Junos® OS for EX Series Ethernet Switches

Junos OS Basics Feature Guide for EX4600 Switches

Release
15.1

Modified: 2016-08-25

Copyright © 2016, Juniper Networks, Inc.

Juniper Networks, Inc.
1133 Innovation Way
Sunnyvale, California 94089
USA
408-745-2000
www.juniper.net

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.

Junos® OS for EX Series Ethernet Switches Junos OS Basics Feature Guide for EX4600 Switches
Release 15.1
Copyright © 2016, 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 . . . xix
Documentation and Release Notes . . . xix
Supported Platforms . . . xix
Using the Examples in This Manual . . . xix
Merging a Full Example . . . xx
Merging a Snippet . . . xx
Documentation Conventions . . . xxi
Documentation Feedback . . . xxiii
Requesting Technical Support . . . xxiii
Self-Help Online Tools and Resources . . . xxiii
Opening a Case with JTAC . . . xxiv

Part 1 Autoinstallation

Chapter 1 **Understanding Autoinstallation . . . 3**

Understanding Autoinstallation of Configuration Files . . . 3
Typical Uses for Autoinstallation . . . 3
Autoinstallation Configuration Files and IP Addresses . . . 4
Typical Autoinstallation Process on a New Switch . . . 4
Configuring Autoinstallation of Configuration Files (CLI Procedure) . . . 5
Upgrading Software by Using Automatic Software Download . . . 7
Verifying Autoinstallation Status . . . 8
Verifying That Automatic Software Download Is Working Correctly . . . 9

Part 2 Basic System Management

Chapter 2 **Understanding Basic System Management . . . 13**

Compressing the Current Configuration File . . . 14
Configuring a DNS Name Server for Resolving a Hostname into Addresses . . . 15
Configuring Console and Auxiliary Port Properties . . . 15
Configuring the Hostname of a Router or Switch by Using a Configuration Group . . . 16
Configuring the Junos OS to Determine Conditions That Trigger Alarms on Different Interface Types . . . 18
Configuring Junos OS to Disable Protocol Redirect Messages on the Router or Switch . . . 18
Configuring Junos OS to Disable the Reporting of IP Address and Timestamps in Ping Responses . . . 19
Configuring Junos OS to Extend the Default Port Address Range . . . 19
Configuring the Junos OS to Select a Fixed Source Address for Locally Generated TCP/IP Packets . . . 20

Configuring System Alarms to Appear Automatically Upon Login 20
Configuring Time-Based User Access 20
Configuring the Timeout Value for Idle Login Sessions 22
Including the Year or Millisecond in Timestamps 22
Mapping the Hostname of the Switch to IP Addresses 23
Modifying the Default Time Zone for a Router or Switch Running Junos OS 24
Rebooting and Halting a Device 25
Reaching a Domain Name System Server 26
Reverting to the Default Factory Configuration by Using the request system zeroize Command 28
Saving Core Files Generated by Junos OS Processes 29
Specifying the Physical Location of the Switch 29
Specifying Access Privileges for Junos OS Operational Mode Commands 30
Updating the IANA Time Zone Database on Junos OS Devices 32
Importing and Installing Time Zone Files 32
Configuring a Custom Time Zone 33
Viewing Core Files from Junos OS Processes 34
Example: Configuring the Name of the Switch, IP Address, and System ID 34

Part 3 Command Line Interface (CLI)

Chapter 3 **Understanding the CLI 37**

CLI User Interface Overview 37
CLI Overview 37
CLI Key Features 38
CLI Command Modes 38
Configuring Login Tips 40
Format for Specifying Filenames and URLs in Junos OS CLI Commands 40
Junos OS Operational Mode Commands That Combine Other Commands 41
Overview of Junos OS CLI Operational Mode Commands 42
CLI Command Categories 42
Commonly Used Operational Mode Commands 43
Overview of Navigating the CLI 45
CLI Command Hierarchy 45
CLI Configuration Statements 46
Moving Among Hierarchy Levels 46
Understanding the Brief, Detail, Extensive, and Terse Options of Junos OS Operational Commands 46
Understanding Junos OS CLI Configuration Mode 47
Configuration Mode Commands 49
Configuration Statements and Identifiers 50
Configuration Statement Hierarchy 52

Part 4 Dynamic Host Control Protocol (DHCP)

Chapter 4 **Understanding DHCP 57**

Understanding DHCP Services for Switches 57
DHCP Client/Server Model 57
Using DHCP 58

 Copyright © 2016, Juniper Networks, Inc.

DHCP Relay Servers and DHCP Servers . . . 58
Legacy DHCP and Extended DHCP for Server Versions . . . 59
Configuring DHCP on a Switch . . . 60
How DHCP Works . . . 60
Configuring a DHCP Client (CLI Procedure) . . . 61
Configuring a DHCP Server on Switches (CLI Procedure) . . . 62
Configuring an Extended DHCP Server on a Switch . . . 63
Configuring a Legacy DHCP Server on a Switch (CLI Procedure) . . . 63

Part 5 Internet Control Message Protocol (ICMP)

Chapter 5 **Understanding ICMP . . . 69**

Configuring Junos OS to Disable the Reporting of IP Address and Timestamps in Ping Responses . . . 69
Configuring Junos OS to Disable the Routing Engine Response to Multicast Ping Packets . . . 70
Configuring the Junos OS ICMPv4 Rate Limit for ICMPv4 Routing Engine Messages . . . 70

Part 6 In-Service Software Upgrade (ISSU)

Chapter 6 **Understanding ISSU . . . 73**

In-Service Software Upgrade (ISSU) System Requirements . . . 73
In-Service Software Upgrade (ISSU) Protocol and Process Support . . . 73
Understanding In-Service Software Upgrade (ISSU) . . . 75
In-Service Software Upgrade Process . . . 75
Performing an In-Service Software Upgrade (ISSU) . . . 76
Preparing the Switch for Software Installation . . . 76
Upgrading the Software Using ISSU . . . 77
Verifying a Unified ISSU . . . 78

Part 7 Licenses

Chapter 7 **Using Licenses . . . 83**

Junos OS Feature Licenses . . . 83
Junos OS Feature License Keys . . . 84
Release-Tied License Keys and Upgrade Licenses on MX Series Routers . . . 84
Licensable Ports on MX5, MX10, and MX40 Routers . . . 85
Port Activation on MX104 Routers . . . 86
Generating License Keys . . . 87
Adding New Licenses (CLI Procedure) . . . 89
Deleting a License (CLI Procedure) . . . 90
Saving License Keys . . . 91
Verifying Junos OS License Installation . . . 92
Displaying Installed Licenses . . . 92
Displaying License Usage . . . 93

Copyright © 2016, Juniper Networks, Inc.

Part 8 Login Classes

Chapter 8 Understanding Login Classes 97

Configuring Junos OS User Accounts 97
Configuring the Junos OS to Display a System Login Announcement 98
Configuring Junos OS to Display a System Login Message 98

Part 9 Network Time Protocol (NTP)

Chapter 9 Understanding NTP 103

Understanding NTP Time Servers 103
Configuring NTP Authentication Keys 104
Configuring the NTP Time Server and Time Services 105
Configuring the Switch to Operate in Client Mode 105
Configuring the Router or Switch to Operate in Symmetric Active Mode . . . 106
Configuring the Router or Switch to Operate in Broadcast Mode 106
Configuring the Router or Switch to Operate in Server Mode 107
Configuring the Switch to Listen for Broadcast Messages Using NTP 107
Configuring the Switch to Listen for Multicast Messages Using NTP 108
Setting the Date and Time 108
Synchronizing and Coordinating Time Distribution Using NTP 109
Configuring NTP 109
Configuring the NTP Boot Server 109
Specifying a Source Address for an NTP Server 110
Example: Configuring NTP 111
Example: Configuring NTP as a Single Time Source for Router and Switch Clock Synchronization 114

Part 10 Non-Stop Software Upgrade (NSSU)

Chapter 10 Understanding NSSU 117

Understanding Nonstop Software Upgrade on a Virtual Chassis Fabric 117
Requirements for Performing an NSSU 118
How an NSSU Works 119
Virtual Chassis Fabric 119
NSSU Limitations 120
NSSU and Junos OS Release Support 120
Overview of NSSU Configuration and Operation 120
Upgrading Software on a Virtual Chassis Fabric Using Nonstop Software Upgrade 120
Preparing the Switch for Software Installation 121
Upgrading the Software Using NSSU 122

Part 11 Passwords

Chapter 11 Understanding Passwords 133

Configuring the Root Password 133
Recovering the Root Password 135
Example: Changing the Requirements for Junos OS Plain-Text Passwords 136

 Copyright © 2016, Juniper Networks, Inc.

Part 12 RADIUS and TACACS+ System Accounting

Chapter 12 Understanding RADIUS and TACACS+ System Accounting 141

Configuring RADIUS System Accounting 141
Configuring Auditing of User Events on a RADIUS Server 141
Specifying RADIUS Server Accounting and Auditing Events 142
Configuring RADIUS Server Accounting 142
Configuring TACACS+ System Accounting 144
Specifying TACACS+ Auditing and Accounting Events 144
Configuring TACACS+ Server Accounting 144

Part 13 Recovery Installation

Chapter 13 Understanding Recovery Installation 149

Creating an Emergency Boot Device 149
Creating a Snapshot and Using It to Boot a Device 150
Creating a Snapshot on an External USB Flash Drive and Using It to Boot the Device 151
Performing a Recovery Installation Using an Emergency Boot Device 153
Recovering from a Failed Software Installation 154

Part 14 Routine Monitoring

Chapter 14 Understanding Routine Monitoring 159

Monitoring System Process Information 159
Monitoring System Properties 160
Monitoring Interface Status and Traffic 161
Other Tools to Configure and Monitor Devices Running Junos OS 162

Part 15 Standard Software Installation and Upgrade

Chapter 15 Understanding Standard Software Installation and Upgrade 165

Junos OS Package Names 165
Software Installation Overview 166
Creating an Emergency Boot Device 166
Upgrading Software 168
Downloading Software Files with a Browser 169
Accessing Software Downloaded to a Remote Location 170
Connecting to the Console Port 170
Backing Up the Current Configuration Files 170
Installing a Standard Software Package 170
Installing a Standard Software Package on a QFX10008 Switch 172

Part 16 System Snapshot

Chapter 16 Understanding System Snapshot 177

Understanding System Snapshot 177
Creating a Snapshot and Using It to Boot a Device 178
Creating a Snapshot on an External USB Flash Drive and Using It to Boot the Device 178

Copyright © 2016, Juniper Networks, Inc.

