SIB0_XF3,13_0 Up F13_SIB0_XF3,13_0->F13_SIB0_XF6,13_0 Up
F13_SIB0_XF6,14_0->F13_SIB0_XF3,12_0 Up F13_SIB0_XF3,12_0->F13_SIB0_XF6,14_0 Up
F13_SIB0_XF6,15_0->F13_SIB0_XF3,11_0 Up F13_SIB0_XF3,11_0->F13_SIB0_XF6,15_0 Up
F13_SIB0_XF6,00_0->F13_SIB0_XF1,02_0 Up F13_SIB0_XF1,02_0->F13_SIB0_XF6,00_0 Up
F13_SIB0_XF6,01_0->F13_SIB0_XF1,01_0 Up F13_SIB0_XF1,01_0->F13_SIB0_XF6,01_0 Up
F13_SIB0_XF6,02_0->F13_SIB0_XF1,00_0 Up F13_SIB0_XF1,00_0->F13_SIB0_XF6,02_0 Up
F13_SIB0_XF6,03_0->F13_SIB0_XF1,15_0 Up F13_SIB0_XF1,15_0->F13_SIB0_XF6,03_0 Up
F13_SIB0_XF6,04_0->F13_SIB0_XF1,14_0 Up F13_SIB0_XF1,14_0->F13_SIB0_XF6,04_0 Up
F13_SIB0_XF6,05_0->F13_SIB0_XF1,13_0 Up F13_SIB0_XF1,13_0->F13_SIB0_XF6,05_0 Up
F13_SIB0_XF6,06_0->F13_SIB0_XF1,12_0 Up F13_SIB0_XF1,12_0->F13_SIB0_XF6,06_0 Up
F13_SIB0_XF6,07_0->F13_SIB0_XF1,11_0 Up F13_SIB0_XF1,11_0->F13_SIB0_XF6,07_0 Up
F13_SIB0_XF2,02_0->F13_SIB0_XF5,00_0 Up F13_SIB0_XF5,00_0->F13_SIB0_XF2,02_0 Up
F13_SIB0_XF2,01_0->F13_SIB0_XF5,01_0 Up F13_SIB0_XF5,01_0->F13_SIB0_XF2,01_0 Up
F13_SIB0_XF2,00_0->F13_SIB0_XF5,02_0 Up F13_SIB0_XF5,02_0->F13_SIB0_XF2,00_0 Up
F13_SIB0_XF2,15_0->F13_SIB0_XF5,03_0 Up F13_SIB0_XF5,03_0->F13_SIB0_XF2,15_0 Up
F13_SIB0_XF2,14_0->F13_SIB0_XF5,04_0 Up F13_SIB0_XF5,04_0->F13_SIB0_XF2,14_0 Up
F13_SIB0_XF2,13_0->F13_SIB0_XF5,05_0 Up F13_SIB0_XF5,05_0->F13_SIB0_XF2,13_0 Up
F13_SIB0_XF2,12_0->F13_SIB0_XF5,06_0 Up F13_SIB0_XF5,06_0->F13_SIB0_XF2,12_0 Up
F13_SIB0_XF2,11_0->F13_SIB0_XF5,07_0 Up F13_SIB0_XF5,07_0->F13_SIB0_XF2,11_0 Up
F13_SIB0_XF0,02_0->F13_SIB0_XF5,08_0 Up F13_SIB0_XF5,08_0->F13_SIB0_XF0,02_0 Up
F13_SIB0_XF0,01_0->F13_SIB0_XF5,09_0 Up F13_SIB0_XF5,09_0->F13_SIB0_XF0,01_0 Up
F13_SIB0_XF0,00_0->F13_SIB0_XF5,10_0 Up F13_SIB0_XF5,10_0->F13_SIB0_XF0,00_0 Up


```

F13_SIB0_XF0,15_0->F13_SIB0_XF5,11_0 Up  F13_SIB0_XF5,11_0->F13_SIB0_XF0,15_0 Up
F13_SIB0_XF0,14_0->F13_SIB0_XF5,12_0 Up  F13_SIB0_XF5,12_0->F13_SIB0_XF0,14_0 Up
F13_SIB0_XF0,13_0->F13_SIB0_XF5,13_0 Up  F13_SIB0_XF5,13_0->F13_SIB0_XF0,13_0 Up
F13_SIB0_XF0,12_0->F13_SIB0_XF5,14_0 Up  F13_SIB0_XF5,14_0->F13_SIB0_XF0,12_0 Up
F13_SIB0_XF0,11_0->F13_SIB0_XF5,15_0 Up  F13_SIB0_XF5,15_0->F13_SIB0_XF0,11_0 Up
F13_SIB0_XF3,02_0->F13_SIB0_XF7,08_0 Up  F13_SIB0_XF7,08_0->F13_SIB0_XF3,02_0 Up
F13_SIB0_XF3,01_0->F13_SIB0_XF7,09_0 Up  F13_SIB0_XF7,09_0->F13_SIB0_XF3,01_0 Up
F13_SIB0_XF3,00_0->F13_SIB0_XF7,10_0 Up  F13_SIB0_XF7,10_0->F13_SIB0_XF3,00_0 Up
F13_SIB0_XF3,15_0->F13_SIB0_XF7,11_0 Up  F13_SIB0_XF7,11_0->F13_SIB0_XF3,15_0 Up
F13_SIB0_XF3,14_0->F13_SIB0_XF7,12_0 Up  F13_SIB0_XF7,12_0->F13_SIB0_XF3,14_0 Up
F13_SIB0_XF3,13_0->F13_SIB0_XF7,13_0 Up  F13_SIB0_XF7,13_0->F13_SIB0_XF3,13_0 Up
F13_SIB0_XF3,12_0->F13_SIB0_XF7,14_0 Up  F13_SIB0_XF7,14_0->F13_SIB0_XF3,12_0 Up
F13_SIB0_XF3,11_0->F13_SIB0_XF7,15_0 Up  F13_SIB0_XF7,15_0->F13_SIB0_XF3,11_0 Up
F13_SIB0_XF1,02_0->F13_SIB0_XF7,00_0 Up  F13_SIB0_XF7,00_0->F13_SIB0_XF1,02_0 Up
F13_SIB0_XF1,01_0->F13_SIB0_XF7,01_0 Up  F13_SIB0_XF7,01_0->F13_SIB0_XF1,01_0 Up
F13_SIB0_XF1,00_0->F13_SIB0_XF7,02_0 Up  F13_SIB0_XF7,02_0->F13_SIB0_XF1,00_0 Up
F13_SIB0_XF1,15_0->F13_SIB0_XF7,03_0 Up  F13_SIB0_XF7,03_0->F13_SIB0_XF1,15_0 Up
F13_SIB0_XF1,14_0->F13_SIB0_XF7,04_0 Up  F13_SIB0_XF7,04_0->F13_SIB0_XF1,14_0 Up
F13_SIB0_XF1,13_0->F13_SIB0_XF7,05_0 Up  F13_SIB0_XF7,05_0->F13_SIB0_XF1,13_0 Up
F13_SIB0_XF1,12_0->F13_SIB0_XF7,06_0 Up  F13_SIB0_XF7,06_0->F13_SIB0_XF1,12_0 Up
F13_SIB0_XF1,11_0->F13_SIB0_XF7,07_0 Up  F13_SIB0_XF7,07_0->F13_SIB0_XF1,11_0 Up
F2S_SIB2_XF,12_0->F13_SIB0_XF4,00_0 Up  F13_SIB0_XF4,00_0->F2S_SIB2_XF,12_0 Up
F2S_SIB2_XF,08_0->F13_SIB0_XF4,01_0 Up  F13_SIB0_XF4,01_0->F2S_SIB2_XF,08_0 Up
F2S_SIB2_XF,14_0->F13_SIB0_XF4,02_0 Up  F13_SIB0_XF4,02_0->F2S_SIB2_XF,14_0 Up
F2S_SIB2_XF,10_0->F13_SIB0_XF4,03_0 Up  F13_SIB0_XF4,03_0->F2S_SIB2_XF,10_0 Up
F2S_SIB3_XF,12_0->F13_SIB0_XF4,04_0 Up  F13_SIB0_XF4,04_0->F2S_SIB3_XF,12_0 Up
F2S_SIB3_XF,08_0->F13_SIB0_XF4,05_0 Up  F13_SIB0_XF4,05_0->F2S_SIB3_XF,08_0 Up
F2S_SIB3_XF,14_0->F13_SIB0_XF4,06_0 Up  F13_SIB0_XF4,06_0->F2S_SIB3_XF,14_0 Up
F2S_SIB3_XF,10_0->F13_SIB0_XF4,07_0 Up  F13_SIB0_XF4,07_0->F2S_SIB3_XF,10_0 Up
F2S_SIB0_XF,12_0->F13_SIB0_XF4,08_0 Up  F13_SIB0_XF4,08_0->F2S_SIB0_XF,12_0 Up

```

F2S_SIB0_XF,08_0->F13_SIB0_XF4,09_0 Up	F13_SIB0_XF4,09_0->F2S_SIB0_XF,08_0 Up
F2S_SIB0_XF,14_0->F13_SIB0_XF4,10_0 Up	F13_SIB0_XF4,10_0->F2S_SIB0_XF,14_0 Up
F2S_SIB0_XF,10_0->F13_SIB0_XF4,11_0 Up	F13_SIB0_XF4,11_0->F2S_SIB0_XF,10_0 Up
F2S_SIB1_XF,12_0->F13_SIB0_XF4,12_0 Up	F13_SIB0_XF4,12_0->F2S_SIB1_XF,12_0 Up
F2S_SIB1_XF,08_0->F13_SIB0_XF4,13_0 Up	F13_SIB0_XF4,13_0->F2S_SIB1_XF,08_0 Up
F2S_SIB1_XF,14_0->F13_SIB0_XF4,14_0 Up	F13_SIB0_XF4,14_0->F2S_SIB1_XF,14_0 Up
F2S_SIB1_XF,10_0->F13_SIB0_XF4,15_0 Up	F13_SIB0_XF4,15_0->F2S_SIB1_XF,10_0 Up
F2S_SIB2_XF,13_0->F13_SIB0_XF6,00_0 Up	F13_SIB0_XF6,00_0->F2S_SIB2_XF,13_0 Up
F2S_SIB2_XF,09_0->F13_SIB0_XF6,01_0 Up	F13_SIB0_XF6,01_0->F2S_SIB2_XF,09_0 Up
F2S_SIB2_XF,15_0->F13_SIB0_XF6,02_0 Up	F13_SIB0_XF6,02_0->F2S_SIB2_XF,15_0 Up
F2S_SIB2_XF,11_0->F13_SIB0_XF6,03_0 Up	F13_SIB0_XF6,03_0->F2S_SIB2_XF,11_0 Up
F2S_SIB3_XF,13_0->F13_SIB0_XF6,04_0 Up	F13_SIB0_XF6,04_0->F2S_SIB3_XF,13_0 Up
F2S_SIB3_XF,09_0->F13_SIB0_XF6,05_0 Up	F13_SIB0_XF6,05_0->F2S_SIB3_XF,09_0 Up
F2S_SIB3_XF,15_0->F13_SIB0_XF6,06_0 Up	F13_SIB0_XF6,06_0->F2S_SIB3_XF,15_0 Up
F2S_SIB3_XF,11_0->F13_SIB0_XF6,07_0 Up	F13_SIB0_XF6,07_0->F2S_SIB3_XF,11_0 Up
F2S_SIB0_XF,13_0->F13_SIB0_XF6,08_0 Up	F13_SIB0_XF6,08_0->F2S_SIB0_XF,13_0 Up
F2S_SIB0_XF,09_0->F13_SIB0_XF6,09_0 Up	F13_SIB0_XF6,09_0->F2S_SIB0_XF,09_0 Up
F2S_SIB0_XF,15_0->F13_SIB0_XF6,10_0 Up	F13_SIB0_XF6,10_0->F2S_SIB0_XF,15_0 Up
F2S_SIB0_XF,11_0->F13_SIB0_XF6,11_0 Up	F13_SIB0_XF6,11_0->F2S_SIB0_XF,11_0 Up
F2S_SIB1_XF,13_0->F13_SIB0_XF6,12_0 Up	F13_SIB0_XF6,12_0->F2S_SIB1_XF,13_0 Up
F2S_SIB1_XF,09_0->F13_SIB0_XF6,13_0 Up	F13_SIB0_XF6,13_0->F2S_SIB1_XF,09_0 Up
F2S_SIB1_XF,15_0->F13_SIB0_XF6,14_0 Up	F13_SIB0_XF6,14_0->F2S_SIB1_XF,15_0 Up
F2S_SIB1_XF,11_0->F13_SIB0_XF6,15_0 Up	F13_SIB0_XF6,15_0->F2S_SIB1_XF,11_0 Up
F13_SIB0_XF5,00_0->F2S_SIB2_XF,12_0 Up	F2S_SIB2_XF,12_0->F13_SIB0_XF5,00_0 Up
F13_SIB0_XF5,01_0->F2S_SIB2_XF,08_0 Up	F2S_SIB2_XF,08_0->F13_SIB0_XF5,01_0 Up
F13_SIB0_XF5,02_0->F2S_SIB2_XF,14_0 Up	F2S_SIB2_XF,14_0->F13_SIB0_XF5,02_0 Up
F13_SIB0_XF5,03_0->F2S_SIB2_XF,10_0 Up	F2S_SIB2_XF,10_0->F13_SIB0_XF5,03_0 Up
F13_SIB0_XF5,04_0->F2S_SIB3_XF,12_0 Up	F2S_SIB3_XF,12_0->F13_SIB0_XF5,04_0 Up
F13_SIB0_XF5,05_0->F2S_SIB3_XF,08_0 Up	F2S_SIB3_XF,08_0->F13_SIB0_XF5,05_0 Up
F13_SIB0_XF5,06_0->F2S_SIB3_XF,14_0 Up	F2S_SIB3_XF,14_0->F13_SIB0_XF5,06_0 Up
F13_SIB0_XF5,07_0->F2S_SIB3_XF,10_0 Up	F2S_SIB3_XF,10_0->F13_SIB0_XF5,07_0 Up

```

F13_SIB0_XF5,08_0->F2S_SIB0_XF,12_0 Up   F2S_SIB0_XF,12_0->F13_SIB0_XF5,08_0 Up
F13_SIB0_XF5,09_0->F2S_SIB0_XF,08_0 Up   F2S_SIB0_XF,08_0->F13_SIB0_XF5,09_0 Up
F13_SIB0_XF5,10_0->F2S_SIB0_XF,14_0 Up   F2S_SIB0_XF,14_0->F13_SIB0_XF5,10_0 Up
F13_SIB0_XF5,11_0->F2S_SIB0_XF,10_0 Up   F2S_SIB0_XF,10_0->F13_SIB0_XF5,11_0 Up
F13_SIB0_XF5,12_0->F2S_SIB1_XF,12_0 Up   F2S_SIB1_XF,12_0->F13_SIB0_XF5,12_0 Up
F13_SIB0_XF5,13_0->F2S_SIB1_XF,08_0 Up   F2S_SIB1_XF,08_0->F13_SIB0_XF5,13_0 Up
F13_SIB0_XF5,14_0->F2S_SIB1_XF,14_0 Up   F2S_SIB1_XF,14_0->F13_SIB0_XF5,14_0 Up
F13_SIB0_XF5,15_0->F2S_SIB1_XF,10_0 Up   F2S_SIB1_XF,10_0->F13_SIB0_XF5,15_0 Up
F13_SIB0_XF7,00_0->F2S_SIB2_XF,13_0 Up   F2S_SIB2_XF,13_0->F13_SIB0_XF7,00_0 Up
F13_SIB0_XF7,01_0->F2S_SIB2_XF,09_0 Up   F2S_SIB2_XF,09_0->F13_SIB0_XF7,01_0 Up
F13_SIB0_XF7,02_0->F2S_SIB2_XF,15_0 Up   F2S_SIB2_XF,15_0->F13_SIB0_XF7,02_0 Up
F13_SIB0_XF7,03_0->F2S_SIB2_XF,11_0 Up   F2S_SIB2_XF,11_0->F13_SIB0_XF7,03_0 Up
F13_SIB0_XF7,04_0->F2S_SIB3_XF,13_0 Up   F2S_SIB3_XF,13_0->F13_SIB0_XF7,04_0 Up
F13_SIB0_XF7,05_0->F2S_SIB3_XF,09_0 Up   F2S_SIB3_XF,09_0->F13_SIB0_XF7,05_0 Up
F13_SIB0_XF7,06_0->F2S_SIB3_XF,15_0 Up   F2S_SIB3_XF,15_0->F13_SIB0_XF7,06_0 Up
F13_SIB0_XF7,07_0->F2S_SIB3_XF,11_0 Up   F2S_SIB3_XF,11_0->F13_SIB0_XF7,07_0 Up
F13_SIB0_XF7,08_0->F2S_SIB0_XF,13_0 Up   F2S_SIB0_XF,13_0->F13_SIB0_XF7,08_0 Up
F13_SIB0_XF7,09_0->F2S_SIB0_XF,09_0 Up   F2S_SIB0_XF,09_0->F13_SIB0_XF7,09_0 Up
F13_SIB0_XF7,10_0->F2S_SIB0_XF,15_0 Up   F2S_SIB0_XF,15_0->F13_SIB0_XF7,10_0 Up
F13_SIB0_XF7,11_0->F2S_SIB0_XF,11_0 Up   F2S_SIB0_XF,11_0->F13_SIB0_XF7,11_0 Up
F13_SIB0_XF7,12_0->F2S_SIB1_XF,13_0 Up   F2S_SIB1_XF,13_0->F13_SIB0_XF7,12_0 Up
F13_SIB0_XF7,13_0->F2S_SIB1_XF,09_0 Up   F2S_SIB1_XF,09_0->F13_SIB0_XF7,13_0 Up
F13_SIB0_XF7,14_0->F2S_SIB1_XF,15_0 Up   F2S_SIB1_XF,15_0->F13_SIB0_XF7,14_0 Up
F13_SIB0_XF7,15_0->F2S_SIB1_XF,11_0 Up   F2S_SIB1_XF,11_0->F13_SIB0_XF7,15_0 Up

...

```

show chassis fabric topology (PTX Series)

```

user@host> show chassis fabric topology
In-link  : FPC# FE# TQ# (TQ-TX sub-chnl #) ->
           SIB# TF#_FCORE# (TF-RX port#, TF-RX sub-chn#, TF-RX inst#)

```

Packet Transport Routers)

Out-link : SIB# TF#_FCORE# (TF-TX port#, TF-TX sub-chn#, TF-TX inst#) ->
FPC# FE# TQ# (TQ-RX sub-chnl #)

(6, 4, 06) in FPC02FE0TQ0(02)->S01F0_0(6,4,06) will be TF Rx Port 6, TF CCL Rx Sub-Channel 4, TF CCL Rx Instance 6.

(2, 7, 10) in S01F0_0(2,7,10)->FPC02FE0TQ0(02) will be TF-Tx Port 2, TF CCL Tx Sub-channel 7, TF CCL Tx Instance 10.

SIB 0 FCHIP 0 FCORE 0 :

In-links	State	Out-links	State
FPC00FE0TQ0(00)->S00F0_0(7,4,07)	OK	S00F0_0(3,7,11)->FPC00FE0TQ0(00)	OK
FPC00FE1TQ1(00)->S00F0_0(7,6,07)	OK	S00F0_0(3,5,11)->FPC00FE1TQ1(00)	OK
FPC00FE2TQ2(00)->S00F0_0(7,5,07)	OK	S00F0_0(3,6,11)->FPC00FE2TQ2(00)	OK
FPC00FE3TQ3(00)->S00F0_0(7,7,07)	OK	S00F0_0(3,4,11)->FPC00FE3TQ3(00)	OK
FPC01FE0TQ0(00)->S00F0_0(7,0,07)	OK	S00F0_0(3,3,11)->FPC01FE0TQ0(00)	OK
FPC01FE1TQ1(00)->S00F0_0(7,1,07)	OK	S00F0_0(3,1,11)->FPC01FE1TQ1(00)	OK
FPC01FE2TQ2(00)->S00F0_0(7,2,07)	OK	S00F0_0(3,2,11)->FPC01FE2TQ2(00)	Error
FPC01FE3TQ3(00)->S00F0_0(7,3,07)	OK	S00F0_0(3,0,11)->FPC01FE3TQ3(00)	OK
FPC02FE0TQ0(00)->S00F0_0(6,4,06)	OK	S00F0_0(2,7,10)->FPC02FE0TQ0(00)	OK
FPC02FE1TQ1(00)->S00F0_0(6,5,06)	OK	S00F0_0(2,5,10)->FPC02FE1TQ1(00)	OK
FPC02FE2TQ2(00)->S00F0_0(6,6,06)	OK	S00F0_0(2,6,10)->FPC02FE2TQ2(00)	OK
FPC02FE3TQ3(00)->S00F0_0(6,7,06)	OK	S00F0_0(2,4,10)->FPC02FE3TQ3(00)	OK
FPC03FE0TQ0(00)->S00F0_0(6,0,06)	Down	S00F0_0(2,3,10)->FPC03FE0TQ0(00)	Down
FPC03FE1TQ1(00)->S00F0_0(6,1,06)	Down	S00F0_0(2,0,10)->FPC03FE1TQ1(00)	Down
FPC03FE2TQ2(00)->S00F0_0(6,2,06)	Down	S00F0_0(2,2,10)->FPC03FE2TQ2(00)	Down
FPC03FE3TQ3(00)->S00F0_0(6,3,06)	Down	S00F0_0(2,1,10)->FPC03FE3TQ3(00)	Down
FPC04FE0TQ0(00)->S00F0_0(5,4,05)	OK	S00F0_0(1,7,09)->FPC04FE0TQ0(00)	OK
FPC04FE1TQ1(00)->S00F0_0(5,5,05)	OK	S00F0_0(1,6,09)->FPC04FE1TQ1(00)	OK
FPC04FE2TQ2(00)->S00F0_0(5,6,05)	OK	S00F0_0(1,4,09)->FPC04FE2TQ2(00)	OK
FPC04FE3TQ3(00)->S00F0_0(5,7,05)	OK	S00F0_0(1,5,09)->FPC04FE3TQ3(00)	OK
FPC05FE0TQ0(00)->S00F0_0(5,0,05)	OK	S00F0_0(1,3,09)->FPC05FE0TQ0(00)	OK
FPC05FE1TQ1(00)->S00F0_0(5,1,05)	OK	S00F0_0(1,0,09)->FPC05FE1TQ1(00)	OK
FPC05FE2TQ2(00)->S00F0_0(5,2,05)	OK	S00F0_0(1,2,09)->FPC05FE2TQ2(00)	OK
FPC05FE3TQ3(00)->S00F0_0(5,3,05)	OK	S00F0_0(1,1,09)->FPC05FE3TQ3(00)	OK
FPC06FE0TQ0(00)->S00F0_0(4,4,04)	Down	S00F0_0(0,7,08)->FPC06FE0TQ0(00)	Down
FPC06FE1TQ1(00)->S00F0_0(4,5,04)	Down	S00F0_0(0,5,08)->FPC06FE1TQ1(00)	Down
FPC06FE2TQ2(00)->S00F0_0(4,6,04)	Down	S00F0_0(0,6,08)->FPC06FE2TQ2(00)	Down
FPC06FE3TQ3(00)->S00F0_0(4,7,04)	Down	S00F0_0(0,4,08)->FPC06FE3TQ3(00)	Down
FPC07FE0TQ0(00)->S00F0_0(4,2,04)	Down	S00F0_0(0,3,08)->FPC07FE0TQ0(00)	Down
FPC07FE1TQ1(00)->S00F0_0(4,0,04)	Down	S00F0_0(0,0,08)->FPC07FE1TQ1(00)	Down
FPC07FE2TQ2(00)->S00F0_0(4,1,04)	Down	S00F0_0(0,1,08)->FPC07FE2TQ2(00)	Down
FPC07FE3TQ3(00)->S00F0_0(4,3,04)	Down	S00F0_0(0,2,08)->FPC07FE3TQ3(00)	Down

SIB 0 FCHIP 0 FCORE 1 :

In-links	State	Out-links	State
FPC00FE0TQ0(01)->S00F0_1(3,4,11)	OK	S00F0_1(7,6,07)->FPC00FE0TQ0(01)	OK
FPC00FE1TQ1(01)->S00F0_1(3,5,11)	OK	S00F0_1(7,4,07)->FPC00FE1TQ1(01)	OK
FPC00FE2TQ2(01)->S00F0_1(3,6,11)	OK	S00F0_1(7,7,07)->FPC00FE2TQ2(01)	OK
FPC00FE3TQ3(01)->S00F0_1(3,7,11)	OK	S00F0_1(7,5,07)->FPC00FE3TQ3(01)	OK
FPC01FE0TQ0(01)->S00F0_1(3,0,11)	OK	S00F0_1(7,2,07)->FPC01FE0TQ0(01)	OK
FPC01FE1TQ1(01)->S00F0_1(3,1,11)	OK	S00F0_1(7,0,07)->FPC01FE1TQ1(01)	OK
FPC01FE2TQ2(01)->S00F0_1(3,2,11)	OK	S00F0_1(7,3,07)->FPC01FE2TQ2(01)	OK
FPC01FE3TQ3(01)->S00F0_1(3,3,11)	OK	S00F0_1(7,1,07)->FPC01FE3TQ3(01)	OK
FPC02FE0TQ0(01)->S00F0_1(2,4,10)	OK	S00F0_1(6,5,06)->FPC02FE0TQ0(01)	OK
FPC02FE1TQ1(01)->S00F0_1(2,5,10)	OK	S00F0_1(6,4,06)->FPC02FE1TQ1(01)	OK
FPC02FE2TQ2(01)->S00F0_1(2,6,10)	OK	S00F0_1(6,7,06)->FPC02FE2TQ2(01)	OK
FPC02FE3TQ3(01)->S00F0_1(2,7,10)	OK	S00F0_1(6,6,06)->FPC02FE3TQ3(01)	OK
FPC03FE0TQ0(01)->S00F0_1(2,0,10)	Down	S00F0_1(6,1,06)->FPC03FE0TQ0(01)	Down

```

FPC03FE1TQ1(01)->S00F0_1(2,1,10) Down    S00F0_1(6,0,06)->FPC03FE1TQ1(01) Down
FPC03FE2TQ2(01)->S00F0_1(2,2,10) Down    S00F0_1(6,3,06)->FPC03FE2TQ2(01) Down
FPC03FE3TQ3(01)->S00F0_1(2,3,10) Down    S00F0_1(6,2,06)->FPC03FE3TQ3(01) Down
FPC04FE0TQ0(01)->S00F0_1(1,4,09) OK       S00F0_1(5,5,05)->FPC04FE0TQ0(01) OK
FPC04FE1TQ1(01)->S00F0_1(1,5,09) OK       S00F0_1(5,4,05)->FPC04FE1TQ1(01) OK
FPC04FE2TQ2(01)->S00F0_1(1,6,09) OK       S00F0_1(5,7,05)->FPC04FE2TQ2(01) OK
FPC04FE3TQ3(01)->S00F0_1(1,7,09) OK       S00F0_1(5,6,05)->FPC04FE3TQ3(01) OK
FPC05FE0TQ0(01)->S00F0_1(1,0,09) OK       S00F0_1(5,1,05)->FPC05FE0TQ0(01) OK
FPC05FE1TQ1(01)->S00F0_1(1,1,09) OK       S00F0_1(5,0,05)->FPC05FE1TQ1(01) OK
FPC05FE2TQ2(01)->S00F0_1(1,2,09) OK       S00F0_1(5,3,05)->FPC05FE2TQ2(01) OK
FPC05FE3TQ3(01)->S00F0_1(1,3,09) OK       S00F0_1(5,2,05)->FPC05FE3TQ3(01) OK
FPC06FE0TQ0(01)->S00F0_1(0,4,08) Down    S00F0_1(4,7,04)->FPC06FE0TQ0(01) Down
FPC06FE1TQ1(01)->S00F0_1(0,5,08) Down    S00F0_1(4,0,04)->FPC06FE1TQ1(01) Down
FPC06FE2TQ2(01)->S00F0_1(0,6,08) Down    S00F0_1(4,6,04)->FPC06FE2TQ2(01) Down
FPC06FE3TQ3(01)->S00F0_1(0,7,08) Down    S00F0_1(4,1,04)->FPC06FE3TQ3(01) Down
FPC07FE0TQ0(01)->S00F0_1(0,0,08) Down    S00F0_1(4,3,04)->FPC07FE0TQ0(01) Down
FPC07FE1TQ1(01)->S00F0_1(0,1,08) Down    S00F0_1(4,4,04)->FPC07FE1TQ1(01) Down
FPC07FE2TQ2(01)->S00F0_1(0,2,08) Down    S00F0_1(4,2,04)->FPC07FE2TQ2(01) Down
FPC07FE3TQ3(01)->S00F0_1(0,3,08) Down    S00F0_1(4,5,04)->FPC07FE3TQ3(01) Down

```

SIB 1 FCHIP 0 FCORE 0 :

In-links	State	Out-links	State
FPC00FE0TQ0(02)->S01F0_0(7,4,07)	Error	S01F0_0(3,7,11)->FPC00FE0TQ0(02)	Down
FPC00FE1TQ1(02)->S01F0_0(7,6,07)	OK	S01F0_0(3,5,11)->FPC00FE1TQ1(02)	OK
FPC00FE2TQ2(02)->S01F0_0(7,5,07)	OK	S01F0_0(3,6,11)->FPC00FE2TQ2(02)	OK
FPC00FE3TQ3(02)->S01F0_0(7,7,07)	OK	S01F0_0(3,4,11)->FPC00FE3TQ3(02)	OK
FPC01FE0TQ0(02)->S01F0_0(7,0,07)	OK	S01F0_0(3,3,11)->FPC01FE0TQ0(02)	OK
FPC01FE1TQ1(02)->S01F0_0(7,1,07)	OK	S01F0_0(3,1,11)->FPC01FE1TQ1(02)	OK
FPC01FE2TQ2(02)->S01F0_0(7,2,07)	OK	S01F0_0(3,2,11)->FPC01FE2TQ2(02)	OK
FPC01FE3TQ3(02)->S01F0_0(7,3,07)	OK	S01F0_0(3,0,11)->FPC01FE3TQ3(02)	OK
FPC02FE0TQ0(02)->S01F0_0(6,4,06)	OK	S01F0_0(2,7,10)->FPC02FE0TQ0(02)	OK
FPC02FE1TQ1(02)->S01F0_0(6,5,06)	OK	S01F0_0(2,5,10)->FPC02FE1TQ1(02)	OK
FPC02FE2TQ2(02)->S01F0_0(6,6,06)	OK	S01F0_0(2,6,10)->FPC02FE2TQ2(02)	OK
FPC02FE3TQ3(02)->S01F0_0(6,7,06)	OK	S01F0_0(2,4,10)->FPC02FE3TQ3(02)	OK
FPC03FE0TQ0(02)->S01F0_0(6,0,06)	Down	S01F0_0(2,3,10)->FPC03FE0TQ0(02)	Down
FPC03FE1TQ1(02)->S01F0_0(6,1,06)	Down	S01F0_0(2,0,10)->FPC03FE1TQ1(02)	Down
FPC03FE2TQ2(02)->S01F0_0(6,2,06)	Down	S01F0_0(2,2,10)->FPC03FE2TQ2(02)	Down
FPC03FE3TQ3(02)->S01F0_0(6,3,06)	Down	S01F0_0(2,1,10)->FPC03FE3TQ3(02)	Down
FPC04FE0TQ0(02)->S01F0_0(5,4,05)	OK	S01F0_0(1,7,09)->FPC04FE0TQ0(02)	OK
FPC04FE1TQ1(02)->S01F0_0(5,5,05)	OK	S01F0_0(1,6,09)->FPC04FE1TQ1(02)	OK
FPC04FE2TQ2(02)->S01F0_0(5,6,05)	OK	S01F0_0(1,4,09)->FPC04FE2TQ2(02)	OK
FPC04FE3TQ3(02)->S01F0_0(5,7,05)	OK	S01F0_0(1,5,09)->FPC04FE3TQ3(02)	OK
FPC05FE0TQ0(02)->S01F0_0(5,0,05)	OK	S01F0_0(1,3,09)->FPC05FE0TQ0(02)	OK
FPC05FE1TQ1(02)->S01F0_0(5,1,05)	OK	S01F0_0(1,0,09)->FPC05FE1TQ1(02)	OK
FPC05FE2TQ2(02)->S01F0_0(5,2,05)	OK	S01F0_0(1,2,09)->FPC05FE2TQ2(02)	OK
FPC05FE3TQ3(02)->S01F0_0(5,3,05)	OK	S01F0_0(1,1,09)->FPC05FE3TQ3(02)	OK
FPC06FE0TQ0(02)->S01F0_0(4,4,04)	Down	S01F0_0(0,7,08)->FPC06FE0TQ0(02)	Down
FPC06FE1TQ1(02)->S01F0_0(4,5,04)	Down	S01F0_0(0,5,08)->FPC06FE1TQ1(02)	Down
FPC06FE2TQ2(02)->S01F0_0(4,6,04)	Down	S01F0_0(0,6,08)->FPC06FE2TQ2(02)	Down
FPC06FE3TQ3(02)->S01F0_0(4,7,04)	Down	S01F0_0(0,4,08)->FPC06FE3TQ3(02)	Down
FPC07FE0TQ0(02)->S01F0_0(4,2,04)	Down	S01F0_0(0,3,08)->FPC07FE0TQ0(02)	Down
FPC07FE1TQ1(02)->S01F0_0(4,0,04)	Down	S01F0_0(0,0,08)->FPC07FE1TQ1(02)	Down
FPC07FE2TQ2(02)->S01F0_0(4,1,04)	Down	S01F0_0(0,1,08)->FPC07FE2TQ2(02)	Down
FPC07FE3TQ3(02)->S01F0_0(4,3,04)	Down	S01F0_0(0,2,08)->FPC07FE3TQ3(02)	Down

SIB 1 FCHIP 0 FCORE 1 :

In-links	State	Out-links	State
----------	-------	-----------	-------

FPC00FE0TQ0(03)->S01F0_1(3,4,11)	OK	S01F0_1(7,6,07)->FPC00FE0TQ0(03)	OK
FPC00FE1TQ1(03)->S01F0_1(3,5,11)	OK	S01F0_1(7,4,07)->FPC00FE1TQ1(03)	OK
FPC00FE2TQ2(03)->S01F0_1(3,6,11)	OK	S01F0_1(7,7,07)->FPC00FE2TQ2(03)	OK
FPC00FE3TQ3(03)->S01F0_1(3,7,11)	OK	S01F0_1(7,5,07)->FPC00FE3TQ3(03)	OK
FPC01FE0TQ0(03)->S01F0_1(3,0,11)	OK	S01F0_1(7,2,07)->FPC01FE0TQ0(03)	OK
FPC01FE1TQ1(03)->S01F0_1(3,1,11)	OK	S01F0_1(7,0,07)->FPC01FE1TQ1(03)	OK
FPC01FE2TQ2(03)->S01F0_1(3,2,11)	OK	S01F0_1(7,3,07)->FPC01FE2TQ2(03)	OK
FPC01FE3TQ3(03)->S01F0_1(3,3,11)	OK	S01F0_1(7,1,07)->FPC01FE3TQ3(03)	OK
FPC02FE0TQ0(03)->S01F0_1(2,4,10)	OK	S01F0_1(6,5,06)->FPC02FE0TQ0(03)	OK
FPC02FE1TQ1(03)->S01F0_1(2,5,10)	OK	S01F0_1(6,4,06)->FPC02FE1TQ1(03)	OK
FPC02FE2TQ2(03)->S01F0_1(2,6,10)	OK	S01F0_1(6,7,06)->FPC02FE2TQ2(03)	OK
FPC02FE3TQ3(03)->S01F0_1(2,7,10)	OK	S01F0_1(6,6,06)->FPC02FE3TQ3(03)	OK
FPC03FE0TQ0(03)->S01F0_1(2,0,10)	Down	S01F0_1(6,1,06)->FPC03FE0TQ0(03)	Down
FPC03FE1TQ1(03)->S01F0_1(2,1,10)	Down	S01F0_1(6,0,06)->FPC03FE1TQ1(03)	Down
FPC03FE2TQ2(03)->S01F0_1(2,2,10)	Down	S01F0_1(6,3,06)->FPC03FE2TQ2(03)	Down
FPC03FE3TQ3(03)->S01F0_1(2,3,10)	Down	S01F0_1(6,2,06)->FPC03FE3TQ3(03)	Down
FPC04FE0TQ0(03)->S01F0_1(1,4,09)	OK	S01F0_1(5,5,05)->FPC04FE0TQ0(03)	OK
FPC04FE1TQ1(03)->S01F0_1(1,5,09)	OK	S01F0_1(5,4,05)->FPC04FE1TQ1(03)	OK
FPC04FE2TQ2(03)->S01F0_1(1,6,09)	OK	S01F0_1(5,7,05)->FPC04FE2TQ2(03)	OK
FPC04FE3TQ3(03)->S01F0_1(1,7,09)	OK	S01F0_1(5,6,05)->FPC04FE3TQ3(03)	OK
FPC05FE0TQ0(03)->S01F0_1(1,0,09)	OK	S01F0_1(5,1,05)->FPC05FE0TQ0(03)	OK
FPC05FE1TQ1(03)->S01F0_1(1,1,09)	OK	S01F0_1(5,0,05)->FPC05FE1TQ1(03)	OK
FPC05FE2TQ2(03)->S01F0_1(1,2,09)	OK	S01F0_1(5,3,05)->FPC05FE2TQ2(03)	OK
FPC05FE3TQ3(03)->S01F0_1(1,3,09)	OK	S01F0_1(5,2,05)->FPC05FE3TQ3(03)	OK
FPC06FE0TQ0(03)->S01F0_1(0,4,08)	Down	S01F0_1(4,7,04)->FPC06FE0TQ0(03)	Down
FPC06FE1TQ1(03)->S01F0_1(0,5,08)	Down	S01F0_1(4,0,04)->FPC06FE1TQ1(03)	Down
FPC06FE2TQ2(03)->S01F0_1(0,6,08)	Down	S01F0_1(4,6,04)->FPC06FE2TQ2(03)	Down
FPC06FE3TQ3(03)->S01F0_1(0,7,08)	Down	S01F0_1(4,1,04)->FPC06FE3TQ3(03)	Down
FPC07FE0TQ0(03)->S01F0_1(0,0,08)	Down	S01F0_1(4,3,04)->FPC07FE0TQ0(03)	Down
FPC07FE1TQ1(03)->S01F0_1(0,1,08)	Down	S01F0_1(4,4,04)->FPC07FE1TQ1(03)	Down
FPC07FE2TQ2(03)->S01F0_1(0,2,08)	Down	S01F0_1(4,2,04)->FPC07FE2TQ2(03)	Down
FPC07FE3TQ3(03)->S01F0_1(0,3,08)	Down	S01F0_1(4,5,04)->FPC07FE3TQ3(03)	Down

show chassis fabric degraded-fabric-reachability

Syntax	show chassis fabric degraded-fabric-reachability
Release Information	Command introduced in Junos OS Release 12.1X48R4 for PTX Series Packet Transport Routers.
Description	Display the current state of reachability between the Packet Forwarding Engines in the system.
Additional Information	
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show chassis fabric errors on page 814 • show chassis fabric reachability on page 927 • <i>degraded</i>
List of Sample Output	show chassis fabric degraded-fabric-reachability on page 968
Output Fields	Table 66 on page 967 lists the output fields for the show chassis fabric degraded-fabric-reachability command. Output fields are listed in the approximate order in which they appear.

Table 66: show chassis fabric degraded-fabric-reachability Output Fields

Field Name	Field Description
FPC	Display fabric reachability for the displayed FPC slot.
PFE	Display fabric reachability for the displayed PFE slot on a per SIB and plane basis.
SIBx_Plane y	Display the SIB (x) and plane (y) where link errors occurred.
Link errors FPC/PFEs	Display the list of FPC and PFE slots that are unreachable for the displayed SIB and plane due to link errors.

Sample Output

`show chassis fabric
degraded-fabric-reachability`

```
user@host> show chassis fabric degraded-fabric-reachability
Degraded Fabric reachability Information:
FPC #0
  PFE #0
    SIB0_Plane 0
      Link errors  FPC/PFEs    2/0 5/0 5/1 5/2 5/3
    SIB0_Plane 1
      Link errors  FPC/PFEs    2/0 5/0
  PFE #1
    SIB0_Plane 0
      Link errors  FPC/PFEs    2/0 5/0 5/1 5/2 5/3
    SIB0_Plane 1
      Link errors  FPC/PFEs    2/0 5/0
```


show chassis fabric unreachable-destinations

Syntax	show chassis fabric unreachable-destinations
Release Information	Command introduced before Junos OS Release 11.4. Command introduced in Junos OS Release 12.1 for MX240, MX840, and MX960 routers. Command introduced in Junos OS Release 12.1X48R4 for PTX Series Packet Transport Routers.
Description	(M320, MX240, MX480, MX960, and T Series routers only) Display the list of destinations that have transitioned from a reachable state to an unreachable state.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show chassis fabric reachability on page 927
List of Sample Output	show chassis fabric unreachable-destinations on page 970
Output Fields	The table lists the output fields for the show chassis fabric unreachable-destinations command. Output fields are listed in the approximate order in which they appear.

Table 67: show chassis fabric unreachable-destinations Output Fields

Field Name	Field Description
Flexible PIC Concentrator (FPC) number	Source FPC number where unreachable destinations are present.
Packet Forwarding Engine number	Source Packet Forwarding Engine number where unreachable destinations are present.
Destination error on Packet Forwarding Engine	List of destination FPCs <i>FPC number</i> /Packet Forwarding Engines <i>Packet Forwarding Engine number</i> that are not reachable from the source FPCs <i>FPC number</i> /Packet Forwarding Engines <i>Packet Forwarding Engine number</i> over the fabric.

Sample Output

`show chassis fabric
unreachable-destinations`

```
user@host> show chassis fabric unreachable-destinations
Fabric management unreachable destinations:
FPC 2
  PFE 0
    Destination error on PFEs      2/0 3/0 3/1 7/0
FPC 3
  PFE 0
    Destination error on PFEs      2/0 3/0 3/1 7/0
FPC 3
  PFE 1
    Destination error on PFEs      2/0 3/0 3/1 7/0
FPC 7
  PFE 0
    Destination error on PFEs      2/0 3/0 3/1 7/0
```

show chassis feb

Syntax	show chassis feb
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 12.2 for the ACX Series Universal Access Routers.
Description	(ACX Series routers, and M5, M10, and M120 routers only) Display Forwarding Engine Board (FEB) status information.
Options	This command has no options.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • request chassis feb on page 447 • show chassis fabric feb on page 813 • show chassis fpc-feb-connectivity on page 1018 • <i>feb</i> • <i>Switching Control Board Redundancy</i>
List of Sample Output	show chassis feb (M10 Router) on page 973 show chassis feb (M120 Router) on page 973 show chassis feb detail (M120 Router) on page 973 show chassis feb detail (ACX2000 Universal Access Router) on page 974 show chassis feb detail (ACX1000 Universal Access Router) on page 974
Output Fields	Table 68 on page 971 lists the output fields for the show chassis feb command. Output fields are listed in the approximate order in which they appear.

Table 68: show chassis feb

Field Name	Field Description
State	State of the FEB: <ul style="list-style-type: none"> • Offline—FEB is powered down. • Online—FEB is operational and running. • Check—FEB is in alarmed state where the Switch Interface Board (SIB) plane is partially operational for the following reasons: <ul style="list-style-type: none"> • FEB is not inserted properly. • Two or more links between the FEB and Packet Forwarding Engine fail.
Temp (C) or Intake temperature	Temperature of the air passing by the FEB, in degrees Celsius or in both degrees Celsius and degrees Fahrenheit.

Table 68: show chassis feb (*continued*)

Field Name	Field Description
CPU Utilization (%)	Percentage of CPU being used: <ul style="list-style-type: none"> • Total—Total percentage of CPU being used by the FEB processor. • Interrupt—Of the total CPU being used by the FEB processor, the percentage being used for interrupts.
Memory DRAM (MB)	Total DRAM, in megabytes, available to the FEB processor.
Utilization (%)	Percentage of memory utilization: <ul style="list-style-type: none"> • Heap—Percentage of heap space (dynamic memory) being used by the FEB processor. If this number exceeds 80 percent, you might experience a software problem (memory leak). • Buffer—Percentage of buffer space being used by the FPC processor for buffering internal messages.
Exhaust A temperature	Temperature of the air flowing past Exhaust A.
Exhaust B temperature	Temperature of the air flowing past Exhaust B.
Total DDR DRAM	Amount of double data rate dynamic random access memory (DDR DRAM) available to the FEB CPU.
Total RLD RAM	Amount of reduced latency dynamic random access memory (RLDRAM) available to the FEB CPU.
Start time (Detail output only)	Time when the Routing Engine detected that the FEB was running.
Uptime (Detail output only)	How long the Routing Engine has been connected to the FEB, and therefore, how long the Flexible PIC Concentrator (PIC) has been up and running.

Sample Output

show chassis feb (M10 Router)

```
user@host> show chassis feb
FEB status:
  Temperature                27 degrees C / 80 degrees F
  CPU utilization              3 percent
  Interrupt utilization        0 percent
  Heap utilization             26 percent
  Buffer utilization            50 percent
  Total CPU DRAM               64 MB
  Internet Processor II        Version 1, Foundry IBM, Part number 9
  Start time:                  2010-05-23 13:59:51 PDT
  Uptime:                       6 hours, 33 minutes, 11 seconds
```

show chassis feb (M120 Router)

```
user@host> show chassis feb
```

Slot	State	Temp (C)	CPU Utilization (%)	Memory Utilization (%)	
			Total	DRAM (MB) Heap Buffer	
0	Online	47	4	0	512 7 60
1	Online	54	3	0	512 7 59
2	Online	50	4	0	512 7 59
3	Online	49	4	0	512 7 59
4	Online	46	3	0	512 7 59
5	Online	35	3	0	512 7 59

show chassis feb detail (M120 Router)

```
user@host> show chassis feb detail
Slot 0 information:
  State                Online
  Intake temperature    48 degrees C / 118 degrees F
  Exhaust A temperature 51 degrees C / 123 degrees F
  Exhaust B temperature 52 degrees C / 125 degrees F
  Total DDR DRAM        512 MB
  Total RLDRAM           32 MB
  Start time:            2006-06-28 15:00:40 PDT
  Uptime:                 10 minutes, 21 seconds
Slot 1 information:
  State                Online
  Intake temperature    55 degrees C / 131 degrees F
  Exhaust A temperature 46 degrees C / 114 degrees F
  Exhaust B temperature 45 degrees C / 113 degrees F
  Total DDR DRAM        512 MB
  Total RLDRAM           32 MB
  Start time:            2006-06-28 15:00:33 PDT
  Uptime:                 10 minutes, 28 seconds
Slot 2 information:
  State                Online
  Intake temperature    50 degrees C / 122 degrees F
  Exhaust A temperature 47 degrees C / 116 degrees F
  Exhaust B temperature 47 degrees C / 116 degrees F
  Total DDR DRAM        512 MB
  Total RLDRAM           32 MB
  Start time:            2006-06-28 15:00:35 PDT
  Uptime:                 10 minutes, 26 seconds
Slot 3 information:
  State                Online
  Intake temperature    49 degrees C / 120 degrees F
  Exhaust A temperature 47 degrees C / 116 degrees F
  Exhaust B temperature 49 degrees C / 120 degrees F
  Total DDR DRAM        512 MB
```

```
Total RLD RAM          32 MB
Start time:            2006-06-28 15:00:43 PDT
Uptime:                10 minutes, 18 seconds
Slot 4 information:
State                  Online
Intake temperature     45 degrees C / 113 degrees F
Exhaust A temperature  42 degrees C / 107 degrees F
Exhaust B temperature  42 degrees C / 107 degrees F
Total DDR DRAM         512 MB
Total RLD RAM          32 MB
Start time:            2006-06-28 15:00:29 PDT
Uptime:                10 minutes, 32 seconds
Slot 5 information:
State                  Online
Intake temperature     35 degrees C / 95 degrees F
Exhaust A temperature  33 degrees C / 91 degrees F
Exhaust B temperature  40 degrees C / 104 degrees F
Total DDR DRAM         512 MB
Total RLD RAM          32 MB
Start time:            2006-06-28 15:00:27 PDT
Uptime:                10 minutes, 34 seconds
```

**show chassis feb detail
(ACX2000 Universal
Access Router)**

```
user@host> show chassis feb
FEB status:
Slot 0 information:
State                  Online
Temperature            72 degrees C / 161 degrees F
CPU utilization         17 percent
Interrupt utilization   7 percent
Heap utilization        20 percent
Buffer utilization      37 percent
Total CPU DRAM         512 MB
Start time:            2012-05-09 00:58:51 PDT
Uptime:                5 days, 21 hours, 6 minutes, 34 seconds
```

**show chassis feb detail
(ACX1000 Universal
Access Router)**

```
user@host> show chassis feb
FEB status:
Slot 0 information:
State                  Online
Temperature            46 degrees C / 114 degrees F
CPU utilization         15 percent
Interrupt utilization   5 percent
Heap utilization        45 percent
Buffer utilization      37 percent
Total CPU DRAM         256 MB
Start time:            2012-06-05 19:51:53 PDT
Uptime:                19 minutes, 6 seconds
```

show chassis firmware

Syntax	show chassis firmware
Syntax (TX Matrix Routers)	show chassis firmware <lcc <i>number</i> | scc>
Syntax (TX Matrix Plus Routers)	show chassis firmware <lcc <i>number</i> | sfc <i>number</i> >
Syntax (MX Series Routers)	show chassis firmware <all-members> <local> <member <i>member-id</i> >
Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers)	show chassis firmware
Syntax (QFX Series)	show chassis firmware interconnect-device <i>name</i> node-device <i>name</i>
Syntax (ACX Series Universal Access Routers)	show chassis firmware
Syntax (EX Series Switches)	show chassis firmware <detail>
Release Information	<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>sfc 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> <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 ACX4000 Universal Access Routers.</p> <p>Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.</p>
Description	<p>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).</p> <p>On EX2200, EX3200, and EX4200 switches, and the QFX Series, display the version levels of the firmware running on the switch. On an EX8208 switch, display the version</p>

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 979](#)
[show chassis firmware \(M20 Router\) on page 979](#)
[show chassis firmware \(M40 Router\) on page 979](#)
[show chassis firmware \(M120 Router\) on page 979](#)
[show chassis firmware \(M160 Router\) on page 979](#)
[show chassis firmware \(MX104 Router\) on page 979](#)
[show chassis firmware \(MX240 Router\) on page 980](#)
[show chassis firmware \(MX480 Router\) on page 980](#)
[show chassis firmware \(MX960 Router\) on page 980](#)
[show chassis firmware \(MX2010 Router\) on page 980](#)
[show chassis firmware \(MX2020 Router\) on page 980](#)
[show chassis firmware \(MX240, MX480, MX960 Router with Application Services Modular Line Card\) on page 981](#)
[show chassis firmware \(EX4200 Switch\) on page 982](#)
[show chassis firmware \(EX8200 Switch\) on page 982](#)
[show chassis firmware lcc \(TX Matrix Router\) on page 982](#)
[show chassis firmware scc \(TX Matrix Router\) on page 982](#)
[show chassis firmware \(TX Matrix Plus Router\) on page 982](#)
[show chassis firmware lcc \(TX Matrix Plus Router\) on page 984](#)
[show chassis firmware sfc \(TX Matrix Plus Router\) on page 984](#)
[show chassis firmware \(QFX Series\) on page 985](#)
[show chassis firmware interconnect-device \(QFabric System\) on page 985](#)
[show chassis firmware \(ACX2000 Universal Access Router\) on page 985](#)
[show chassis firmware detail \(EX3300 Switch\) on page 985](#)
[show chassis firmware \(MX Routers with Media Services Blade \[MSB\]\) on page 985](#)

Output Fields [Table 69 on page 977](#) lists the output fields for the **show chassis firmware** command. Output fields are listed in the approximate order in which they appear.

Table 69: show chassis firmware Output Fields

Field Name	Field Description
Part	(MX Series, MX2010, and MX2020 routers) Chassis part name.
Type	(MX Series, MX2010, and MX2020 routers) Type of firmware: On routers: ROM or O/S . On switches: uboot or loader .
Version	(MX Series, MX2010, and MX2020 routers) Version of firmware running on the chassis part.

Table 69: show chassis firmware Output Fields (*continued*)

Field Name	Field Description
FPC	(<i>detail</i> option only) Number of FPC. For a standalone switch, the value is 0. For a Virtual Chassis configuration, value in the range of 0-9; refers to the member ID assigned to the switch.
AFEB	(MX104 routers) Version of the compact Forwarding Engine Board.
Boot	(<i>detail</i> option only) Version of the SYSPLD.
PoE	(<i>detail</i> option only) Version of the PoE firmware.
PFE-<number>	(<i>detail</i> option only) Version of the PFE used in the switch.
PHY-	(<i>detail</i> option only) Version of the physical layer device (PHY) used in the switch.
microcode	(<i>detail</i> option only) Microcode of the physical layer devices (PHY) used in the switch.
uboot	(<i>detail</i> option only) Version of the u-boot used in the switch.
loader	(<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

```

	AFEB	O/S ROM O/S	Version 13.2-20130514.1 by builder on 2013- Juniper ROM Monitor Version 13.1b24 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 O/S	Juniper ROM Monitor Version 8.3b1 Version 9.0-20080103.0 by builder on 2008-0
	FPC 2	ROM O/S	Juniper ROM Monitor Version 8.3b1 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 O/S	Juniper ROM Monitor Version 8.3b1 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 O/S	Juniper ROM Monitor Version 8.0b8 Version 8.2I59 by artem on 2006-10-31 19:22
	FPC 7	ROM O/S	Juniper ROM Monitor Version 8.2b1 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 O/S	Juniper ROM Monitor Version 12.3b1 Version 12.3-20121220.0 by builder on 2012-
	FPC 1	ROM O/S	Juniper ROM Monitor Version 10.1b3 Version 12.3-20121220.0 by builder on 2012-
	FPC 2	ROM O/S	Juniper ROM Monitor Version 10.1b3 Version 12.3-20121220.0 by builder on 2012-
	FPC 3	ROM O/S	Juniper ROM Monitor Version 10.1b3 Version 12.3-20121220.0 by builder on 2012-
	FPC 4	ROM O/S	Juniper ROM Monitor Version 10.0b39 Version 12.3-20121220.0 by builder on 2012-
	FPC 5	ROM O/S	Juniper ROM Monitor Version 10.0b39 Version 12.3-20121220.0 by builder on 2012-
	FPC 6	ROM O/S	Juniper ROM Monitor Version 10.4b1 Version 12.3-20121220.0 by builder on 2012-
	FPC 7	ROM O/S	Juniper ROM Monitor Version 10.1b3 Version 12.3-20121220.0 by builder on 2012-
	FPC 8	ROM O/S	Juniper ROM Monitor Version 10.4b1 Version 12.3-20121220.0 by builder on 2012-
	FPC 9	ROM O/S	Juniper ROM Monitor Version 10.4b1 Version 12.3-20121220.0 by builder on 2012-
	SPMB 0	ROM O/S	Juniper ROM Monitor Version 12.1b1 Version 12.3-20121220.0 by builder on 2012-
	SPMB 1	ROM O/S	Juniper ROM Monitor Version 12.1b1 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 O/S	Juniper ROM Monitor Version 10.0b39 Version 12.3-20130415.0 by builder on 2013-
	FPC 1	ROM O/S	Juniper ROM Monitor Version 10.0b39 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

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:

Application Services Modular Line Card

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	U-Boot 1.1.6 (Dec 4 2009 - 13:17:34) 3.1.0
	loader	FreeBSD/PowerPC U-Boot bootstrap loader 2.2
FPC 5	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 7	U-Boot	U-Boot 1.1.6 (Feb 6 2009 - 05:31:46) 2.4.0
	loader	FreeBSD/PowerPC U-Boot bootstrap loader 2.2
Routing Engine 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
Routing Engine 1	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

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)**

```

user@switch> show chassis firmware
Part          Type          Version
FPC 0
Routing Engine 0    U-Boot        U-Boot 1.1.6 (Sep 15 2010 - 02:11:11) 1.0.5
loader         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        U-Boot 1.1.6 (May 10 2011 - 04:52:59) 1.1.1
loader         FreeBSD/MIPS U-Boot bootstrap loader 0.1
Routing Engine 1    U-Boot        U-Boot 1.1.6 (May 10 2011 - 04:52:59) 1.1.1
loader         FreeBSD/MIPS U-Boot bootstrap loader 0.1

```

**show chassis firmware
(ACX2000 Universal
Access Router)**

```

user@switch> show chassis firmware
Part          Type          Version
FPC           0/S          Version 12.2I13 by jisjoy on 2012-05-29 06:
FEB           0/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
              0/S          Version 12.2I21 by manish on 2012-06-19 17:

```

show chassis forwarding

Syntax	show chassis forwarding
Release Information	<p>Current—Command introduced before Junos OS Release 7.4.</p> <p>Now—Command introduced in Junos OS Release 7.4. Support for Branch SRX Series added in Junos OS Release 10.1</p>
Description	Display status of the forwarding process (fwdd). This command is supported on J Series and Branch SRX Series Services Gateways.
Options	This command has no options.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show chassis feb on page 971 • request chassis feb on page 447 • <i>Configuring FEB Redundancy on the M120 Router</i> • <i>CFEB Overview</i>
List of Sample Output	show chassis forwarding on page 987
Output Fields	<p>Table 70 on page 986 lists the output fields for the show chassis forwarding command. Output fields are listed in the approximate order in which they appear.</p>

Table 70: show chassis forwarding Output Fields

Field Name	Field Description
FWWD status	<p>Forwarding status:</p> <ul style="list-style-type: none"> • State: <ul style="list-style-type: none"> • Online—FWDD is operational and running. • Offline—FWDD is not running. • Microkernel CPU utilization—Percentage of microkernel CPU being used by the forwarding process. • Real-time threads CPU utilization—Percentage of CPU being used by the forwarding process. • Heap utilization—Percentage of heap space (dynamic memory) being used by the forwarding process. If this number exceeds 80 percent, there may be a software problem (memory leak). • Buffer utilization—Percentage of buffer space being used by the forwarding process for buffering internal messages. • Uptime—How long the forwarding process has been up and running.

Sample Output

`show chassis
forwarding`

```
user@host> show chassis forwarding
FWDD status:
  State                               Online
  Microkernel CPU utilization         10 percent
  Real-time threads CPU utilization    4 percent
  Heap utilization                     26 percent
  Buffer utilization                    0 percent
  Uptime:                             1 day, 1 hour, 30 minutes, 11 seconds
```

show chassis fpc

Syntax	show chassis fpc <detail <slot>> | <pic-status <slot>>
Syntax (EX Series Switches)	show chassis fpc <detail <fpc-slot>> | <pic-status <fpc-slot>> <fpc-slot>
Syntax (T4000 Routers)	show chassis fpc <detail <fpc-slot>> <pic-status <fpc-slot>>
Syntax (TX Matrix and TX Matrix Plus Routers)	show chassis fpc <detail <fpc-slot>> | <pic-status <fpc-slot>> <slot>
Syntax (MX Series Routers)	show chassis fpc <detail <slot>> | <pic-status <slot>> <all-members> <local> <member <i>member-id</i> >
Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers)	show chassis fpc <slot> detail | <detail <slot>> | <pic-status <slot>> <fpc-slot>
Syntax (QFX Series)	show chassis fpc <detail> <interconnect-device <i>name</i> <fpc-slot fpc-slot>> <node-device <i>name</i> >
Syntax (PTX Series Packet Transport Routers)	show chassis fpc <detail <fpc-slot>> | <pic-status <fpc-slot>> <fpc-slot>
Syntax (ACX Series Universal Access Routers)	show chassis fpc <detail <fpc-slot>> | <pic-status <fpc-slot>> <fpc-slot>
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 QFX Series. Command introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport 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. Command introduced in Junos OS Release 13.2 for MX04 3D Universal Edge Routers.

Description Display status information about the installed Flexible PIC Concentrators (FPCs) and PICs.

Options **none**—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
```

Utilization (%)	Temp	CPU	Utilization (%)	Memory
Slot State	(C)	Total	Interrupt	DRAM (MB) Heap
Buffer				
0 Empty				
1 Empty				
2 Empty				
3 Empty				
4 Empty				
5 Offline	---	Hard FPC error---		
6 Empty				
7 Online	26	4	0	1024 0
32				

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			
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 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:
 - QFX3500 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 only) (Optional) Display status information for all FPCs on the local Virtual Chassis member.

member member-id—(MX Series routers 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](#).



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 449](#)
 - [show chassis fpc-feb-connectivity on page 1018](#)
 - [show chassis fabric fpcs on page 819](#)
 - [Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online on page 165](#)
 - [MX960 Flexible PIC Concentrator Description](#)
 - [ACX2000 and ACX2100 Routers Hardware and CLI Terminology Mapping](#)
 - [enhanced-mode on page 344](#)

- List of Sample Output**
- [show chassis fpc \(EX6210 Switch\) on page 997](#)
 - [show chassis fpc \(M10 Router\) on page 997](#)
 - [show chassis fpc \(M20 Router\) on page 997](#)
 - [show chassis fpc detail \(M Series Routers\) on page 997](#)
 - [show chassis fpc detail \(MX80 Router\) on page 997](#)
 - [show chassis fpc \(MX104 Router\) on page 998](#)
 - [show chassis fpc detail \(MX104 Router\) on page 998](#)
 - [show chassis fpc pic-status \(MX104 Router\) on page 998](#)

[show chassis fpc \(MX240 Router\) on page 998](#)
[show chassis fpc \(MX480 Router\) on page 998](#)
[show chassis fpc \(MX480 Router with 100-Gigabit Ethernet CFP\) on page 999](#)
[show chassis fpc pic-status \(MX480 Router with 100-Gigabit Ethernet CFP\) on page 999](#)
[show chassis fpc \(MX480 Router with MPC4E\) on page 1000](#)
[show chassis fpc detail \(MX480 Router with MPC4E\) on page 1000](#)
[show chassis fpc \(MX960 Router\) on page 1000](#)
[show chassis fpc \(MX240, MX480, MX960 Routers with Application Services Modular Line Card\) on page 1001](#)
[show chassis fpc \(MX240, MX480, MX960 with Application Services Modular Line Card\) on page 1001](#)
[show chassis fpc \(MX2010 Routers\) on page 1002](#)
[show chassis fpc \(MX2020 Routers\) on page 1002](#)
[show chassis fpc \(MX2020 Router with MPC4E\) on page 1002](#)
[show chassis fpc detail \(MX2020 Router with MPC4E\) on page 1003](#)
[show chassis fpc detail \(MX Series Routers\) on page 1003](#)
[show chassis fpc \(Hardware Not Supported\) on page 1004](#)
[show chassis fpc detail \(Hardware Not Supported\) on page 1004](#)
[show chassis fpc pic-status on page 1004](#)
[show chassis fpc pic-status \(M Series Routers\) on page 1004](#)
[show chassis fpc pic-status \(M120 Router\) on page 1005](#)
[show chassis fpc pic-status \(MX240, MX480, and MX960 Routers with Application Services Modular Line Card\) on page 1005](#)
[show chassis fpc lcc \(TX Matrix Router\) on page 1006](#)
[show chassis fpc pic-status \(TX Matrix Router\) on page 1006](#)
[show chassis fpc pic-status lcc \(TX Matrix Router\) on page 1006](#)
[show chassis fpc \(TX Matrix Plus Router\) on page 1007](#)
[show chassis fpc lcc \(TX Matrix Plus Router\) on page 1007](#)
[show chassis fpc detail \(TX Matrix Plus Router\) on page 1007](#)
[show chassis fpc pic-status \(TX Matrix Plus Router\) on page 1010](#)
[show chassis fpc \(T1600 Router\) on page 1011](#)
[show chassis fpc detail \(T1600 Router\) on page 1011](#)
[show chassis fpc slot \(T1600 Router\) on page 1011](#)
[show chassis fpc pic-status \(T1600 Router\) on page 1012](#)
[show chassis fpc \(T4000 Router\) on page 1012](#)
[show chassis fpc detail \(T4000 Router\) on page 1012](#)
[show chassis fpc pic-status \(T4000 Router\) on page 1013](#)
[show chassis fpc \(QFX Series\) on page 1013](#)
[show chassis fpc detail \(QFX3500 Switches\) on page 1013](#)
[show chassis fpc pic-status \(QFX3500 Switches\) on page 1013](#)
[show chassis fpc interconnect-device \(QFabric System\) on page 1013](#)
[show chassis fpc interconnect-device \(QFabric System\) on page 1014](#)
[show chassis fpc interconnect-device detail \(QFabric System\) on page 1014](#)
[show chassis fpc pic-status interconnect-device \(QFabric System\) on page 1014](#)
[show chassis fpc pic-status node-device \(QFabric System\) on page 1015](#)
[show chassis fpc \(PTX5000 Packet Transport Router\) on page 1015](#)
[show chassis fpc detail \(PTX5000 Packet Transport Router\) on page 1015](#)
[show chassis fpc pic-status \(PTX5000 Packet Transport Router\) on page 1016](#)
[show chassis fpc \(ACX2000 Universal Access Router\) on page 1017](#)

[show chassis fpc 0 \(ACX2000 Universal Access Router\) on page 1017](#)
[show chassis fpc detail \(ACX2000 Universal Access Router\) on page 1017](#)
[show chassis fpc pic-status \(ACX2000 Universal Access Router\) on page 1017](#)
[show chassis FPC 1 \(MX Routers with Media Services Blade \[MSB\]\) on page 1017](#)
[show chassis FPC 1 detail \(MX Routers with Media Services Blade \[MSB\]\) on page 1017](#)

Output Fields Table 71 on page 995 lists the output fields for the **show chassis fpc** command. Output fields are listed in the approximate order in which they appear.

Table 71: show chassis fpc Output Fields

Field Name	Field Description	Level of Output
Slot or Slot State	Slot number and state. The state can be one of the following conditions: <ul style="list-style-type: none"> • Dead—Held in reset because of errors. • Diag—Slot is being ignored while the FPC is running diagnostics. • Dormant—Held in reset. • Empty—No FPC is present. • Offline—(PTX Series Packet Transport Routers only) One of the following two states is displayed: <ul style="list-style-type: none"> • FPC offlined due to unreachable destinations • FPC Offlined due to degraded FPC action • Online—FPC is online and running. • Present—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 Hardware Not Supported or Hardware Not In Right Slot. The FPC is coming up but not yet online. • Probed—Probe is complete; awaiting restart of the Packet Forwarding Engine. • Probe-wait—Waiting to be probed. 	all levels
Logical slot	Slot number.	all levels
Temp (C) or Temperature	Temperature of the air passing by the FPC, in degrees Celsius or in both Celsius and Fahrenheit.	all levels all levels
Temperature (PTX Series)	On PTX Series Packet Transport Routers, temperature details are provided in degrees Celsius and Fahrenheit. Output includes: <ul style="list-style-type: none"> • Temperature (PMB)—Temperature of the air passing by the Processor Mezzanine Board (PMB) at the bottom of the FPC. • Temperature (Intake)—Temperature of the air flowing into the chassis. • Temperature (Exhaust)—Exhaust temperatures for multiple zones (Exhaust A and Exhaust B). • Temperature (TLn)—Temperature of the specified Lookup ASIC (TL) of the packet forwarding engine on the FPC. • Temperature (TQn)—Temperature of the specified Queuing and Memory Interface ASIC (TQ) of the packet forwarding engine on the FPC. 	detail
Total CPU Utilization (%)	Total percentage of CPU being used by the FPC's processor.	all levels

Table 71: show chassis fpc Output Fields (*continued*)

Field Name	Field Description	Level of Output
Interrupt CPU Utilization (%)	Of the total CPU being used by the FPC's processor, the percentage being used for interrupts.	none specified
Memory DRAM (MB)	Total DRAM, in megabytes, available to the FPC's processor.	none specified
Heap Utilization (%)	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). NOTE: On MX Series routers in a broadband edge environment, heap utilization levels higher than 70 percent can affect unified ISSU, router stability, or scaling capability.	none specified
Buffer Utilization (%)	Percentage of buffer space being used by the FPC's processor for buffering internal messages.	none specified
Total CPU DRAM	Amount of DRAM available to the FPC's CPU.	detail
Total RLDRAM	Amount of reduced latency dynamic random access memory (RLDRAM) available to the FPC CPU.	detail
Total DDR DRAM	Amount of double data rate dynamic random access memory (DDR DRAM) available to the FPC CPU.	detail
Total SRAM	Amount of static RAM (SRAM) used by the FPC's CPU.	detail
Total SDRAM	Total amount of memory used for storing packets and notifications.	detail
I/O Manager ASICs information	I/O Manager version number, manufacturer, and part number.	detail
Start time	Time when the Routing Engine detected that the FPC was running.	detail
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 Total	Utilization (%) 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 Total	Utilization (%) 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
Temp  CPU Utilization (%)  Memory      Utilization (%)
Slot State              (C)  Total  Interrupt  DRAM (MB) Heap      Buffer
0  Empty
1  Online                34     6      0        1024    18       30
2  Online                33     9      0        1024    24       30

```

show chassis fpc (MX480 Router)

```

user@host> show chassis fpc
Temp  CPU Utilization (%)  Memory      Utilization (%)
Slot State              (C)  Total  Interrupt  DRAM (MB) 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 (%) Total	Interrupt	Memory DRAM (MB)	Utilization (%) 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

```
user@host> show chassis fpc pic-status
```

```

Slot 1  Online      MPC Type 3
      PIC 2  Online      1X100GE CFP
Slot 2  Online      DPCE 40x 1GE R EQ

```

100-Gigabit Ethernet CFP)

```

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
(MX480 Router with MPC4E)

```

user@host> show chassis fpc
Temp CPU Utilization (%) Memory Utilization (%)
Slot State (C) Total Interrupt 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 RDRAM 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 RDRAM 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 RDRAM 0 MB
Total DDR DRAM 0 MB
Max Power Consumption 520 Watts

```

show chassis fpc
(MX960 Router)

```

user@host> show chassis fpc
Temp CPU Utilization (%) Memory Utilization (%)
Slot State (C) Total Interrupt DRAM (MB) Heap 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
(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

```
user@host> show chassis fpc 1 detail
Slot 1 information:
  State      Online
  Temperature      34
```

Application Services Modular Line Card

```

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
      Temp CPU Utilization (%) Memory  Utilization (%)
Slot State      (C) Total  Interrupt    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 RLDRAM 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 RLDRAM 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 RLDRAM 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 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 (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							
1	Present							
2	Online	0	0	0	0	0	0	0
3	Present							
4	Empty							
5	Empty							
6	Online	0	0	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)

```

user@host> show chassis fpc pic-status
Slot 1 Online      FPC Type 1
PIC 0 Present      2x OC-3 ATM, MM- Hardware Error

```

Routers)

```

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

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
```

Application Services Modular Line Card)

```
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 (C)	CPU Utilization (%)		Memory 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 (C)	CPU Utilization (%)		Memory 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 (C)	CPU Utilization (%)		Memory DRAM (MB)	Utilization (%)	
			Total	Interrupt		Heap	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> show chassis fpc lcc 0
lcc0-re0:
```

Slot	State	Temp (C)	CPU Utilization (%)		Memory 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	14	0	2048	6	24
7	Online	45	6	0	2048	3	24

**show chassis fpc detail
(TX Matrix Plus
Router)**

```
user@host> 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
```

```
1cc0-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

```

```
1cc2-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

```

```
1cc3-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 (C)	CPU Utilization (%)		Memory 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 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

regress@stymphalian# run show chassis fpc

Slot State      Temp CPU Utilization (%) Memory Utilization (%)
      (C) 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)

```

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
3  Online      (C)
                        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**

```
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+
```

**interconnect-device
(QFabric System)**

```

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 (%)		Memory DRAM (MB)	Utilization (%)	
			Total	Interrupt		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

```

user@host> show chassis fpc detail
Slot 2 information:

```

(PTX5000 Packet Transport Router)

```

State
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
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
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)

```

user@host> show chassis fpc pic-status
Slot 2   Online   FPC
PIC 0   Online   24x 10GE(LAN) SFP+

```


Packet Transport Router)

```

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 Utilization (%)
			Total Interrupt	DRAM (MB) Heap Buffer
0	Online	61	17 6	512 21 37

**show chassis fpc 0
(ACX2000 Universal Access Router)**

```

user@host> show chassis fpc 0

```

Slot	State	Temp (C)	CPU Utilization (%)	Memory Utilization (%)
			Total Interrupt	DRAM (MB) Heap Buffer
0	Online	61	17 6	512 21 37

**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 (C)	CPU Utilization (%)	Memory Utilization (%)
			Total Interrupt	DRAM (MB) 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 fpc-feb-connectivity

Syntax	show chassis fpc-feb-connectivity
Release Information	Command introduced in Junos OS Release 8.0.
Description	(M120 router only) Display the Flexible PIC Concentrator (FPC) and Forwarding Engine Board (FEB) mapping and their respective states.
Options	This command has no options.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • request chassis fpc on page 449 • show chassis fpc on page 988 • show chassis fabric fpcs on page 819 • Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online on page 165 • MX960 Flexible PIC Concentrator Description
List of Sample Output	show chassis fpc-feb-connectivity on page 1019
Output Fields	Table 72 on page 1018 lists the output fields for the show chassis fpc-feb-connectivity command. Output fields are listed in the approximate order in which they appear.