Part 17 Zero Touch Provisioning (ZTP)

Chapter 17 Understanding ZTP 183

Understanding Zero Touch Provisioning 183
Understanding Zero Touch Provisioning 183
Zero Touch Provisioning Process 185
Zero Touch Provisioning Restart Process Triggers 188
Configuring Zero Touch Provisioning 190
Monitoring Zero Touch Provisioning 195
Using the Console to Monitor Zero Touch Provisioning 195
Using System Log Alerts to Monitor Zero Touch Provisioning 196
Using Error Messages to Monitor Zero Touch Provisioning 196
Using System Log Files to Monitor Zero Touch Provisioning 196
Using the show dhcp client binding Command 197
Using the show dhcp client statistics Command 197

Part 18 Configuration Statements and Operational Commands

Chapter 18 Basic System Management Configuration Statements 201

arp (System) 203
auxiliary 204
checksum 205
compress-configuration-files (System) 206
console (Physical Port) 207
default-address-selection 208
domain-name 209
domain-search 209
ethernet (Alarm) 210
host-name 210
icmpv4-rate-limit 211
internet-options 212
link-down 213
location 214
login-alarms 215
management-ethernet (Alarm) 216
max-configurations-on-flash 217
name-server 217
no-ping-record-route 218
no-ping-time-stamp 218
no-redirects (IPv4 Traffic) 219
optional 220
ports 220
retry 221
saved-core-context 222
saved-core-files 222
source-port (Port Addresses) 223
static-host-mapping 224
system 225
time-format 230

 Copyright © 2016, Juniper Networks, Inc.

time-zone . . . 231
traceoptions (Layer 2 Learning) . . . 233
uid . . . 235
use-imported-time-zones . . . 235

Chapter 19 DHCP Configuration Statements . . . 237

client-identifier (DHCP Client) . . . 237
lease-time . . . 238
retransmission-attempt . . . 239
retransmission-interval . . . 240
server-address . . . 241
update-server . . . 242
vendor-option . . . 243

Chapter 20 ICMP Configuration Statements . . . 245

no-multicast-echo . . . 245

Chapter 21 Login Classes Configuration Statements . . . 247

access-end . . . 248
access-start . . . 248
allow-commands . . . 249
allow-configuration . . . 250
allowed-days . . . 250
announcement . . . 251
authentication (Login) . . . 252
class (Defining Login Classes) . . . 253
class (Assigning a Class to an Individual User) . . . 254
deny-commands . . . 254
deny-configuration . . . 255
idle-timeout . . . 256
load-key-file . . . 257
login . . . 258
login-tip . . . 259
message . . . 259
user (Access) . . . 260

Chapter 22 NTP Configuration Statements . . . 261

authentication-key . . . 262
boot-server (NTP) . . . 263
broadcast . . . 264
broadcast-client . . . 265
multicast-client . . . 265
ntp . . . 266
peer . . . 267
server (NTP) . . . 268
source-address (NTP, RADIUS, System Logging, or TACACS+) . . . 269
trusted-key . . . 270

Chapter 23 Password Configuration Statements . . . 271

authentication (Login) . . . 272
change-type . . . 273

format 274
maximum-length 275
minimum-changes 276
minimum-length 277
minimum-lower-cases 278
minimum-numerics 279
minimum-punctuations 280
minimum-upper-cases 281
password (Login) 282
permissions 282
retry-options 283
root-authentication 285
ssh-dsa 286
ssh-rsa 286
user (Access) 287

Chapter 24 RADIUS and TACACS+ Accounting Configuration Statements 289

accounting-port (RADIUS Server) 290
destination (Accounting) 291
events 292
port (TACACS+ Server) 292
radius (System) 293
secret 294
server (RADIUS Accounting) 295
server (TACACS+ Accounting) 295
single-connection 296
tacplus 296
timeout 297

Chapter 25 Autoinstallation Operational Commands 299

show system autoinstallation status 300

Chapter 26 Basic System Management Operational Commands 303

commit 305
clear log 311
clear chassis display message 312
clear system commit 315
clear system reboot 316
file 320
file archive 321
file checksum md5 323
file checksum sha1 324
file checksum sha-256 325
file compare 326
file delete 330
file list 331
file rename 333
file show 335
load 337
ping 339

 Copyright © 2016, Juniper Networks, Inc.

request chassis beacon . . . 343
request chassis fpc . . . 345
request chassis pic . . . 350
request chassis routing-engine master . . . 355
request message . . . 360
request system configuration rescue delete . . . 361
request system configuration rescue save . . . 362
request system halt . . . 363
request system logout . . . 369
request system power-off . . . 370
request system reboot . . . 375
request system storage cleanup . . . 378
request system zeroize . . . 388
restart . . . 393
save . . . 404

Chapter 27 CLI Operational Commands . . . 407

show cli . . . 408
show cli authorization . . . 410
show cli directory . . . 414
show cli history . . . 415

Chapter 28 ISSU Operational Commands . . . 417

request system software in-service-upgrade . . . 418
show chassis in-service-upgrade . . . 431

Chapter 29 Licensing Operational Commands . . . 435

request system license add . . . 436
request system license delete . . . 437
request system license save . . . 438
show system license . . . 439

Chapter 30 NSSU Operational Commands . . . 447

request system software nonstop-upgrade . . . 448
show chassis nonstop-upgrade . . . 458

Chapter 31 NTP Operational Commands . . . 461

show ntp associations . . . 462
show ntp status . . . 464

Chapter 32 Routine Monitoring Operational Commands . . . 467

show chassis alarms . . . 469
show chassis beacon . . . 484
show chassis environment . . . 486
show chassis environment fpc . . . 550
show chassis environment pem . . . 577
show chassis environment routing-engine . . . 586
show chassis fan . . . 591
show chassis firmware . . . 605
show chassis fpc . . . 616
show chassis hardware . . . 656

Copyright © 2016, Juniper Networks, Inc.

show chassis lcd . . . 838
show chassis led . . . 852
show chassis location . . . 862
show chassis mac-addresses . . . 866
show chassis pic . . . 871
show chassis routing-engine . . . 888
show chassis temperature-thresholds . . . 914
show chassis zones . . . 934
show host . . . 940
show log . . . 941
show subscribers . . . 945
show system alarms . . . 965
show system audit . . . 968
show system boot-messages . . . 976
show system buffers . . . 983
show system certificate . . . 990
show system commit . . . 992
show system configuration archival . . . 995
show system configuration rescue . . . 996
show system connections . . . 998
show system core-dumps . . . 1017
show system directory-usage . . . 1031
show system processes . . . 1035
show system reboot . . . 1064
show system resource-cleanup processes . . . 1067
show system services service-deployment . . . 1069
show system software . . . 1070
show system statistics . . . 1078
show system storage . . . 1115
show system uptime . . . 1123
show system users . . . 1128
show system virtual-memory . . . 1133
show version . . . 1191
start shell . . . 1204
test configuration . . . 1206
traceroute . . . 1207
traceroute monitor . . . 1211

Chapter 33 Standard Software Installation and Upgrade Operational Commands . . 1213

request system software add . . . 1214
request system software delete . . . 1224
request system software download . . . 1228
request system software rollback . . . 1230
request system software validate . . . 1235
rollback . . . 1239
show system rollback . . . 1240

Chapter 34 System Snapshot Operational Commands . . . 1243

request system snapshot . . . 1244

 Copyright © 2016, Juniper Networks, Inc.

List of Figures

Part 3 Command Line Interface (CLI)

Chapter 3 **Understanding the CLI 37**

Figure 1: Commands That Combine Other Commands 42
Figure 2: CLI Command Hierarchy 45
Figure 3: Command Output Options 47
Figure 4: Configuration Mode Hierarchy of Statements 52

Part 4 Dynamic Host Control Protocol (DHCP)

Chapter 4 **Understanding DHCP 57**

Figure 5: DHCP Client/Server Model 58
Figure 6: DHCP Four-Step Transfer 60

Copyright © 2016, Juniper Networks, Inc.

List of Tables

About the Documentation xix

Table 1: Notice Icons xxi
Table 2: Text and Syntax Conventions xxi

Part 3 Command Line Interface (CLI)

Chapter 3 **Understanding the CLI 37**

Table 3: Commonly Used Operational Mode Commands 44
Table 4: Summary of Configuration Mode Commands 49
Table 5: Configuration Mode Top-Level Statements 51

Part 4 Dynamic Host Control Protocol (DHCP)

Chapter 4 **Understanding DHCP 57**

Table 6: Legacy DHCP and Extended DHCP Server Hierarchy Levels 59
Table 7: DHCP Client Settings 61

Part 6 In-Service Software Upgrade (ISSU)

Chapter 6 **Understanding ISSU 73**

Table 8: ISSU Protocol Support 73

Part 7 Licenses

Chapter 7 **Using Licenses 83**

Table 9: Upgrade Licenses for Enhancing Port Capacity 86
Table 10: Port Activation License Model for MX104 Routers 87

Part 10 Non-Stop Software Upgrade (NSSU)

Chapter 10 **Understanding NSSU 117**

Table 11: Platform and Release Support for NSSU on a Virtual Chassis Fabric . . 120

Part 14 Routine Monitoring

Chapter 14 **Understanding Routine Monitoring 159**

Table 12: Summary of System Process Information Output Fields 159
Table 13: Summary of Key System Properties Output Fields 160

Part 15 Standard Software Installation and Upgrade

Chapter 15 **Understanding Standard Software Installation and Upgrade 165**

Table 14: Caveats for Downgrading from Junos OS Release 15.1X53-D60 to Previous Software Releases . . . 171
Table 15: Caveats for Downgrading from Junos OS Release 15.1X53-D60 to Previous Software Releases . . . 173

Part 18 Configuration Statements and Operational Commands

Chapter 25 Autoinstallation Operational Commands . . . 299
Table 16: show system autoinstallation status Output Fields . . . 300

Chapter 26 Basic System Management Operational Commands . . . 303
Table 17: request system storage cleanup Output Fields . . . 380

Chapter 27 CLI Operational Commands . . . 407
Table 18: show cli Output Fields . . . 408
Table 19: show cli authorization Output Fields . . . 410
Table 20: show cli directory Output Fields . . . 414
Table 21: show cli history Output Fields . . . 415

Chapter 28 ISSU Operational Commands . . . 417
Table 22: show chassis in-service-upgrade Output Fields . . . 431

Chapter 29 Licensing Operational Commands . . . 435
Table 23: show system license Output Fields . . . 439

Chapter 30 NSSU Operational Commands . . . 447
Table 24: show chassis nonstop-upgrade Output Fields . . . 458

Chapter 31 NTP Operational Commands . . . 461
Table 25: show ntp associations Output Fields . . . 462
Table 26: show ntp status Output Fields . . . 464

Chapter 32 Routine Monitoring Operational Commands . . . 467
Table 27: show chassis alarms Output Fields . . . 476
Table 28: show chassis led Output Fields . . . 484
Table 29: show chassis environment Output Fields . . . 493
Table 30: show chassis environment fpc Output Fields . . . 553
Table 31: show chassis environment pem Output Fields . . . 579
Table 32: show chassis environment routing-engine Output Fields . . . 588
Table 33: show chassis fan Output Fields . . . 593
Table 34: show chassis firmware Output Fields . . . 608
Table 35: show chassis fpc Output Fields . . . 624
Table 36: Routing Engines Displaying DIMM Information . . . 659
Table 37: show chassis hardware Output Fields . . . 664
Table 38: show chassis lcd Output Fields . . . 840
Table 39: show chassis led Output Fields . . . 853
Table 40: show chassis location Output Fields . . . 864
Table 41: show chassis mac-addresses Output Fields . . . 868
Table 42: show chassis pic Output Fields . . . 875
Table 43: show chassis routing-engine Output Fields . . . 891
Table 44: show chassis temperature-thresholds Output Fields . . . 916
Table 45: show chassis zones Output Fields . . . 935

 Copyright © 2016, Juniper Networks, Inc.

Table 46: show subscribers Output Fields 948
Table 47: show system alarms Output Fields 966
Table 48: show system buffers Output Fields 986
Table 49: show system certificate Output Fields 990
Table 50: show system commit Output Fields 992
Table 51: show system connections Output Fields 1001
Table 52: show system core-dumps Output Fields 1020
Table 53: show system directory-usage Output Fields 1033
Table 54: show system processes Output Fields 1043
Table 55: show system resource-cleanup processes Output Fields 1067
Table 56: show system services service-deployment Output Fields 1069
Table 57: show system storage Output Fields 1118
Table 58: show system uptime Output Fields 1125
Table 59: show system users Output Fields 1130
Table 60: show system virtual-memory Output Fields 1136
Table 61: traceroute Output Fields 1209
Table 62: traceroute monitor Output Fields 1212

Copyright © 2016, Juniper Networks, Inc.

Copyright © 2016, Juniper Networks, Inc.

About the Documentation

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

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:

- EX 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.xsl; }
   ```

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

Copyright © 2016, Juniper Networks, Inc.

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

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

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

For more information about the **load** command, see CLI Explorer.

Documentation Conventions

Table 1 on page xxi defines notice icons used in this guide.

Table 1: Notice Icons

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

Table 2 on page xxi defines the text and syntax conventions used in this guide.

Table 2: Text and Syntax Conventions

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

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

Convention	Description	Examples
`Fixed-width text like this`	Represents output that appears on the terminal screen.	`user@host>` **show chassis alarms** `No alarms currently active`
Italic text like this	• Introduces or emphasizes important new terms. • Identifies guide names. • Identifies RFC and Internet draft titles.	• A policy *term* is a named structure that defines match conditions and actions. • *Junos OS CLI User Guide* • RFC 1997, *BGP Communities Attribute*
Italic text like this	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** *domain-name*
Text like this	Represents names of configuration statements, commands, files, and directories; configuration hierarchy levels; or labels on routing platform components.	• To configure a stub area, include the **stub** statement at the **[edit protocols ospf area area-id]** hierarchy level. • The console port is labeled **CONSOLE**.
< > (angle brackets)	Encloses optional keywords or variables.	**stub <default-metric** *metric***>;**
| (pipe symbol)	Indicates a choice between the mutually exclusive keywords or variables on either side of the symbol. The set of choices is often enclosed in parentheses for clarity.	**broadcast | multicast** **(*string1* | *string2* | *string3*)**
# (pound sign)	Indicates a comment specified on the same line as the configuration statement to which it applies.	**rsvp { # Required for dynamic MPLS only**
[ ] (square brackets)	Encloses a variable for which you can substitute one or more values.	**community name members [** *community-ids* **]**

Indention and braces ({ })	Identifies a level in the configuration hierarchy.	[edit]
		routing-options {
		static {
		route default {
		nexthop *address*;
		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.	• In the Logical Interfaces box, select **All Interfaces**. • To cancel the configuration, click **Cancel**.

Copyright © 2016, Juniper Networks, Inc.

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

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

Documentation Feedback

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

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

Requesting Technical Support

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

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

Self-Help Online Tools and Resources

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

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

Copyright © 2016, Juniper Networks, Inc.

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

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

Opening a Case with JTAC

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

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

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

Copyright © 2016, Juniper Networks, Inc.

PART 1

Autoinstallation

- Understanding Autoinstallation on page 3

Copyright © 2016, Juniper Networks, Inc.

Copyright © 2016, Juniper Networks, Inc.

CHAPTER 1

Understanding Autoinstallation

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

Understanding Autoinstallation of Configuration Files

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

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

NOTE: **The QFX5200 switches only work with HTTP for autoinstallation. TFTP and FTP protocols are not supported.**

This topic describes:

- Typical Uses for Autoinstallation on page 3
- Autoinstallation Configuration Files and IP Addresses on page 4
- Typical Autoinstallation Process on a New Switch on page 4

Typical Uses for Autoinstallation

Typical uses for autoinstallation of the software include:

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

Copyright © 2016, Juniper Networks, Inc.

Autoinstallation Configuration Files and IP Addresses

For the autoinstallation process to work, you must store one or more host-specific or default configuration files on a configuration server in the network and have a service available—typically Dynamic Host Configuration Protocol (DHCP)—to assign an IP address to the switch.

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

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

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

Typical Autoinstallation Process on a New Switch

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

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

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

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

     If the DHCP server provides the server's hostname, a DNS server must be available on the network to resolve the name to an IP address.
   - The IP address of an intermediate device if the configuration server is on a different LAN segment from the switch.

Copyright © 2016, Juniper Networks, Inc.

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

Related Documentation

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

Configuring Autoinstallation of Configuration Files (CLI Procedure)

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

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

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

- Have a service available—typically Dynamic Host Configuration Protocol (DHCP)—to assign an IP address to the switch
- Configure a DHCP server on your network to meet your network requirements. You can configure a switch to operate as a DHCP server. For more information, see "Configuring a DHCP Server on Switches (CLI Procedure)" on page 62.
- Create one of the following configuration files, and store it on a TFTP server (or HTTP server or FTP server) in the network:
  - A host-specific file with the name ***hostname*.conf** for each switch undergoing autoinstallation. Replace ***hostname*** with the name of a switch. The ***hostname*.conf** file typically contains all the configuration information necessary for the switch with this hostname.
  - A default configuration file named **switch.conf** with the minimum configuration necessary to enable you to telnet into the new switch for further configuration.
- Physically attach the switch to the network using a Gigabit Ethernet port.
- If you configure the DHCP server to provide only the TFTP server hostname, add an IP address-to-hostname mapping entry for the TFTP server to the DNS database file on the Domain Name System (DNS) server in the network.
- If the switch is not on the same network segment as the DHCP server (or other device providing IP address resolution), configure an existing device as an intermediate device to receive TFTP and DNS requests and forward them to the TFTP server and the DNS server. You must configure the LAN or serial interface on the intermediate device with the IP addresses of the hosts providing TFTP and DNS services. Connect this interface to the switch.
- If you are using ***hostname*.conf** files for autoinstallation, you must also complete the following tasks:
  - Configure the DHCP server to provide a ***hostname*.conf** filename to each switch. Each switch uses its ***hostname*.conf** filename to request a configuration file from the TFTP server. Copy the necessary ***hostname*.conf** configuration files to the TFTP server.
  - Create a default configuration file named **network.conf**, and copy it to the TFTP server. This file contains IP-address-to-hostname mapping entries. If the DHCP server does not send a ***hostname*.conf** filename to a new switch, the switch uses **network.conf** to resolve its hostname based on its IP address.

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

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

To configure autoinstallation:

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

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

 Copyright © 2016, Juniper Networks, Inc.

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

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

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

Related Documentation

- Verifying Autoinstallation Status on page 8
- Understanding Autoinstallation of Configuration Files on page 3
- Understanding DHCP Services for Switches on page 57

Upgrading Software by Using Automatic Software Download

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

The switch reboots automatically to complete the upgrade.

Related Documentation

- Verifying That Automatic Software Download Is Working Correctly on page 9
- *Understanding Software Installation on EX Series Switches*
- Configuring a DHCP Server on Switches (CLI Procedure) on page 62
- *Configuring DHCP Services (J-Web Procedure)*

Verifying Autoinstallation Status

Purpose Display the status of the autoinstallation feature.

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

Sample Output

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

 Copyright © 2016, Juniper Networks, Inc.