Table 72: show chassis fpc-feb-connectivity Output Fields

Field Name	Field Description
FPC	Slot number of the Flexible PIC Concentrator (FPC).
FPC type	Type of FPC: Type 1 , Type 2 , Type 3 , or cFPC .
FPC state	<p>State of the FPC. State can be any of the following:</p> <ul style="list-style-type: none"> • Announce offline—Intermediate state where FPC is going down but is not offline and the Chassis manager acknowledges that the FPC is in the process of going offline. • Announce online—Intermediate state where FPC is coming up but is not online and the Chassis manager acknowledges that the FPC is in the process of coming online. • Empty—No FPC is present. • Offline—FPC is powered down. • Online—FPC is online and running. • Present—The chassis process has detected the FPC, but the FPC is either not supported by the current version of the Junos OS or FPC is coming up but is not online. • Ready—FPC is in transition state.
Connected FEB	Slot number of the Forwarding Engine Board (FEB) connected to the FPC or None if the FPC is not connected to a FEB.

Table 72: show chassis fpc-feb-connectivity Output Fields (*continued*)

Field Name	Field Description
FEB state	<p>State of the FEB. State can be any of the following:</p> <ul style="list-style-type: none"> • Announce offline—Intermediate state where FEB is going down but is not offline and the Chassis manager acknowledges that the FEB is in the process of going offline. • Announce online—Intermediate state where FEB is coming up but is not online and the Chassis manager acknowledges that the FEB is in the process of coming online. • Empty—No FEB is present. • Offline—FEB is powered down. • Online—FEB is online and running. • Present—The chassis process has detected the FEB, but the FEB is either not supported by the current version of the Junos OS or FEB is coming up but is not online. • Ready—FEB is in transition state.
Link status	<p>Status of the link connecting the R-FEB and R-FPC:</p> <ul style="list-style-type: none"> • Error • Misconfiguration—Configuration between the R-FEB and the F-FPC is incorrect. • OK

Sample Output

show chassis
fpc-feb-connectivity

user@host> show chassis fpc-feb-connectivity

```

FPC  FPC type  FPC state    Connected FEB  FEB state    Link status
0    cFPC      Online      0              Empty
1    cFPC      Online      1              Online       OK
2    Type 3   Online      3              Online       OK
3    Type 2   Online      None
4    Type 1   Online      4              Online       OK
5    Type 3   Online      None

FIFO errors: 0, HS link CRC errors: 0, MTU errors: 0, Resource errors: 0
Egress queues: 8 supported, 8 in use
Queue counters:      Queued packets  Transmitted packets    Dropped packets

  0 best-effort                0                  0                  0
  1 expedited-fo                0                  0                  0
  2 assured-forw                0                  0                  0
  3 network-cont                0                  0                  0

Active alarms  : PLL, LOS, LINK
Active defects : PLL, LOF, LOS, SEF, LOP, BERR-SF, PLM-P, LINK
PCS statistics
  Bit errors          0
  Errored blocks      3
MAC statistics:
  Total octets        0
  Total packets       0
  Receive             0
  Transmit            0

```

show chassis hardware

Syntax	show chassis hardware <detail | extensive> <clei-models> <models>
Syntax (EX Series)	show chassis hardware <clei-models> <detail | extensive> <models>
Syntax (T4000 Router)	show chassis hardware <clei-models> <detail | extensive> <models>
Syntax (TX Matrix Router)	show chassis hardware <clei-models> <detail | extensive> <models> <lcc <i>number</i> | scc>
Syntax (TX Matrix Plus Router)	show chassis hardware <clei-models> <detail | extensive> <models> <lcc <i>number</i> | sfc <i>number</i> >
Syntax (MX Series Routers)	show chassis hardware <detail | extensive> <clei-models> <models> <all-members> <local> <member <i>member-id</i> >
Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers)	show chassis hardware <clei-models> <detail | extensive> <models>
Syntax (QFX Series)	show chassis hardware <detail | extensive> <clei-models> <interconnect-device <i>name</i> > <node-device <i>name</i> > <models>
Syntax (PTX Series Packet Transport Routers)	show chassis hardware <detail | extensive> <clei-models> <models>

Syntax (ACX Series Universal Access Routers)	<pre>show chassis hardware <detail | extensive> <clei-models> <models></pre>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>models option introduced in Junos OS Release 8.2.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>sfc 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>
Description	<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"> On EX2200 switches, EX3200 switches, EX4200 standalone switches, and EX4500 switches—Refers to the switch; FPC <i>number</i> is always 0. 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. On EX8208 and EX8216 switches—Refers to a line card; FPC <i>number</i> equals the slot number for the line card. <p>On a QFX3500 standalone switch, both the FPC and FPC <i>number</i> are always 0.</p> <p>On Type 5 FPC on T4000 routers, there are no top temperature sensor or bottom temperature sensor parameters. Instead, fan intake temperature sensor and fan exhaust temperature sensors parameters are displayed.</p>
Options	<p>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.</p> <p>clei-models—(Optional) Display Common Language Equipment Identifier (CLEI) barcode and model number for orderable field-replaceable units (FRUs).</p> <p>detail—(Optional) Include RAM and disk information in output.</p> <p>extensive—(Optional) Display ID EEPROM information.</p> <p>all-members—(MX Series routers only) (Optional) Display hardware-specific information for all the members of the Virtual Chassis configuration.</p> <p>interconnect-device <i>name</i>—(QFabric systems only) (Optional) Display hardware-specific information for the Interconnect device.</p>

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 73: 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

Required Privilege Level view

Related Documentation	<ul style="list-style-type: none"> • show chassis power on page 1184
List of Sample Output	<ul style="list-style-type: none"> show chassis hardware (EX8216 Switch) on page 1028 show chassis hardware clei-models (EX8216 Switch) on page 1029 show chassis hardware clei-models (T1600 Router) on page 1029 show chassis hardware detail (EX4200 Switch) on page 1030 show chassis hardware models (EX4500 Switch) on page 1030 show chassis hardware (J6350 Router) on page 1030 show chassis hardware (J6300 Router) on page 1030 show chassis hardware (M7i Router) on page 1031 show chassis hardware (M10 Router) on page 1031 show chassis hardware models (M10 Router) on page 1032 show chassis hardware (M20 Router) on page 1032 show chassis hardware models (M20 Router) on page 1033 show chassis hardware (M40 Router) on page 1033 show chassis hardware (M40e Router) on page 1034 show chassis hardware (M120 Router) on page 1034 show chassis hardware detail (M120 Router) on page 1035 show chassis hardware models (M120 Router) on page 1036 show chassis hardware (M160 Router) on page 1037 show chassis hardware models (M160 Router) on page 1037 show chassis hardware detail (M160 Router) on page 1038 show chassis hardware (M320 Router) on page 1039 show chassis hardware models (M320 Router) on page 1039 show chassis hardware (MX5 Router) on page 1040 show chassis hardware (MX10 Router) on page 1041 show chassis hardware (MX40 Router) on page 1041 show chassis hardware (Fixed MX80 Router) on page 1042 show chassis hardware (Modular MX80 Router) on page 1042 show chassis hardware (MX104 Router) on page 1043 show chassis hardware detail (MX104 Router) on page 1043 show chassis hardware extensive (MX104 Router) on page 1044 show chassis hardware models (MX104 Router) on page 1047 show chassis hardware clei-models (MX104 Router) on page 1047 show chassis hardware (MX240 Router) on page 1048 show chassis hardware detail (MX 240 Router with Routing Engine Displaying DIMM information) on page 1048 show chassis hardware (MX240 Router with Enhanced MX SCB) on page 1049 show chassis hardware (MX480 Router) on page 1050 show chassis hardware (MX480 Router with Enhanced MX SCB) on page 1050 show chassis hardware (MX960 Router) on page 1050 show chassis hardware (MX960 Router with Bidirectional Optics) on page 1051 show chassis hardware (MX960 Router with Enhanced MX SCB) on page 1052 show chassis hardware models (MX960 Router with Enhanced MX SCB) on page 1053 show chassis hardware detail (MX960 Router) on page 1054 show chassis hardware (MX2010 Router) on page 1054 show chassis hardware detail (MX2010 Router) on page 1057 show chassis hardware extensive (MX2010 Router) on page 1061

[show chassis hardware models \(MX2010 Router\) on page 1067](#)
[show chassis hardware clei-models \(MX2010 Routers\) on page 1067](#)
[show chassis hardware \(MX2020 Router\) on page 1068](#)
[show chassis hardware detail \(MX2020 Router\) on page 1077](#)
[show chassis hardware models \(MX2020 Router\) on page 1085](#)
[show chassis hardware clei-models \(MX2020 Router\) on page 1087](#)
[show chassis hardware \(MX Series routers with ATM MIC\) on page 1088](#)
[show chassis hardware \(MX240, MX480, MX960 routers with Application Services Modular Line Card\) on page 1088](#)
[show chassis hardware extensive \(MX240, MX480, MX960 routers with Application Services Modular Line Card\) on page 1089](#)
[show chassis hardware \(MX480 Router with MPC4E\) on page 1090](#)
[show chassis hardware \(MX2020 Router with MPC4E\) on page 1091](#)
[show chassis hardware \(T320 Router\) on page 1093](#)
[show chassis hardware \(T640 Router\) on page 1094](#)
[show chassis hardware models \(T640 Router\) on page 1094](#)
[show chassis hardware extensive \(T640 Router\) on page 1095](#)
[show chassis hardware \(T4000 Router\) on page 1096](#)
[show chassis hardware \(T4000 Router with 16 GB line card chassis \(LCC\) Routing Engine\) on page 1098](#)
[show chassis hardware \(T4000 Router with LSR FPC\) on page 1099](#)
[show chassis hardware clei-models \(T4000 Router\) on page 1099](#)
[show chassis hardware detail \(T4000 Router\) on page 1100](#)
[show chassis hardware models \(T4000 Router\) on page 1102](#)
[show chassis hardware lcc \(TX Matrix Router\) on page 1102](#)
[show chassis hardware scc \(TX Matrix Router\) on page 1103](#)
[show chassis hardware \(T1600 Router\) on page 1103](#)
[show chassis hardware \(TX Matrix Plus Router\) on page 1105](#)
[show chassis hardware sfc \(TX Matrix Plus Router\) on page 1110](#)
[show chassis hardware extensive \(TX Matrix Plus Router\) on page 1112](#)
[show chassis hardware clei-models \(TX Matrix Plus Router\) on page 1113](#)
[show chassis hardware detail \(TX Matrix Plus Router\) on page 1115](#)
[show chassis hardware models \(TX Matrix Plus Router\) on page 1117](#)
[show chassis hardware \(TX Matrix Plus router with 3D SIBs\) on page 1120](#)
[show chassis hardware clei-models \(TX Matrix Plus router with 3D SIBs\) on page 1123](#)
[show chassis hardware detail \(TX Matrix Plus router with 3D SIBs\) on page 1127](#)
[show chassis hardware lcc \(TX Matrix Plus router with 3D SIBs\) on page 1131](#)
[show chassis hardware sfc \(TX Matrix Plus router with 3D SIBs\) on page 1132](#)
[show chassis hardware \(16-Port 10-Gigabit Ethernet MPC with SFP+ Optics \[MX Series Routers\]\) on page 1133](#)
[show chassis hardware \(MPC3E \[MX Series Routers\]\) on page 1134](#)
[show chassis hardware \(QFX3500 Switches\) on page 1135](#)
[show chassis hardware detail \(QFX3500 Switches\) on page 1135](#)
[show chassis hardware models \(QFX3500 Switches\) on page 1137](#)
[show chassis hardware clei-models \(QFX3500 Switches\) on page 1137](#)
[show chassis hardware interconnect-device \(QFabric Systems\) on page 1137](#)
[show chassis hardware node-device \(QFabric Systems\) on page 1137](#)
[show chassis hardware \(PTX5000 Packet Transport Router\) on page 1137](#)
[show chassis hardware clei-models \(PTX5000 Packet Transport Router\) on page 1138](#)

[show chassis hardware detail \(PTX5000 Packet Transport Router\) on page 1139](#)
[show chassis hardware models \(PTX5000 Packet Transport Router\) on page 1141](#)
[show chassis hardware extensive \(PTX5000 Packet Transport Router\) on page 1141](#)
[show chassis hardware \(MX Routers with Media Services Blade \[MSB\]\) on page 1142](#)
[show chassis hardware extensive \(MX Routers with Media Services Blade \[MSB\]\) on page 1142](#)

Output Fields [Table 74 on page 1025](#) lists the output fields for the **show chassis hardware** command. Output fields are listed in the approximate order in which they appear.

Table 74: show chassis hardware Output Fields

Field Name	Field Description	Level of Output
Item	<p>Chassis component:</p> <ul style="list-style-type: none"> (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>. (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). (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. (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. (QFX Series)—Information about the chassis, 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). (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). (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. 	All levels

Table 74: show chassis hardware Output Fields (*continued*)

Field Name	Field Description	Level of Output
Version	Revision level of the chassis component.	All levels
Part number	Part number of the chassis component.	All levels
Serial number	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
Assb ID or Assembly ID	(extensive keyword only) Identification number that describes the FRU hardware.	extensive
Assembly Version	(extensive keyword only) Version number of the FRU hardware.	extensive
Assembly Flags	(extensive keyword only) Flags.	extensive
FRU model number	(clei-models , extensive , and models keyword only) Model number of the FRU hardware component.	none specified
CLEI code	(clei-models and extensive 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
EEPROM Version	ID EEPROM version used by the hardware component: 0x00 (version 0), 0x01 (version 1), or 0x02 (version 2).	extensive
Description	<p>Brief description of the hardware item:</p> <ul style="list-style-type: none"> • Type of power supply. • Type of PIC. If the PIC type is not supported on the current software release, the output states Hardware Not Supported. • Type of FPC: FPC Type 1, FPC Type 2, FPC Type 3, FPC Type 4, or FPC TypeOC192. <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"> • 2x FE—Either two built-in Fast Ethernet interfaces (fixed PIM) or dual-port Fast Ethernet PIM • 4x FE—4-port Fast Ethernet ePIM • 1x GE Copper—Copper Gigabit Ethernet ePIM (one 10-Mbps, 100-Mbps, or 1000-Mbps port) • 1x GE SFP—SFP Gigabit Ethernet ePIM (one fiber port) • 4x GE Base PIC—Four built-in Gigabit Ethernet ports on a J4350 or J6350 chassis (fixed PIM) • 2x Serial—Dual-port serial PIM • 2x T1—Dual-port T1 PIM • 2x E1—Dual-port E1 PIM 	All levels

Table 74: show chassis hardware Output Fields (*continued*)

Field Name	Field Description	Level of Output
	<ul style="list-style-type: none"> • 2x CT1E1—Dual-port channelized T1/E1 PIM • 1x T3—T3 PIM (one port) • 1x E3—E3 PIM (one port) • 4x BRI S/T—4-port ISDN BRI S/T PIM • 4x BRI U—4-port ISDN BRI U PIM • 1x ADSL Annex A—ADSL 2/2+ Annex A PIM (one port, for POTS) • 1x ADSL Annex B—ADSL 2/2+ Annex B PIM (one port, for ISDN) • 2x SHDSL (ATM)—G SHDSL PIM (2-port two-wire module or 1-port four-wire module) • 1x TGM550—TGM550 Telephony Gateway Module (Avaya VoIP gateway module with one console port, two analog LINE ports, and two analog TRUNK ports) • 1x DS1 TIM510—TIM510 E1/T1 Telephony Interface Module (Avaya VoIP media module with one E1 or T1 trunk termination port and ISDN PRI backup) • 4x FXS, 4x FXO, TIM514—TIM514 Analog Telephony Interface Module (Avaya VoIP media module with four analog LINE ports and four analog TRUNK ports) • 4x BRI TIM521—TIM521 BRI Telephony Interface Module (Avaya VoIP media module with four ISDN BRI ports) • Crypto Accelerator Module—For enhanced performance of cryptographic algorithms used in IP Security (IPsec) services • MPC M16x10GE—16-port 10-Gigabit Module Port Concentrator that supports SFP+ optical transceivers. (Not on EX Series switches.) • For hosts, the Routing Engine type. • For small form-factor pluggable transceiver (SFP) modules, the type of fiber: LX, SX, LH, or T. • LCD description for EX Series switches (except EX2200 switches). • MPC2—1-port MPC2 that supports two separate slots for MICs. • MPC3E—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. • 100GBASE-LR4, pluggable CFP optics • Supports the Enhanced MX Switch Control Board with fabric redundancy and existing SCBs without fabric redundancy. • Interoperates with existing MX Series line cards, including Flexible Port Concentrators (FPC), Dense Port Concentrators (DPCs), and Modular Port Concentrators (MPCs). • MPC4E—Fixed configuration MPC4E that is available in two flavors: MPC4E-3D-32XGE-SFP and MPC4E-3D-20GE-8XGE on MX2020, MX960, MX480, and MX240 routers. • LCD description for MX Series routers 	

Sample Output

show chassis hardware
(EX8216 Switch)

user@host> show chassis hardware

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis	REV 06		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> 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-S0N-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 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 (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

user@host> show chassis hardware

Hardware inventory:

(M10 Router)

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> 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> 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 126CT505S07635C00110	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		CRAFT-M120-S
PEM 0	Rev 05	740-011936		PWR-M120-AC-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-4OC3-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
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
CPU           REV 03   710-001217   S/N AB3329
PIC 0         REV 01
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
FPM Display   REV 02   710-009351
CIP           REV 03   710-005926
PEM 2         Rev X4   740-009148
PEM 3         Rev X4   740-009148
Routing Engine 0 REV 02   740-008883
Routing Engine 1 REV 02   740-008883
FPC 0         REV 02   710-010419
PIC 0         REV 01   750-001323
PIC 1         REV 02   750-002987
PIC 2         REV 04   750-001894
PIC 3         REV 04   750-001896
FPC 1         REV 02   710-010419
PIC 0         REV 04   750-001894
PIC 1         REV 04   750-001894
PIC 3         REV 03   750-001894
FPC 2         REV 02   710-010419
PIC 0         REV 10   750-005634
PIC 1         REV 10   750-005634
PIC 2         REV 07   750-005634
PIC 3         REV 07   750-005634
PIC 1         REV 10   750-005634
PIC 2         REV 07   750-005634

```

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	P9POXV3	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	P9M0U37	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	2xOC12/8xOC3 CC-CE
PIC 0		BUILTIN	BUILTIN	2xOC12/8xOC3 CC-CE
Xcvr 0	REV 01	740-011615	PCQ0U2J	SFP-IR
Xcvr 1	REV 01	740-016068	PJL7A6G	SFP-SR
Xcvr 2	REV 01	740-016068	PJL7A5J	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+
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      2xOC12/8xOC3 CC-CE
PIC 0          BUILTIN          BUILTIN      2xOC12/8xOC3 CC-CE
Xcvr 0         REV 01 740-011615 PCQOU2J      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 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+
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			G3503	MX104
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: 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 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 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 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 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 ff
Address 0x70: ff ff ff 72 ff 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:              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 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

```

```

usb0 (addr 1) EHCI root hub 0      Freescale      uhub0
usb0 (addr 2) USB2513Bi 9491      SMC            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: 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 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 2x0C12/8x0C3 CC-CE
Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N: 750-036132        S/N: 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 BUILTIN BUILTIN 2x0C12/8x0C3 CC-CE
Xcvr 0 REV 01 740-011615 PCQ0U2J SFP-IR
Xcvr 1 REV 01 740-016068 PJL7A6G SFP-SR
Xcvr 2 REV 01 740-016068 PJL7A5J 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 PBK0NK3 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+
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:         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 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 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

```

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  BUILTIN
FPC 0         BUILTIN  BUILTIN
FPC 1         BUILTIN  BUILTIN
MIC 0         REV 01   750-046905   PROTOXCLEI     MIC-3D-20GE-SFP-EH
FPC 2         BUILTIN  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)**

user@host> show chassis hardware detail

Item	Version	Part number	Serial number	Description
Chassis			JN11279B4AFc	MX240 Backplane

Displaying DIMM information)

```

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
(MX960 Router)**

user@host> show chassis hardware

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
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 (MX960 Router with Bidirectional Optics)

user@host> show chassis hardware

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN10BA5B9AFA	MX960
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	P9MOTL9	SFP-SX
Xcvr 7	REV 01	740-011782	P9POXXH	SFP-SX
Xcvr 9	REV 01	740-011782	P9MOTN1	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-U
Xcvr 2	REV 01	740-011613	PAJ4Y5B	SFP-SX
Xcvr 6	REV 01	740-011782	P9MOU3M	SFP-SX
Xcvr 7	REV 01	740-011782	P9MOTLA	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 OC-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 OC-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 OC-3 1x OC-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)

user@host> show chassis hardware models

Hardware inventory:

Item	Version	Part number	Serial number	FRU model number
------	---------	-------------	---------------	------------------

Router with Enhanced
MX SCB)

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	DPC-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
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	NROWT5925N77 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
(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	ACA11388	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	REV 0C	740-033727	VJ00151	DC 52V Power Supply
Module				
PSM 8	REV 0C	740-033727	VJ00149	DC 52V Power Supply
Module				
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	AJCOJML	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	ALPOTR1	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	03D206A01018	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)

```
user@host > show chassis hardware extensive
```

```
Hardware inventory:
```

Item	Version	Part number	Serial number	Description
Chassis			JN11E233DAFK	MX2010

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
Address 0x10: 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
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:           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:           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:           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
FPM Board      REV 08    760-044634    ABBV9726      Front Panel Display
Jedec Code:    0x7fb0      EEPROM Version: 0x02
P/N:           760-044634    S/N:           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
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
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
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
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
  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:          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 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:          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 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:          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 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:          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 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 HMPD PMB 2G

Jedec Code: 0x7fb0 EEPROM Version: 0x01
 P/N: 711-035209 S/N: S/N CAAB9842
 Assembly ID: 0x0b04 Assembly Version: 01.08
 Date: 05-17-2012 Assembly Flags: 0x00
 Version: REV 08

ID: HMPD 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 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 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 4x10GE SFPP

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 SFPP

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: 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 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 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 ff
Address 0x70: ff ff ff 3a 00 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	000000000000000000000000
PSM 5	REV 0B	740-033727	VG00015	000000000000000000000000
PSM 6	REV 0B	740-033727	VH00097	000000000000000000000000
PSM 7	REV 0C	740-033727	VJ00151	000000000000000000000000
PSM 8	REV 0C	740-033727	VJ00149	000000000000000000000000
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	711-0323856
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	000000000000000000000000
PSM 5	REV 0B	740-033727	0000000000	000000000000000000000000
PSM 6	REV 0B	740-033727	0000000000	000000000000000000000000

PSM 7	REV 0C	740-033727	0000000000	000000000000000000000000
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 (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	CAA6141	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	ABB11082	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)

```
user@host> show chassis hardware detail
```

```
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	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	CAAA6141	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	ABB0966	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	AK80LFC	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)

user@host > show chassis hardware models

Hardware inventory:

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 (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

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 I2C Hex Data:

Application Services
Modular Line Card)

```

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
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:            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 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
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:            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 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
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 ff
Address 0x70: ff ff ff f6 c0 03 e1 bc 00 00 00 00 00 00 00 00
PIC 0          BUILTIN    BUILTIN          AS-MSC
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	HMPC 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	HMPC 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-OC192-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-OC192-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 (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),DwDM
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
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 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
Midplane            REV 04  710-002726  AX5633
Jedec Code: 0x7fb0      EEPROM Version: 0x01
P/N: 710-002726.        S/N: 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	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
(T4000 Router with 16

```
user@host> show chassis hardware
```

```
Hardware inventory:
```

Item	Version	Part number	Serial number	Description
------	---------	-------------	---------------	-------------

**GB line card chassis
(LCC) Routing Engine)**

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@switch> 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
Fan Tray 1
Fan Tray 2
FANTRAY-T-S
FANTRAY-T4000-S
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	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	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
Fan Tray 1
-- Rev 2
Fan Tray 2

Front Top Fan Tray
Front Bottom Fan Tray

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			B2703	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:
```

```
-----
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:

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-DU0-1800
Routing Engine 1	REV 01	740-026941	737F-1104	RE-DU0-1800
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	PAR1LRL	SFP-SX
Xcvr 4	REV 01	740-011782	P9MOU3Z	SFP-SX
Xcvr 5	REV 01	740-011782	P9MOU0C	SFP-SX
Xcvr 6	REV 01	740-011782	P9MOTLG	SFP-SX
Xcvr 7	REV 01	740-011782	P9MOU0F	SFP-SX
Xcvr 8	REV 01	740-011613	PFA6LAP	SFP-SX
Xcvr 9	REV 01	740-011782	PCH2POU	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: 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 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 Display       REV 03  710-024027  DX0282      TXP FPM Display
  Jedec Code: 0x7fb0      EEPROM Version: 0x01
  P/N: 710-024027      S/N: 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 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 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:             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
FPM Display         REV 03    710-024027
CIP 0               REV 05    710-023792
CIP 1               REV 05    710-023792
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
Routing Engine 1    REV 06    740-026942
CB 0                REV 05    710-022606
CB 1                REV 09    710-022606
SIB F13 0           REV 04    750-024564
SIB F13 3           REV 04    750-024564
SIB F13 8           REV 04    750-024564
SIB F13 11          REV 04    750-024564
SIB F13 12          REV 03    750-024564
SIB F2S 0/0         REV 05    710-022603
SIB F2S 0/2         REV 05    710-022603
SIB F2S 0/4         REV 04    710-022603
SIB F2S 0/6         REV 04    710-022603
SIB F2S 1/0         REV 04    710-022603
SIB F2S 1/2         REV 05    710-022603
SIB F2S 1/4         REV 04    710-022603
SIB F2S 1/6         REV 05    710-022603
SIB F2S 2/0         REV 04    710-022603
SIB F2S 2/2         REV 04    710-022603
SIB F2S 2/4         REV 05    710-022603
SIB F2S 2/6         REV 04    710-022603
SIB F2S 3/0         REV 05    710-022603
SIB F2S 3/2         REV 03    710-022603
SIB F2S 3/4         REV 05    710-022603
SIB F2S 3/6         REV 03    710-022603
SIB F2S 4/0         REV 03    710-022603
SIB F2S 4/2         REV 05    710-022603
SIB F2S 4/4         REV 04    710-022603
SIB F2S 4/6         REV 03    710-022603
Fan Tray 0          REV 02    760-024497
Fan Tray 1          REV 02    760-024497
Fan Tray 2          REV 05    760-024502
Fan Tray 3
Fan Tray 4          REV 05    760-024502
Fan Tray 5          REV 02    760-024502

```

```

lcc0-re0:

```

Hardware inventory:

Item	Version	Part number	CLEI code	FRU model number
Midplane	REV 03	710-017247	IPUPAC8KTA	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		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	IPUPAC8KTA	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		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

lcc0-re0:

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:
```

```
-----
```

Hardware inventory:

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	yyyyyyyyyyyyyyyyyyyy
Routing Engine 0	REV 01	740-026942	737A-1064	RE-TXP-SFC-DU0-2600-16G
Routing Engine 1	REV 01	740-026942	737A-1082	RE-TXP-SFC-DU0-2600-16G
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:
```

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:

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:

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:
```

```
-----
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
Fan Tray 2

FANTRAY-T-S
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   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:

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:

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
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)

user@host> show chassis hardware clei-models
sfc0-re0:

Plus router with 3D
SIBs)

Hardware inventory:

Item	Version	Part number	CLEI code	FRU model number
Midplane	REV 05	710-022574		CHAS-BP-TXP-S
FPM Display	REV 09	710-024027		CRAFT-TXP-S
CIP 0	REV 12	710-023792		CIP-TXP-S
CIP 1	REV 12	710-023792		CIP-TXP-S
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

lcc0-re0:

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
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]

```

```
user@host> show chassis hardware detail
```

show chassis hardware
detail (TX Matrix Plus
router with 3D SIBs)

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
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:
```

```
-----
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
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			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
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  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

user@host> show chassis hardware

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN112D865AFA	MX960

SFP+ Optics [MX Series Routers])

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	HMPD 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	ULH0KG3	CFP-100G-LR4
MIC 1	REV 02	750-033199	YG3245	1X100GE CFP
PIC 2		BUILTIN	BUILTIN	1X100GE CFP
Xcvr 0	REV 01	740-032210	ULH0KGF	CFP-100G-LR4
FPC 4	REV 12.3.09	750-033205	YR9437	MPC Type 3
CPU	REV 03	711-035209	YT5857	HMPC 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		BUILTIN	BUILTIN	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-AF0
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
Fan Tray 1
QFX Fan Tray
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
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
FPC 0               REV 02    711-032234
Power Supply 0     PSMI 2C   11-d65800

```

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
Midplane            REV 07    750-021261   BH0208188289   QFX_olive
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
Xcvr 8             REV 01    740-030658   AD0946A028B   FPC CPU
                                     48x 10G-SFP+
                                     SFP+-10G-USR
...

```

show chassis hardware (PTX5000 Packet Transport Router)

```

user@switch> show chassis hardware
Hardware inventory:
Item                Version  Part number  Serial number  Description
Chassis
Midplane            REV 03    711-031896   ABAC5589      PTX5000
FPM                 REV 08    760-030647   EG1679        Midplane-8S
PDU 0               Rev 05    740-032019   ZE00006       Front Panel Display
PSM 0               Rev 05    740-032022   ZJ00018       DC Power Dist Unit
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	AJCOBHC	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

```
user@switch> show chassis hardware clei-models
```

**show chassis hardware
clei-models (PTX5000
Packet Transport
Router)**

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
detail (PTX5000)**

user@switch> show chassis hardware detail

Hardware inventory:

Item	Version	Part number	Serial number	Description
------	---------	-------------	---------------	-------------

Packet Transport
Router)

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	AJCOBHC	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 models (PTX5000 Packet Transport Router)

user@switch> 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 extensive (PTX5000)

user@switch> show chassis hardware extensive

Hardware inventory:

Item	Version	Part number	Serial number	Description
------	---------	-------------	---------------	-------------

Packet Transport Router)

```

.....
PDU 0          Rev 04   740-032019   UE0003          DC Power Dist Unit
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           740-032019      S/N:              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:              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 01 00 ff 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   BUILTIN        BUILTIN        AS-MXC
  PIC 2                               BUILTIN        BUILTIN        AS-MXC

```

show chassis hardware extensive (MX Routers)

```

user@switch> show chassis hardware extensive
FPC 1          REV 11   750-037207   ZW9726         AS-MCC
Jedec Code:    0x7fb0          EEPROM Version:    0x02

```

with Media Services
Blade [MSB])

```

P/N:          750-037207      S/N:          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:          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-MSC
Jedec Code:  0x7fb0      EEPROM Version: 0x02
P/N:         750-037214  S/N:          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-MSC          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-MSC
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 00 ff ff ff
Address 0x30: ff 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 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.

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*
- *Unified ISSU Concepts*
- *Performing a Unified ISSU*

List of Sample Output [show chassis in-service-upgrade on page 1147](#)
[show chassis in-service-upgrade \(MX2010 Router\) on page 1147](#)
[show chassis in-service-upgrade \(MX2020 Router\) on page 1147](#)
[show chassis in-service-upgrade \(TX Matrix Plus Router\) on page 1147](#)

Output Fields [Table 75 on page 1145](#) 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 75: show chassis in-service-upgrade Output Fields

Field Name	Field Description
Item	Flexible PIC Concentrator (FPC) slot number.

Table 75: show chassis in-service-upgrade Output Fields (*continued*)

Field Name	Field Description
Status	FPC and corresponding PIC state. State can be either of the following: <ul style="list-style-type: none">• Online—FPC is online and running.• Offline—FPC is powered down.
Reason	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
```

lcc0-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 lccs

Syntax	show chassis lccs
Release Information	Command introduced before Junos OS Release 7.4.
Description	(TX Matrix and TX Matrix Plus routers only) On a TX Matrix router, display the status of all T640 LCC connected to the TX Matrix router. On a TX Matrix Plus router, display the status of all LCC connected to the TX Matrix Plus router.
Options	This command has no options.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • request chassis lcc on page 455 • <i>Configuring Line-Card Upgrade Groups for Nonstop Software Upgrade (CLI Procedure)</i> • <i>fpc</i>
List of Sample Output	show chassis lccs on page 1150 show chassis lccs (TX Matrix Plus router with 3D SIBs) on page 1150
Output Fields	Table 76 on page 1149 lists the output fields for the show chassis lccs command. Output fields are listed in the approximate order in which they appear.

Table 76: show chassis lccs Output Fields

Field Name	Field Description
Slot	LCC slot number.
State	LCC status: <ul style="list-style-type: none"> • Online—LCC is online and running. • Offline—LCC is powered down. • Empty—No LCC is present.
Uptime	How long the LCC has been up and running.

Sample Output

show chassis lccs

```
user@host> show chassis lccs
Slot  State                Uptime
0     Online                3 minutes, 17 seconds
1     Empty
2     Online                3 minutes, 23 seconds
3     Empty
```

show chassis lccs (TX Matrix Plus router with 3D SIBs)

```
user@host> show chassis lccs
Slot  State                Uptime
0     Offline
1     Empty
2     Online                1 day, 4 hours, 57 minutes, 7 seconds
3     Empty
4     Online                1 day, 4 hours, 56 minutes, 58 seconds
5     Empty
6     Empty
7     Online                3 hours, 45 minutes, 41 seconds
```

show chassis lcc-mode

Syntax show chassis lcc-mode

Release Information Command introduced in Junos OS Release 13.1.

Description (TX Matrix Plus routers only) Display the mode in which LCCs are connected to a TX Matrix Plus router.



NOTE: This command is supported only on TX Matrix Plus routers with 3D SIBs.

Options This command has no options.

Required Privilege Level view

Related Documentation

- [lcc-mode on page 367](#)
- *Overview of a Routing Matrix with TXP-Mixed-LCC-3D Configuration*

List of Sample Output [show chassis lcc-mode \(TX Matrix Plus Router with 3D SIBs\) on page 1152](#)

Output Fields [Table 77 on page 1151](#) lists the output fields for the **show chassis lcc-mode** command. Output fields are listed in the approximate order in which they appear.

Table 77: show chassis lcc-mode Output Fields

Field Name	Field Description
Slot	The LCC number.
LCC-mode	Displays the mode of the LCC: <ul style="list-style-type: none"> • T1600—LCC functions as a T1600 router. • T4000—LCC functions as a T4000 router. • EMPTY—LCC is not configured as either a T1600 or a T4000 router.

Sample Output

`show chassis lcc-mode`
(TX Matrix Plus Router
with 3D SIBs)

`user@host> show chassis lcc-mode`

Slot	LCC-mode
0	T4000
1	EMPTY
2	T4000
3	EMPTY
4	T4000
5	EMPTY
6	T1600
7	EMPTY

show chassis location

Syntax	show chassis location
Syntax (TX Matrix Router)	show chassis location <fpc | interface (by-name <i>name</i> | by-slot fpc number lcc number) | lcc number | scc>
Syntax (TX Matrix Plus Router)	show chassis location <fpc | interface (by-name <i>name</i> | by-slot fpc number lcc number) | lcc number | sfc number>
Syntax (MX Series Router)	show chassis location <all-members> <local> <member <i>member-id</i> >
Syntax (QFX Series)	show chassis location <interconnect-device <i>name</i> > <node-device <i>name</i> >
Release Information	Command introduced before 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.
Description	Display the physical location of the chassis. This command can only be used on the master Routing Engine.
Options	<p>none—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>all-members—(MX Series routers only) (Optional) Display the physical location of the chassis for all the member routers in the Virtual Chassis configuration.</p> <p>fpc—(TX Matrix router and TX Matrix Plus router only) (Optional) Display the physical location of all Flexible PIC Concentrators (FPCs).</p> <p>interconnect-device <i>name</i>—(QFabric systems only) (Optional) Display the physical location of the Interconnect device.</p> <p>interface by-name <i>name</i>—(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.</p> <p>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</p>

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

List of Sample Output

[show chassis location on page 1156](#)

[show chassis location fpc \(TX Matrix Router\) on page 1156](#)

[show chassis location interface by-slot \(TX Matrix Router\) on page 1156](#)

[show chassis location fpc \(TX Matrix Plus Router\) on page 1156](#)
[show chassis location interface by-slot \(TX Matrix Plus Router\) on page 1156](#)
[show chassis location \(QFX3500 Switches\) on page 1156](#)
[show chassis location \(QFabric Systems\) on page 1156](#)

Output Fields Table 78 on page 1155 lists the output fields for the **show chassis location** command. Output fields are listed in the approximate order in which they appear.

Table 78: 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.
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 (QFX3500 Switches) 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

Syntax	show chassis mac-addresses
Syntax (TX Matrix Router)	show chassis mac-addresses <lcc <i>number</i> | scc>
Syntax (TX Matrix Plus Router)	show chassis mac-addresses <lcc <i>number</i> | sfc <i>number</i> >
Syntax (MX Series Router)	show chassis mac-addresses <all-members> <local> <member <i>member-id</i> >
Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers)	show chassis mac-addresses
Syntax (QFX Series)	show chassis mac-addresses <interconnect-device <i>name</i> > <node-group <i>name</i> >
Syntax (ACX Series Universal Access Routers)	show chassis mac-addresses
Release Information	<p>Command introduced before JUNOS Release 7.4.</p> <p>Command introduced in JUNOS Release 9.0 for EX Series switches.</p> <p>sfc 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>
Description	Display the media access control (MAC) addresses for the router, switch chassis, or switch.
Options	<p>none—(TX Matrix, TX Matrix Plus routers, and the QFX Series) 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.</p> <p>all-members—(MX Series routers only) (Optional) Display the MAC addresses for all the member routers of the Virtual Chassis configuration.</p> <p>interconnect-device <i>name</i>—(QFabric systems only) (Optional) Display the MAC addresses for the Interconnect device.</p>

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 1160](#)
[show chassis mac-addresses \(MX104 Router\) on page 1160](#)
[show chassis mac-addresses \(MX2010 Router\) on page 1160](#)
[show chassis mac-addresses \(MX2020 Router\) on page 1160](#)
[show chassis mac-addresses \(TX Matrix Router\) on page 1160](#)
[show chassis mac-addresses \(TX Matrix Plus Router\) on page 1160](#)
[show chassis mac-addresses \(QFX3500 Switches\) on page 1161](#)
[show chassis mac-addresses interconnect-device \(QFabric Systems\) on page 1161](#)
[show chassis mac-addresses node-group \(QFabric Systems\) on page 1161](#)
[show chassis mac-addresses \(ACX2000 Universal Access Router\) on page 1162](#)

Output Fields [Table 79 on page 1159](#) lists the output fields for the **show chassis mac-addresses** command. Output fields are listed in the approximate order in which they appear.

Table 79: show chassis mac-addresses Output Fields

Field Name	Field Description
MAC address information	
Public base address	Base address of the MAC addresses allocated to this router or switch.
Public count	Number of allocated public addresses.
Private base address	Base address of the private MAC addresses allocated to this router or switch.
Private count	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

```
user@host> show chassis mac-addresses
sfc0-re0:
```


**mac-addresses (TX
Matrix Plus Router)**

```

-----
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

```

```

1cc0-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

```

```

1cc1-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

```

```

1cc2-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

```

```

1cc3-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
(QFX3500 Switches)**

```

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**

```

user@switch> show chassis mac-addresses node-group NW-NG-0
MAC address information:
-----

```

node-group (QFabric Systems)

```
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 network services

Syntax	show chassis network services
Release Information	Command introduced in Junos OS Release 9.4. 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 MX104 3D Universal Edge Routers.
Description	Display the network services mode that the router is configured to run in—IP Network Services mode, Ethernet Network Services mode, Enhanced IP Network Services mode, or Enhanced Ethernet Network Services mode.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show chassis network services on page 1164 show chassis network services (MX104 Router) on page 1164 show chassis network services (MX2010 Router) on page 1164 show chassis network services (MX2020 Router) on page 1164
Output Fields	Table 80 on page 1163 lists the output fields for the show chassis network services command. Output fields are listed in the approximate order in which they appear.

Table 80: show chassis network services Output Fields

Field Name	Field Description
Network Services Mode	Network services mode configured for the MX Series router: <ul style="list-style-type: none"> • IP—IP Network Services mode. • Ethernet—Ethernet Network Services mode. • enhanced-ip—Enhanced IP Network Services mode • enhanced-ethernet—Enhanced Ethernet Network Services mode

Sample Output

`show chassis network services` `user@host> show chassis network services`
Network Services Mode: IP

`show chassis network services (MX104 Router)` `user@host> show chassis network services`
Network Services Mode: IP

`show chassis network services (MX2010 Router)` `user@host> show chassis network services`
Network Services Mode: Enhanced-IP

`show chassis network services (MX2020 Router)` `user@host> show chassis network services`
Network Services Mode: Enhanced-IP

show chassis oss-map

Syntax	show chassis oss-map
Release Information	Command introduced in Junos OS Release 12.3R3, 13.1R2, and 13.2R1 for T4000 routers.
Description	(T4000 routers only) Display the operations support systems (OSS) mapping details.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• Configuring OSS Mapping to Represent a T4000 Chassis as a T1600 or a T640 Chassis on page 138• Example: Configuring a T4000 Chassis to Represent a T640 Chassis on page 309• oss-map on page 382• Understanding Operations Support Systems Mapping on page 19
Output Fields	Table 81 on page 1165 lists the output fields for the show chassis oss-map command. Output fields are listed in the approximate order in which they appear.

Table 81: show chassis oss-map Output Fields

Field Name	Field Description
Chassis type	Displays the original chassis type.
Oss-map	Displays the mapped chassis type.

Sample Output

```
user@T4000# show chassis oss-map
Chassis type      Oss-map
T4000             T640
```

show chassis pic

Syntax	show chassis pic fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i>
Syntax (TX Matrix and TX Matrix Plus Routers)	show chassis pic fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i> <lcc <i>number</i> >
Syntax (MX Series Routers)	show chassis pic fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i> <all-members> <local> <member <i>member-id</i> >
Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers)	show chassis pic fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i>
Syntax (PTX Series Packet Transport Router)	show chassis pic transport fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i>
Syntax (QFX Series)	show chassis pic <interconnect-device <i>name</i> (fpc-slot <i>slot-number</i> | pic-slot <i>slot-number</i>)> <node-device <i>name</i> pic-slot <i>slot-number</i> >
Syntax (ACX Series Universal Access Routers)	show chassis pic fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i>
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 QFX Series. 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. Command introduced in Junos OS Release 13.2 for PTX Series Packet Transport Routers. Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.
Description	Display status information about the PIC installed in the specified Flexible PIC Concentrator (FPC) and PIC slot.
Options	fpc-slot <i>slot-number</i> —Display information about the PIC in this particular FPC slot: <ul style="list-style-type: none">On a TX Matrix router, if you specify the number of the T640 router by using the lcc <i>number</i> option (the recommended method), replace <i>slot-number</i> with a value from 0 through 7. Otherwise, replace <i>slot-number</i> 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 <i>number</i> option (the recommended method), replace <i>slot-number</i> with a value from 0 through 7. Otherwise, replace <i>slot-number</i> 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 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 standalone switch and the QFabric system, replace *slot-number* with 0 or 1.

transport—Display PIC information for optical transport network.

Required Privilege Level

view

Related Documentation

- [request chassis pic on page 462](#)
- [show chassis hardware on page 1020](#)
- *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 1172](#)
[show chassis pic fpc-slot pic-slot \(PIC Offline\) on page 1172](#)
[show chassis pic fpc-slot pic-slot \(FPC Offline\) on page 1172](#)
[show chassis pic fpc-slot pic-slot \(FPC Not Present\) on page 1172](#)
[show chassis pic fpc-slot pic-slot \(PIC Not Present\) on page 1172](#)
[show chassis pic fpc-slot pic-slot \(M120 Router\) on page 1172](#)
[show chassis pic fpc-slot pic-slot \(MX104 Router\) on page 1172](#)
[show chassis pic fpc-slot pic-slot \(MX960 Router Bidirectional Optics\) on page 1173](#)

[show chassis pic fpc-slot pic-slot \(MX480 Router with 100-Gigabit Ethernet MIC\) on page 1173](#)
[show chassis pic fpc-slot pic-slot \(MX240, MX480, MX960 Routers with Application Services Modular Line Card\) on page 1173](#)
[show chassis pic fpc-slot pic-slot \(MX480 Router with MPC4E\) on page 1174](#)
[show chassis pic fpc-slot pic-slot \(MX2010 Router\) on page 1174](#)
[show chassis pic fpc-slot pic-slot \(MX2020 Router\) on page 1174](#)
[show chassis pic fpc-slot pic-slot \(MX2020 Routers with MPC4E\) on page 1174](#)
[show chassis pic fpc-slot pic-slot \(T1600 Router with 100-Gigabit Ethernet PIC\) on page 1175](#)
[show chassis pic fpc-slot pic-slot lcc \(TX Matrix Router\) on page 1175](#)
[show chassis pic fpc-slot pic-slot lcc \(TX Matrix Plus Router\) on page 1175](#)
[show chassis pic fpc-slot pic-slot \(Next-Generation SONET/SDH SFP\) on page 1175](#)
[show chassis pic fpc-slot pic-slot \(12-Port T1/E1\) on page 1176](#)
[show chassis pic fpc-slot pic-slot \(4x CHOC3 SONET CE SFP\) on page 1176](#)
[show chassis pic fpc-slot pic-slot \(SONET/SDH OC3/STM1 \[Multi-Rate\] MIC with SFP\) on page 1176](#)
[show chassis pic fpc-slot pic-slot \(8-port Channelized SONET/SDH OC3/STM1 \[Multi-Rate\] MIC with SFP\) on page 1177](#)
[show chassis pic fpc-slot pic-slot \(4-port Channelized SONET/SDH OC3/STM1 \[Multi-Rate\] MIC with SFP\) on page 1177](#)
[show chassis pic fpc-slot pic-slot \(1-port OC192/STM64 MIC with XFP\) on page 1177](#)
[show chassis pic fpc-slot 1 pic-slot 2 \(8-port DS3/E3 MIC\) on page 1178](#)
[show chassis pic fpc-slot pic-slot \(OTN\) on page 1178](#)
[show chassis pic fpc-slot pic-slot \(QFX3500 Switch\) on page 1178](#)
[show chassis pic interconnect-device fpc-slot pic-slot \(QFabric Systems\) on page 1178](#)
[show chassis pic node-device fpc-slot pic-slot \(QFabric System\) on page 1178](#)
[show chassis pic fpc-slot pic-slot \(ACX2000 Universal Access Router\) on page 1179](#)
[show chassis pic fpc-slot pic-slot \(MX Routers with Media Services Blade \[MSB\]\) on page 1180](#)
[show chassis pic FPC slot PIC slot \(MX Routers with Media Services Blade \[MSB\]\) on page 1180](#)
[show chassis pic transport fpc-slot pic-slot \(PTX Series Packet Transport Routers\) on page 1180](#)

Output Fields [Table 82 on page 1169](#) lists the output fields for the **show chassis pic** command. Output fields are listed in the approximate order in which they appear.

Table 82: show chassis pic Output Fields

Field Name	Field Description
Type	<p>PIC type.</p> <p>NOTE: On the 1-port OC192/STM64 MICs with the SDH framing mode, the type is displayed as MIC-3D-1STM64-XFP and with the SONET framing mode, the type is displayed as MIC-3D-1OC192-XFP. By default, the 1-port OC192/STM64 MICs displays the type as MIC-3D-1OC192-XFP.</p>

Table 82: show chassis pic Output Fields (*continued*)

Field Name	Field Description
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"> • Online— PIC is online and running. • Offline—PIC is powered down.
PIC version	PIC hardware version.
Uptime	How long the PIC has been online.
Package	(Multiservices PICs only) Services package supported: Layer-2 or Layer-3 .
Port Number	Port number for the PIC.
Cable Type	Type of cable connected to the port: LH , LX , or SX .
PIC Port Information (MX480 Router 100-Gigabit Ethernet CFP)	Port-level information for the PIC. <ul style="list-style-type: none"> • Port—Port number • Cable type—Type of optical transceiver installed. • Fiber type—Type of fiber. SM is single-mode. • Xcvr vendor—Transceiver vendor name. • Xcvr vendor part number—Transceiver vendor part number. • Wavelength—Wavelength of the transmitted signal. Uplinks and downlinks are always 1550 nm. There is a separate fiber for each direction
PIC Port Information (MX960 Router Bidirectional Optics)	Port-level information for the PIC. <ul style="list-style-type: none"> • Port—Port number • Cable type—Type of small form-factor pluggable (SFP) optical transceiver installed. Uplink interfaces display -U. Down link interfaces display -D. • Fiber type—Type of fiber. SM is single-mode. • Xcvr vendor—Transceiver vendor name. • Xcvr vendor part number—Transceiver vendor part number. <ul style="list-style-type: none"> • BX10-10-km bidirectional optics. • BX40-40-km bidirectional optics. • SFP-LX-40-km SFP optics. • Wavelength—Wavelength of the transmitted signal. Uplinks are always 1310 nm. Downlinks are either 1490 nm or 1550 nm.

Table 82: show chassis pic Output Fields (*continued*)

Field Name	Field Description
PIC Port Information (Next-Generation SONET/SDH SFP)	<p>Port-level information for the next-generation SONET/SDH SFP PIC.</p> <ul style="list-style-type: none"> • Port—Port number. • Cable type—Type of small form-factor pluggable (SFP) optical transceiver installed. • Fiber type—Type of fiber: SM (single-mode) or MM (multimode). • Xcvr vendor—Transceiver vendor name. • Xcvr vendor part number—Transceiver vendor part number. • Wavelength—Wavelength of the transmitted signal. Next-generation SONET/SDH SFPs use 1310 nm.
Pic port information (MX104 router)	<p>Port-level information for the PIC.</p> <ul style="list-style-type: none"> • Port—Port number • Cable type—Type of optical transceiver installed. • Fiber type—Type of fiber. SM is single-mode. • Xcvr vendor—Transceiver vendor name. • Xcvr vendor part number—Transceiver vendor part number. • Wavelength—Wavelength of the transmitted signal. • Xcvr Firmware—Firmware version of the transceiver.
Multirate Mode	Rate-selectability status for the MIC: Enabled or Disabled .
Channelization	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	OCP	TRXBG1LXDBVM2-JW	1490 nm
4	SFP-1000BASE-BX10-D	SM	OCP	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	OCP	TRXBG1LXDBBMH-J1	1310 nm
8	SFP-1000BASE-BX10-U	SM	OCP	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:

Port	Cable type	Fiber type	Xcvr vendor	part number	Wavelength
0	100GBASE LR4	SM	FINISAR CORP.	FTLC1181RDNS-J3	1310 nm
Xcvr vendor firmware version 1.8					

show chassis pic
fpc-slot pic-slot
(MX240, MX480,
MX960 Routers with

```
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
```

Application Services Modular Line Card)

show chassis pic fpc-slot pic-slot (MX480 Router 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 (MX2010 Router)

```
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 Router)

```
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

```
user@host> show chassis pic fpc-slot 14 pic-slot 0
FPC slot 14, PIC slot 2 information:
  Type          4x10GE SFPP
```

(MX2020 Routers with MPC4E)

```

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
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	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

```
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
```

**(Next-Generation
SONET/SDH 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.	FTRJ1321P1BTL-J2	1310 nm
1	OC3 short reach	MM	OCF	TRPA03MM3BAS-JE	1310 nm
2	OC3 short reach	MM	OCF	TRXA03MM3BAS-JW	1310 nm
3	OC12 inter reach	SM	FINISAR CORP.	FTLF1322P1BTR	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	OPNEX INC	TRF5456AVLB314	1310 nm

**show chassis pic
fpc-slot pic-slot
(SONET/SDH
OC3/STM1)**

```

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

```


[Multi-Rate] MIC with SFP)

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

user@host> show chassis pic fpc-slot 1 pic-slot 0

FPC slot 1, PIC slot 0 information:

Type	MIC-3D-10C192-XFP
------	-------------------

OC192/STM64 MIC with 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 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	user@switch> show chassis pic node-device node1 pic-slot 0					
	FPC slot node1, PIC slot 0 information:					
	Type	48x 10G-SFP+ Builtin				

pic-slot (QFabric
System)

State
Uptime

Online
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

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

(ACX2000 Universal
Access Router)

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 power-ratings

Syntax	show chassis power-ratings
Release Information	Command introduced in Junos OS Release 8.4.
Description	(J Series routers only) Display the low-power consumption, high-power consumption, and heat dissipation ratings of the router. Low-power consumption, high-power consumption, and heat dissipation values are represented in nondimensional tokens.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show chassis power-ratings on page 1183 show chassis power-ratings (Power Management Disabled) on page 1183
Output Fields	Table 83 on page 1181 lists the output fields for the show chassis power-ratings command. Output fields are listed in the approximate order in which they appear.

Table 83: show chassis power-ratings Output Fields

Field Name	Field Description
Device	Physical Interface Module (PIM) slot. (PIM slot numbers appear as FPC numbers in the output.)
Total Tokens	<p>Maximum number of low-power, high-power, and heat tokens available for the router:</p> <ul style="list-style-type: none"> • Low Power—Maximum number of low-power consumption tokens available for the router. • High Power—Maximum number of high-power consumption tokens available for the router. • Heat—Maximum number of heat tokens available for the router.

Table 83: show chassis power-ratings Output Fields (*continued*)

Field Name	Field Description
FPC number	<p>PIM slot number and power and heat information for the PIM in this slot:</p> <ul style="list-style-type: none"> • Low Power—PIM low-power consumption. The number of low-power tokens used by the PIM. • High Power—PIM high-power consumption. The number of high-power tokens used by the PIM. • Heat—The number of PIM heat dissipation tokens used by this PIM. • Ratings—Status of the PIM slot. The status of the slot is based on either the configuration of the slot or the power use and heat dissipation of the PIM in that slot: <p>NOTE: The request chassis fpc command has no effect on the status of the PIM slot.</p> <ul style="list-style-type: none"> • OK—The PIM in this PIM slot can be brought online. • Exceeded—The PIM cannot be brought online because the PIM slot has been disabled by J Series power management. The PIM in this PIM slot exceeds the maximum number of low-power tokens, high-power tokens, or heat tokens. • Empty—No PIM is installed in the PIM slot. • Cfg offline—The PIM cannot be brought online because the PIM slot has been disabled by the set chassis fpc offline command.
Tokens Used	<p>Total number of low-power, high-power, and heat tokens used by the router:</p> <ul style="list-style-type: none"> • Low Power—The total number of low-power tokens used by the router. • High Power—The total number of high-power tokens used by the router. • Heat—Number of heat tokens used by the router. • Ratings—If blank, J Series power management is enabled. No Power Mgmt indicates that J Series power management has been disabled by the set chassis disable_power_management command. <p>NOTE: Use extreme caution when disabling J Series power management. To prevent equipment damage, do not install a combination of PIMs that exceeds the power and heat capacity of the router when J Series power management is disabled.</p>

Sample Output

**show chassis
power-ratings**

```
user@host> show chassis power-ratings
Device           Low      High      Heat      Ratings
                  Power    Power
Total Tokens    83       83       83       -
FPC 1           6        27       21       OK
FPC 2           3        27       18       OK
FPC 3           0         0         0       Empty
FPC 4           0         0         0       Empty
FPC 5           2         0         2       Exceeded
Tokens Used     11       54       41       -
```

**show chassis
power-ratings (Power
Management
Disabled)**

```
user@host> show chassis power-ratings
Device           Low      High      Heat      Ratings
                  Power    Power
Total Tokens    83       83       83       -
FPC 1           6        27       21       OK
FPC 2           3        27       18       OK
FPC 3           0         0         0       Empty
FPC 4           0         0         0       Empty
FPC 5           2         0         2       Exceeded
Tokens Used     11       54       41       No Power Mgmt
```

show chassis power

Syntax	show chassis power
Syntax (MX Series Router)	show chassis power <all-members> <local> <member <i>member-id</i> >
Syntax (MX2020 3D Universal Edge Routers)	show chassis power
Syntax (PTX Series)	show chassis power <detail>
Syntax (MX2010 3D Universal Edge Routers)	show chassis power
Release Information	Command introduced in Junos OS Release 10.0. Command introduced in Junos OS Release 12.1 for PTX Series Packet Transport 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.
Description	(MX Series 3D Universal Edge Routers and PTX Series Packet Transport Routers only) Display power limits and usage information for the AC or DC power sources.

- On the MX Series 3D Universal Edge Routers, power is supplied by Power Entry Modules (PEMs).



NOTE: The new high-capacity (4100 W) 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.

- On the MX2020 3D Universal Edge Routers, the power system consists of three components: the power supply modules (PSMs), the power distribution module (PDM), and the power midplane. The power feed is connected to the PDM. The PDM delivers power to the power midplane. The power midplane supplies power to the PSMs. The MX2020 router chassis provides 3+3 (2500W/80A) or 4+4 (2100W/60A) PSM redundancy for the critical FRUs with two power zones.
- On the MX2010 3D Universal Edge Routers, the power system consists of three components: the power supply modules (PSMs), the power distribution module (PDM), and the power midplane. The power feed is connected to the PDM. The PDM delivers power to the power midplane. The power midplane supplies power to the PSMs. Unlike

the MX2020 router chassis, the MX2010 router chassis does not provide redundancy for the critical FRUs because there is only one power zone.

- On the PTX Series Packet Transport Routers, power is supplied by power supply modules (PSMs). On PTX5000 routers, the power feeds connect to the power distribution units (PDUs).

Options **none**—Display basic power usage information for the AC and DC power sources.

all-members—(MX Series routers only) (Optional) Display power usage information for all members of the Virtual Chassis configuration.

detail—(PTX Series only) (Optional) Include power usage for specific FRUs.

local—(MX Series routers only) (Optional) Display power usage information for the local Virtual Chassis member.

member *member-id*—(MX Series routers only) (Optional) Display power usage 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.

Required Privilege Level view

Related Documentation

- *show chassis power sequence*
- *Checklist for Monitoring Power Supplies*

List of Sample Output

[show chassis power \(MX960 Router with DC PEM\) on page 1189](#)
[show chassis power \(MX960 Router with AC PEM\) on page 1189](#)
[show chassis power \(MX480 Router with AC PEM\) on page 1190](#)
[show chassis power \(MX240 Router with DC PEM\) on page 1190](#)
[show chassis power \(MX2010 Router\) on page 1191](#)
[show chassis power \(MX2020 Router\) on page 1192](#)
[show chassis power \(PTX5000 Packet Transport Router\) on page 1194](#)
[show chassis power detail \(PTX5000 Packet Transport Router\) on page 1194](#)

Output Fields [Table 84 on page 1186](#) lists the output fields for the **show chassis power** command. Output fields are listed in the approximate order in which they appear.

Table 84: show chassis power Output Fields

Field Name	Field Description	Level of Output
PEM number	<p>(MX Series routers only) AC or DC PEM number on the chassis. The following output fields are displayed for the PEM:</p> <ul style="list-style-type: none"> • State—State of the PEM: <ul style="list-style-type: none"> • Online—PEM is present in the slot and online. • Empty—PEM is not present in the slot. • Present—PEM is present in the slot, but not online. • AC/DC Input—OK or Check—State of the AC or DC input power feed with the number of active and expected feeds (one or two). For a DC input power feed, this output field also displays the reference voltage input with maximum input voltage displayed in mV (in parentheses) for the AC or DC PEM. • Capacity—Actual power input capacity with maximum capacity displayed (in parentheses) in watts. <p>NOTE: The maximum capacity for AC and DC PEMs is:</p> <ul style="list-style-type: none"> • MX960 AC PEM—4100 W if two feeds are connected. 1700 W if one feed is connected. • MX960 DC PEM—4100 W if two feeds are connected. 1700 W if one feed is connected. • MX480 AC PEM—2520 W if it is high-line. 1450 W if it is low-line. • MX480 DC PEM—2400 W if the DIP switch is off. 2600 W if the DIP switch is on. • MX240 AC PEM—2520 W if it is high-line. 1450 W if it is low-line. • MX240 DC PEM—2400 W if the DIP switch is off. 2600 W if the DIP switch is on. • DC Output—DC power output in Watts for the specified zone, at the specified amps and voltage (A @ V), and load and percentage utilization of the maximum capacity) for the zone. 	All levels

Table 84: show chassis power Output Fields (*continued*)

Field Name	Field Description	Level of Output
System	<p>(MX Series, MX2020, and MX2010 routers only) Overall power statistics for the system zone.</p> <p>The following output fields are displayed for MX Series routers:</p> <ul style="list-style-type: none"> • <i>Zone number</i>: <ul style="list-style-type: none"> • Capacity—Maximum power capacity applicable for the zone, in watts. • Allocated power—Actual capacity allocated for the zone, in watts, with remaining power displayed in parentheses. • Actual usage—Actual power usage for the zone, in watts. • Total system capacity—Cumulative power capacity of all the zones, in watts. • Total remaining capacity—Difference between the Total system capacity and cumulative Allocated power of all the zones, in watts. <p>The following output fields are displayed for MX2010 and MX2020 routers:</p> <ul style="list-style-type: none"> • Capacity—Maximum power capacity applicable for the zone, in watts. • Allocated power—Actual capacity allocated for the zone, in watts, with remaining power displayed in parentheses. • Actual usage—Actual power usage for the zone, in watts. <p>NOTE: For MX2020 routers, there are two power subsystems (Lower Zone and Upper Zone) and the listed output fields are displayed for each zone.</p>	All levels
Total Power	(PTX Series only) Total power used by the switch (displayed in watts).	All levels
PDU number	(PTX5000 only) ID number of the power distribution unit (PDU) on the chassis.	All levels

Table 84: show chassis power Output Fields (*continued*)

Field Name	Field Description	Level of Output
PSM number	<p>(PTX Series, MX2020 routers, and MX2010 routers only) ID number of the power supply module..</p> <p>(PTX Series) The following output fields are displayed for each PSM:</p> <ul style="list-style-type: none"> • Input (V)—Voltage supplied to the PSM. • Used (W)—Actual power usage for the PSM (measured in watts). <p>(MX2010 and MX2020 routers) The following output fields are displayed for each PSM:</p> <ul style="list-style-type: none"> • State—State of the PSM: <ul style="list-style-type: none"> • Online—PSM is present in the slot and online. • Empty—PSM is not present in the slot. • Present—PSM is present in the slot but not online. • DC Input—State of the DC input power feed with the number of active or expected feeds (in parentheses). • Capacity—Actual power input capacity and maximum capacity (in parentheses) displayed in watts. <p>NOTE: The maximum capacity for AC and DC PSMs is:</p> <ul style="list-style-type: none"> • MX2010/MX2020 AC PSM—2500 W. • MX2010/MX2020 DC PSM—2100 W if the DIP switch is at 60A settings. 2500 W if the DIP switch is at 80A settings. • DC Output—DC power output in watts for the specified zone at the specified amperes and voltage (A at V), and load and percentage utilization of the maximum capacity for the zone. 	All levels
Item	<p>(PTX Series only) (detail keyword only)</p> <p>Actual power usage (measured in watts) for the following FRUs:</p> <ul style="list-style-type: none"> • Fan Tray <i>n</i>—Power usage for the specified fan tray. • RE<i>n</i>/CB<i>n</i>—Power usage for the specified Routing Engines and Control Boards • SIB/CCG/FPD—Power usage for the Switch Interface Board, Centralized Clock Generator (PTX5000 only), and Front Panel Display (craft interface). • FPC <i>n</i>—Power usage for the FPC in the slot specified. 	detail

Sample Output

show chassis power
(MX960 Router with
DC PEM)

```
user@host> show chassis power
PEM 0:
  State:      Online
  DC input:   OK (2 feed expected, 2 feed connected)
  DC input:   48.0 V input (57000 mV)
  Capacity:   4100 W (maximum 4100 W)
  DC output:  513 W (zone 0, 9 A at 57 V, 12% of capacity)

PEM 1:
  State:      Online
  DC input:   OK (2 feed expected, 2 feed connected)
  DC input:   48.0 V input (57000 mV)
  Capacity:   4100 W (maximum 4100 W)
  DC output:  228 W (zone 1, 4 A at 57 V, 5% of capacity)

PEM 2:
  State:      Online
  DC input:   OK (2 feed expected, 2 feed connected)
  DC input:   48.0 V input (57000 mV)
  Capacity:   4100 W (maximum 4100 W)
  DC output:  513 W (zone 0, 9 A at 57 V, 12% of capacity)

PEM 3:
  State:      Online
  DC input:   OK (2 feed expected, 2 feed connected)
  DC input:   48.0 V input (57000 mV)
  Capacity:   4100 W (maximum 4100 W)
  DC output:  342 W (zone 1, 6 A at 57 V, 8% of capacity)

System:
  Zone 0:
    Capacity:      4100 W (maximum 4100 W)
    Allocated power: 1680 W (2420 W remaining)
    Actual usage:   1026 W
  Zone 1:
    Capacity:      4100 W (maximum 4100 W)
    Allocated power: 1263 W (2837 W remaining)
    Actual usage:   570 W
  Total system capacity: 8200 W (maximum 8200 W)
  Total remaining power: 5257 W
```

show chassis power
(MX960 Router with
AC PEM)

```
user@host> show chassis power
PEM 0:
  State:      Online
  AC input:   OK (2 feed expected, 2 feed connected)
  Capacity:   4100 W (maximum 4100 W)
  DC output:  0 W (zone 0, 0 A at 56 V, 0% of capacity)

PEM 1:
  State:      Present
  AC input:   Check (2 feed expected, 1 feed connected)
  Capacity:   1700 W (maximum 4100 W)

PEM 2:
  State:      Empty
  Input:      Absent
```

```
PEM 3:
  State:      Online
  AC input:   OK (1 feed expected, 1 feed connected)
  Capacity:   1700 W (maximum 1700 W)
```

```
System:
  Zone 0:
    Capacity:      4100 W (maximum 4100 W)
    Allocated power: 540 W (3560 W remaining)
    Actual usage:   0 W
  Zone 1:
    Capacity:      0 W (maximum 0 W)
    Allocated power: 0 W (0 W remaining)
    Actual usage:   0 W
  Total system capacity: 4100 W (maximum 4100 W)
  Total remaining power: 3560 W
```

show chassis power (MX480 Router with AC PEM)

```
user@host> show chassis power
PEM 0:
  State:      Online
  AC input:   OK (1 feed expected, 1 feed connected)
  Capacity:   2520 W (maximum 2520 W)
  DC output:  472 W (zone 0, 8 A at 59 V, 18% of capacity)

PEM 1:
  State:      Online
  AC input:   OK (1 feed expected, 1 feed connected)
  Capacity:   2520 W (maximum 2520 W)
  DC output:  472 W (zone 0, 8 A at 59 V, 18% of capacity)

PEM 2:
  State:      Online
  AC input:   OK (1 feed expected, 1 feed connected)
  Capacity:   2520 W (maximum 2520 W)
  DC output:  118 W (zone 0, 2 A at 59 V, 4% of capacity)

PEM 3:
  State:      Empty
  Input:      Absent

System:
  Maximum capacity: 5040 W
  Allocated capacity: 1675 W (33% of maximum)
  Remaining capacity: 3365 W
  Actual usage:      1062 W
```

show chassis power (MX240 Router with DC PEM)

```
user@host> show chassis power
PEM 0:
  State:      Online
  DC input:   OK (1 feed expected, 1 feed connected)
  DC input:   48.0 V input (53500 mV)
  Capacity:   2400 W (maximum 2400 W)
  DC output:  318 W (zone 0, 6 A at 53 V, 13% of capacity)

PEM 1:
  State:      Online
  DC input:   OK (1 feed expected, 1 feed connected)
  DC input:   48.0 V input (54000 mV)
  Capacity:   2400 W (maximum 2400 W)
  DC output:  0 W (zone 0, 0 A at 54 V, 0% of capacity)
```

```

PEM 2:
  State:      Online
  DC input:   OK (1 feed expected, 1 feed connected)
  DC input:   48.0 V input (52500 mV)
  Capacity:   2400 W (maximum 2400 W)
  DC output:  312 W (zone 0, 6 A at 52 V, 13% of capacity)