```
    Protocol: RARP Client
    Acquired address: None
```

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

Related Documentation

- Configuring Autoinstallation of Configuration Files (CLI Procedure) on page 5

Verifying That Automatic Software Download Is Working Correctly

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

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

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

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

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

Related Documentation

- Upgrading Software by Using Automatic Software Download on page 7

Copyright © 2016, Juniper Networks, Inc.

PART 2

Basic System Management

- Understanding Basic System Management on page 13

Copyright © 2016, Juniper Networks, Inc.

CHAPTER 2

Understanding Basic System Management

- Compressing the Current Configuration File on page 14
- Configuring a DNS Name Server for Resolving a Hostname into Addresses on page 15
- Configuring Console and Auxiliary Port Properties on page 15
- Configuring the Hostname of a Router or Switch by Using a Configuration Group on page 16
- Configuring the Junos OS to Determine Conditions That Trigger Alarms on Different Interface Types on page 18
- Configuring Junos OS to Disable Protocol Redirect Messages on the Router or Switch on page 18
- Configuring Junos OS to Disable the Reporting of IP Address and Timestamps in Ping Responses on page 19
- Configuring Junos OS to Extend the Default Port Address Range on page 19
- Configuring the Junos OS to Select a Fixed Source Address for Locally Generated TCP/IP Packets on page 20
- Configuring System Alarms to Appear Automatically Upon Login on page 20
- Configuring Time-Based User Access on page 20
- Configuring the Timeout Value for Idle Login Sessions on page 22
- Including the Year or Millisecond in Timestamps on page 22
- Mapping the Hostname of the Switch to IP Addresses on page 23
- Modifying the Default Time Zone for a Router or Switch Running Junos OS on page 24
- Rebooting and Halting a Device on page 25
- Reaching a Domain Name System Server on page 26
- Reverting to the Default Factory Configuration by Using the request system zeroize Command on page 28
- Saving Core Files Generated by Junos OS Processes on page 29
- Specifying the Physical Location of the Switch on page 29
- Specifying Access Privileges for Junos OS Operational Mode Commands on page 30
- Updating the IANA Time Zone Database on Junos OS Devices on page 32

Copyright © 2016, Juniper Networks, Inc.

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

Compressing the Current Configuration File

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

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

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

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

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

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

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

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

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

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

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


Copyright © 2016, Juniper Networks, Inc.

Related Documentation

- *Junos OS Commit Model for Router or Switch Configuration*
- compress-configuration-files on page 206

Configuring a DNS Name Server for Resolving a Hostname into Addresses

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

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

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

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

Related Documentation

- name-server on page 217

Configuring Console and Auxiliary Port Properties

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

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

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

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

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

2. To specify the auxiliary port terminal type:

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

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

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

3. To check the configuration:

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

Related Documentation

- auxiliary on page 204
- console (Physical Port) on page 207
- ports on page 220

Configuring the Hostname of a Router or Switch by Using a Configuration Group

The hostname of a device is its identification. A router or switch must have its identity established to be accessible on the network to other devices. That is perhaps the most important reason to have a hostname, but a hostname has other purposes: Junos OS uses the configured hostname as part of the command prompt, to prepend log files and other accounting information, as well as in other places where knowing the device identity is useful. We recommend that the hostname be descriptive and memorable.

You can configure the hostname at the **[edit system]** hierarchy level, a procedure shown in *Example: Configuring the Unique Identity of a Router for Making it Accessible on the Network*. Optionally, instead of configuring the hostname at the **[edit system]** hierarchy level, you can use a configuration group, as shown in this procedure. This is a recommended best practice for configuring the hostname, especially if the device has dual Routing Engines. This procedure uses groups called **re0** and **re1** as an example.

Copyright © 2016, Juniper Networks, Inc.

NOTE: If you configure hostnames that are longer than the CLI screen width, regardless of the terminal screen width setting, the commit operation occurs successfully, starting with Junos OS release 13.2R3. Even if the terminal screen width is less than the hostname length, commit is successful. In Junos OS releases earlier than Release 13.2R3, if you configured such hostnames by using the **host-name** *hostname* statement at the **[edit system]** hierarchy level and the the terminal screen width was less than the length of the hostname by using the **set cli screen-width** statement, a foreign file propagation (ffp) failure error message is displayed when you attempt to commit the configuration. In such a case, because of the ffp failure, the commit operation does not complete and you cannot recover the router unless you make the modification in the backend in the **juniper.conf.gz** file and commit the change from the shell prompt.

To set the hostname using a configuration group:

1. Include the **host-name** statement in the configuration at the **[edit groups** *group-name* **system** hierarchy level.

   The name value must be less than 256 characters.

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

   For example:

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

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

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

   For example:

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

3. Commit the changes.

   [edit]
   root@# **commit**

   The hostname subsequently appears in the device CLI prompt.

   san-jose-router@#

Related Documentation

- *Understanding Hostnames*

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

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

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

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

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

alarm-name is the name of an alarm.

Related Documentation

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

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

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

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

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

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

Related Documentation

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

Copyright © 2016, Juniper Networks, Inc.

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

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

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

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

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

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

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

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

Related Documentation

- Configuring Junos OS to Disable the Routing Engine Response to Multicast Ping Packets on page 70

Configuring Junos OS to Extend the Default Port Address Range

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

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

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

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

Related Documentation

- *Configuring Junos OS to Disable TCP RFC 1323 Extensions*
- *Configuring Junos OS ARP Learning and Aging Options for Mapping IPv4 Network Addresses to MAC Addresses*
- source-port on page 223

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

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

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

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

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

Related Documentation

- Configuring Junos OS to Disable Protocol Redirect Messages on the Router or Switch on page 18
- default-address-selection on page 208

Configuring System Alarms to Appear Automatically Upon Login

You can configure Juniper Networks routers and switches to run the **show system alarms** command whenever a user with the login class **admin** logs in to the router or switch. To do so, include the **login-alarms** statement at the **[edit system login class admin]** hierarchy level.

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

For more information on the **show system alarms** command, see the CLI Explorer.

Related Documentation

- show system alarms on page 965

Configuring Time-Based User Access

The Junos OS enables you to configure time-based restrictions for user access to log in to a device. This is useful for restricting the time and duration of user logins for all users

 Copyright © 2016, Juniper Networks, Inc.

belonging to a login class. You can specify the days of the week when users can log in, the access start time, and the access end time.

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

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

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

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

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

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

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

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

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

Related Documentation

- *Examples: Configuring Time-Based User Access*
- *Defining Junos OS Login Classes*
- *access-end*
- *access-start*
- *allowed-days*
- access-end on page 248

Configuring the Timeout Value for Idle Login Sessions

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

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

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

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

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

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

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

Related Documentation

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

Including the Year or Millisecond in Timestamps

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

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


Copyright © 2016, Juniper Networks, Inc.

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

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

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

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

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

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

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

For information about the **structured-data** statement, see *Logging Messages in Structured-Data Format*. For information about the contents of a structured-data message, see the *Junos OS System Log Reference for Security Devices*.

Related Documentation

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

Mapping the Hostname of the Switch to IP Addresses

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

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

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

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

Related Documentation

- Reaching a Domain Name System Server on page 26
- *Example: Configuring the Unique Identity of a Router for Making it Accessible on the Network*
- static-host-mapping on page 224

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

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

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

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

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

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

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

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

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

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

Related Documentation

- Understanding NTP Time Servers on page 103
- Updating the IANA Time Zone Database on Junos OS Devices on page 32

Copyright © 2016, Juniper Networks, Inc.

Rebooting and Halting a Device

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

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

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

NOTE: Not all options shown in the preceding command output are available on all QFX Series, OCX Series, and EX4600 switches. See the documentation for the request system reboot command for details about options.

NOTE: When you issue the **request system reboot hypervisor** command on QFX10000 switches, the reboot takes longer than a standard Junos OS reboot.

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

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

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

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

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

Related Documentation

- clear system reboot on page 316
- request system reboot on page 375
- request system halt on page 363
- request system power-off on page 370
- *Connecting a QFX Series Device to a Management Console*

Reaching a Domain Name System Server

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

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

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

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

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

1. Reference the IP addresses of your DNS servers.

```
[edit groups group-name system]
name-server {
```

 Copyright © 2016, Juniper Networks, Inc.

```
    address;
  }
```

The following example shows how to reference two DNS servers:

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

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

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

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

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

   The following example shows how to configure the domain name:

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

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

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

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

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

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

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

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

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

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

5. Commit the configuration.

```
user@host# commit
```

6. Verify the configuration.

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

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

   For example:

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

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

Related Documentation

- *DNS Overview*

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

The **request system zeroize** command is a standard Junos OS operational mode command that removes all configuration information and resets all key values. The operation unlinks all user-created data files, including customized configuration and log files, from their directories. The switch then reboots and reverts to the factory-default configuration.

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

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

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

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

Related Documentation

- request system zeroize on page 388

Copyright © 2016, Juniper Networks, Inc.
   ```

Saving Core Files Generated by Junos OS Processes

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

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

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

- To save the core files only:

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

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

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

  [edit system]
  saved-core-context;

Related Documentation

- Viewing Core Files from Junos OS Processes on page 34

Specifying the Physical Location of the Switch

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

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

Copyright © 2016, Juniper Networks, Inc.

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

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

Related Documentation

- Example: Configuring the Name of the Switch, IP Address, and System ID on page 34

Specifying Access Privileges for Junos OS Operational Mode Commands

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

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

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

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

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

NOTE: The regular expression to allow/deny commands for any login class is supported at the command level but not at the argument level. For example, you can completely block **ping** but not **ping *argument1***.