```

```

PEM 3:
  State:      Online
  DC input:   OK (1 feed expected, 1 feed connected)
  DC input:   48.0 V input (55000 mV)
  Capacity:   2400 W (maximum 2400 W)
  DC output:  0 W (zone 0, 0 A at 55 V, 0% of capacity)

```

```

System:
  Maximum capacity: 2400 W
  Allocated capacity: 1270 W (52% of maximum)
  Remaining capacity: 1130 W
  Actual usage:     630 W

```

show chassis power (MX2010 Router)

```

user@host > show chassis power
PSM 0:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  1022.06 W (19.75 A at 51.75 V, 40.88% of capacity)

PSM 1:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  996.19 W (19.25 A at 51.75 V, 39.85% of capacity)

PSM 2:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  1022.06 W (19.75 A at 51.75 V, 40.88% of capacity)

PSM 3:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  1004.25 W (19.50 A at 51.50 V, 40.17% of capacity)

PSM 4:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  996.19 W (19.25 A at 51.75 V, 39.85% of capacity)

PSM 5:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  1017.12 W (19.75 A at 51.50 V, 40.69% of capacity)

PSM 6:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)

```

Capacity: 2500 W (maximum 2500 W)
DC output: 1009.12 W (19.50 A at 51.75 V, 40.37% of capacity)

PSM 7:

State: Online
DC input: OK (INP0 feed expected, INP0 feed connected)
Capacity: 2500 W (maximum 2500 W)
DC output: 996.19 W (19.25 A at 51.75 V, 39.85% of capacity)

PSM 8:

State: Online
DC input: OK (INP0 feed expected, INP0 feed connected)
Capacity: 2500 W (maximum 2500 W)
DC output: 1004.25 W (19.50 A at 51.50 V, 40.17% of capacity)

System:

Capacity: 22500 W (maximum 22500 W)
Allocated power: 12888 W (9612 W remaining)
Actual usage: 9067.44 W

**show chassis power
(MX2020 Router)**

user@host > show chassis power

PSM 0:

State: Online
DC input: OK (INP0 feed expected, INP0 feed connected)
Capacity: 2500 W (maximum 2500 W)
DC output: 858.44 W (Lower Zone, 16.75 A at 51.25 V, 34.34% of capacity)

PSM 1:

State: Online
DC input: OK (INP0 feed expected, INP0 feed connected)
Capacity: 2500 W (maximum 2500 W)
DC output: 854.25 W (Lower Zone, 16.75 A at 51.00 V, 34.17% of capacity)

PSM 2:

State: Online
DC input: OK (INP0 feed expected, INP0 feed connected)
Capacity: 2500 W (maximum 2500 W)
DC output: 858.44 W (Lower Zone, 16.75 A at 51.25 V, 34.34% of capacity)

PSM 3:

State: Online
DC input: OK (INP0 feed expected, INP0 feed connected)
Capacity: 2500 W (maximum 2500 W)
DC output: 867.00 W (Lower Zone, 17.00 A at 51.00 V, 34.68% of capacity)

PSM 4:

State: Online
DC input: OK (INP0 feed expected, INP0 feed connected)
Capacity: 2500 W (maximum 2500 W)
DC output: 871.25 W (Lower Zone, 17.00 A at 51.25 V, 34.85% of capacity)

PSM 5:

State: Empty
Input: Absent

PSM 6:

State: Empty
Input: Absent

PSM 7:

State: Online

DC input: OK (INP0 feed expected, INP0 feed connected)
Capacity: 2500 W (maximum 2500 W)
DC output: 867.00 W (Lower Zone, 17.00 A at 51.00 V, 34.68% of capacity)

PSM 8:

State: Online
DC input: OK (INP0 feed expected, INP0 feed connected)
Capacity: 2500 W (maximum 2500 W)
DC output: 879.75 W (Lower Zone, 17.25 A at 51.00 V, 35.19% of capacity)

PSM 9:

State: Online
DC input: OK (INP0 feed expected, INP0 feed connected)
Capacity: 2100 W (maximum 2500 W)
DC output: 624.75 W (Upper Zone, 12.25 A at 51.00 V, 29.75% of capacity)

PSM 10:

State: Online
DC input: OK (INP0 feed expected, INP0 feed connected)
Capacity: 2100 W (maximum 2500 W)
DC output: 615.00 W (Upper Zone, 12.00 A at 51.25 V, 29.29% of capacity)

PSM 11:

State: Online
DC input: OK (INP0 feed expected, INP0 feed connected)
Capacity: 2100 W (maximum 2500 W)
DC output: 624.75 W (Upper Zone, 12.25 A at 51.00 V, 29.75% of capacity)

PSM 12:

State: Online
DC input: OK (INP0 feed expected, INP0 feed connected)
Capacity: 2100 W (maximum 2500 W)
DC output: 624.75 W (Upper Zone, 12.25 A at 51.00 V, 29.75% of capacity)

PSM 13:

State: Online
DC input: OK (INP0 feed expected, INP0 feed connected)
Capacity: 2100 W (maximum 2500 W)
DC output: 612.00 W (Upper Zone, 12.00 A at 51.00 V, 29.14% of capacity)

PSM 14:

State: Online
DC input: OK (INP0 feed expected, INP0 feed connected)
Capacity: 2100 W (maximum 2500 W)
DC output: 627.81 W (Upper Zone, 12.25 A at 51.25 V, 29.90% of capacity)

PSM 15:

State: Online
DC input: OK (INP0 feed expected, INP0 feed connected)
Capacity: 2100 W (maximum 2500 W)
DC output: 627.81 W (Upper Zone, 12.25 A at 51.25 V, 29.90% of capacity)

PSM 16:

State: Online
DC input: OK (INP0 feed expected, INP0 feed connected)
Capacity: 2100 W (maximum 2500 W)
DC output: 615.00 W (Upper Zone, 12.00 A at 51.25 V, 29.29% of capacity)

PSM 17:

State: Online
DC input: OK (INP0 feed expected, INP0 feed connected)

Capacity: 2100 W (maximum 2500 W)
DC output: 624.75 W (Upper Zone, 12.25 A at 51.00 V, 29.75% of capacity)

System:

Upper Zone:

Capacity: 18900 W (maximum 22500 W)
Allocated power: 12900 W (6000 W remaining)
Actual usage: 5596.62 W

Lower Zone:

Capacity: 17500 W (maximum 17500 W)
Allocated power: 12900 W (4600 W remaining)
Actual usage: 6056.12 W

Total system capacity: 36400 W (maximum 40000 W)
Total remaining power: 10600 W

show chassis power
(PTX5000 Packet
Transport Router)

```
user@host> show chassis power
Chassis Power      Input(V)      Used(W)
Total Power                               4006

PDU 0
  PSM 0
    Input 1          54          149
  PSM 1
    Input 1          54          377
  PSM 2
    Input 1          54          745
  PSM 3
    Input 1          54          715

PDU 1
  PSM 0
    Input 1          54          246
  PSM 1
    Input 1          54          332
  PSM 2
    Input 1          54          721
  PSM 3
    Input 1          54          721
```

show chassis power
detail (PTX5000

```
user@host> show chassis power detail
Chassis Power      Input(V)      Used(W)
```

Packet Transport Router)

Total Power		3997
PDU 0		1975
PSM 0		
Input 1	54	136
PSM 1		
Input 1	54	377
PSM 2		
Input 1	54	741
PSM 3		
Input 1	54	721
PDU 1		2022
PSM 0		
Input 1	54	235
PSM 1		
Input 1	54	332
PSM 2		
Input 1	54	726
PSM 3		
Input 1	54	729
Item	Used(W)	
Fan Tray 0	49	
Fan Tray 1	127	
Fan Tray 2	117	
RE0/CB0	109	
RE1/CB1	100	
SIB/CCG/FPD	375	
FPC 0	381	
FPC 1	0	
FPC 2	447	
FPC 3	560	
FPC 4	0	
FPC 5	448	
FPC 6	379	
FPC 7	388	

show chassis psd

Syntax `show chassis psd`

Release Information Command introduced in Junos OS Release 9.1.

Description (Root System Domain [RSD] only) Display information about Protected System Domains (PSDs). A PSD is initially created by the RSD configuration. An RSD and PSDs are supported on a T320 or T640 router, or a T1600 routing node, or a TX Matrix Plus Platform that is interconnected with the JCS1200 platform.



NOTE: RSD configuration is not supported on a routing matrix based on TX Matrix Plus router with 3D SIBs.

Options This command has no options.

Additional Information For more information about PSDs, RSDs, and the JCS1200 platform, see the *Junos OS Protected System Domain Configuration Guide*.

Required Privilege Level view

List of Sample Output [show chassis psd on page 1197](#)

Output Fields [Table 85 on page 1196](#) lists the output fields for the `show chassis psd` command. Output fields are listed in the approximate order in which they appear.

Table 85: show chassis psd Output Fields

Field Name	Field Description
Slot Description	PSD identification.
State	PSD status: <ul style="list-style-type: none"> • Online—PSD is online and running. • Offline—PSD is powered down.
Uptime	Length of time that the PSD has been up and running.

Sample Output

`show chassis psd`

{master}

user@host> `show chassis psd`

Slot	Description	State	Uptime
1		Online	12 hours, 19 minutes, 51 seconds
2		Online	2 hours, 18 minutes, 17 seconds
3		Online	12 hours, 19 minutes, 51 seconds

show chassis redundancy feb

Syntax	show chassis redundancy feb <errors> <redundancy-group <i>group-name</i> >
Release Information	Command introduced in Junos OS Release 8.2.
Description	(M120 routers only) Display information about the status of configured Forwarding Engine Board (FEB) redundancy groups.
Options	<p>none—Display information about the status of all configured FEB redundancy groups.</p> <p>redundancy-group <i>group-name</i>—(Optional) Display information about the specified configured redundancy group.</p> <p>errors—(Optional) Display information about any errors encountered on the components in configured redundancy groups or on links between a FEB and a Flexible PIC Concentrator (FPC).</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • request chassis redundancy feb slot on page 466 • <i>Configuring FEB Redundancy on the M120 Router</i> • <i>Switching Control Board Redundancy</i>
List of Sample Output	show chassis redundancy feb on page 1199 show chassis redundancy feb redundancy-group grp1 on page 1199 show chassis redundancy feb redundancy-group grp0 errors on page 1199
Output Fields	Table 86 on page 1198 lists the output fields for the show chassis redundancy feb command. Output fields are listed in the approximate order in which they appear.

Table 86: show chassis redundancy feb Output Fields

Field name	Field Description
Group	Name of configured redundancy group.
FEB	Slot number of each FEB included in redundancy groups.
State	State of each FEB: <ul style="list-style-type: none"> • Online—FEB is online and running. • Offline—FEB is powered down.
Priority	(Standard and redundancy-group option) Status of FEB in the redundancy group: Backup , Primary , Other , or null.

Table 86: show chassis redundancy feb Output Fields (*continued*)

Field name	Field Description
Connected FPCs	(Standard and redundancy-group option) Slot number of each FPC connected to the FEB. The status Check is displayed when an error might have occurred.
Redundancy State	(Standard and redundancy-group option) Status of the FEB: <ul style="list-style-type: none"> • Active—FEB is currently active. • Ready—Backup FEB is ready for a switchover • Not Ready—Backup FEB is not ready for a switchover.
Auto-failover	(Standard and redundancy-group option) Automatic failover status of redundancy group: Enabled or Disabled .
Switch-reason	(Standard and redundancy-group option) Reason a switchover occurred to the backup FEB in the redundancy group.
Hard error: Yes	(errors option only) Displayed when a hard error occurs on a FEB.
FPC	(errors option only) Slot number and status of FPC: link ok or link error .
Fabric plane	(errors option only) Slot number and status of fabric plane.

Sample Output

show chassis
redundancy feb

```
user@host> show chassis redundancy feb
Group:          cfpc
FEB  State      Priority  Connected FPCs  Redundancy state
0    Offline      Backup
1    Online              5              Active
Auto-failover: Enabled
Group:          grp0
FEB  State      Priority  Connected FPCs  Redundancy state
3    Offline      Backup
5    Online      Primary   0              Active
Auto-failover: Enabled
```

show chassis
redundancy feb
redundancy-group grp1

```
user@host> show chassis redundancy feb redundancy-group grp1
Group:          grp1
FEB  State      Priority  Connected FPCs  Redundancy state
0    Online      Other     0              Active
1    Online      Other     1              Active
4    Online      Primary   4              Active
5    Online      Backup              Ready
Autofailover: Enabled
Switch-reason: Switchover from CLI
```

show chassis
redundancy feb

```
user@host> show chassis redundancy feb redundancy-group grp0 errors
Group: grp0
FEB: 0    State: Online
```

redundancy-group
grp0 errors

```
FPC 0 link OK
Fabric plane 0 OK
Fabric plane 1 OK
Fabric plane 2 OK
Fabric plane 3 OK
FEB: 1    State: Online
FPC 0 link OK
Fabric plane 0 OK
Fabric plane 1 OK
Fabric plane 2 OK
Fabric plane 3 OK
FEB: 2    State: Online
FPC 2 link OK
Fabric plane 0 OK
Fabric plane 1 OK
Fabric plane 2 OK
Fabric plane 3 OK
FEB: 3    State: Online
FPC 3 link OK
Fabric plane 0 OK
Fabric plane 1 OK
Fabric plane 2 OK
Fabric plane 3 OK
FEB: 4    State: Online
FPC 4 link OK
Fabric plane 0 OK
Fabric plane 1 OK
Fabric plane 2 OK
Fabric plane 3 OK
FEB: 5    State: Online
FPC 5 link OK
Fabric plane 0 OK
Fabric plane 1 OK
Fabric plane 2 OK
Fabric plane 3 OK
```


show chassis routing-engine

Syntax	show chassis routing-engine <bios | <i>slot</i> >
Syntax (EX Series Switches)	show chassis routing-engine < <i>slot</i> >
Syntax (T Series routers)	show chassis routing-engine <bios | <i>slot</i> >
Syntax (TX Matrix Routers)	show chassis routing-engine <bios | <i>slot</i> > <lcc <i>number</i> | scc>
Syntax (TX Matrix Plus Routers)	show chassis routing-engine <bios | <i>slot</i> > <lcc <i>number</i> | sfc <i>number</i> >
Syntax (QFX Series)	show chassis routing-engine <interconnect-device <i>name</i> > <node-device <i>name</i> >
Syntax (MX Series Routers)	show chassis routing-engine <bios | <i>slot</i> > <all-members> <local> <member <i>member-id</i> >
Syntax (MX2010 and MX2020 3D Universal Edge Routers)	show chassis routing-engine <bios | <i>slot</i> >
Syntax (MX104 3D Universal Edge Routers)	show chassis routing-engine
Syntax (ACX Series Universal Access Routers)	show chassis routing-engine
Release Information	<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>sfc 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>
Description	Display the status of the Routing Engine.

Options **none**—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.

all-members—(MX Series routers only) (Optional) Display Routing Engine information for all members of the Virtual Chassis configuration.

bios—(Optional) Display the (BIOS) firmware version.

interconnect-device *number*—(QFabric systems only) (Optional) Display Routing Engine information for a specified Interconnect device.

lcc *number*—(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.

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 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 467](#)
 - [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 1206](#)
[show chassis routing-engine \(M10 Router\) on page 1206](#)
[show chassis routing-engine \(M20 Router\) on page 1206](#)
[show chassis routing-engine \(M40 Router\) on page 1207](#)
[show chassis routing-engine \(M120 Router\) on page 1207](#)
[show chassis routing-engine \(M160 Router\) on page 1208](#)
[show chassis routing-engine \(MX104 Router\) on page 1209](#)
[show chassis routing-engine \(MX240 Router\) on page 1209](#)
[show chassis routing-engine \(MX480 Router\) on page 1210](#)
[show chassis routing-engine \(MX960 Router\) on page 1210](#)
[show chassis routing-engine \(MX2010 Router\) on page 1210](#)
[show chassis routing-engine \(MX2020 Router\) on page 1211](#)
[show chassis routing-engine \(T320 router\) on page 1212](#)
[show chassis routing-engine \(T640 router\) on page 1213](#)
[show chassis routing-engine \(T1600 router\) on page 1213](#)
[show chassis routing-engine \(T4000 router\) on page 1214](#)
[show chassis routing-engine \(TX Matrix Router\) on page 1215](#)
[show chassis routing-engine lcc \(TX Matrix Router\) on page 1216](#)
[show chassis routing-engine bios \(TX Matrix Router\) on page 1216](#)
[show chassis routing-engine \(TX Matrix Plus Router\) on page 1216](#)
[show chassis routing-engine lcc \(TX Matrix Plus Router\) on page 1218](#)
[show chassis routing-engine bios \(TX Matrix Plus Router\) on page 1219](#)
[show chassis routing-engine \(QFX Series\) on page 1219](#)
[show chassis routing-engine \(PTX Series Packet Transport Router\) on page 1219](#)
[show chassis routing-engine \(ACX2000 Universal Access Router\) on page 1220](#)
[show chassis routing-engine \(ACX1000 Universal Access Router\) on page 1220](#)

Output Fields [Table 87 on page 1203](#) lists the output fields for the **show chassis routing-engine** command. Output fields are listed in the approximate order in which they appear.

Table 87: show chassis routing-engine Output Fields

Field Name	Field Description
Slot	(Systems with single and multiple Routing Engines) Slot number.
Current state	(Systems with multiple Routing Engines) Current state of the Routing Engine: Master , Backup , or Disabled .
Election priority	(Systems with multiple Routing Engines) Election priority for the Routing Engine: Master or Backup .
Temperature	Temperature of the air flowing past the Routing Engine.

Table 87: show chassis routing-engine Output Fields (*continued*)

Field Name	Field Description
CPU Temperature	Temperature of the CPU.
DRAM	Total DRAM available to the Routing Engine's processor. Starting with Junos OS Release 12.3R1, the DRAM field displays both available memory and installed memory.
Memory utilization	Percentage of Routing Engine memory being used.
CPU utilization	Information about the Routing Engine's CPU utilization: <ul style="list-style-type: none"> • User—Percentage of CPU time being used by user processes. • Background—Percentage of CPU time being used by background processes. • Kernel—Percentage of CPU time being used by kernel processes. • Interrupt—Percentage of CPU time being used by interrupts. • Idle—Percentage of CPU time that is idle.
Model	Routing Engine model number.
Serial ID	(Systems with multiple Routing Engines) Identification number of the Routing Engine in this slot.
Start time	Time at which the Routing Engine started running.
Uptime	How long the Routing Engine has been running.
Routing Engine BIOS Version	BIOS version being run by the Routing Engine.

Table 87: 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"> • power cycle/failure—Halt of the Routing Engine using the halt 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 request system halt 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. • watchdog—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. • reset-button reset—(Not available on the J Series router or EX Series switch) Reboot due to pressing of the reset button on the Routing Engine. • power-button hard power off—Reboot due to pressing of the power button on the chassis. A powering down of the software also occurs if you enter the request system power-off command. You can enter this command to power down the chassis or specific Routing Engines; you can then restart the software. • misc hardware reason—Reboot due to miscellaneous hardware reasons. • thermal shutdown—Reboot due to the router or switch reaching a critical temperature at which point it is unsafe to continue operations. • hard disk failure—Reboot due to a hard disk or solid-state drive (SSD) failure. • reset from debugger—Reboot due to reset from the debugger. • chassis control reset—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 restart chassis-control command. • bios auto recovery reset—Reboot due to a BIOS auto-recovery reset. • could not be determined—Reboot due to an undetermined reason. • Router rebooted after a normal shutdown—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 request system reboot command. You can enter this command to reboot the chassis or specific Routing Engines.
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-DUO-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
lcc0-re0:
-----
Routing Engine BIOS Version: V1.0.17
lcc2-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

lcc0-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
lcc0-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 (PTX)**

```
user@switch> show chassis routing-engine
```

```
Routing Engine status:
```

```
Slot 0:
```

Series Packet Transport Router)

```

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 (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

```

user@host> show chassis routing-engine
Routing Engine status:
  Temperature                 36 degrees C / 96 degrees F

```

(ACX1000 Universal
Access Router)

```
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 scb

Syntax	show chassis scb
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M40 router only) Display System Control Board (SCB) status information.
Options	This command has no options.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> <i>Checklist for Monitoring the SCB</i>
List of Sample Output	show chassis scb on page 1223
Output Fields	Table 88 on page 1222 lists the output fields for the show chassis scb command. Output fields are listed in the approximate order in which they appear.

Table 88: show chassis scb Output Fields

Field Name	Field Description
Temperature	Temperature of the air passing by the SCB, in degrees Celsius.
CPU utilization	Total percentage of CPU being used by the SCB's processor.
Interrupt utilization	Of the total CPU being used by the SCB's processor, the percentage being used for interrupts.
Heap utilization	Percentage of heap space being used by the SCB's processor.
Buffer utilization	Percentage of buffer space being used by the SCB's processor.
DRAM	Total DRAM available to the SCB's processor.
Start time	Time when the SCB started running.
Uptime	How long the SCB has been running.
Internet Processor memory	Information about the memory of the Internet Processor ASIC on the SCB: <ul style="list-style-type: none"> IP routes—Number of IP routes known to the Internet Processor. MPLS routes—Number of MPLS routes known to the Internet Processor. SRAM banks enabled—Which SRAM banks are enabled. SRAM size—Size of SCB SRAM, in bytes. SRAM used—Amount of SRAM used, in bytes. SRAM utilization—Percentage of SRAM used.

Sample Output

`show chassis scb`

```
user@host> show chassis scb
SCB status:
  Temperature:          30 Centigrade
  CPU utilization:      5 percent
  Interrupt utilization: 0 percent
  Heap utilization:     0 percent
  Buffer utilization:    2 percent
  DRAM:                 64 Mbytes
  Start time:           1998-10-28 18:35:46 UTC
  Uptime:               6 minutes, 16 seconds
Internet Processor memory:
  IP routes:            16
  MPLS routes:          1
  SRAM banks enabled:   [ 1 1 1 1 ]
  SRAM size:            4 Mbytes
  SRAM used:            256 bytes
  SRAM utilization:     0 percent
```

show chassis sfb

Syntax	<code>show chassis sfb</code> <code>< slot <i>sfb-slot-number</i>></code>
Release Information	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.
Description	Display chassis information about the Switch Fabric Board (SFB).
Options	none —Display chassis information about all Switch Fabric Boards. <i>sfb-slot-number</i> —(Optional) Display chassis information about the specified Switch Fabric Board. For MX2020 and MX2010 routers, replace <i>sfb-slot-number</i> with a value from 0 through 7.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> request chassis sfb on page 474
List of Sample Output	show chassis sfb (MX2020 Router) on page 1225 show chassis sfb (MX2010 Router) on page 1225
Output Fields	Table 89 on page 1224 lists the output fields for the show chassis sfb command. Output fields are listed in the approximate order in which they appear.

Table 89: show chassis sfb Output Fields

Field Name	Field Description
Slot	Slot number.
State	Status of the SFB. <ul style="list-style-type: none"> Online—The SFB is online and running. Offline— SFB is powered down.
Uptime	How long the Routing Engine has been connected to the SFB and, therefore, how long the SFB has been up and running.

Sample Output

show chassis sfb
(MX2020 Router)

```
user@host> show chassis sfb
Slot  State                Uptime
0     Online                6 hours, 11 minutes, 33 seconds
1     Online                6 hours, 11 minutes, 27 seconds
2     Online                6 hours, 11 minutes, 21 seconds
3     Online                6 hours, 11 minutes, 15 seconds
4     Online                6 hours, 11 minutes, 8 seconds
5     Online                6 hours, 11 minutes, 2 seconds
6     Online                6 hours, 10 minutes, 57 seconds
7     Online                6 hours, 10 minutes, 51 seconds
```

show chassis sfb
(MX2010 Router)

```
user@host> show chassis sfb
Slot  State                Uptime
0     Online                6 hours, 48 minutes, 28 seconds
1     Online                6 hours, 48 minutes, 23 seconds
2     Online                6 hours, 48 minutes, 17 seconds
3     Offline              --- Restarting unresponsive board ---
4     Online                6 hours, 48 minutes, 12 seconds
5     Online                6 hours, 48 minutes, 6 seconds
6     Online                6 hours, 48 minutes
7     Online                6 hours, 47 minutes, 55 seconds
```

show chassis sfm

Syntax	show chassis sfm <detail < <i>sfm-slot</i> >>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M40e and M160 routers only) Display Switching and Forwarding Module (SFM) status information.
Options	<p>none—Display standard status information about all SFMs.</p> <p>detail—(Optional) Display detailed SFM status information.</p> <p><i>sfm-slot</i>—(Optional) Display status information about the SFM in the specified slot only. For the M40e router, replace <i>sfm-slot</i> with 0 or 1. For the M160 router, replace <i>sfm-slot</i> with a value from 0 through 3.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • request chassis sfm on page 476 • request chassis sfm master switch on page 475 • <i>Switching the Global Master and Backup Roles in a Virtual Chassis Configuration</i>
List of Sample Output	show chassis sfm (M160 Router) on page 1228 show chassis sfm detail (M40e Router) on page 1228 show chassis sfm detail (M160 Router) on page 1228
Output Fields	Table 90 on page 1226 lists the output fields for the show chassis sfm command. Output fields are listed in the approximate order in which they appear.

Table 90: show chassis sfm Output Fields

Field Name	Field Description	Level of Output
Slot	Slot number.	All levels
State	Status of the SFM. State can be any of the following: <ul style="list-style-type: none"> • Online—SFM is online and running. • Online-Standby (M40e router only)—SFM is online, operating as Standby. • Offline—SFM is powered down. • Empty—No SFM is present. 	All levels
Reason	If the status is Offline , reason for this state.	All levels
Temp	Temperature of air passing by the SFM, in degrees Celsius.	none specified
CPU Utilization (%)	Information about CPU usage.	none specified

Table 90: show chassis sfm Output Fields (*continued*)

Field Name	Field Description	Level of Output
Total	Total percentage of the CPU being used by the SFM's processor.	All levels
Interrupt	Of the total CPU being used by the SFM's processor, the percentage being used for interrupts.	All levels
Memory Utilization	Information about memory usage.	none specified
DRAM	Total DRAM available to the SFM's processor, in megabytes (MB).	All levels
Heap	Percentage of heap space (dynamic memory) being used by the SFM's processor. If this number exceeds 80 percent, it might indicate a software problem (memory leak).	All levels
Buffer	Percentage of buffer space being used by the SFM's processor for buffering internal messages.	All levels
SPP Temperature	Temperature of air passing by the Switch Plane Processor card, in degrees Celsius and Fahrenheit	detail
SPR Temperature	Temperature of air passing by the Switch Plane Router card, in degrees Celsius and Fahrenheit.	detail
Total CPU DRAM	Total amount of CPU DRAM being used by the SFM's processor.	detail
Total SSRAM	Total amount of SSRAM being used by the SFM's processor.	detail
Internet processor II	(M160 router only) Processor type.	detail
Start time	Time this SFM became active.	detail
Uptime	How long the SFM has been up and running.	detail
Packet scheduling mode	(M160 router only) Enabled or disabled.	detail

Sample Output

show chassis sfm (M160 Router)

```
user@host> show chassis sfm
SFM status:
```

Slot	State	Temp (C)	CPU Total	Utilization (%) Interrupt	Memory DRAM (MB)	Utilization (%) Heap	Utilization (%) Buffer
0	Online	39	0	0	64	0	6
1	Online	43	0	0	64	0	6
2	Empty	0	0	0	0	0	0
3	Empty	0	0	0	0	0	0

show chassis sfm detail (M40e Router)

```
user@host> show chassis sfm detail
Slot 0 information:
  State: Offline
  Reason: - power configured off
Slot 1 information:
  State: Present
  SPP temperature: 0 degrees C / 32 degrees F
  SPR temperature: 0 degrees C / 32 degrees F
  Total CPU DRAM: 0 MB
  Total SSRAM: 0 MB
```

show chassis sfm detail (M160 Router)

```
user@host> show chassis sfm detail
Slot 0 information:
  State: Online
  SPP temperature: 37 degrees C / 98 degrees F
  SPR temperature: 39 degrees C / 102 degrees F
  Total CPU DRAM: 64 MB
  Total SSRAM: 8 MB
  Internet Processor II: Version 1, Foundry IBM, Part number 9
  Start time: 2004-08-17 09:23:08 PDT
  Uptime: 72 days, 1 hour, 15 minutes, 57 seconds
Slot 1 information:
  State: Online
  SPP temperature: 36 degrees C / 96 degrees F
  SPR temperature: 37 degrees C / 98 degrees F
  Total CPU DRAM: 64 MB
  Total SSRAM: 8 MB
  Internet Processor II: Version 1, Foundry IBM, Part number 9
  Start time: 2004-08-17 09:23:08 PDT
  Uptime: 72 days, 1 hour, 15 minutes, 57 seconds
Slot 2 information:
  ....
Packet scheduling mode : Disabled
```

show chassis sibs

Syntax	show chassis sibs
Syntax (TX Matrix Router)	show chassis sibs <lcc <i>number</i> | scc>
Syntax (TX Matrix Plus Router)	show chassis sibs <lcc <i>number</i> | sfc <i>number</i> >
Syntax (PTX Series Packet Transport Routers)	show chassis sibs <detail> <slot>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 12.1 for the PTX Series Packet Transport Routers.</p> <p>sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6.</p> <p>detail and sib-slot options introduced for the PTX Packet Transport Router in Junos OS Release 12.1</p>
Description	(M320,T Series routers, TX Matrix routers, TX Matrix Plus routers, and PTX Series routers only) Display Switch Interface Boards (SIBs) status information.
Options	<p>none—(TX Matrix routers and TX Matrix Plus routers only) On a TX Matrix router, display the SIB status for the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display the SIB status for the TX Matrix Plus router and its attached routers.</p> <p>detail—(PTX Series) (Optional) Display detailed SIB status information.</p> <p>lcc <i>number</i>—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display SIB status information 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 SIB status information for a specified T1600 or T4000 router (LCC) 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"> • 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 SIB status information for the TX Matrix router (switch-card chassis).

sfc *number*—(TX Matrix Plus routers only) (Optional) Display SIB status information for the TX Matrix Plus router (switch-fabric chassis or SFC). Replace *number* with 0.

slot—(PTX Series) (Optional) Display status information about the SIB in the specified slot only. The range of values is 0 through 8.

Required Privilege Level

view

Related Documentation

- [request chassis sib on page 477](#)
- [show chassis spmb sibs on page 1250](#)
- [show chassis environment sib on page 712](#)
- *Monitoring the SIBs*
- *M320 SIB Description*
- [Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

List of Sample Output

[show chassis sibs \(T640 Router\) on page 1234](#)
[show chassis sibs \(T4000 Router\) on page 1234](#)
[show chassis sibs \(TX Matrix Router\) on page 1234](#)
[show chassis sibs \(T1600 Router\) on page 1234](#)
[show chassis sibs \(TX Matrix Plus Router\) on page 1234](#)
[show chassis sibs \(TX Matrix Plus Router with 3D SIBs\) on page 1236](#)
[show chassis sibs sfc \(TX Matrix Plus Router\) on page 1237](#)
[show chassis sibs lcc \(TX Matrix Plus Router\) on page 1238](#)
[show chassis sibs lcc \(TX Matrix Plus Router with 3D SIBs\) on page 1239](#)
[show chassis sibs \(M320 Router\) on page 1239](#)
[show chassis sibs \(PTX Series\) on page 1239](#)
[show chassis sibs \(PTX Series\) on page 1239](#)

Output Fields

Table 91 on page 1230 lists the output fields for the **show chassis sibs** command. Output fields are listed in the approximate order in which they appear.

Table 91: show chassis sibs Output Fields

Field Name	Field Description
Slot	SIB slot number.
Type	(TX Matrix Plus router only) SIB type.
Uptime	How long the SIB has been up and running.
State	SIB status: <ul style="list-style-type: none"> • Activating—SIB is coming online; this is a transitional state. • Deactivating—SIB is going offline; this is a transitional state.