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

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


Copyright © 2016, Juniper Networks, Inc.

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

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

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

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

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

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

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

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

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

Related Documentation

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

Updating the IANA Time Zone Database on Junos OS Devices

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

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

1. Importing and Installing Time Zone Files on page 32
2. Configuring a Custom Time Zone on page 33

Importing and Installing Time Zone Files

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

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

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

   device@user# start shell

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

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

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

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

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

Copyright © 2016, Juniper Networks, Inc.

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

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

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

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

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

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

7. Set the time zone and commit the configuration:

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

8. Verify that the time zone change has taken effect:

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

Configuring a Custom Time Zone

To use a custom time zone, follow these steps:

1. Download a time zones archive (from a known or designated source) to the router or switch. Compile the time zone archive using the *zic* time zone compiler, which generates *tz* files.

2. Using the CLI, configure the router or switch to enable the use of the generated tz files as follows:

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

3. Display the imported time zones (saved in the directory **/var/db/zoneinfo/**):

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

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

Related Documentation

- *Modifying the Default Time Zone for a Router or Switch Running Junos OS*
- *NTP Overview*
- Understanding NTP Time Servers on page 103

- Example: Configuring NTP as a Single Time Source for Router and Switch Clock Synchronization on page 114
- *use-imported-time-zones*

Viewing Core Files from Junos OS Processes

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

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

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

Related Documentation

- *Saving Core Files from Junos OS Processes*

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

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

```
[edit]
user@switch# set system host-nameswitch-sj1
[edit]
user@switch# set system static-host-mapping switch-sj1 inet 192.168.1.77
[edit]
user@switch# set system static-host-mapping switch-sj1 alias sj1
[edit]
user@switch# set system static-host-mapping switch-sj1 sysid 1921.6800.1077
[edit]
user@switch# show
system {
  host-name switch-sj1;
  static-host-mapping {
    switch-sj1 {
      inet 192.168.1.77;
      alias sj1;
      sysid 1921.6800.1077;
    }
  }
}
```

Related Documentation

- *Getting Started Guide for Routing Devices*

 Copyright © 2016, Juniper Networks, Inc.

PART 3

Command Line Interface (CLI)

- Understanding the CLI on page 37

Copyright © 2016, Juniper Networks, Inc.

CHAPTER 3

Understanding the CLI

- CLI User Interface Overview on page 37
- Configuring Login Tips on page 40
- Format for Specifying Filenames and URLs in Junos OS CLI Commands on page 40
- Junos OS Operational Mode Commands That Combine Other Commands on page 41
- Overview of Junos OS CLI Operational Mode Commands on page 42
- Overview of Navigating the CLI on page 45
- Understanding the Brief, Detail, Extensive, and Terse Options of Junos OS Operational Commands on page 46
- Understanding Junos OS CLI Configuration Mode on page 47

CLI User Interface Overview

- CLI Overview on page 37
- CLI Key Features on page 38
- CLI Command Modes on page 38

CLI Overview

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

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

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

Copyright © 2016, Juniper Networks, Inc.

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

CLI Key Features

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

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

CLI Command Modes

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

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

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

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

 Copyright © 2016, Juniper Networks, Inc.

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

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

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

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

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

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

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

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

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

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

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

Related Documentation

- Configuring Login Tips on page 40
- Overview of Navigating the CLI on page 45
- *CLI User Guide*
- Other Tools to Configure and Monitor Devices Running Junos OS on page 162

Configuring Login Tips

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

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

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

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

Related Documentation

- *Defining Junos OS Login Classes*

Format for Specifying Filenames and URLs in Junos OS CLI Commands

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

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

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

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

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

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

Copyright © 2016, Juniper Networks, Inc.

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

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

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

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

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

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

NOTE: You cannot specify a URL for a file on a Hypertext Transfer Protocol (HTTP) server, because HTTP URLs are not writable.

Related Documentation

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

Junos OS Operational Mode Commands That Combine Other Commands

In some cases, some Junos OS operational commands are created from a combination of other operational commands. These commands can be useful shortcuts for collecting information about the device, as shown in Figure 1 on page 42.

Figure 1: Commands That Combine Other Commands

The **request support information** command provides output from a combination of other operational commands.

```
user@host> request support information

root@host> show system uptime

Current time: 2007-02-16 13:10:08 PST
System booted: 2007-02-02 09:21:50 PST (2w0d 03:48 ago)
Protocols started: 2007-02-02 09:24:42 PST (2w0d 03:45 ago)
Last configured: 2007-02-16 03:04:58 PST (10:05:10 ago) by root
 1:10PM  up 14 days,  3:48, 2 users, load averages: 0.01, 0.02, 0.00

root@host> show version detail

Hostname: host
Model: m320
JUNOS Base OS boot [8.3-R1.1]
```

```
root@host> show system core-dumps

/var/tmp/*core*: No such file or directory
/var/crash/kernel.*: No such file or directory

/var/crash/cores:
total 9780
-rw-r--r--  1 root  wheel    4990976 Feb 9  15:39
core-FPC2.core.0.060209.1539

root@host> show chassis hardware detail

Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                23120             M20
Backplane        REV 07   710-001517   AW4431            M20 Backplane
Power Supply B   REV 09   740-001466   004233            DC Power Supply
```

g016767

Related Documentation

- Overview of Junos OS CLI Operational Mode Commands on page 42
- Understanding the Brief, Detail, Extensive, and Terse Options of Junos OS Operational Commands on page 46

Overview of Junos OS CLI Operational Mode Commands

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

- CLI Command Categories on page 42
- Commonly Used Operational Mode Commands on page 43

CLI Command Categories

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

- Commands for controlling the CLI environment—Some set commands in the **set** hierarchy configure the CLI display screen. For information about these commands, see *Understanding the Junos OS CLI Modes, Commands, and Statement Hierarchies*.
- Commands for monitoring and troubleshooting—The following commands display information and statistics about the software and test network connectivity. Detailed command descriptions are provided in the *Junos OS Interfaces Command Reference*.

Copyright © 2016, Juniper Networks, Inc.

  - **clear**—Clear statistics and protocol database information.
  - **mtrace**—Trace mtrace packets from source to receiver.
  - **monitor**—Perform real-time debugging of various software components, including the routing protocols and interfaces.
  - **ping**—Determine the reachability of a remote network host.
  - **show**—Display the current configuration and information about interfaces, routing protocols, routing tables, routing policy filters, system alarms, and the chassis.
  - **test**—Test the configuration and application of policy filters and autonomous system (AS) path regular expressions.
  - **traceroute**—Trace the route to a remote network host.

- Commands for connecting to other network systems—The **ssh** command opens Secure Shell connections, and the **telnet** command opens telnet sessions to other hosts on the network. For information about these commands, see the CLI Explorer.
- Commands for copying files—The **copy** command copies files from one location on the router or switch to another, from the router or switch to a remote system, or from a remote system to the router or switch. For information about these commands, see the CLI Explorer.
- Commands for restarting software processes—The commands in the **restart** hierarchy restart the various Junos OS processes, including the routing protocol, interface, and SNMP. For information about these commands, see the CLI Explorer.
- A command—**request**—for performing system-level operations, including stopping and rebooting the router or switch and loading Junos OS images. For information about this command, see the CLI Explorer.
- A command—**start**—to exit the CLI and start a UNIX shell. For information about this command, see the CLI Explorer.
- A command—**configure**—for entering configuration mode, which provides a series of commands that configure Junos OS, including the routing protocols, interfaces, network management, and user access. For information about the CLI configuration commands, see "Understanding Junos OS CLI Configuration Mode" on page 47.
- A command—**quit**—to exit the CLI. For information about this command, see the CLI Explorer.
- For more information about the CLI operational mode commands, see the CLI Explorer.
  .

Commonly Used Operational Mode Commands

Table 3 on page 44 lists some operational commands you may find useful for monitoring router or switch operation. For a complete description of operational commands, see the Junos OS command references.

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

Table 3: Commonly Used Operational Mode Commands

Items to Check	Description	Command
Software version	Versions of software running on the router or switch	**show version**
Log files	Contents of the log files	**monitor**
	Log files and their contents and recent user logins	**show log**
Remote systems	Host reachability and network connectivity	**ping**
	Route to a network system	**traceroute**
Configuration	Current system configuration	**show configuration**
Manipulate files	List of files and directories on the router or switch	**file list**
	Contents of a file	**file show**
Interface information	Detailed information about interfaces	**show interfaces**
Chassis	Chassis alarm status	**show chassis alarms**
	Information currently on craft display	**show chassis craft-interface**
	Router or switch environment information	**show chassis environment**
	Hardware inventory	**show chassis hardware**
Routing table information	Information about entries in the routing tables	**show route**
Forwarding table information	Information about data in the kernel's forwarding table	**show route forwarding-table**
IS-IS	Adjacent routers or switches	**show isis adjacency**
OSPF	Display standard information about OSPF neighbors	**show ospf neighbor**
BGP	Display information about BGP neighbors	**show bgp neighbor**

Copyright © 2016, Juniper Networks, Inc.