Table 91: show chassis sibs Output Fields (*continued*)

Field Name	Field Description
	<ul style="list-style-type: none"> • Connected—SIBs on a T1600 router are connected and trained but are either not online or are spare, because the plane on the TX Matrix Plus router (or switch-fabric chassis) is still offline. • Disconnected—SIBs on all T640 routers on the TX Matrix router (switch-card chassis) are in the Disconnected state, because a SIB on the SCC has gone offline. Likewise, SIBs on all T1600 routers on the TX Matrix Plus router (or switch-fabric chassis) are in the Disconnected state, because a SIB on the SFC has gone offline. On the TX Matrix Plus router with 3D SIBs, the LCC SIB is also disconnected if the F13 SIB is online, but none of the cables are connected or trained. • Online—SIB is operational and running. • Offline—SIB is powered down. <p>NOTE: If a SIB transitions to the Offline state, the command displays an appropriate reason in the output. For instance, if the SIB is taken offline using the request chassis sib command, the show chassis sibs command displays --- Offlined by cli command --- in the output.</p> <ul style="list-style-type: none"> • Spare—SIB is redundant and will move to active state if one of the working SIBs fails to pass traffic. <p>NOTE: Spare does not apply to PTX Series Packet Transport Routers, as there are no spare SIBs.</p> <ul style="list-style-type: none"> • Empty—No SIB is present. • Fault—SIB is in an alarmed state in which the SIB's plane is not operational for one of the following reasons: <ul style="list-style-type: none"> • Onboard fabric ASIC is not operational. • Fiber-optic connector faults. • FPC connector faults. • SIB midplane connector faults. • Check—SIB is in an alarmed state due to link errors or destination errors. A SIB can transition to the Check state from the online or spare state. The Check state can be caused by the following reasons: <ul style="list-style-type: none"> • Unsupported FPC installed on a router. • SIB not inserted properly (such as bent pins). • Destination errors are detected on the SIB. In this case, the Packet Forwarding Engine stops using the SIB to send traffic to the affected destination Packet Forwarding Engine. When a Packet Forwarding Engine cannot be reached on that plane or SIB, a destination error is reported against that SIB. <p>NOTE: For SIBs in the Check state, the output displays some additional information:</p> <ul style="list-style-type: none"> • In Junos OS Release 9.6 and later, the Check state message shows the number of Packet Forwarding Engines in the plane having destination errors. For example, Check (10 destination errors) indicates 10 Packet Forwarding Engines cannot be reached on

Table 91: show chassis sibs Output Fields (*continued*)

Field Name	Field Description
	<p>that particular SIB. If there are no destination errors, and if the SIB transitions to the Check state because of link errors only, the Check state message shows Check (0 destination errors).</p> <ul style="list-style-type: none"> In Junos OS Release 9.5 and earlier, the Check state message shows Check (destination errors) if there are Packet Forwarding Engines with destination errors in this plane. However, it does not show the number of Packet Forwarding Engines having destination errors. If there are no destination errors and if the SIB transitions to the Check state because of link errors only, the Check state message shows Check (no destination errors). <p>If the SIB is in a Check state, because of destination errors, the CLI displays an additional line in the output, use "show chassis fabric fpcs" and "show chassis fabric sibs" for more details.</p> <ul style="list-style-type: none"> Link errors are detected on the channel between the SIB and a Packet Forwarding Engine. Link errors can be detected at initialization time or runtime: <ul style="list-style-type: none"> Link errors caused by a link training failure at initialization time—The Packet Forwarding Engine does not use the SIB to send traffic. The show chassis fabric fpcs command shows Plane disabled as status for this link. Link errors caused by CRC errors detected at runtime—The Packet Forwarding Engine continues to use the SIB to send traffic. The show chassis fabric fpcs command shows Link error as the status for this link. <p>NOTE: The Check state does not apply to PTX Series Packet Transport Routers.</p> <ul style="list-style-type: none"> SFC Error—If an F13 SIB on the TX Matrix Plus router (SFC) transitions to the Fault state (for instance, because of link errors), and then if an LCC SIB (connected to the F13 SIB) comes online, the LCC SIB transitions to the SFC Error state. This state indicates that the F13 SIB to which the LCC SIB is connected has errors. <p>NOTE: The Connected, Disconnected, and SFC Error states are only applicable to the SIBs on an LCC.</p> <ul style="list-style-type: none"> Invalid—The specific SIB slot is not valid for 4-LCC chassis configuration. See the <i>TX Matrix Plus Hardware Guide</i> for more information about the supported SIB slots. <p>NOTE: The Invalid state is applicable to TX Matrix Plus routers only.</p>
Fabric links	<p>Indicates status of fabric links on the SIB.</p> <ul style="list-style-type: none"> Active—All fabric links on SIB are active. Errors detected on the SIB's fabric links, if any, are reported in the Errors column. Unused—All fabric links on the SIB are not used for fabric traffic.
Errors	<p>Indicates if there is any error on the SIB.</p> <ul style="list-style-type: none"> None—No errors Link Errors—Fabric link errors were found on SIB RX link.

Table 91: show chassis sibs Output Fields (*continued*)

Field Name	Field Description
	<ul style="list-style-type: none">• Cell drops—Fabric cell drops were found on the SIB ASIC.• Link Errors, Cell drops—Both link errors and cell drops were detected on at least one of the SIB's fabric links.
Link Errors	indicate the number of links which are marked faulty because the errors on them have crossed threshold.
Cable Errors	Indicate the number of mandatory cables that are not connected, or in up state for that plane
Destination Errors	Indicate the number of destinations that are not reachable on this plane.

Sample Output

show chassis sibs (T640 Router)

```
user@host> show chassis sibs
Slot  State                      Uptime
0     Empty
1     Offline                    --- Offlined by cli command ---
2     Check (21 destination errors) 1 day, 1 hour, 32 minutes, 55 seconds
3     Check (0 destination errors)  1 day, 1 hour, 32 minutes, 45 seconds
4     Empty
```

use "show chassis fabric fpcs" and "show chassis fabric sibs" for more details

show chassis sibs (T4000 Router)

```
user@host> show chassis sibs
Slot  State                      Uptime
0     Spare
1     Online                    3 hours, 48 minutes, 38 seconds
2     Online                    3 hours, 48 minutes, 22 seconds
3     Online                    3 hours, 48 minutes, 5 seconds
4     Online                    3 hours, 47 minutes, 49 seconds
```

show chassis sibs (TX Matrix Router)

```
user@host> show chassis sibs
scc-re0:
-----
Slot  State                      Uptime
0     Empty
1     Empty
2     Offline                    --- Offlined by cli command ---
3     Offline
4     Online                    7 days, 21 hours, 50 minutes, 4 seconds
lcc0-re0:
-----
Slot  State                      Uptime
0     Offline                    --- Offlined by cli command ---
1     Empty
2     Check (21 destination errors) 1 day, 1 hour, 32 minutes, 55 seconds
3     Check (0 destination errors)  1 day, 1 hour, 32 minutes, 45 seconds
4     Empty
```

use "show chassis fabric fpcs" and "show chassis fabric sibs" for more details

show chassis sibs (T1600 Router)

```
user@host> show chassis sibs
Slot
Slot  State                      Uptime
0     Check (destination errors)  2 hours, 23 minutes, 2 seconds
1     Offline                    --- Offlined by cli command ---
2     Check (destination errors)  2 hours, 23 minutes, 3 seconds
3     Check (destination errors)  2 hours, 23 minutes, 3 seconds
4     Check (destination errors)  2 hours, 23 minutes, 3 seconds
```

use "show chassis fabric fpcs" and "show chassis fabric sibs" for more details

show chassis sibs (TX Matrix Plus Router)

```
user@host> show chassis sibs
sfc0-re0:
-----
Slot  State                      Type          Link errors  Destination errors  Uptime
```

0	Spare	SIB F13	NONE	NONE	
1	Empty		NONE	NONE	
2	Invalid		NONE	NONE	
3	Online	SIB F13	NONE	NONE	1 hour,
53 minutes, 19 seconds					
4	Empty		NONE	NONE	
5	Invalid		NONE	NONE	
6	Online	SIB F13	NONE	NONE	1 hour,
53 minutes, 8 seconds					
7	Empty		NONE	NONE	
8	Online	SIB F13	NONE	NONE	1 hour,
52 minutes, 57 seconds					
9	Empty		NONE	NONE	
10	Invalid		NONE	NONE	
11	Online	SIB F13	NONE	NONE	1 hour,
52 minutes, 46 seconds					
12	Empty		NONE	NONE	
13	Invalid		NONE	NONE	
14	Invalid		NONE	NONE	
15	Invalid		NONE	NONE	
0/0	Spare	SIB F2S	NONE	NONE	
0/2	Spare	SIB F2S	NONE	NONE	
0/4	Spare	SIB F2S	NONE	NONE	
0/6	Spare	SIB F2S	NONE	NONE	
1/0	Online	SIB F2S	NONE	NONE	1 hour,
53 minutes, 29 seconds					
1/2	Online	SIB F2S	NONE	NONE	1 hour,
53 minutes, 28 seconds					
1/4	Online	SIB F2S	NONE	NONE	1 hour,
53 minutes, 27 seconds					
1/6	Online	SIB F2S	NONE	NONE	1 hour,
53 minutes, 26 seconds					
2/0	Online	SIB F2S	NONE	NONE	1 hour,
53 minutes, 18 seconds					
2/2	Online	SIB F2S	NONE	NONE	1 hour,
53 minutes, 17 seconds					
2/4	Online	SIB F2S	NONE	NONE	1 hour,
53 minutes, 16 seconds					
2/6	Online	SIB F2S	NONE	NONE	1 hour,
53 minutes, 14 seconds					
3/0	Online	SIB F2S	NONE	NONE	1 hour,
53 minutes, 7 seconds					
3/2	Online	SIB F2S	NONE	NONE	1 hour,
53 minutes, 5 seconds					
3/4	Online	SIB F2S	NONE	NONE	1 hour,
53 minutes, 4 seconds					
3/6	Online	SIB F2S	NONE	NONE	1 hour,
53 minutes, 3 seconds					
4/0	Online	SIB F2S	NONE	NONE	1 hour,
52 minutes, 56 seconds					
4/2	Online	SIB F2S	NONE	NONE	1 hour,
52 minutes, 54 seconds					
4/4	Online	SIB F2S	NONE	NONE	1 hour,
52 minutes, 53 seconds					
4/6	Online	SIB F2S	NONE	NONE	1 hour,
52 minutes, 52 seconds					

lcc0-re0:

Slot	State	Link errors	Destination errors	Uptime
0	Spare	NONE	NONE	

```

1   Online                NONE                NONE                1 hour, 53 minutes, 31
seconds
2   Online                NONE                NONE                1 hour, 53 minutes, 27
seconds
3   Online                NONE                NONE                1 hour, 53 minutes, 23
seconds
4   Online                NONE                NONE                1 hour, 53 minutes, 19
seconds

```

**show chassis sibs (TX
Matrix Plus Router with
3D SIBs)**

```

user@host> show chassis sibs
sfc0-re0:

```

```

-----
Slot State          Type          Cable errors Link errors Destination
errors Uptime
0   Online          SIB F13          6             NONE          NONE
    21 hours, 54 minutes, 28 seconds
1   Online          SIB F13          8             NONE          NONE
    21 hours, 54 minutes, 12 seconds
2   Invalid
3   Online          SIB F13          6             NONE          NONE
    21 hours, 57 minutes, 6 seconds
4   Online          SIB F13          8             1             NONE
    21 hours, 56 minutes, 49 seconds
5   Invalid
6   Online          SIB F13          6             NONE          NONE
    21 hours, 56 minutes, 25 seconds
7   Online          SIB F13          8             NONE          NONE
    21 hours, 56 minutes, 8 seconds
8   Online          SIB F13          6             NONE          NONE
    21 hours, 55 minutes, 43 seconds
9   Online          SIB F13          8             NONE          NONE
    21 hours, 55 minutes, 26 seconds
10  Invalid
11  Empty           NONE            NONE          NONE          NONE
12  Empty           NONE            NONE          NONE          NONE
13  Invalid         NONE            NONE          NONE          NONE
14  Invalid         NONE            NONE          NONE          NONE
15  Invalid         NONE            NONE          NONE          NONE
0/0 Online          SIB F2S         -n/a-         NONE          NONE
    21 hours, 55 minutes, 16 seconds
0/2 Online          SIB F2S         -n/a-         NONE          NONE
    21 hours, 54 minutes, 49 seconds
0/4 Online          SIB F2S         -n/a-         NONE          NONE
    21 hours, 54 minutes, 47 seconds
0/6 Online          SIB F2S         -n/a-         NONE          NONE
    21 hours, 54 minutes, 45 seconds
1/0 Online          SIB F2S         -n/a-         NONE          NONE
    21 hours, 57 minutes, 29 seconds
1/2 Online          SIB F2S         -n/a-         NONE          NONE
    21 hours, 57 minutes, 27 seconds
1/4 Online          SIB F2S         -n/a-         NONE          NONE
    21 hours, 57 minutes, 25 seconds
1/6 Online          SIB F2S         -n/a-         NONE          NONE
    21 hours, 57 minutes, 23 seconds
2/0 Online          SIB F2S         -n/a-         NONE          NONE
    21 hours, 56 minutes, 48 seconds
2/2 Online          SIB F2S         -n/a-         NONE          NONE
    21 hours, 56 minutes, 46 seconds
2/4 Online          SIB F2S         -n/a-         NONE          NONE
    21 hours, 56 minutes, 43 seconds
2/6 Online          SIB F2S         -n/a-         NONE          NONE

```

```

21 hours, 56 minutes, 41 seconds
3/0 Online SIB F2S -n/a- NONE NONE
21 hours, 56 minutes, 6 seconds
3/2 Online SIB F2S -n/a- NONE NONE
21 hours, 56 minutes, 4 seconds
3/4 Online SIB F2S -n/a- NONE NONE
21 hours, 56 minutes, 2 seconds
3/6 Online SIB F2S -n/a- NONE NONE
21 hours, 56 minutes
4/0 Online SIB F2S -n/a- NONE NONE
21 hours, 55 minutes, 24 seconds
4/2 Online SIB F2S -n/a- NONE NONE
21 hours, 55 minutes, 22 seconds
4/4 Online SIB F2S -n/a- NONE NONE
21 hours, 55 minutes, 20 seconds
4/6 Online SIB F2S -n/a- NONE NONE
21 hours, 55 minutes, 18 seconds

```

lcc0-re0:

```

-----
Slot State Cable errors Link errors Destination errors Uptime
0 Online 6 NONE NONE 21 hours,
47 minutes, 29 seconds
1 Online 6 NONE NONE 21 hours,
47 minutes, 50 seconds
2 Online 6 NONE NONE 21 hours,
47 minutes, 43 seconds
3 Online 6 NONE NONE 21 hours,
47 minutes, 36 seconds
4 Empty NONE NONE NONE
use "show chassis fabric fpcs" and "show chassis fabric sibs" for more details

```

lcc4-re0:

```

-----
Slot State Cable errors Link errors Destination errors Uptime
0 Online 6 NONE NONE 21 hours,
57 minutes, 1 second
1 Online 6 NONE NONE 21 hours,
57 minutes, 21 seconds
2 Online 6 NONE NONE 21 hours,
57 minutes, 14 seconds
3 Online 6 NONE NONE 21 hours,
57 minutes, 7 seconds
4 Empty NONE NONE NONE
use "show chassis fabric fpcs" and "show chassis fabric sibs" for more details

```

lcc7-re0:

```

-----
Slot State Cable errors Link errors Destination errors Uptime
0 Online 2 NONE NONE 21 hours,
56 minutes, 54 seconds
1 Online 2 NONE NONE 21 hours,
57 minutes, 21 seconds
2 Online 2 NONE NONE 21 hours,
57 minutes, 12 seconds
3 Online 2 NONE NONE 21 hours,
57 minutes, 3 seconds
4 Empty NONE NONE NONE
use "show chassis fabric fpcs" and "show chassis fabric sibs" for more details

```

user@host> show chassis sibs sfc 0

show chassis sibs sfc
(TX Matrix Plus
Router))

sfc0-re0:

```
-----
Slot  State                Type                Link errors  Destination errors  Uptime
0      Spare                SIB F13          NONE          NONE
1      Empty
2      Invalid
3      Online                SIB F13          NONE          NONE          12 hours,
6 minutes, 22 seconds
4      Empty
5      Invalid
6      Online                SIB F13          NONE          NONE          12 hours,
6 minutes, 11 seconds
7      Empty
8      Online                SIB F13          NONE          NONE          12 hours,
6 minutes
9      Empty
10     Invalid
11     Online                SIB F13          NONE          NONE          12 hours,
5 minutes, 49 seconds
12     Empty
13     Invalid
14     Invalid
15     Invalid
0/0    Spare                SIB F2S          NONE          NONE
0/2    Spare                SIB F2S          NONE          NONE
0/4    Spare                SIB F2S          NONE          NONE
0/6    Spare                SIB F2S          NONE          NONE
1/0    Online                SIB F2S          NONE          NONE          12 hours,
6 minutes, 32 seconds
1/2    Online                SIB F2S          NONE          NONE          12 hours,
6 minutes, 31 seconds
1/4    Online                SIB F2S          NONE          NONE          12 hours,
6 minutes, 30 seconds
1/6    Online                SIB F2S          NONE          NONE          12 hours,
6 minutes, 29 seconds
2/0    Online                SIB F2S          NONE          NONE          12 hours,
6 minutes, 21 seconds
2/2    Online                SIB F2S          NONE          NONE          12 hours,
6 minutes, 20 seconds
2/4    Online                SIB F2S          NONE          NONE          12 hours,
6 minutes, 19 seconds
2/6    Online                SIB F2S          NONE          NONE          12 hours,
6 minutes, 17 seconds
3/0    Online                SIB F2S          NONE          NONE          12 hours,
6 minutes, 10 seconds
3/2    Online                SIB F2S          NONE          NONE          12 hours,
6 minutes, 9 seconds
3/4    Online                SIB F2S          NONE          NONE          12 hours,
6 minutes, 7 seconds
3/6    Online                SIB F2S          NONE          NONE          12 hours,
6 minutes, 6 seconds
4/0    Online                SIB F2S          NONE          NONE          12 hours,
5 minutes, 59 seconds
4/2    Online                SIB F2S          NONE          NONE          12 hours,
5 minutes, 57 seconds
4/4    Online                SIB F2S          NONE          NONE          12 hours,
5 minutes, 56 seconds
4/6    Online                SIB F2S          NONE          NONE          12 hours,
5 minutes, 55 seconds
```

user@host> show chassis sibs lcc 0

show chassis sibs lcc
(TX Matrix Plus Router)

```
lcc0-re0:
-----
Slot  State                Link errors  Destination errors  Uptime
0      Online                NONE         NONE                20 hours, 14 minutes,
50 seconds
1      Fault                NONE         NONE
2      Online                NONE         NONE                20 hours, 15 minutes,
2 seconds
3      Online                NONE         NONE                20 hours, 14 minutes,
58 seconds
4      Online                NONE         NONE                20 hours, 14 minutes,
54 seconds
```

show chassis sibs lcc
(TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis sibs lcc 0
lcc0-re0:
-----
Slot  State                Cable errors  Link errors  Destination errors  Uptime
0      Disconnected        NONE         NONE         NONE                17 hours,
2 minutes, 37 seconds
1      Online                NONE         NONE         NONE                17 hours,
3 minutes, 6 seconds
2      Online                NONE         NONE         NONE                17 hours,
2 minutes, 59 seconds
3      Online                NONE         NONE         NONE                17 hours,
2 minutes, 52 seconds
4      Online                NONE         NONE         NONE                17 hours,
2 minutes, 44 seconds
```

show chassis sibs
(M320 Router)

```
user@host> show chassis sibs

0      Online                1 hour, 18 minutes, 3 seconds
1      Offline                --- Offlined by cli command ---
2      Online                1 hour, 18 minutes, 18 seconds
3      Online                1 hour, 18 minutes, 3 seconds
```

show chassis sibs
(PTX Series)

```
user@host> show chassis sibs
Slot  State                Fabric links  Errors
0      Online                Active        None
1      Online                Active        Link Errors
2      Online                Active        None
3      Online                Active        Cell drops
4      Offline                Unused        None
5      Online                Active        None
6      Online                Active        None
7      Online                Active        None
8      Online                Active        None
```

show chassis sibs
(PTX Series)

```
user@host> show chassis sibs detail
Slot 4 information
State                Offline
Reason                Offlined by cli command
Fabric links          Unused
Errors                None
```

show chassis spmb

Syntax	show chassis spmb
Syntax (T4000 Routers)	show chassis spmb <sibs>
Syntax (TX Matrix Routers)	show chassis spmb <sibs> <lcc <i>number</i> | scc>
Syntax (TX Matrix Plus Routers)	show chassis spmb <sibs> <lcc <i>number</i> | sfc <i>number</i> >
Release Information	Command introduced before Junos OS Release 7.4. sibs option introduced for the T1600 and TX Matrix Plus routers in Junos OS Release 9.6. 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.
Description	(T Series routers, MX2010 and MX2020 routers only) Display Switch Processor Mezzanine Board (SPMB) status information.
Options	<p>none—(TX Matrix, TX Matrix Plus router , MX2010, and MX2020 routers only) On a TX Matrix router, display SPMB status for the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display SPMB status for the TX Matrix Plus router and its attached routers. On MX2010 and MX2020 routers, display the SPMB status for the routers.</p> <p>lcc <i>number</i>—(TX Matrix and TX Matrix Plus router only) (Optional) On a TX Matrix router, display information about the SPMB on a specified T640 router (line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, display information about the SPMB on 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">• 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. <p>scc—(TX Matrix routers only) (Optional) Display information about the SPMB on the TX Matrix router (switch-card chassis).</p>

sfc number—(TX Matrix Plus router only) (Optional) Display information about the SPMB on the TX Matrix Plus router (switch-fabric chassis). Replace **number** with **0**.

sibs—(TX Matrix and TX Matrix Plus router only) (Optional) On a TX Matrix Plus router, display information about the SIBs on the TX Matrix router (switch-card chassis). On a TX Matrix Plus router, display information about the SIBs on The TX Matrix Plus router (switch-fabric chassis). The **sibs** option has the following sub-options:

lcc number (TX Matrix, TX Matrix Plus router only) (Optional) On a TX Matrix router, display information about the SIBs on a specified T640 router (line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, display information about the SIBs 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.

scc number—(TX Matrix routers only) (Optional) Display information about the SIBs on the TX Matrix router (switch-card chassis). Replace **number** variable with **0**.

sfc number—(TX Matrix Plus router only) (Optional) Display information about the SIBs on the TX Matrix Plus router (switch-fabric chassis). Replace **number** variable with **0**.

Required Privilege
Level

view

Related
Documentation

- [request chassis sib on page 477](#)
- [request chassis spmb restart on page 485](#)
- [show chassis spmb sibs on page 1250](#)

List of Sample Output

[show chassis spmb on page 1243](#)
[show chassis spmb \(MX2010 Router\) on page 1243](#)
[show chassis spmb \(MX2020 Router\) on page 1243](#)
[show chassis spmb \(T4000 Router\) on page 1243](#)
[show chassis spmb lcc \(TX Matrix Router\) on page 1244](#)
[show chassis spmb scc \(TX Matrix Router\) on page 1244](#)
[show chassis spmb \(T1600 Router\) on page 1244](#)
[show chassis spmb sibs \(T1600 Router\) on page 1244](#)
[show chassis spmb \(TX Matrix Plus Router\) on page 1245](#)

[show chassis spmb lcc \(TX Matrix Plus Router\) on page 1246](#)
[show chassis spmb scc \(TX Matrix Plus Router\) on page 1246](#)
[show chassis spmb sibs \(TX Matrix Plus Router\) on page 1247](#)
[show chassis spmb lcc \(TX Matrix Plus router with 3D SIBs\) on page 1248](#)
[show chassis spmb sfc \(TX Matrix Plus router with 3D SIBs\) on page 1248](#)

Output Fields Table 92 on page 1242 lists the output fields for the **show chassis spmb** command. Output fields are listed in the approximate order in which they appear.

Table 92: show chassis spmb Output Fields

Field Name	Field Description
Slot	SPMB slot number: 0 or 1.
State	SPMB status: <ul style="list-style-type: none"> • Online—SPMB is operational and running. • Offline—SPMB is powered down.
Total CPU Utilization (%)	Total percentage of CPU being used by the SPMB processor.
Interrupt CPU Utilization (%)	Of the total CPU being used by the SPMB processor, the percentage being used for interrupts.
Memory Heap Utilization (%)	Percentage of heap space (dynamic memory) being used by the FPC processor. If this number exceeds 80 percent, there may be a software problem (memory leak).
Buffer Utilization (%)	Percentage of buffer space being used by the SPMB processor for buffering internal messages.
Start time	Time at which the SPMB last came online.
Uptime	How long the SPMB has been up and running.

Sample Output

show chassis spmb

```
user@host> show chassis spmb
Slot 0 information:
  State                               Online
  Total CPU Utilization                1%
  Interrupt CPU Utilization             0%
  Memory Heap Utilization               0%
  Buffer Utilization                    40%
  Start time:                          2001-08-27 14:05:04 PDT
  Uptime:                              46 minutes, 36 seconds
```

show chassis spmb (MX2010 Router)

```
user@host> show chassis spmb
Slot 0 information:
  State                               Online
  Total CPU Utilization                12%
  Interrupt CPU Utilization             0%
  Memory Heap Utilization               1%
  Buffer Utilization                    22%
  Start time:                          2012-10-04 15:34:29 PDT
  Uptime:                              7 hours, 10 minutes, 15 seconds
Slot 1 information:
  State                               Online - Standby
  Total CPU Utilization                1%
  Interrupt CPU Utilization             0%
  Memory Heap Utilization               0%
  Buffer Utilization                    22%
  Start time:                          2012-10-02 14:34:54 PDT
  Uptime:                              2 days, 8 hours, 9 minutes, 50 seconds
```

show chassis spmb (MX2020 Router)

```
user@host> show chassis spmb
Slot 0 information:
  State                               Online
  Total CPU Utilization                100%
  Interrupt CPU Utilization             0%
  Memory Heap Utilization               3%
  Buffer Utilization                    22%
  Start time:                          2012-10-03 14:58:26 PDT
  Uptime:                              1 day, 12 hours, 16 minutes, 14 seconds
Slot 1 information:
  State                               Online - Standby
  Total CPU Utilization                0%
  Interrupt CPU Utilization             0%
  Memory Heap Utilization               0%
  Buffer Utilization                    22%
  Start time:                          2012-10-03 14:58:27 PDT
  Uptime:                              1 day, 12 hours, 16 minutes, 13 seconds
```

show chassis spmb (T4000 Router)

```
user@host> show chassis spmb
Slot 0 information:
  State                               Online
  Total CPU Utilization                18%
  Interrupt CPU Utilization             0%
  Memory Heap Utilization               0%
  Buffer Utilization                    22%
  Start time:                          2012-02-09 22:51:09 PST
```

```
Uptime: 2 hours, 25 minutes, 45 seconds
Slot 1 information:
State Online - Standby
Total CPU Utilization 0%
Interrupt CPU Utilization 0%
Memory Heap Utilization 0%
Buffer Utilization 22%
Start time: 2012-02-09 22:51:10 PST
Uptime: 2 hours, 25 minutes, 44 seconds
```

show chassis spmb lcc
(TX Matrix Router)

```
user@host> show chassis spmb lcc 0
lcc0-re0:
```

```
-----
Slot 0 information:
State Online
Total CPU Utilization 0%
Interrupt CPU Utilization 0%
Memory Heap Utilization 0%
Buffer Utilization 42%
Start time: 2004-08-05 18:43:38 PDT
Uptime: 8 days, 55 minutes, 52 seconds
```

show chassis spmb scc
(TX Matrix Router)

```
user@host> show chassis spmb scc
scc-re0:
```

```
-----
Slot 0 information:
State Online
Total CPU Utilization 1%
Interrupt CPU Utilization 0%
Memory Heap Utilization 0%
Buffer Utilization 42%
Start time: 2004-08-05 18:43:37 PDT
Uptime: 8 days, 1 hour, 6 minutes, 51 seconds
```

show chassis spmb
(T1600 Router)

```
user@host> show chassis spmb
Slot 0 information:
State Online
Total CPU Utilization 2%
Interrupt CPU Utilization 0%
Memory Heap Utilization 0%
Buffer Utilization 24%
Start time: 2009-05-07 22:34:03 PDT
Uptime: 3 days, 4 hours, 14 minutes, 33 seconds
Slot 1 information:
State Online - Standby
Total CPU Utilization 0%
Interrupt CPU Utilization 0%
Memory Heap Utilization 0%
Buffer Utilization 24%
Start time: 2009-05-07 22:34:02 PDT
Uptime: 3 days, 4 hours, 14 minutes, 34 seconds
```

show chassis spmb
sibs (T1600 Router)

```
user@host> show chassis spmb sibs
Slot State Uptime
0 Check 3 days, 4 hours, 11 minutes, 59 seconds
1 Disconnected 3 days, 4 hours, 12 minutes, 36 seconds
2 Disconnected 3 days, 4 hours, 12 minutes, 26 seconds
3 Disconnected 3 days, 4 hours, 12 minutes, 17 seconds
```

4 Disconnected 3 days, 4 hours, 12 minutes, 8 seconds

**show chassis spmb
(TX Matrix Plus
Router)**

```
user@host> show chassis spmb
sfc0-re0:
```

Slot 0 information:

State	Online
Total CPU Utilization	84%
Interrupt CPU Utilization	0%
Memory Heap Utilization	0%
Buffer Utilization	24%
Start time:	2009-05-11 01:25:20 PDT
Uptime:	46 minutes, 6 seconds

Slot 1 information:

State	Online - Standby
Total CPU Utilization	0%
Interrupt CPU Utilization	0%
Memory Heap Utilization	0%
Buffer Utilization	24%
Start time:	2009-05-11 01:25:20 PDT
Uptime:	46 minutes, 6 seconds

lcc0-re1:

Slot 0 information:

State	Online - Standby
Total CPU Utilization	0%
Interrupt CPU Utilization	0%
Memory Heap Utilization	0%
Buffer Utilization	24%
Start time:	2009-05-11 01:25:09 PDT
Uptime:	46 minutes, 24 seconds

Slot 1 information:

State	Online
Total CPU Utilization	5%
Interrupt CPU Utilization	0%
Memory Heap Utilization	0%
Buffer Utilization	24%
Start time:	2009-05-11 01:25:08 PDT
Uptime:	46 minutes, 25 seconds

lcc1-re1:

Slot 0 information:

State	Online - Standby
Total CPU Utilization	1%
Interrupt CPU Utilization	0%
Memory Heap Utilization	0%
Buffer Utilization	24%
Start time:	2009-05-11 01:25:09 PDT
Uptime:	46 minutes, 24 seconds

Slot 1 information:

State	Online
Total CPU Utilization	5%
Interrupt CPU Utilization	0%
Memory Heap Utilization	0%
Buffer Utilization	24%
Start time:	2009-05-11 01:25:10 PDT
Uptime:	46 minutes, 23 seconds

lcc2-re1:

```

-----
Slot 0 information:
  State                               Online - Standby
  Total CPU Utilization                0%
  Interrupt CPU Utilization            0%
  Memory Heap Utilization              0%
  Buffer Utilization                   24%
  Start time:                         2009-05-11 01:25:08 PDT
  Uptime:                             46 minutes, 25 seconds
Slot 1 information:
  State                               Online
  Total CPU Utilization                5%
  Interrupt CPU Utilization            0%
  Memory Heap Utilization              0%
  Buffer Utilization                   24%
  Start time:                         2009-05-11 01:25:10 PDT
  Uptime:                             46 minutes, 23 seconds

```

```
lcc3-re1:
```

```

-----
Slot 0 information:
  State                               Online - Standby
  Total CPU Utilization                1%
  Interrupt CPU Utilization            0%
  Memory Heap Utilization              0%
  Buffer Utilization                   24%
  Start time:                         2009-05-11 01:25:10 PDT
  Uptime:                             46 minutes, 23 seconds
Slot 1 information:
  State                               Online
  Total CPU Utilization                5%
  Interrupt CPU Utilization            0%
  Memory Heap Utilization              0%
  Buffer Utilization                   24%
  Start time:                         2009-05-11 01:25:09 PDT
  Uptime:                             46 minutes, 24 seconds

```

show chassis spmb lcc
(TX Matrix Plus
Router)

```
user@host> show chassis spmb lcc 2
lcc2-re1:
```

```

-----
Slot 0 information:
  State                               Online - Standby
  Total CPU Utilization                0%
  Interrupt CPU Utilization            0%
  Memory Heap Utilization              0%
  Buffer Utilization                   24%
  Start time:                         2009-05-11 01:25:08 PDT
  Uptime:                             45 minutes, 18 seconds
Slot 1 information:
  State                               Online
  Total CPU Utilization                6%
  Interrupt CPU Utilization            0%
  Memory Heap Utilization              0%
  Buffer Utilization                   24%
  Start time:                         2009-05-11 01:25:10 PDT
  Uptime:                             45 minutes, 16 seconds

```

show chassis spmb scc
(TX Matrix Plus

```
user@host> show chassis spmb sfc 0
sfc0-re0:
```

Router)

```

Slot 0 information:
  State                Online
  Total CPU Utilization 87%
  Interrupt CPU Utilization 0%
  Memory Heap Utilization 0%
  Buffer Utilization    24%
  Start time:          2009-05-11 01:25:20 PDT
  Uptime:              43 minutes, 32 seconds
Slot 1 information:
  State                Online - Standby
  Total CPU Utilization 0%
  Interrupt CPU Utilization 0%
  Memory Heap Utilization 0%
  Buffer Utilization    24%
  Start time:          2009-05-11 01:25:20 PDT
  Uptime:              43 minutes, 32 seconds

```

show chassis spmb
sibs (TX Matrix Plus
Router)

```

user@host> show chassis spmb sibs
sfc0-re0:

```

```

-----
Slot  State                Type                Uptime
0      Online              SIB F13            1 hour, 18 minutes, 54 seconds
1      Online              SIB F13            1 hour, 18 minutes, 45 seconds
2      Invalid
3      Online              SIB F13            1 hour, 20 minutes, 21 seconds
4      Online              SIB F13            1 hour, 20 minutes, 18 seconds
5      Invalid
6      Online              SIB F13            1 hour, 19 minutes, 51 seconds
7      Fault              SIB F13
8      Online              SIB F13            1 hour, 19 minutes, 17 seconds
9      Online              SIB F13            1 hour, 19 minutes, 13 seconds
10     Invalid
11     Online              SIB F13            1 hour, 17 minutes, 54 seconds
12     Online              SIB F13            1 hour, 17 minutes, 51 seconds
13     Invalid
14     Invalid
15     Invalid
0/0    Online              SIB F2S            1 hour, 18 minutes, 52 seconds
0/2    Online              SIB F2S            1 hour, 18 minutes, 51 seconds
0/4    Online              SIB F2S            1 hour, 18 minutes, 49 seconds
0/6    Online              SIB F2S            1 hour, 18 minutes, 48 seconds
1/0    Online              SIB F2S            1 hour, 20 minutes, 16 seconds
1/2    Online              SIB F2S            1 hour, 20 minutes, 15 seconds
1/4    Online              SIB F2S            1 hour, 20 minutes, 14 seconds
1/6    Online              SIB F2S            1 hour, 20 minutes, 13 seconds
2/0    Online              SIB F2S            1 hour, 19 minutes, 48 seconds
2/2    Online              SIB F2S            1 hour, 19 minutes, 47 seconds
2/4    Online              SIB F2S            1 hour, 19 minutes, 46 seconds
2/6    Online              SIB F2S            1 hour, 19 minutes, 44 seconds
3/0    Online              SIB F2S            1 hour, 19 minutes, 24 seconds
3/2    Online              SIB F2S            1 hour, 19 minutes, 22 seconds
3/4    Online              SIB F2S            1 hour, 19 minutes, 21 seconds
3/6    Online              SIB F2S            1 hour, 19 minutes, 20 seconds
4/0    Online              SIB F2S            1 hour, 18 minutes, 2 seconds
4/2    Online              SIB F2S            1 hour, 18 minutes
4/4    Online              SIB F2S            1 hour, 17 minutes, 58 seconds
4/6    Online              SIB F2S            1 hour, 17 minutes, 58 seconds

```

```

lcc0-re1:

```

```

-----
Slot  State                Uptime

```

0	Online	1 hour, 18 minutes, 58 seconds
1	Online	1 hour, 20 minutes, 25 seconds
2	Fault	
3	Online	1 hour, 18 minutes, 30 seconds
4	Online	1 hour, 18 minutes, 28 seconds

lcc1-re1:

Slot	State	Uptime
0	Online	1 hour, 18 minutes, 58 seconds
1	Online	1 hour, 20 minutes, 26 seconds
2	Fault	
3	Online	1 hour, 18 minutes, 22 seconds
4	Online	1 hour, 18 minutes, 20 seconds

lcc2-re1:

Slot	State	Uptime
0	Online	1 hour, 18 minutes, 19 seconds
1	Online	1 hour, 20 minutes, 25 seconds
2	Fault	
3	Online	1 hour, 18 minutes, 17 seconds
4	Online	1 hour, 18 minutes, 15 seconds

lcc3-re1:

Slot	State	Uptime
0	Online	1 hour, 18 minutes, 27 seconds
1	Online	1 hour, 20 minutes, 24 seconds
2	Fault	
3	Online	1 hour, 18 minutes, 25 seconds
4	Online	1 hour, 18 minutes, 23 seconds

show chassis spmb lcc
(TX Matrix Plus router
with 3D SIBs)

user@host > show chassis spmb lcc 0

lcc0-re1:

Slot 0 information:

State	Online - Standby
Total CPU Utilization	0%
Interrupt CPU Utilization	0%
Memory Heap Utilization	0%
Buffer Utilization	0%
Start time:	2013-02-08 00:57:20 PST
Uptime:	19 minutes, 43 seconds

Slot 1 information:

State	Online
Total CPU Utilization	0%
Interrupt CPU Utilization	0%
Memory Heap Utilization	0%
Buffer Utilization	22%
Start time:	2013-02-08 00:56:59 PST
Uptime:	20 minutes, 4 seconds

show chassis spmb sfc
(TX Matrix Plus router
with 3D SIBs)

user@host> show chassis spmb sfc 0

sfc0-re0:

Slot 0 information:

State	Online
Total CPU Utilization	0%
Interrupt CPU Utilization	0%