Table 3: Commonly Used Operational Mode Commands *(continued)*

Items to Check	Description	Command
MPLS	Status of interfaces on which MPLS is running	**show mpls interface**
	Configured LSPs on the router or switch, as well as all ingress, transit, and egress LSPs	**show mpls lsp**
	Routes that form a label-switched path	**show route label-switched-path**
RSVP	Status of interfaces on which RSVP is running	**show rsvp interface**
	Currently active RSVP sessions	**show rsvp session**
	RSVP packet and error counters	**show rsvp statistics**

Related Documentation

- Junos OS Operational Mode Commands That Combine Other Commands on page 41
- Understanding the Brief, Detail, Extensive, and Terse Options of Junos OS Operational Commands on page 46

Overview of Navigating the CLI

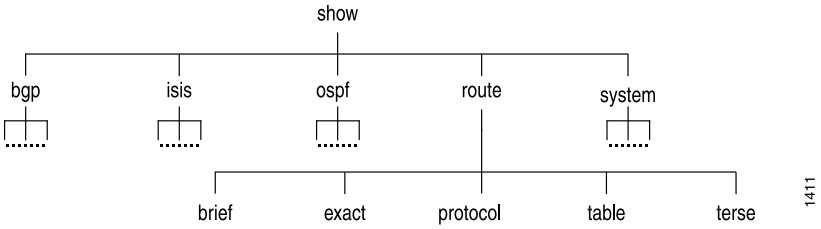
This topic describes how to navigate the CLI.

- CLI Command Hierarchy on page 45
- CLI Configuration Statements on page 46
- Moving Among Hierarchy Levels on page 46

CLI Command Hierarchy

CLI commands are organized in a hierarchy. Commands that perform a similar function are grouped together under the same level of the hierarchy. For example, all commands that display information about the system and the system software are grouped under the **show system** command, and all commands that display information about the routing table are grouped under the **show route** command. Figure 2 on page 45 illustrates a portion of the **show** command hierarchy.

Figure 2: CLI Command Hierarchy



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

CLI Configuration Statements

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

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

Moving Among Hierarchy Levels

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

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

Related Documentation

- CLI User Interface Overview on page 37
- *CLI User Guide*

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

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

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

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

 Copyright © 2016, Juniper Networks, Inc.

```
statistics          Display statistics and detailed output
terse               Display terse output
|                   Pipe through a command
```

2. Choose the option you wish to use with the command. (See Figure 3 on page 47.)

Figure 3: Command Output Options

Command output with the **brief** option.

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

Command output with the **terse** option.

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

Command output with the **extensive** option.

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

g016766

Related Documentation

- Overview of Junos OS CLI Operational Mode Commands on page 42
- *Controlling the Scope of an Operational Mode Command*

Understanding Junos OS CLI Configuration Mode

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

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

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

This topic covers:

- Configuration Mode Commands on page 49
- Configuration Statements and Identifiers on page 50
- Configuration Statement Hierarchy on page 52

Copyright © 2016, Juniper Networks, Inc.

Configuration Mode Commands

Table 4 on page 49 summarizes each CLI configuration mode command. The commands are organized alphabetically.

Table 4: Summary of Configuration Mode Commands

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

Copyright © 2016, Juniper Networks, Inc.

Table 4: Summary of Configuration Mode Commands *(continued)*

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

Configuration Statements and Identifiers

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

Copyright © 2016, Juniper Networks, Inc.

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

Table 5 on page 51 describes top-level CLI configuration mode statements.

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

Table 5: Configuration Mode Top-Level Statements

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

Copyright © 2016, Juniper Networks, Inc.

Table 5: Configuration Mode Top-Level Statements *(continued)*

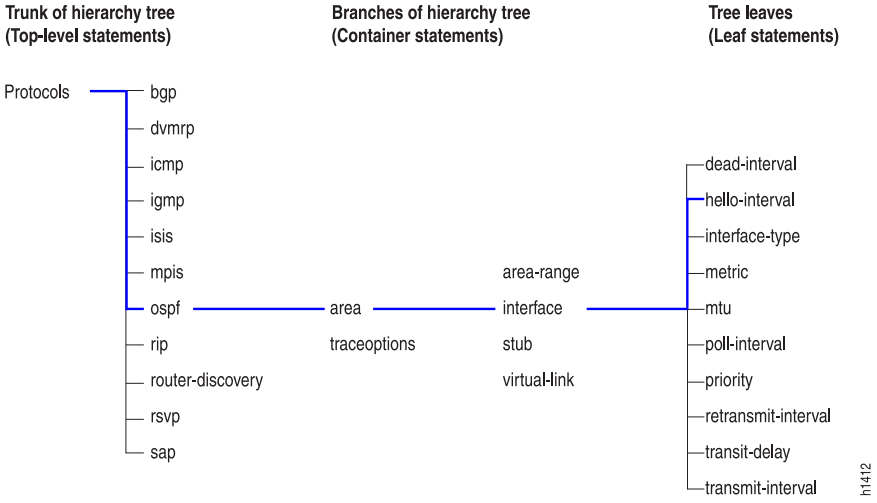
Statement	Description
routing-instances	Configure multiple routing instances. For information about the statements in this hierarchy, see the *Junos OS Routing Protocols Library for Routing Devices*.
routing-options	Configure protocol-independent routing options, such as static routes, autonomous system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

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

Configuration Statement Hierarchy

The Junos OS configuration consists of a hierarchy of *statements*. There are two types of statements: *container statements*, which are statements that contain other statements, and *leaf statements*, which do not contain other statements (see Figure 4 on page 52). All of the container and leaf statements together form the *configuration hierarchy*.

Figure 4: Configuration Mode Hierarchy of Statements



Copyright © 2016, Juniper Networks, Inc.

Each statement at the top level of the configuration hierarchy resides at the trunk (or root level) of a hierarchy tree. The top-level statements are container statements, containing other statements that form the tree branches. The leaf statements are the leaves of the hierarchy tree. An individual hierarchy of statements, which starts at the trunk of the hierarchy tree, is called a *statement path*. Figure 4 on page 52 illustrates the hierarchy tree, showing a statement path for the portion of the protocol configuration hierarchy that configures the hello interval on an interface in an OSPF area.

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

The CLI represents the statement path shown in Figure 4 on page 52 as **[edit protocols ospf area *area-number* interface *interface-name*]** and displays the configuration as follows:

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

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

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

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

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

Likewise, in the following example, **dynamic-profile** ***dynamic-profile-name*** **aggregate-clients;** is a oneliner because the **dynamic-profile** statement, its identifier ***dynamic-profile-name***, and leaf statement **aggregate-clients** all appear on one line when you run the **show** command in the configuration mode:

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

Related Documentation

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

Copyright © 2016, Juniper Networks, Inc.

PART 4

Dynamic Host Control Protocol (DHCP)

- Understanding DHCP on page 57

Copyright © 2016, Juniper Networks, Inc.

CHAPTER 4

Understanding DHCP

- Understanding DHCP Services for Switches on page 57
- Configuring a DHCP Client (CLI Procedure) on page 61
- Configuring a DHCP Server on Switches (CLI Procedure) on page 62

Understanding DHCP Services for Switches

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

This topic describes:

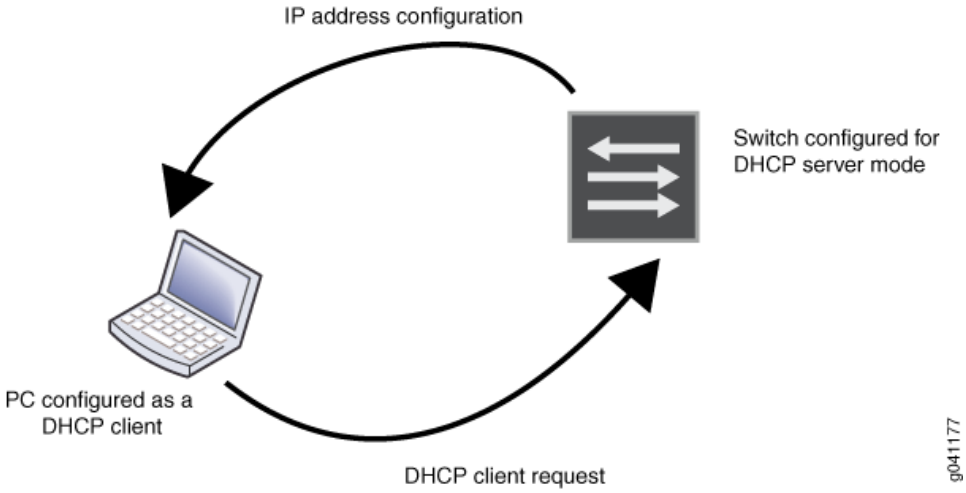
- DHCP Client/Server Model on page 57
- Using DHCP on page 58
- DHCP Relay Servers and DHCP Servers on page 58
- Legacy DHCP and Extended DHCP for Server Versions on page 59
- Configuring DHCP on a Switch on page 60
- How DHCP Works on page 60

DHCP Client/Server Model

DHCP IP address allocation works on a client/server model in which the server, in this case a switch, assigns the client reusable IP information from an address pool. A DHCP client might receive offer messages from multiple DHCP servers and can accept any one of the offers; however, the client usually accepts the first offer it receives. See Figure 5 on page 58.

Copyright © 2016, Juniper Networks, Inc.

Figure 5: DHCP Client/Server Model



Using DHCP

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

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

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

DHCP Relay Servers and DHCP Servers

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

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

Copyright © 2016, Juniper Networks, Inc.

Legacy DHCP and Extended DHCP for Server Versions

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

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

The extended DHCP server version has the following added features:

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

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

Legacy DHCP and extended DHCP servers can be configured at the hierarchy levels shown in Table 6 on page 59:

Table 6: Legacy DHCP and Extended DHCP Server Hierarchy Levels

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

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

Configuring DHCP on a Switch

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

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

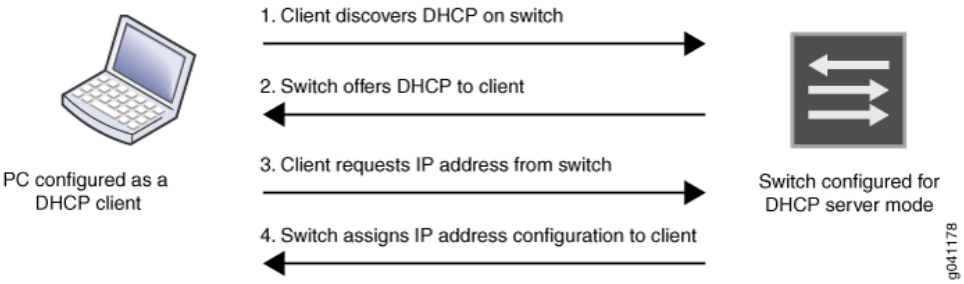
For directions for configuring either a legacy DHCP server or an extended DHCP server, see "Configuring a DHCP Server on Switches (CLI Procedure)" on page 62.