```
Memory Heap Utilization      0%
Buffer Utilization           0%
Start time:                  2013-02-06 19:16:55 PST
Uptime:                      1 day, 6 hours, 2 minutes, 59 seconds

Slot 1 information:
State                        Online - Standby
Total CPU Utilization        0%
Interrupt CPU Utilization     0%
Memory Heap Utilization      0%
Buffer Utilization           0%
Start time:                  2013-02-06 19:16:53 PST
Uptime:                      1 day, 6 hours, 3 minutes, 1 second
```

show chassis spmb sibs

Syntax	show chassis spmb sibs
Syntax (TX Matrix Router)	show chassis spmb sibs <lcc <i>number</i> | scc>
Syntax (TX Matrix Plus Router)	show chassis spmb sibs <lcc <i>number</i> | sfc <i>number</i> >
Release Information	Command introduced before Junos OS Release 7.4. sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6.
Description	(T Series routers only) Display Switch Processor Mezzanine Board (SPMB) Switch Interface Board (SIB) status information.
Options	<p>none—(TX Matrix and TX Matrix Plus routers only) On a TX Matrix router, display the SIB status for the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display the SIB status for the TX Matrix Plus router and its attached routers.</p> <p>lcc <i>number</i>—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display SIB status information for a specified T640 router (line-card chassis) that is connected to a TX Matrix router. On a TX Matrix Plus router, display SIB status information for a specified router (line-card chassis) that is connected to a 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">• 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. <p>scc—(TX Matrix router only) (Optional) Display SIB status information for the TX Matrix router (switch-card chassis).</p> <p>sfc—(TX Matrix Plus router only) (Optional) Display SIB status information for the TX Matrix Plus router (or switch-fabric chassis).</p>
Additional Information	On a T Series router, you can use either this command or the show chassis sibs command to produce the same output. The show chassis sibs command is supported on the M320 router and on the T Series routers.

Required Privilege Level view

- Related Documentation**
- [show chassis sibs on page 1229](#)
 - [request chassis sib on page 477](#)
 - [request chassis spmb restart on page 485](#)

List of Sample Output

[show chassis spmb sibs \(T320 Router\) on page 1253](#)
[show chassis-spmb-sibs \(T1600 Router\) on page 1253](#)
[show chassis spmb sibs \(T4000 Router\) on page 1253](#)
[show chassis spmb sibs \(TX Matrix Router\) on page 1253](#)
[show chassis spmb sibs lcc \(TX Matrix Router\) on page 1253](#)
[show chassis spmb sibs scc \(TX Matrix Router\) on page 1253](#)
[show chassis spmb sibs \(TX Matrix Plus Router\) on page 1253](#)
[show chassis spmb sibs sfc \(TX Matrix Plus Router\) on page 1254](#)

Output Fields [Table 93 on page 1251](#) lists the output fields for the **show chassis spmb sibs** command. Output fields are listed in the approximate order in which they appear.

Table 93: show chassis spmb sibs Output Fields

Field Name	Field Description
Slot	SIB slot number: <ul style="list-style-type: none">• T640 router, T1600 router or TX Matrix router—0 through 4• TX Matrix Plus router:<ul style="list-style-type: none">• TXP-F13 SIB Slots—0 through 16• TXP-F2S SIB Slots —0 – 4/[0|2|4|6]• T320 router—0 through 2

Table 93: show chassis spmb sibs Output Fields (*continued*)

Field Name	Field Description
State	<p>SIB status:</p> <ul style="list-style-type: none"> • Disconnected—SIBs on all T640 routers on the TX Matrix router (switch-card chassis) are in the Disconnected state, because a SIB on the SCC has gone offline. Likewise, SIBs on all T1600 or T4000 routers on the TX Matrix Plus router (or switch-fabric chassis) are in the Disconnected state, because a SIB on the SFC has gone offline. • Online—SPMB is operational and running. • Offline—SPMB is powered down. • Spare—SIB is redundant and will move to active state if one of the working SIBs fail to pass traffic. • Empty—No SPMB is present. • Fault—SIB is in alarmed state where the SIB's plane is not operational for the following reasons: <ul style="list-style-type: none"> • On-board F-chip is not operational. • Fiber optic connector faults. • FPC connector faults. • SIB midplane connector faults. • Check—SIB is in alarmed state where the SIB's plane is partially operational for the following reasons: <ul style="list-style-type: none"> • SIB is not inserted properly. • Two or more links between the SIB and PFE fails.
Uptime	How long the SIB has been up and running.

Sample Output

**show chassis spmb
sibs (T320 Router)**

```
user@host> show chassis spmb sibs
Slot  State
0     Spare
1     Online
2     Online
```

**show
chassis-spmb-sibs
(T1600 Router)**

```
user@host> show chassis spmb sibs
Slot  State
0     Spare
1     Online
2     Empty
3     Online
4     Offline
```

**show chassis spmb
sibs (T4000 Router)**

```
user@host> show chassis spmb sibs

Slot  State                                Uptime
0     Spare
1     Online                             2 hours, 28 minutes, 13 seconds
2     Online                             2 hours, 27 minutes, 57 seconds
3     Online                             2 hours, 27 minutes, 40 seconds
4     Online                             2 hours, 27 minutes, 24 seconds
```

**show chassis spmb
sibs (TX Matrix Router)**

```
user@host> show chassis spmb sibs
Slot  State
0     Online
1     Online
2     Empty
3     Online
4     Offline
```

**show chassis spmb
sibs lcc (TX Matrix
Router)**

```
user@host> show chassis spmb sibs lcc 0
lcc0-re0:
-----
Slot  State                                Uptime
0     Empty
1     Empty
2     Empty
3     Disconnected                        8 days, 48 minutes, 58 seconds
4     Online                             8 days, 48 minutes, 57 seconds
```

**show chassis spmb
sibs scc (TX Matrix
Router)**

```
user@host> show chassis spmb sibs scc
scc-re0:
-----
Slot  State                                Uptime
0     Empty
1     Empty
2     Empty
3     Offline
4     Online                             8 days, 54 minutes, 1 second
```

```
user@host> show chassis spmb sibs
```

**show chassis spmb
sibs (TX Matrix Plus
Router)**

sfc0-re0:

Slot	State	Type	Uptime
0	Online	SIB F13	1 hour, 52 minutes, 55 seconds
1	Empty		
2	Invalid		
3	Online	SIB F13	1 hour, 53 minutes, 3 seconds
4	Empty		
5	Invalid		
6	Empty		
7	Empty		
8	Empty		
9	Empty		
10	Invalid		
11	Empty		
12	Empty		
13	Invalid		
14	Invalid		
15	Invalid		
0/0	Online	SIB F2S	1 hour, 53 minutes, 2 seconds
0/2	Online	SIB F2S	1 hour, 53 minutes, 1 second
0/4	Online	SIB F2S	1 hour, 52 minutes, 59 seconds
0/6	Online	SIB F2S	1 hour, 52 minutes, 58 seconds
1/0	Online	SIB F2S	1 hour, 53 minutes, 10 seconds
1/2	Online	SIB F2S	1 hour, 53 minutes, 8 seconds
1/4	Online	SIB F2S	1 hour, 53 minutes, 7 seconds
1/6	Online	SIB F2S	1 hour, 53 minutes, 6 seconds
2/0	Empty		
2/2	Empty		
2/4	Empty		
2/6	Empty		
3/0	Empty		
3/2	Empty		
3/4	Empty		
3/6	Empty		
4/0	Empty		
4/2	Empty		
4/4	Empty		
4/6	Empty		

lcc0-re0:

Slot	State	Uptime
0	Online	1 hour, 53 minutes, 1 second
1	Online	1 hour, 53 minutes, 3 seconds
2	Empty	
3	Empty	
4	Empty	

lcc1-re1:

Slot	State	Uptime
0	Online	1 hour, 47 minutes, 13 seconds
1	Online	1 hour, 47 minutes, 15 seconds
2	Empty	
3	Empty	
4	Empty	

**show chassis spmb
sibs sfc (TX Matrix**

user@host> show chassis spmb sibs sfc 0
sfc0-re0:

Plus Router)**Slot 0 information:**

State	Online
Total CPU Utilization	16%
Interrupt CPU Utilization	0%
Memory Heap Utilization	0%
Buffer Utilization	24%
Start time:	2009-06-17 20:59:47 PDT
Uptime:	1 hour, 56 minutes, 30 seconds

Slot 1 information:

State	Online - Standby
Total CPU Utilization	0%
Interrupt CPU Utilization	0%
Memory Heap Utilization	0%
Buffer Utilization	24%
Start time:	2009-06-17 20:59:48 PDT
Uptime:	1 hour, 56 minutes, 29 seconds

show chassis synchronization

Syntax	<code>show chassis synchronization</code> <code><extensive></code> <code><backup | master></code>
Release Information	Command introduced in Junos OS Release 7.6 for M320 routers. Command introduced in Junos OS Release 8.3 for M40e routers. Command introduced in Junos OS Release 9.3 for M120 routers. Command introduced in Junos OS Release 10.2 for T320, T640, and T1600 routers. Command introduced in Junos OS Release 12.1 for PTX Series Packet Transport Routers. Command introduced in Junos OS Release 12.2 for ACX Series routers.
Description	(ACX Series, M320, M40e, M120, T320, T640, and T1600 routers and PTX Series Packet Transport Routers only) Display information about the external clock source currently used for chassis synchronization.
Options	extensive —(Optional) Display clock synchronization information in detail. backup —(Optional) Display clock synchronization information about the backup clock. master —(Optional) Display clock synchronization information about the master clock.
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none">• request chassis synchronization switch on page 487• Configuring Clock Synchronization Interface for MX Series Routers on page 185• show chassis synchronization (MX Series Routers) on page 1260• <i>Supported Time Synchronization Standard</i>• <i>Configuring External Clock Synchronization for ACX Series Routers</i>
List of Sample Output	show chassis synchronization on page 1258 show chassis synchronization master on page 1258 show chassis synchronization backup on page 1258 show chassis synchronization extensive on page 1258 show chassis synchronization (T320, T640, and T1600 Routers) on page 1258 show chassis synchronization (PTX Series Packet Transport Routers) on page 1259 show chassis synchronization extensive (ACX Series Routers) on page 1259
Output Fields	Table 94 on page 1257 lists the output fields for the show chassis synchronization command. Output fields are listed in the approximate order in which they appear. show chassis synchronizations show chassis synchronizations show chassis synchronization

Table 94: show chassis synchronization Output Fields

Field Name	Field Description
Current state	<p>Indicates current status of external clock sources:</p> <ul style="list-style-type: none"> • backup—Source is currently the backup clock source. • master—Source is currently the master clock source. • Online-Master—(PTX Series Packet Transport Routers) Source is the master clock. Source is online. • Online-Standby—(PTX Series Packet Transport Routers) Source is the standby (backup) clock. Source is online.
Current clock state	<p>Indicates current source of external synchronization:</p> <ul style="list-style-type: none"> • internal—Source is providing its own clocking. • locked to master CB—(M320, M40e, and M120 routers) Source is locked to master clock source. • locked to master SCG—(T320, T640, and T1600 routers) Source is locked to master clock source. • locked to master CCG—(PTX Series Packet Transport Routers) Source is locked to master clock source.
Selected for	Number of seconds this clock has been the master or backup clock source.
Selected since	Timestamp for establishment as master or backup clock source.
Deviation (in ppm)	Difference in clock timing, in parts per million (ppm).
Last deviation (in ppm)	Previous difference in clock timing, if any, in ppm.
Configured sources	Information about clock sources eligible for selection as master clock.
Source	Information about external clock sources.
Priority	<p>Indicates priority of external clock sources:</p> <ul style="list-style-type: none"> • primary—Source is a primary reference. • secondary—Source is a secondary reference.
Deviation (in ppm)	<p>Current difference in clock timing, in ppm:</p> <ul style="list-style-type: none"> • measuring—Establishing source deviation. • number—Deviation in ppm.
Last deviation (in ppm)	<p>Previous difference in clock timing, in ppm:</p> <ul style="list-style-type: none"> • number—Deviation in ppm.
Status	<p>Indicates status of external sources:</p> <ul style="list-style-type: none"> • present—Source is configured and present. • qualified—Source is eligible for synchronization source.

Sample Output

show chassis synchronization

```
user@host> show chassis synchronization
Clock Synchronization Status :
  Clock module on CB 0
    Current state           : master
    Current clock state     : internal
    Selected for            : 18 hours, 12 minutes, 43 seconds
    Selected since         : 2008-09-10 03:27:47 PDT
    Deviation (in ppm)     : +0.00
    Last deviation (in ppm): +0.00
  Clock Synchronization Status :
    Clock module on CB 1
      Current state         : backup
      Current clock state   : locked to master CB
      Selected for          : 1 day, 12 hours, 49 minutes, 20 seconds
      Selected since        : 2008-09-09 08:51:10 PDT
```

show chassis synchronization master

```
user@host> show chassis synchronization master
Clock Synchronization Status :
  Clock module on CB 0
    Current state           : master
    Current clock state     : internal
    Selected for            : 8 days, 21 minutes, 12 seconds
    Selected since         : 2008-08-27 21:05:40 PDT
    Deviation (in ppm)     : +0.00
    Last deviation (in ppm): +0.00
```

show chassis synchronization backup

```
user@host> show chassis synchronization backup
Clock Synchronization Status :
  Clock module on CB 1
    Current state           : backup
    Current clock state     : locked to master CB
    Selected for            : 34 days, 20 hours, 17 minutes, 8 seconds
    Selected since         : 2008-08-01 01:22:16 PDT
```

show chassis synchronization extensive

```
user@host> show chassis synchronization extensive
Clock Synchronization Status :
  Clock module on CB 0
    Current state           : master
    Current clock state     : internal
    Selected for            : 8 days, 36 minutes, 29 seconds
    Selected since         : 2008-08-27 21:05:40 PDT
    Deviation (in ppm)     : +0.00
    Last deviation (in ppm): +0.00
  Clock Synchronization Status :
    Clock module on CB 1
      Current state         : backup
      Current clock state   : locked to master CB
      Selected for          : 34 days, 20 hours, 19 minutes, 53 seconds
      Selected since        : 2008-08-01 01:22:16 PDT
```

show chassis synchronization (T320,

```
user@host> show chassis synchronization
Clock Synchronization Status :
  Clock module on SCG 0
```

T640, and T1600 Routers)

```

Current state           : master
Current clock state     : locked to external-a
  Selected for          : 2 hours, 28 minutes, 4 seconds
  Selected since        : 2006-02-17 01:12:58 PST
Configured sources
  Source      Priority  Deviation    Last deviation  Status
                (in ppm) (in ppm)
  external-a  primary   measuring    -0.10           in-use
  external-b  secondary -0.10        -0.10           qualified
Clock Synchronization Status :
Clock module on SCG 1
  Current state         : backup
  Current clock state   : locked to master SCG
  Selected for          : 19 hours, 49 minutes, 14 seconds
  Selected since        : 2006-02-16 07:51:48 PST
Configured sources
  Source      Priority  Deviation    Last deviation  Status
                (in ppm) (in ppm)
  external-a  primary   -0.25        -0.25           qualified
  external-b  secondary -0.25        -0.25           qualified

```

show chassis synchronization (PTX Series Packet Transport Routers)

```

user@host> show chassis synchronization
Clock Synchronization Status :
Clock module on CCG 0
  Current state         : Online - Master
  Current clock state   : internal
  Selected for          : 1 hour, 24 minutes, 21 seconds
  Selected since        : 2011-03-21 15:59:37 PDT
  Deviation (in ppm)    : +0.51
  Last deviation (in ppm): +0.51
Clock Synchronization Status :
Clock module on CCG 1
  Current state         : Online - Standby
  Current clock state   : locked to master CCG
  Selected for          : 1 hour, 39 minutes, 12 seconds
  Selected since        : 2011-03-21 15:44:46 PDT

```

show chassis synchronization extensive (ACX Series Routers)

```

user@host> show chassis synchronization extensive
Current clock status : Locked
Clock locked to      : Primary
Configured sources:
Interface           : ce1-0/0/4
Status              : Primary                               Index      : 132
Clock source state   : Clk qualified   Priority      : Default(8)
Configured QL        : PRC              ESMC QL      : Unknown
Clock source type    : ifd              Clock Event  : Clock locked
Kernel flags         : Up,pri,

```

show chassis synchronization (MX Series Routers)

Syntax	<code>show chassis synchronization</code> <code><clock-module <(re0 | re1 | routing-engine (backup | both | local | master | other))>></code> <code><extensive></code> <code><interface <i>interface-name</i>></code>
Release Information	Command introduced in Junos OS Release 10.4. clock-module option introduced in Junos OS Release 12.2.
Description	Display information about clocks used for chassis synchronization.



NOTE: The Switch Control Board (SCB) framer in MX Series routers supports only the first-generation synchronization status message (SSM) format. Therefore, whenever the router needs to transmit an SSM value of ST3E or TNC via an external interface, an SSM value of ST3 is transmitted.

However, on a Synchronous Ethernet interface, an ESMC packet with the unadjusted SSM is transmitted. The term *unadjusted* here means:

- If the receive-quality statement at the [edit chassis synchronization selection-mode] hierarchy level is configured, the originally received SSM value ST3E or TNC (corresponding to the currently active Synchronous Ethernet clock interface) is transmitted.
- If the configured quality statement at the [edit chassis synchronization selection-mode] hierarchy level is configured, the originally configured SSM value of ST3E or TNC (corresponding to the currently active Synchronous Ethernet clock interface) is transmitted.

Note that when the external interface receives an SSM value of either ST3E or TNC, the SCB framer does not recognize either of these SSM codes, and therefore, it reports that the Do Not Use (DNU) quality value has been received.

Options	clock-module —(MX240, MX480, and MX960 routers with Enhanced MX Switch Control Board only) (Optional) Display clock module information. You can optionally specify one of these Routing Engine qualifiers: re0 —Routing Engine 0 re1 —Routing Engine 1 routing-engine (backup | both | local | master | other) —Routing Engine type extensive —(Optional) Display clock synchronization information in detail. interface <i>interface-name</i> —(Optional) Display clock synchronization information for the specified interface.
----------------	--

Required Privilege Level maintenance

- Related Documentation**
- [Configuring an External Clock Synchronization Interface for MX Series Routers on page 185](#)
 - [Configuring External Clock Synchronization for ACX Series Routers](#)
 - [Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC on page 197](#)
 - [request chassis synchronization mode](#)
 - [show chassis synchronization on page 1256](#)
 - [synchronization \(MX Series\) on page 411](#)
 - [Synchronous Ethernet Overview on page 25](#)

List of Sample Output

[show chassis synchronization on page 1265](#)
[show chassis synchronization extensive on page 1265](#)
[show chassis synchronization extensive \(Synchronous Ethernet with link down\) on page 1265](#)
[show chassis synchronization extensive \(Synchronous Ethernet with physical interface not restored\) on page 1265](#)
[show chassis synchronization extensive \(Synchronous Ethernet configured on ineligible slot 10\) on page 1266](#)
[show chassis synchronization interface on page 1266](#)
[show chassis synchronization clock-module on page 1266](#)
[show chassis synchronization \(configured external clock interface\) on page 1266](#)
[show chassis synchronization clock-module \(configured external clock interface\) on page 1267](#)
[show chassis synchronization extensive \(configured external clock interface\) on page 1267](#)

Output Fields [Table 95 on page 1261](#) lists the output fields for the **show chassis synchronization** command. Output fields are listed in the approximate order in which they appear.

Table 95: show chassis synchronization Output Fields

Field Name	Field Description	Level of Output
Current clock status	Indicates the current status of chassis synchronization: <ul style="list-style-type: none"> • Locked—Clock is operational. • Holdover—Clock is not operational. • Freerun—Clock is locked to the free-run local oscillator. 	none
Clock locked to	Indicates whether the clock is locked to either the primary source or the secondary source.	none
Configured sources	Heading for the list of interfaces configured for chassis synchronization and their subsequent status indicators.	none

Table 95: show chassis synchronization Output Fields (*continued*)

Field Name	Field Description	Level of Output
Source name	Indicates the configured interface that is the source. The external source name indicates the external clock interface.	none
Configured Priority	Indicates the priority configured for the interface.	none
Interface Status	Indicates the status of the interface as primary , secondary , or n/a (external).	none
Configured quality	Indicates the configured quality of the interface. <ul style="list-style-type: none"> • prs—Primary reference source—Stratum 1 • st2—Stratum 2 • tnc—Transit node clock • st3e—Stratum 3E • st3—Stratum 3 • smc—SONET minimum clock • st4—Stratum 4 • prc—Primary reference clock • ssu-a—Synchronization supply unit A • ssu-b—Synchronization supply unit B • sec—SDH equipment clock 	none
Interface	Indicates the configured interface: <ul style="list-style-type: none"> • ge-fpc/pic/port—Indicates the interface type and which FPC, PIC, and port are configured. 	extensive
Status	Indicates the synchronization status of the indicated interface, as follows: <ul style="list-style-type: none"> • Primary—This interface is the selected primary chassis clock source. • Secondary—This interface is the selected secondary chassis clock source. • n/a—This interface is not a selected clock source. 	extensive
Index	Unique numeric identifier for the established Synchronous Ethernet configuration.	extensive
Clock source state	Indicates the status of the Synchronous Ethernet clock source: <ul style="list-style-type: none"> • Clk qualified—The Synchronous Ethernet clock source is qualified. • n/a—The Synchronous Ethernet clock source is not qualified. 	extensive
Priority	Indicates the configured priority. The range is from 1 through 5. The following values indicate whether the parameter is not specified or undefined: <ul style="list-style-type: none"> • Default(8)—The parameter is not specified. • -—The parameter is undefined or out of range. 	extensive

Table 95: show chassis synchronization Output Fields (*continued*)

Field Name	Field Description	Level of Output
Configured QL	<p>Indicates the configured source interface quality level (QL), which is dependent on the source interface and option. The following quality levels are supported and the configured QL is indicated:</p> <ul style="list-style-type: none"> • prs | st2 | tnc | st3e | st3 | smc | st4—Network option I QLs • prc | ssu-a | ssu-b | sec—Network option II QLs 	extensive
ESMC QL	<p>Indicates the configured Ethernet Synchronization Message Channel (ESMC) quality level:</p> <ul style="list-style-type: none"> • DNU—Network option I source • DSU—Network option II source 	extensive
Clock source type	<p>Indicates that the configured chassis synchronization clock source is one of the following types:</p> <ul style="list-style-type: none"> • ifd—Uses the free-run local oscillator. • extern—Uses a configured qualified clock source. 	extensive
Clock Event	<p>Indicates the event clock status:</p> <ul style="list-style-type: none"> • Clock locked—Clock is established. • n/a—Clock is not established. 	extensive
Configuration flags	Indicates Ext for external interface configuration	
Kernel flags	<p>Indicates the Synchronous Ethernet software operational status:</p> <ul style="list-style-type: none"> • Up—The Synchronous Ethernet software is operational for the configured interface. • pri—The source is the selected primary clock source. • Dn—The Synchronous Ethernet software is not operational for the configured interface. 	extensive
Ineligibility reason	<p>Indicates the reason the interface is ineligible for the Synchronous Ethernet operation, including the following:</p> <ul style="list-style-type: none"> • Link Down—The link between the Synchronous Ethernet interfaces is not operational. • Not restored—The Synchronous Ethernet link has not yet been restored because it is waiting for the specified wait-to-restore time to elapse. • Forbidden slot—Slot 10 is not supported. • Interface unit missing—The unit parameter is not set or is invalid. • Locked—The paired interface is not available. • No cfg—Synchronous Ethernet is not configured. • RX Disabled—The receiving interface is disabled. • Undefined/invalid QL—The QL mode is not specified in the configuration or, if specified, is not supported. • System initialization in progress—The remote system is performing initialization and not currently available for synchronization. • Unsupported interface—The configured interface does not support Synchronous Ethernet. 	extensive

Table 95: show chassis synchronization Output Fields (*continued*)

Field Name	Field Description	Level of Output
Clock module on	Indicates whether the clock module is on the Switch Control Board SCB0 or SCB1 .	clock-module
Current role	Indicates the role of the clock module: <ul style="list-style-type: none"> master—The clock module is on the primary SCB, which is the active chassis clock source. backup—The clock module is on the backup SCB, which mirrors the state of the active clock. 	clock-module
Current state	Indicates the state of the clock module: <ul style="list-style-type: none"> freerun—The clock module is in free-run mode. When the system starts up, the default clock module state is free-run. acquiring-lock on—The clock module is attempting to acquire a lock on the specified clock source. locked to—The clock module is locked to the specified clock source. holdover on—The clock module is in holdover mode on the specified clock source. Prior to the specified clock source becoming invalid, the clock module was locked on the source and holdover data was collected. holdover—The clock module has transitioned into holdover prior to locking on a valid clock source and collecting holdover data. 	clock-module
Monitored clock sources	Displays information about monitored clock sources.	clock-module
Interface	Indicates the interface type and which FPC, PIC, and port are configured: <ul style="list-style-type: none"> external—External clock source ge-fpc/pic/port—Line Synchronous Ethernet or PTP slave xe-fpc/pic/port—Line Synchronous Ethernet or PTP slave 	clock-module
Type	Indicates the type of clock source: <ul style="list-style-type: none"> t1—BITS T1 framed e1—BITS E1 framed 2048khz—BITS unframed 2048 KHz frequency source syncE—Synchronous Ethernet frequency source ptp—PTP slave source ptp-hybrid—PTP slave source using Synchronous Ethernet for frequency 	clock-module
Status	Indicates the status of the clock source: <ul style="list-style-type: none"> failed—The clock source is in the failed state. qualifying—The clock source is being qualified. qualified—The clock source is qualified and can be selected as the chassis clock source. qualified-selected—The clock source is qualified and selected as the chassis clock source. 	clock-module

Sample Output

show chassis
synchronization

```
user@host> show chassis synchronization
```

```
Current clock status: Locked
Clock locked to : Primary
```

Configured sources

Source Name	Configured Priority	Interface Status	Configured Quality
ge-1/0/0	-	Primary	PRC

Sample Output

show chassis
synchronization
extensive

```
user@host> show chassis synchronization extensive
```

```
Current clock status: Locked
Clock locked to      : Primary
```

Configured sources:

```
Interface      : ge-1/0/0
Status         : Primary      Index : 143
Clock source state : Clk qualified Priority : -
Configured QL    : PRC        ESMC QL : DNU
Clock source type : ifd        Clock Event : Clock locked
Kernel flags     : Up,pri,
```

Sample Output

show chassis
synchronization
extensive
(Synchronous Ethernet
with link down)

```
user@host> show chassis synchronization extensive
```

```
Current clock status : Holdover
Configured sources:
```

```
Interface      : ge-1/0/2
Status         : n/a          Index   : 142
Clock source state : n/a          Priority : Default(8)
Configured QL    : SSU-B       ESMC QL  : DNU
Clock source type : ifd        Clock Event : n/a
Kernel flags     : Dn,
Ineligibility reason: Link Down,
```

Sample Output

show chassis
synchronization
extensive
(Synchronous Ethernet)

```
user@host> show chassis synchronization extensive
```

```
Current clock status : Holdover
Configured sources:
```

```
Interface      : ge-1/0/2
```

with physical interface
not restored)

Status	: n/a	Index	: 142
Clock source state	: n/a	Priority	: Default(8)
Configured QL	: SSU-B	ESMC QL	: DNU
Clock source type	: ifd	Clock Event	: n/a
Kernel flags	: Restoring in 13s,ESMC TX(QL DNU/SSM 0xf),		
Ineligibility reason:	Not restored,		

Sample Output

show chassis
synchronization
extensive
(Synchronous Ethernet
configured on ineligible
slot 10)

```
user@host> show chassis synchronization extensive
Current clock status : Holdover
Configured sources:
Interface          : ge-10/0/2 # Note: configuration 10/x/y (slot 10), which
does not support Synchronous Ethernet
Status             : n/a      Index      : 142
Clock source state : n/a      Priority   : Default(8)
Configured QL      : SSU-B    ESMC QL   : DNU
Clock source type  : ifd      Clock Event : n/a
Kernel flags       : Up,
Ineligibility reason: Forbidden slot,
```

Sample Output

show chassis
synchronization
interface

```
user@host> show chassis synchronization interface ge-1/0/2
Current clock status : Locked
Clock locked to      : Primary
```

Sample Output

show chassis
synchronization
clock-module

```
user@host> show chassis synchronization clock-module
Clock module on SCB0
Current role      : master
Current state     : locked to ge-4/1/0
State for        : 0 days, 00 hrs, 00 mins, 15 secs
State since      : Mon Jun  6 07:29:40 2011
Monitored clock sources
Interface  Type      Status
ge-4/1/0   syncE    qualified-selected
ge-4/3/0   syncE    qualified
```

show chassis
synchronization

```
user@host> show chassis synchronization
Current clock status : Free-run
```

(configured external
clock interface)

Configured interfaces:

Name	Signal type	Rx status	Tx status
external	e1 (g704 ami sa4)	loss of signal	squelched

Configured outputs:

Interface	Tx status	Minimum QL	Tx QL
external	squelched	SEC	DNU

Configured sources:

Source Name	Configured Priority	Interface Status	Configured Quality
external	Default(6)	n/a	SSU-A

show chassis
synchronization
clock-module
(configured external
clock interface)

```
user@host> show chassis synchronization clock-module re0:
```

Clock module on SCB0

```
Current role      : master
Current state     : freerun
State for        : 2 days, 06 hrs, 16 mins, 57 secs
State since      : Wed Nov 14 08:02:07 2012
```

Monitored clock sources

Interface	Type	Status
external	e1	failed

show chassis
synchronization
extensive (configured
external clock
interface)

```
user@host> show chassis synchronization extensive
Current clock status : Free-run
```

Configured interfaces:

```
Name           : external
Signal type    : e1 (g704 ami sa4)
Rx status      : loss of signal
Tx status      : squelched
LED color      : red
```

Configured outputs:

```
Interface       : external
Tx status       : squelched (holdover data invalid)
Minimum QL      : SEC           Tx QL           : DNU
Holdover mode   : enabled       Wander filter : disabled
Source mode     : chassis       Source Tx DNU : disabled
Holdover data   : invalid
Current state    : holdover
State for       : 2 days, 06 hrs, 03 mins, 46 secs
State since     : Wed Nov 14 08:02:09 2012
```

Configured sources:

```
Interface       : external
Status          : n/a           Index         : 0
Clock source state : n/a       Priority       : Default(6)
Configured QL     : SSU-A       ESMC QL       : DNU
Clock source type  : extern     Clock Event    : n/a
Interface State   : Dn,ESMC Rx(SSM 0xf),
Ineligibility reason: Link Down,
```

show chassis temperature-thresholds

Syntax	show chassis temperature-thresholds
Syntax (TX Matrix Routers)	show chassis temperature-thresholds <lcc <i>number</i> | scc>
Syntax (TX Matrix Plus Routers)	show chassis temperature-thresholds <lcc <i>number</i> | sfc <i>number</i> >
Syntax (MX Series Routers)	show chassis temperature-thresholds <all-members> <local> <member <i>member-id</i> >
Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers)	show chassis temperature-thresholds
Syntax (QFX Series)	show chassis temperature-thresholds <interconnect-device <i>name</i> > <node-device <i>name</i> >
Release Information	<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>sfc 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>
Description	Display chassis temperature threshold settings, in degrees Celsius.
Options	<p>none—Display the temperature threshold details.</p> <p>all-members—(MX Series routers only) (Optional) Display the chassis temperature threshold settings of all member routers in the Virtual Chassis configuration.</p> <p>interconnect-device <i>name</i>—(QFabric systems only) (Optional) Display the chassis temperature threshold settings of the Interconnect device.</p> <p>lcc <i>number</i>—(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.</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.

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 1271](#)
[show chassis temperature-thresholds \(MX104 Router\) on page 1271](#)
[show chassis temperature-thresholds \(MX240, MX480, MX960 Routers with Application Services Modular Line Card\) on page 1271](#)
[show chassis temperature-thresholds \(MX480 Router with MPC4E\) on page 1272](#)
[show chassis temperature-thresholds \(MX2010 Router\) on page 1273](#)
[show chassis temperature-thresholds \(MX2020 Router\) on page 1275](#)
[show chassis temperature-thresholds \(MX2020 Router with MPC4E\) on page 1278](#)
[show chassis temperature-thresholds \(T4000 Core Routers\) on page 1280](#)
[show chassis temperature-thresholds \(TX Matrix Plus Router\) on page 1281](#)
[show chassis temperature-thresholds lcc \(TX Matrix Plus Router\) on page 1283](#)
[show chassis temperature-thresholds sfc \(TX Matrix Plus Router\) on page 1283](#)
[show chassis temperature-thresholds \(TX Matrix Plus routers with 3D SIBs\) on page 1284](#)
[show chassis temperature-thresholds \(QFX3500 Switch and QFX3600\) on page 1286](#)

[show chassis temperature-thresholds interconnect-device \(QFabric System\)](#) on page 1286

[show chassis temperature-thresholds \(PTX5000 Packet Transport Router\)](#) on page 1286

[show chassis temperature-thresholds \(MX Routers with Media Services Blade \[MSB\]\)](#) on page 1287

Output Fields Table 96 on page 1270 lists the output fields for the **show chassis temperature-thresholds** command. Output fields are listed in the approximate order in which they appear.

Table 96: show chassis temperature-thresholds Output Fields

Field name	Field Description
Item	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.
Fan speed	<p>NOTE: On the QFX3500 switch and QFX3600 switch, there are four fan speeds: low, medium-low, medium-high, and high. 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"> Normal—The fans operate at normal speed if the component is at or below this temperature and all the fans are present and functioning normally. <p>NOTE: On a TX Matrix Plus router with 3D SIBs, the threshold temperature at the XF junction is set to 70°C for Normal fan speed, which is less than or equal to 4800 RPM.</p> <ul style="list-style-type: none"> High—The fans operate at high speed if the component has exceeded this temperature or a fan has failed or is missing. <p>NOTE: On a TX Matrix Plus router with 3D SIBs, the threshold temperature at the XF junction is set to 75°C for High fan speed, which is greater than or equal to 5000 RPM.</p> <p>NOTE: For MX480 Routers, there are three fan speeds: Low, Medium, and High.</p> <p>An alarm is not triggered until the temperature exceeds the threshold settings for a yellow alarm or a red alarm.</p>
Yellow alarm	<p>Temperature threshold settings, in degrees Celsius, that trigger a yellow alarm.</p> <ul style="list-style-type: none"> Normal—The temperature that must be exceeded on the component to trigger a yellow alarm when the fans are running at full speed. Bad fan—The temperature that must be exceeded on the component to trigger a yellow alarm when one or more fans have failed or are missing.
Red alarm	<p>Temperature threshold settings, in degrees Celsius, that trigger a red alarm.</p> <ul style="list-style-type: none"> Normal—The temperature that must be exceeded on the component to trigger a red alarm when the fans are running at full speed. Bad fan—The temperature that must be exceeded on the component to trigger a red alarm when one or more fans have failed or are missing.
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 (degrees C)		Yellow alarm (degrees C)		Red alarm (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 (degrees C)		Yellow alarm (degrees C)		Red alarm (degrees C)		Fire Shutdown (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

user@host> show chassis temperature-thresholds

Item	Fan speed (degrees C)		Yellow alarm (degrees C)		Red alarm (degrees C)		Fire Shutdown (degrees C)	
	Normal	High	Normal	Bad fan	Normal	Bad fan	Normal	Bad fan

**Application Services
Modular Line Card)**

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**

```
user@ host> show chassis temperature-thresholds
Fan speed      Yellow alarm   Red alarm      Fire Shutdown
              (degrees C)   (degrees C)    (degrees C)
```


(MX480 Router with
MPC4E)

(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)

	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	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)

Item	Fan speed		Yellow alarm		Red alarm		Fire Shutdown
	(degrees C)		(degrees C)		(degrees C)		(degrees C)
	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

user@host> **show chassis temperature-thresholds**

Fan speed	Yellow alarm	Red alarm	Fire Shutdown	
	(degrees C)	(degrees C)	(degrees C)	(degrees

(MX2020 Router with
MPC4E)

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

	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	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`

```
user@host> show chassis temperature-thresholds
sfc0-re0:
```

(TX Matrix Plus Router)

Item	Fan speed (degrees C)		Yellow alarm (degrees C)		Red alarm (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

1cc0-re0:

Item	Fan speed (degrees C)		Yellow alarm (degrees C)		Red alarm (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

1cc1-re0:

Item	Fan speed (degrees C)		Yellow alarm (degrees C)		Red alarm (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      Yellow alarm      Red alarm
                  (degrees C)      (degrees C)      (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

```

user@host> show chassis temperature-thresholds sfc 0
sfc0-re0:

```

sfc (TX Matrix Plus Router)

Item	Fan speed (degrees C)		Yellow alarm (degrees C)		Red alarm (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

```
user@host> show chassis temperature-thresholds
sfc0-re0:
```

(TX Matrix Plus routers
with 3D SIBs)

Shutdown (degrees C) Item	Fan speed		Yellow alarm		Red alarm		Fire
	(degrees C)		(degrees C)		(degrees C)		
	Normal	High	Normal	Bad fan	Normal	Bad fan	
Normal							
Chassis default	48	54	65	55	75	65	
100							
Routing Engine 0	70	75	90	87	102	97	
115							
Routing Engine 1	70	75	90	87	102	97	
115							
SIB F13 0 Board	60	65	78	75	85	80	
95							
SIB F13 0 XF Junction	70	75	82	74	105	100	
107							
SIB F13 4 Board	60	65	78	75	85	80	
95							
SIB F13 4 XF Junction	70	75	82	74	105	100	
107							
SIB F13 6 Board	60	65	78	75	85	80	
95							
SIB F13 6 XF Junction	70	75	82	74	105	100	
107							
SIB F2S 16 Board	60	65	78	75	85	80	
95							
SIB F2S 16 XF Junction	70	75	82	74	105	100	
107							
SIB F2S 17 Board	60	65	78	75	85	80	
95							
SIB F2S 17 XF Junction	70	75	82	74	105	100	
107							
SIB F2S 18 Board	60	65	78	75	85	80	
95							
SIB F2S 18 XF Junction	70	75	82	74	105	100	
107							
SIB F2S 19 Board	60	65	78	75	85	80	
95							
SIB F2S 19 XF Junction	70	75	82	74	105	100	
107							
SIB F2S 24 Board	60	65	78	75	85	80	
95							
SIB F2S 24 XF Junction	70	75	82	74	105	100	
107							
SIB F2S 25 Board	60	65	78	75	85	80	
95							
SIB F2S 25 XF Junction	70	75	82	74	105	100	
107							
SIB F2S 26 Board	60	65	78	75	85	80	
95							
SIB F2S 26 XF Junction	70	75	82	74	105	100	
107							
SIB F2S 27 Board	60	65	78	75	85	80	
95							
SIB F2S 27 XF Junction	70	75	82	74	105	100	
107							
lcc0-re0:							

	Fan speed		Yellow alarm		Red alarm		Fire
Shutdown							

(degrees C) Item	(degrees C)		(degrees C)		(degrees C)	
	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 (degrees C)		Yellow alarm (degrees C)		Red alarm (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

user@switch> show chassis temperature-thresholds

user@switch> show chassis temperature-thresholds

Fan speed Yellow alarm Red alarm Fire Shutdown

(PTX5000 Packet Transport Router)

Item	(degrees C)		(degrees C)		(degrees C)		(degrees C)	
	Normal	High	Normal	Bad fan	Normal	Bad fan	Normal	
Routing Engine 0	70	75	90	87	102	97	115	
Routing Engine 1	70	75	90	87	102	97	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	20	25	65	60	80	75	100	
FPC 1 Exhaust A	60	65	78	75	85	80	95	
FPC 1 Exhaust B	60	65	78	75	85	80	95	
FPC 1 TL0	70	75	90	87	102	97	115	
FPC 1 TQ0	70	75	90	87	102	97	115	
FPC 1 TL1	70	75	90	87	102	97	115	
FPC 1 TQ1	70	75	90	87	102	97	115	
FPC 1 TL2	70	75	90	87	102	97	115	
FPC 1 TQ2	70	75	90	87	102	97	115	
FPC 1 TL3	70	75	90	87	102	97	115	
FPC 1 TQ3	70	75	90	87	102	97	115	
FPC 2 Exhaust A	60	65	78	75	85	80	95	
FPC 2 Exhaust B	60	65	78	75	85	80	95	
FPC 2 TL0	70	75	90	87	102	97	115	
FPC 2 TQ0	70	75	90	87	102	97	115	
FPC 2 TL1	70	75	90	87	102	97	115	
FPC 2 TQ1	70	75	90	87	102	97	115	
FPC 2 TL2	70	75	90	87	102	97	115	
FPC 2 TQ2	70	75	90	87	102	97	115	
FPC 2 TL3	70	75	90	87	102	97	115	
FPC 2 TQ3	70	75	90	87	102	97	115	
PIC 2/0 Ambient	60	65	78	75	85	80	95	
PIC 2/0 cfp-2/0/1	60	65	70	67	75	72	85	
PIC 2/1 Ambient	60	65	78	75	85	80	95	
SIB 0 Exhaust	60	65	78	75	85	80	95	
SIB 0 Junction	70	75	90	87	102	97	115	
SIB 1 Exhaust	60	65	78	75	85	80	95	
SIB 1 Junction	70	75	90	87	102	97	115	
SIB 2 Exhaust	60	65	78	75	85	80	95	
SIB 2 Junction	70	75	90	87	102	97	115	
SIB 3 Exhaust	60	65	78	75	85	80	95	
SIB 3 Junction	70	75	90	87	102	97	115	
SIB 4 Exhaust	60	65	78	75	85	80	95	
SIB 4 Junction	70	75	90	87	102	97	115	
SIB 5 Exhaust	60	65	78	75	85	80	95	
SIB 5 Junction	70	75	90	87	102	97	115	
SIB 6 Exhaust	60	65	78	75	85	80	95	
SIB 6 Junction	70	75	90	87	102	97	115	
SIB 7 Exhaust	60	65	78	75	85	80	95	
SIB 7 Junction	70	75	90	87	102	97	115	
SIB 8 Exhaust	60	65	78	75	85	80	95	
SIB 8 Junction	70	75	90	87	102	97	115	

show chassis
temperature-thresholds
(MX Routers with

```
user@switch> show chassis temperature-thresholds
Fan speed      Yellow alarm    Red alarm      Fire Shutdown
(degrees C)    (degrees C)    (degrees C)    (degrees C)
```

**Media Services Blade
[MSB])**

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

Syntax	show chassis zones <detail>
Syntax (QFX Series)	show chassis zones <detail> <interconnect-device <i>name</i> >
Release Information	Command introduced in Junos OS Release 11.3 for the QFX Series. 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.
Description	(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.
Options	<p>detail—(MX2010 and MX2020 routers only) (Optional) Display detailed status of the cooling system zones.</p> <p>detail <i>device-name</i>— (QFabric systems only) (Optional) Display detailed status of the two cooling systems on the Interconnect device.</p> <p>interconnect-device <i>name</i>— (QFabric systems only) (Optional) Display the status of the cooling zones on the Interconnect device.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • request chassis beacon • show chassis fan on page 788 • show chassis temperature-thresholds on page 1268
List of Sample Output	show chassis zones interconnect-device (QFabric System) on page 1291 show chassis zones (MX2010 Router) on page 1291 show chassis zones detail (MX2010 Router) on page 1291 show chassis zones (MX2020 Router) on page 1292 show chassis zones detail (MX2020 Router) on page 1292 show chassis beacon interconnect-device (QFabric System) on page 1293 show chassis beacon interconnect-device fpc (QFabric System) on page 1294 show chassis beacon node-device (QFabric System) on page 1294 show chassis beacon node-device fpc (QFabric System) on page 1294
Output Fields	Table 97 on page 1290 lists the output fields for the show chassis zones command. Output fields are listed in the approximate order in which they appear.

Table 97: 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"> Off—The beacon is OFF. On—The beacon is ON.
show chassis zones command output fields for MX2020 and MX2010 routers:	
Driving FRU	Field replacable unit (FRU).
Temperature	Temperature of the specified FRU in degrees Celsius and degrees Fahrenheit.
Condition	Condition of the specified FRU. Condition can be HIGH TEMP , WARM TEMP , OK , and Offline .
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"> Information about the chassis, Routing Engines, Control Boards (CBs), Switch Fabric Boards (SFBs), PICs, Flexible PIC Concentrators (FPCs), and Adapter Cards (ADCs).
Measurement	Fan tray speed utilization in percentage.
Status	Status of the specified item. Status can be OK , Absent , or Offline .

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 fib-local-accounting ip

Syntax	show fib-local-accounting ip
Release Information	Command introduced in Junos OS Release 12.3 for MX Series routers.
Description	Display the number of packets that were sent to an anchor MPC due to FIB localization.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • fib-remote on page 72 • fib-local on page 72 • Example: Configuring Packet Forwarding Engine FIB Localization on page 68

Sample Output

```

user@host> show fib-local-accounting ip
fib-local-accounting ip
PFE 0
    fe_addr      packets      bytes
    28           0           0
    29           0           0
    30           0           0
    31           0           0
PFE 1
    fe_addr      packets      bytes
    28           0           0
    29           0           0
    30           0           0
    31           0           0

```


PART 4

Index

- [Index on page 1299](#)

Index

Symbols

#, comments in configuration statements.....	xxvi
(), in syntax descriptions.....	xxvi
100-Gigabit Ethernet	
configuration	
interoperability modes.....	122
sa-multicast.....	122
< >, in syntax descriptions.....	xxvi
[], in configuration statements.....	xxvi
{ }, in configuration statements.....	xxvi
| (pipe), in syntax descriptions.....	xxvi

A

account-layer2-overhead (Interface level)	
statement.....	319
account-layer2-overhead (PIC level)	
statement.....	320
accounting of Layer 2 overhead	
viewing.....	133
action-fpc-restart-disable statement.....	320
active control board	
configuring	
redundancy fabric mode.....	235
increased fabric bandwidth, enabling	
redundancy fabric mode.....	235
adaptive-services statement.....	321
usage guidelines.....	181
ADC	
chassis information, displaying.....	494
environmental information, displaying.....	590
AFEB	
status, displaying.....	496
aggregate-ports statement.....	321
aggregated devices, configuring.....	167
aggregated-devices statement.....	322
usage guidelines.....	167
alarm conditions.....	251
backup Routing Engine.....	290
chassis alarm conditions.....	253
silencing alarm devices.....	292
alarm cutoff button.....	292

alarm statement.....	323
usage guidelines.....	251
alarms, displaying	
chassis.....	498
alternative media.....	262
announce-interval statement.....	325
announce-timeout statement.....	324
ATM.....	220
ATM interfaces	
PIC alarm conditions.....	252
ATM MICs	
framing mode	
SDH.....	150
SONET.....	150
atm-cell-relay-accumulation statement.....	325
usage guidelines.....	151
atm-l2circuit-mode statement.....	326
usage guidelines.....	156, 219
ATM2 IQ interfaces	
Layer 2 circuit transport mode.....	219

B

bandwidth statement.....	327
braces, in configuration statements.....	xxvi
brackets	
angle, in syntax descriptions.....	xxvi
square, in configuration statements.....	xxvi

C

CB	
environmental information, displaying.....	601
Ethernet switch, displaying port	
information.....	740
operation of, controlling.....	440
SPMB operation, restarting.....	485
cel statement.....	328
usage guidelines.....	154
CFEB	
operation, controlling.....	443
status, displaying.....	511
cfeb statement.....	6, 224, 316
channel-group statement.....	329
usage guidelines.....	175
channelization	
configuring.....	177
channelization statement.....	329
channelized DS3-to-DS0 naming.....	175
channelized E1 naming.....	154
channelized mode.....	153

chassis	
alarm conditions, displaying.....	498
chassis fabric optics, displaying.....	864
cip information, displaying.....	513
configuration	
alarm conditions.....	251
craft interface display messages	
clearing the display of.....	436
displaying.....	489
displaying through the CLI.....	515
stopping the display of.....	489
environmental information, displaying.....	533
Ethernet switch information, displaying.....	740
fabric	
show chassis fabric reachability,	
displaying.....	927
unreachable-destinations,	
displaying.....	969
firmware version, displaying.....	975
forwarding process, displaying.....	986
installed hardware, displaying.....	1020
location, displaying.....	1153
MAC addresses, displaying.....	1157
network services, displaying.....	1163
serial numbers, displaying.....	1020
show chassis oss-map displaying.....	1165
switch fabric errors	
displaying.....	814
switch fabric status	
FPCs, displaying.....	819
SIBs, displaying.....	934
switch fabric topology, displaying.....	944
synchronization (MX Series).....	411
synchronization source information,	
displaying.....	1256
temperature threshold settings,	
displaying.....	1268
chassis fabric optics, displaying.....	864
chassis interface names.....	50, 56
chassis statement.....	330
CIP	
operation of, controlling.....	444
clear chassis alarms degraded fabric display	
message command.....	434
clear chassis display message command.....	436
clock sources.....	23
clock-class statement.....	330
clock-class-to-quality-level-mapping	
statement.....	331
clock-client statement.....	335
clock-mode statement.....	334
clock-source statement	
hybrid.....	333
slave.....	332
clock-step statement.....	335
clocking statement	
usage guidelines.....	23
comments, in configuration statements.....	xxvi
concatenated mode.....	153
config-button statement.....	336
usage guidelines.....	141
configuration	
aggregated devices.....	167
sanity poll.....	240
configuring	
action-fpc-restart-disable.....	234
redundancy-mode redundant.....	235
connectivity	
FPC to FEB, M120 routers.....	105
Control Board See CB	
conventions	
text and syntax.....	xxv
convert-clock-class-to-quality-level	
statement.....	337
craft interface	
alarm conditions	
chassis.....	254
M20 router.....	262
M40 router.....	266
M40e and M160 routers.....	271
overview.....	251
alarm cutoff button.....	292
disabling.....	245
craft interface display messages	
clearing.....	436
displaying	
on the craft interface display.....	489
through the CLI.....	515
stopping.....	489
craft-lockout statement.....	337
usage guidelines.....	245
ct3 statement.....	338
usage guidelines.....	175
curly braces, in configuration statements.....	xxvi
customer support.....	xxvii
contacting JTAC.....	xxvii

D

degraded-fabric-detection-enable	
statement.....	338
degraded-fpc-bad-plane-threshold	
statement.....	339
delay buffers.....	158
delay-request statement.....	339
device-count statement.....	340
usage guidelines.....	167
disabling	
FPC restart.....	234
disk-failure-action statement.....	340
documentation	
comments on.....	xxvii
domain statement.....	341
DPC	
bound to a Layer 2 port-mirroring	
instance.....	110
DS1 interfaces, PIC alarm conditions.....	253
dynamic-profile-options statement.....	341

E

e1 statement.....	342
usage guidelines.....	154
E3 interfaces	
PIC alarm conditions.....	253
egress-policer-overhead statement.....	343
usage guidelines.....	160, 239
enhanced AC PEM	
MX Series	
configuring at the chassis level.....	126
environmental information	
CB, displaying.....	601
chassis, displaying.....	513, 534
FPC, displaying.....	620
FPM, displaying.....	648
MCSs, displaying.....	669
monitored temperatures, displaying.....	655
PCGs, displaying.....	671
PEMs, displaying.....	673
Routing Engines, displaying.....	687
SCG, displaying.....	692
SFM, displaying.....	708
SIB, displaying.....	712
Ethernet	
PIC alarm conditions.....	253
ethernet statement.....	345
chassis.....	345
usage guidelines.....	167

Ethernet switch information, displaying.....	740
Ethernet switching interfaces.....	142, 143
Ethernet Synchronization Message Channel	
overview.....	32
external clock synchronization interface	
usage guidelines	
MX Series.....	185
external synchronization interface.....	183, 191, 409
usage guidelines.....	24

F

fabric	
reachability, displaying.....	927
unreachable-destinations, displaying.....	969
fabric degradation	
traffic black hole.....	225
fabric down	
T1600	
signal neighboring routers.....	224
T640	
signal neighboring routers.....	224
Fabric Management	
Active planes	
Spare planes.....	16
fabric redundancy mode	
status, displaying, MX routers.....	926
fabric upgrade-mode statement.....	345
failover statement.....	6, 224, 316
family statement	
chassis.....	347
fan alarm conditions	
M120 routers.....	276
M20 routers.....	262
M320 routers.....	281
M40 routers.....	266
M40e and M160 routers.....	271
M5 and M10 routers.....	255
M7i and M10i routers.....	258
MX240 routers.....	286
MX480 routers.....	286
MX960 routers.....	286
FEB	
firmware version, displaying.....	975
operation of, controlling (M120 routers	
only).....	466
status, displaying.....	971
FEB alarm condition.....	255
M120 routers.....	276

FEB redundancy group	
status, displaying, M120 routers.....	1198
feb statement.....	6, 317
FEBs	
connectivity.....	224
feeds statement.....	348, 363, 386
FIB localization	
overview.....	66, 67
fib localization	
configuring.....	68, 73
fib-local statement.....	72, 349
fib-remote statement.....	72, 349
filb-local	
usage guidelines.....	66, 67, 68, 73
filb-remote	
usage guidelines.....	66, 67, 68, 73
filter statement.....	350
firmware	
chassis, displaying.....	975
font conventions.....	xxv
forwarding process, displaying.....	986
FPC	
environmental information, displaying.....	620
firmware version, displaying.....	975
installed, displaying list.....	1021
operation of, controlling.....	449
status, displaying.....	989
switch fabric status, displaying.....	814, 819
FPC alarm condition	
M20 routers.....	262
M320 routers.....	282
M40 routers.....	266
M40e and M160 routers.....	271
M5 and M10 routers.....	255
FPC restart	
disabling.....	234
fpc statement	
M Series and T Series routers.....	351
MX Series routers.....	352
TX Matrix routers.....	353
usage guidelines.....	153
FPC, configuring to stay offline.....	145
fpc-feb-connectivity statement.....	354
usage guidelines.....	105
fpc-resync statement.....	165, 355
FPC-to-FEB connectivity	
configuring, M120 routers.....	105
example, M120 routers.....	105
FPM	
environmental information, displaying.....	648
resynchronizing craft interface status.....	453
framing statement	
chassis.....	355
usage guidelines.....	147, 150
frequency-only statement.....	357
Front Panel Module See FPM	
fru-poweron-sequence	
configuring.....	137
fru-poweron-sequence statement.....	356
usage guidelines.....	126
G	
graceful-switchover statement.....	6, 224, 317
H	
hard disk errors.....	238
hardware, installed, displaying.....	1020
hash-key statement.....	358
heat dissipation	
ratings	
displaying for a router.....	1181
hot-swapping alarm condition.....	255
Hybrid Mode	
configuration.....	209
example configuration.....	212
Hybrid Mode Overview.....	39
hybrid statement.....	359
I	
idle-cell-format statement.....	360
usage guidelines.....	220
ILMI with cell relay.....	156
inet statement	
chassis.....	361
ingress-policer-overhead statement.....	362
usage guidelines.....	160, 239
interface naming	
routing matrix.....	50, 56
TX Matrix Plus router.....	56
TX Matrix router.....	50
interfaces	
clock sources.....	23
J	
J Series Services Routers.....	142, 143

K

keepalive-time statement.....6, 224, 317

L

lacp statement.....364

large delay buffers.....158

LCC

operation, receiving.....483

operation, transmitting.....484

prefix.....50, 56

T1600 router.....79

T640 router.....63

TX Matrix Plus router.....52

TX Matrix router.....47

lcc

operation, controlling.....481

lcc statement.....365

usage guidelines.....63, 79

line-card chassis *See* LCC

operation, controlling.....455

status, displaying.....1149

linerate-mode statement.....368

link protection

non-revertive statement.....377

Link Services PIC.....157

link-protection statement

LACP

chassis.....368

local-ip-address statement

master.....369

slave.....369

location, chassis.....1153

logical devices.....167

M

MAC addresses

displaying.....1157

management Ethernet interface

PIC alarm conditions.....253

manuals

comments on.....xxvii

master statement.....370

max-queues-per-interface statement.....372

usage guidelines.....107

maximum-ecmp statement.....371

usage guidelines.....171

maximum-links command.....372

maximum-links statement

usage guidelines.....167

MCS

environmental information, displaying.....669

operation of, controlling.....457

memory-enhanced statement.....373

usage guidelines.....236

MICs

operation of, controlling.....458

Miscellaneous Control Subsystem *See* MCS

mlfr-uni-nni-bundles statement.....373

usage guidelines.....157

monitored temperatures.....655

monitored temperatures, environmental

information, displaying.....655

MPC4E

configuration

interoperability modes.....124

sa-multicast.....124, 125

Fabric Management.....16

Fabric Mode configuring.....298

overview.....118

interoperability modes.....12

sa-multicast.....12

tunnel interfaces.....121

multiplexed mode.....153

multiservice statement.....374

N

network-services statement.....375

Next-generation SONET/SDH PICs

configuring.....147

no-auto-failover statement.....6, 224, 317

no-concatenate statement.....376

usage guidelines.....153

no-multi-rate statement.....376

no-packet-scheduling statement.....383

usage guidelines.....104

no-route-localize

usage guidelines.....66, 67, 68, 73

no-route-localize statement.....73, 377

non-revertive statement.....377

nonconcatenated mode.....153

number-of-ports statement.....378

O

offline statement.....378

usage guidelines.....65, 80

offline-on-fabric-bandwidth-reduction

statement.....379

on-disk-failure statement.....	6, 224, 316, 379
usage guidelines.....	238
on-error statement.....	380
usage guidelines.....	240
on-loss-of-keepalives statement.....	6, 224, 316
online-expected statement.....	381
usage guidelines.....	65, 80
optics	
reactivate.....	460
oss-map statement.....	382
P	
Packet Forwarding Engine	
bound to a Layer 2 port-mirroring instance.....	110
Packet Forwarding Engine clock generator See PCG	
packet scheduling.....	104
packet-scheduling statement.....	383
usage guidelines.....	104
parentheses, in syntax descriptions.....	xxvi
payload statement.....	384
PCG	
environmental information, displaying.....	671
operation of, controlling.....	461
pem	
feeds.....	348, 363, 386
feeds statement.....	348, 363, 386
pem feeds	
configuring.....	247
pem statement.....	385
usage guidelines.....	108
PEM, environmental information, displaying.....	673
PFE	
PCG operation, controlling.....	461
physical devices, aggregating.....	167
physical interfaces	
clock sources.....	23
physical interfaces framing modes.....	147
pic statement	
M Series, MX Series, and T Series routers.....	387
TX Matrix routers.....	388
usage guidelines.....	153
PICs	
installed, displaying list.....	1021
operation of, controlling.....	462
status	
displaying for a specific PIC.....	1166
displaying FPCs and PICs.....	988
policer overhead	
configuring.....	160, 239
policer-drop-probability-low statement.....	389
port mirroring.....	8
port mirroring, Layer 2	
MX Series	
for a specific DPC.....	110
for a specific PFE.....	110
port speed	
configuring.....	161
port statement	
channelized T3 interface.....	390
port-mirroring instance, Layer 2	
binding to a specific PFE.....	110
M120 routers	
associating with an FEB.....	102
M320 routers	
associating with an FPC.....	101
MX Series	
binding to a specific DPC.....	110
port-mirroring instances	
overview.....	8
power consumption	
displaying for a router.....	1181
Power Entry Module.....	673
power management	
t4000.....	17
power statement	
chassis.....	390
power statement (fpc)	
usage guidelines.....	145
power supply alarm conditions.....	256
power supply input feeds	
configuring.....	247
power usage	
displaying for a router.....	1184
Precision Time Protocol	
configuration.....	201
example configuration.....	205
Precision Time Protocol Overview.....	38
Primary-level entry	
secondary-level entry.....	300
Primary-level entry only.....	300
priority1 statement.....	391
priority2 statement.....	392
PSM	
environmental information, displaying.....	682
PTX Series Packet Transport Router clock sources	
overview.....	190

Q

q-pic-large-buffer statement.....	393
usage guidelines.....	158
quality-level statement	
hybrid.....	394

R

reachability	
fabric, displaying.....	927
red alarm conditions.....	251
red-buffer-occupancy statement.....	395
redundancy group	
status, displaying, M120 routers.....	1198
redundancy mode, active control boards	
status, displaying, MX routers.....	926
redundancy statement.....	6, 224, 316, 317
redundancy-group statement.....	224
redundancy-mode redundant statement.....	396
request chassis cb command.....	440
request chassis cfeb command.....	443
request chassis cib command.....	444
request chassis fpc command.....	449
request chassis fpm resync command.....	453
request chassis lcc command.....	455
request chassis mcs command.....	457
request chassis mic command.....	458
request chassis optics command.....	460
request chassis pcg command.....	461
request chassis pic command.....	462
request chassis redundancy feb slot	
command.....	466
request chassis routing-engine master	
command.....	467
request chassis scg command.....	472
request chassis sfb command.....	474
request chassis sfm command.....	476
request chassis sfm master switch command.....	475
request chassis sib command.....	477
request chassis sib f13 train-link-receive slot	
command.....	479
request chassis sib f13 train-link-transmit slot	
command.....	480
request chassis sib lcc optics command.....	481
request chassis sib sfc optics command.....	482
request chassis sib train-link-receive slot	
command.....	483
request chassis sib train-link-transmit slot	
command.....	484
request chassis spmb restart command.....	485

request chassis synchronization switch	
command.....	487
resynchronizing FPM status.....	453
retry count.....	240
retry-count statement.....	397
route statement	
chassis.....	397
usage guidelines.....	236
route-localization statement.....	73, 398
route-memory-enhanced statement.....	399
Routing Engines	
environmental information, displaying.....	687
operation of, controlling.....	467
status, displaying.....	1201
routing matrix.....	63, 79
interface naming.....	50, 56
LCC.....	63, 79
online expected alarm.....	65, 80
overview.....	47, 52
routing-engine statement	
reboot on disk failure.....	398
redundancy.....	224
usage guidelines.....	238

S

sampling-instance statement.....	400
sanity poll, configuring.....	240
sanity-poll statement.....	401
usage guidelines.....	240
SCB	
firmware version, displaying.....	975
status, displaying.....	1222
SCB alarm condition.....	255
SCC.....	50
SCG	
environmental information, displaying.....	692
operation, controlling.....	472
scheduling packets.....	104
SDH	
interfaces	
framing mode.....	147
SDH interfaces	
framing.....	147
PIC alarm conditions.....	252
serial numbers, displaying.....	1020
service-package statement.....	402
usage guidelines.....	126, 181
session-offload statement.....	402
set chassis display message command.....	489

SFB		
chassis information, displaying.....	1224	
environmental information, displaying.....	698	
operation of, controlling.....	474	
SFC.....	56	
operation, receiving.....	479	
operation, transmitting.....	480	
sfc		
operation, controlling.....	482	
SFM		
environmental information, displaying.....	708	
firmware version, displaying.....	975	
master, determining.....	475	
operation, controlling.....	476	
status, displaying.....	1226	
sfm statement.....	224	
power off.....	403	
usage guidelines.....	104	
SFMs		
alarm condition.....	255	
offline.....	104	
show chassis adc command.....	494	
show chassis alarms command.....	498	
show chassis cfeb command.....	511	
show chassis cip command.....	513	
show chassis craft-interface command.....	515	
show chassis environment adc command.....	590	
show chassis environment cb command.....	601	
show chassis environment command.....	533	
show chassis environment fpc command.....	620	
show chassis environment fpm command.....	648	
show chassis environment mcs command.....	669	
show chassis environment monitored		
command.....	655	
show chassis environment pcg command.....	671	
show chassis environment pem command.....	673	
show chassis environment psm command.....	682	
show chassis environment routing-engine		
command.....	687	
show chassis environment scg command.....	692	
show chassis environment sfb command.....	698	
show chassis environment sfm command.....	708	
show chassis environment sib command.....	712	
show chassis ethernet-switch command.....	740	
show chassis fabric degraded-fabric-reachability		
command.....	967	
show chassis fabric destinations command.....	801	
show chassis fabric errors command.....	814	
show chassis fabric fpcs command.....	819	
show chassis fabric optics command.....	864	
show chassis fabric plane command.....	876	
show chassis fabric reachability command.....	927	
show chassis fabric redundancy-mode		
command.....	926	
show chassis fabric sibs command.....	934	
show chassis fabric topology command.....	944	
show chassis fabric unreachable-destinations		
command.....	969	
show chassis fan command.....	788	
show chassis feb command.....	971	
show chassis firmware command.....	975	
show chassis forwarding command.....	986	
show chassis fpc command.....	988	
show chassis hardware command.....	1020	
show chassis in-service-upgrade command.....	1145	
show chassis lccs command.....	1149	
show chassis location command.....	1153	
show chassis mac-addresses command.....	1157	
show chassis network services command.....	1163	
show chassis oss-map.....	1165	
show chassis oss-map, displaying.....	1165	
show chassis pic command.....	1166	
show chassis power command.....	1184	
show chassis power-ratings command.....	1181	
show chassis psd command.....	1196	
show chassis redundancy feb command.....	1198	
show chassis routing-engine command.....	1201	
show chassis scb command.....	1222	
show chassis sfb command.....	1224	
show chassis sfm command.....	1226	
show chassis sibs command.....	1229	
show chassis spmb command.....	1240	
show chassis spmb sibs command.....	1250	
show chassis synchronization command.....	1256	
MX Series.....	1260	
show chassis temperature-thresholds		
command.....	1268	
SIB		
chassis fabric optics, displaying.....	864	
environmental information, displaying.....	712	
information, displaying.....	1229	
operation, controlling.....	477, 481, 482	
SPMB status, displaying.....	1250	
status, displaying.....	1229	
switch fabric status, displaying.....	934	
switch fabric topology, displaying.....	944	
sib statement.....	403	
usage guidelines.....	108	

-
- six-input dc power supply
 - configuring.....247
 - slave statement.....405
 - slow-pfe-alarm statement.....404
 - SONET
 - interfaces
 - framing.....147
 - framing mode.....147
 - PIC alarm conditions.....252
 - SONET Clock Generator *See* SCG
 - sonet statement.....404
 - usage guidelines.....167
 - sparse-dlcis statement.....406
 - usage guidelines.....152
 - speed statement
 - chassis.....407
 - SPMB
 - information, displaying.....1240
 - restarting.....485
 - SIB status, displaying.....1250
 - SSB
 - alarm condition.....255, 269
 - firmware version, displaying.....975
 - ssb statement.....7, 224, 317
 - support, technical *See* technical support
 - switch fabric
 - errors, displaying.....814
 - status, displaying.....819, 934
 - switch fabric topology, displaying.....944
 - Switch Interface Board *See* SIB
 - Switch Processor Mezzanine Board *See* SPMB
 - Switching and Forwarding Module.....476
 - See also* SFM
 - symmetric-hash statement.....408
 - symmetrical hashing for load balancing, 802.3ad
 - LAG
 - MX Series
 - configuring at the PIC level.....111
 - example configurations.....293
 - sync-interval statement.....408
 - synchronization source, displaying.....1256
 - synchronization statement
 - M Series and T Series
 - usage guidelines.....183
 - M Series, T Series, and PTX Series.....409
 - MX Series.....411
 - usage guidelines.....185
 - PTX Series
 - usage guidelines.....191
 - synchronized timing.....409
 - Synchronous Ethernet
 - MX Series
 - usage guidelines.....185
 - overview.....25
 - synchronous-ethernet-mapping statement.....419
 - syntax conventions.....xxv
 - System Control Board *See* SCB
 - system-priority statement
 - LACP
 - interface.....420
 - T**
 - tl statement.....421
 - usage guidelines.....176
 - T1600 router chassis
 - downgrade to LCC0.....85
 - upgrade to LCC0.....81
 - T1600 routers.....56
 - role in routing matrix.....52
 - T3 interfaces
 - PIC alarm conditions.....253
 - t4000 power mangement
 - overview.....17
 - T640 router
 - operation of, controlling.....455
 - status, displaying.....1149
 - T640 routers.....50
 - role in routing matrix.....47
 - technical support
 - contacting JTAC.....xxvii
 - temperature alarm conditions.....257
 - text message on craft interface
 - clearing.....436
 - displaying.....489
 - timeslots statement
 - channel groups.....329
 - usage guidelines.....175
 - traffic black hole
 - fabric degradation.....225
 - traffic-manager statement.....422
 - transport statement
 - master.....423
 - slave.....423
 - tunnel-services statement.....424
 - TX Matrix Plus router
 - chassis and interface names.....56
 - committing configurations.....55
 - configure a T1600 router.....79

interface naming.....	56
offline.....	80
online expected alarm.....	80
overview.....	52
rebooting process.....	54
reinstallation.....	53
software upgrades.....	53
TX Matrix router	
chassis and interface names.....	50
committing configurations.....	49
configure a T640 router.....	63
interface naming.....	50
offline.....	65
online expected alarm.....	65
overview.....	47
rebooting process.....	49
reinstallation.....	49
software upgrades.....	49
 U	
ucode-imem-remap statement.....	425
unicast-mode statement	
master.....	426
slave.....	427
unicast-negotiation statement.....	428
unified ISSU	
status, displaying.....	1145
unreachable-destinations	
fabric, displaying.....	969
uPIM Ethernet interfaces.....	142, 143
 V	
version	
firmware, displaying.....	975
Virtual Chassis statements	
network-services.....	375
virtual links	
aggregated devices.....	167
vpn-label statement.....	428
usage guidelines.....	236
vrf-mtu-check statement.....	429
usage guidelines.....	102
vtmapping statement.....	430
usage guidelines.....	177
 Y	
yellow alarm condition.....	251