To configure a DHCP client, set the client's DHCP interface address in the **[edit interfaces interface-name unit 0 family inet dhcp]** hierarchy. For directions for configuring a DHCP client on a switch, see "Configuring a DHCP Client (CLI Procedure)" on page 61.

How DHCP Works

DHCP consists of a four-step transfer process beginning with a broadcast DHCP discovery message from the client. As the second step, the client receives a DHCP offer message from the server. This message includes the IP address and mask, and some other specific parameters. The client then sends a DHCP request message to accept the IP address and other parameters that it received from the server in the previous step. The DHCP server sends a DHCP response message and removes the now-allocated address from the DHCP address pool. See Figure 6 on page 60.

Figure 6: DHCP Four-Step Transfer



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

Related Documentation

- Configuring a DHCP Client (CLI Procedure) on page 61
- Configuring a DHCP Server on Switches (CLI Procedure) on page 62

Copyright © 2016, Juniper Networks, Inc.

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

Configuring a DHCP Client (CLI Procedure)

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

DHCP configuration consists of two components, configuration of DHCP clients and configuration of a DHCP server. Client configuration determines how clients send a message requesting an IP address, whereas a DHCP server configuration enables the server to send an IP address configuration back to the client. This topic describes configuring a DHCP client. For directions for configuring a DHCP server, see "Configuring a DHCP Server on Switches (CLI Procedure)" on page 62 or *Configuring a DHCP Server on Switches (CLI Procedure)*.

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

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

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

The options that you can configure are listed in Table 7 on page 61. Replace the variable *configuration-statement* with one or more of the statements listed in this table. If you do not explicitly configure these options, the switch uses default values for them.

Table 7: DHCP Client Settings

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

Copyright © 2016, Juniper Networks, Inc.

Table 7: DHCP Client Settings *(continued)*

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

Related Documentation

- Configuring a DHCP Server on Switches (CLI Procedure) on page 62
- Understanding DHCP Services for Switches on page 57

Configuring a DHCP Server on Switches (CLI Procedure)

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

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

A DHCP configuration consists of two components—an optional reconfiguration of default settings on DHCP clients and the configuration of a DHCP server. This topic covers configuration of the DHCP server. For information about reconfiguring a DHCP client, see "Configuring a DHCP Client (CLI Procedure)" on page 61.

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

This topic includes the following tasks:

1. Configuring an Extended DHCP Server on a Switch on page 63
2. Configuring a Legacy DHCP Server on a Switch (CLI Procedure) on page 63

Copyright © 2016, Juniper Networks, Inc.

Configuring an Extended DHCP Server on a Switch

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

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

1. Create an address pool for DHCP IP addresses:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Copyright © 2016, Juniper Networks, Inc.

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

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

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

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

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

4. (Optional) Change the DHCP options:

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

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

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

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

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

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

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

8. (Optional) Change the SIP server:

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

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

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

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

10. (Optional) Change the NetBIOS name server:

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

Copyright © 2016, Juniper Networks, Inc.

Related Documentation

- Configuring a DHCP Client (CLI Procedure) on page 61
- *Configuring a DHCP SIP Server (CLI Procedure)*
- Understanding DHCP Services for Switches on page 57

Copyright © 2016, Juniper Networks, Inc.

Copyright © 2016, Juniper Networks, Inc.

PART 5

Internet Control Message Protocol (ICMP)

- Understanding ICMP on page 69

Copyright © 2016, Juniper Networks, Inc.

CHAPTER 5

Understanding ICMP

- Configuring Junos OS to Disable the Reporting of IP Address and Timestamps in Ping Responses on page 69
- Configuring Junos OS to Disable the Routing Engine Response to Multicast Ping Packets on page 70
- Configuring the Junos OS ICMPv4 Rate Limit for ICMPv4 Routing Engine Messages on page 70

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

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

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

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

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

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

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

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

Related Documentation

- Configuring Junos OS to Disable the Routing Engine Response to Multicast Ping Packets on page 70

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

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

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

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

Related Documentation

- Configuring Junos OS to Disable the Reporting of IP Address and Timestamps in Ping Responses on page 19

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

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

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

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

Related Documentation

- icmpv4-rate-limit on page 211

Copyright © 2016, Juniper Networks, Inc.

PART 6

In-Service Software Upgrade (ISSU)

- Understanding ISSU on page 73

Copyright © 2016, Juniper Networks, Inc.

CHAPTER 6

Understanding ISSU

- In-Service Software Upgrade (ISSU) System Requirements on page 73
- Understanding In-Service Software Upgrade (ISSU) on page 75
- Performing an In-Service Software Upgrade (ISSU) on page 76
- Verifying a Unified ISSU on page 78

In-Service Software Upgrade (ISSU) System Requirements

To perform an in-service software upgrade (ISSU), your device must be running Junos OS Release 13.2X51-D15 or later.

NOTE: ISSU does not support extension application packages developed with the Junos SDK.

NOTE: The QFX5200 switches do not support ISSU.

Video: How Does ISSU Work on the QFX5100?

- In-Service Software Upgrade (ISSU) Protocol and Process Support on page 73

In-Service Software Upgrade (ISSU) Protocol and Process Support

Table 8 on page 73 lists the protocols and processes that are supported during an ISSU. Protocols that are not supported might cause packet loss.

Table 8: ISSU Protocol Support

Protocol	Junos OS Release
Graceful Routing Engine switchover (GRES)	Junos OS 13.2X51-D15 and later
Internet Group Management Protocol (IGMP)	Junos OS 13.2X51-D15 and later
Layer 2 MAC routes	Junos OS 13.2X51-D15 and later

Copyright © 2016, Juniper Networks, Inc.

Table 8: ISSU Protocol Support *(continued)*

Protocol	Junos OS Release
Layer 3 unicast and multicast routes	Junos OS 13.2X51-D15 and later
Layer 2 multicast routes	Junos OS 13.2X51-D15 and later
Link Aggregation Control Protocol (LACP) NOTE: Configure LACP before you issue an ISSU. The LACP **periodic fast** mode is not supported. Instead, configure the **periodic slow** mode. If you configure the **periodic fast** mode, the configuration can be committed without any commit or system log error messages, but you might experience a larger than expected amount of traffic drops. Traffic drops occur because the LACP links go down during an ISSU. Link changes are processed after an ISSU is complete.	Junos OS 13.2X51-D15 and later
Multicast Listener Discovery (MLD) snooping	Junos OS 13.2X51-D15 and later
Nonstop bridging	Junos OS 13.2X51-D15 and later
Nonstop active routing	Junos OS 13.2X51-D15 and later
Spanning tree protocols: • Multiple Spanning Tree Protocol (MSTP) • Rapid Spanning Tree Protocol (RSTP) • Spanning Tree Protocol (STP) • VLAN Spanning Tree Protocol (VSTP)	Junos OS 13.2X51-D15 and later

Related Documentation

- Understanding In-Service Software Upgrade (ISSU) on page 75
- Performing an In-Service Software Upgrade (ISSU) on page 76

Copyright © 2016, Juniper Networks, Inc.

Understanding In-Service Software Upgrade (ISSU)

An in-service software upgrade (ISSU) enables you to upgrade between two different Junos OS releases with minimal disruption on the control plane and with minimal disruption of traffic. During an ISSU, the Junos OS runs in two separate virtual machines (VMs)—one VM is in the master role acting as the master Routing Engine, and the other VM is in the backup role acting as the backup Routing Engine. The Junos OS is upgraded on the backup VM. After a successful software upgrade, the backup VM then becomes the master VM, and the original master VM is no longer needed and is shut down.

Video: How Does ISSU Work on the QFX5100?

NOTE: **ISSU is supported in Junos OS Release 13.2X51-D15 and later.**

ISSU provides the following benefits:

- Eliminates network downtime during software image upgrades
- Reduces operating costs, while delivering higher service levels
- Allows fast implementation of new features
- In-Service Software Upgrade Process on page 75

In-Service Software Upgrade Process

When you request an ISSU on a standalone device:

1. The management process (mgd) verifies that non-stop routing (NSR), graceful Routing Engine switchover (GRES), and non-stop bridging (NSB) are enabled.
2. The switch downloads and validates the software package.
3. The ISSU state machine spawns the backup Routing Engine (RE) with the newer software.
4. The ISSU state machine checks to see if the backup RE has synchronized all of the data with the master RE.
5. The ISSU state machine moves the devices (for example, forwarding ASIC, FPGA, management port and serial console) from the master RE to the backup RE.
6. The mastership is switched between the REs, so the backup RE becomes the master RE.
7. The old master RE is shut down.

Related Documentation

- In-Service Software Upgrade (ISSU) System Requirements on page 73
- Performing an In-Service Software Upgrade (ISSU) on page 76

Copyright © 2016, Juniper Networks, Inc.

Performing an In-Service Software Upgrade (ISSU)

You can use an in-service software upgrade to upgrade the software running on the switch with minimal traffic disruption during the upgrade.

NOTE: **ISSU is supported in Junos OS Release 13.2X51-D15 and later on QFX5100 switches, and in Junos OS Release 13.2X51-D25 and later on EX4600 switches.**

This topic covers:

1. Preparing the Switch for Software Installation on page 76
2. Upgrading the Software Using ISSU on page 77

Preparing the Switch for Software Installation

Before you begin software installation using ISSU:

NOTE: **Before you perform an in-service software upgrade, if applicable, remove the set system internet-options no-tcp-reset drop-all-tcp command from the configuration, otherwise the upgrade will fail and an error message will be displayed.**

- Ensure that nonstop active routing (NSR) and nonstop bridging (NSB) are enabled. If enabled, disable graceful restart (GR), because NSR and GR cannot be enabled simultaneously. NSB and GR enable NSB-supported Layer 2 protocols to synchronize protocol information between the master and backup Routing Engines.

  ```
  user@switch> show task replication
          Stateful Replication: Enabled
          RE mode: Master
  ```

  -->

  If nonstop active routing is not enabled (**Stateful Replication** is **Disabled**), see *Configuring Nonstop Active Routing on Switches*for information on how to enable it.

- Enable nonstop bridging (NSB). See *Configuring Nonstop Bridging on Switches (CLI Procedure)* for information on how to enable it.

- (Optional) Back up the system software—Junos OS, the active configuration, and log files—on the switch to an external storage device with the **request system snapshot** command.

Copyright © 2016, Juniper Networks, Inc.

Upgrading the Software Using ISSU

This procedure describes how to upgrade the software running on a standalone switch:

NOTE: If the Host OS software needs to be updated, you cannot perform an ISSU. Instead, perform a standard software upgrade.

To upgrade the switch using ISSU:

1. Download the software package by following the procedure in the Downloading Software Files with a Browser section in "Upgrading Software" on page 168.
2. Copy the software package or packages to the switch. We recommend that you copy the file to the **/var/tmp** directory.
3. Log in to the console connection. Using a console connection allows you to monitor the progress of the upgrade.
4. Start the ISSU:
   - On the switch, enter:

     user@switch> request system software in-service-upgrade **/var/tmp/*package-name*.tgz**

   where ***package-name*.tgz** is, for example, **jinstall-132_x51_vjunos.domestic.tgz**.

   NOTE: During the upgrade, you will not be able to access the Junos OS CLI.

   The switch displays status messages similar to the following messages as the upgrade executes:

```
warning: Do NOT use /user during ISSU. Changes to /user during ISSU may get
lost!
ISSU: Validating Image
ISSU: Preparing Backup RE
Prepare for ISSU
ISSU: Backup RE Prepare Done
Extracting jinstall-qfx-5-13.2X51-D15.4-domestic ...
Install jinstall-qfx-5-13.2X51-D15.4-domestic completed
Spawning the backup RE
Spawn backup RE, index 0 successful
GRES in progress
GRES done in 0 seconds
Waiting for backup RE switchover ready
GRES operational
Copying home directories
Copying home directories successful
Initiating Chassis In-Service-Upgrade
Chassis ISSU Started
ISSU: Preparing Daemons
ISSU: Daemons Ready for ISSU
```

```
ISSU: Starting Upgrade for FRUs
ISSU: FPC Warm Booting
ISSU: FPC Warm Booted
ISSU: Preparing for Switchover
ISSU: Ready for Switchover
Checking In-Service-Upgrade status
  Item           Status                  Reason
  FPC 0          Online (ISSU)
Send ISSU done to chassisd on backup RE
Chassis ISSU Completed
ISSU: IDLE
Initiate em0 device handoff
```

NOTE: An ISSU might stop instead of abort if the FPC is at the warm boot stage. Also, any links that go down and up will not be detected during a warm boot of the Packet Forwarding Engine (PFE).

NOTE: If the ISSU process stops, you can look at the log files to diagnose the problem. The log files are located at /var/log/vjunos-log.tgz.

5. Log in after the reboot of the switch completes. To verify that the software has been upgraded, enter the following command:

   user@switch> **show version**

6. Disable nonstop active routing (NSR) and enable graceful Routing Engine (GRES).

   See *Configuring Nonstop Active Routing on Switches* for more information.

Related Documentation

- Understanding In-Service Software Upgrade (ISSU) on page 75
- **request system software in-service-upgrade on page 418**

Verifying a Unified ISSU

Purpose Verify the status of FPCs and their corresponding PICs after the most recent unified ISSU.

Action Issue the **show chassis in-service-upgrade** command on the master Routing Engine.

```
user@host> show chassis in-service-upgrade
  Item           Status                  Reason
  FPC 0          Online
  FPC 1          Online
  FPC 2          Online
    PIC 0        Online
    PIC 1        Online
  FPC 3          Offline                 Offlined by CLI command
  FPC 4          Online
    PIC 1        Online
  FPC 5          Online
    PIC 0        Online
  FPC 6          Online
    PIC 3        Online
  FPC 7          Online
```


Copyright © 2016, Juniper Networks, Inc.

Display the unified ISSU process messages by using the **show log messages** command.

Meaning See show chassis in-service-upgrade for more information.

Related Documentation

- *Example: Performing a Unified ISSU*
- *Troubleshooting Unified ISSU Problems*
- *Understanding the Unified ISSU Process*
- *Unified ISSU System Requirements*
- *Managing and Tracing BFD Sessions During Unified ISSU Procedures*

Copyright © 2016, Juniper Networks, Inc.

Copyright © 2016, Juniper Networks, Inc.

PART 7

Licenses

- Using Licenses on page 83

Copyright © 2016, Juniper Networks, Inc.

CHAPTER 7

Using Licenses

- Junos OS Feature Licenses on page 83
- Junos OS Feature License Keys on page 84
- Generating License Keys on page 87
- Adding New Licenses (CLI Procedure) on page 89
- Deleting a License (CLI Procedure) on page 90
- Saving License Keys on page 91
- Verifying Junos OS License Installation on page 92

Junos OS Feature Licenses

Some Junos OS software features require a license to activate the feature. To enable a licensed feature, you need to purchase, install, manage, and verify a license key that corresponds to each licensed feature. To conform to Junos OS feature licensing requirements, you must purchase one license per feature per device. The presence of the appropriate software license key on your device determines whether you are eligible to configure and use the licensed feature.

To speed deployment of licensed features, Junos OS software implements an honor-based licensing structure and provides you with a 30-day grace period to use a licensed feature without a license key installed. The grace period begins when you configure the feature and your device uses the licensed feature for the first time, but not necessarily when you install the license. After the grace period expires, the system generates system log messages saying that the feature requires a license. To clear the error message and use the licensed feature properly, you must install and verify the required license.

For information about how to purchase software licenses, contact your Juniper Networks sales representative.

Related Documentation

- *License Enforcement*
- *Junos OS Feature License Model Number for SRX Series Services Gateways*
- Adding New Licenses (CLI Procedure) on page 89
- Deleting a License (CLI Procedure) on page 90
- Saving License Keys on page 91

- Verifying Junos OS License Installation on page 92

Junos OS Feature License Keys

Some Junos OS software features require a license to be activated. To enable each licensed feature, you must purchase, install, manage, and verify a license key that corresponds to the licensed feature.

Release-Tied License Keys and Upgrade Licenses on MX Series Routers

The Junos OS licensing infrastructure currently associates a license feature with attributes such as date, platform, and validity. In addition to these attributes, for MX Series routers running Junos OS Release 12.2 and later, a licensed feature can be associated with a release number at the time of generating the license key. This type of release-tied license key is used to validate a particular licensed feature while attempting a software upgrade. The upgrade process aborts if the release number in the license key is earlier than the Junos OS release number to which the system is being upgraded.

Additionally, an upgrade license key can be generated for a release-tied licensed feature. An upgrade license key is used for carrying forward a capacity license to the upgrade release. Although an upgrade license might be an acceptable license on the current release, it does not add to the existing capacity limit. The capacity added in the upgrade license key is valid for the upgrade software release only.

The release number embedded in the license key indicates the maximum release number up to which Junos OS can be upgraded.

As an example, assume that your system is running Junos OS Release 12.2 and is using the **scale-subscriber** licensed feature with a later release-tied upgrade license key installed. If you request a software upgrade to the later release of Junos OS, the software upgrade operation fails and the following error message is displayed:

```
mgd: error: No valid upgrade license found for feature 'scale-subscriber'.
Aborting Software upgrade.
Validation failed
```

In this example, to successfully upgrade to the later release of Junos OS, the release number included in the upgrade license key should be greater than or equal to the later release number. Also, you can perform software upgrades up to the previous release without any additional license keys to retain the existing scale limit.

 Copyright © 2016, Juniper Networks, Inc.

NOTE:

When you install a release-tied license, the following apply:

- You can purchase an upgrade capacity license only if a base capacity license for the same scale-tier has already been generated or purchased.
- You cannot install an upgrade license if the capacity does not match any of the existing base capacity licenses on the system.
- The license installation fails when you install a lower release number license key on a higher software release number.
- A release-tied license can be installed on a Junos OS release number that is lower than or equal to the release number included in the license key. For example, a 12.2 license key is valid on Junos OS Release 12.1.
- An upgrade license is valid only on the target release number specified in the license key, but can be installed on an earlier Junos OS release. For example, a 4 K scale-tier upgrade license for Junos OS Release 12.2 can be installed on an earlier release, and the installed count of licenses remains unaltered.
- Release-tied licenses of the previous release are not deleted on upgrading Junos OS to a newer release version.

Licensable Ports on MX5, MX10, and MX40 Routers

Starting with Junos OS Release 12.2, license keys are available to enhance the port capacity on MX5, MX10, and MX40 routers up to the port capacity of an MX80 router. The MX5, MX10, and MX40 routers are derived from the modular MX80 chassis with similar slot and port assignments, and provide all functionality available on an MX80 router, but at a lower capacity. Restricting port capacity is achieved by making a set of MIC slots and ports licensable. MICs without a license are locked, and are unlocked or made usable by installing appropriate upgrade licenses.

The base capacity of a router is identified by the Ideeprom assembly ID (I2C ID), which defines the board type. However, the Junos OS licensing infrastructure allows the use of restricted ports without a license for a grace period of 30 days. After the grace period expires, the router reverts back to the base capacity if no upgrade license is purchased and installed for the locked ports. The I2C ID along with an upgrade license determine the final capacity of an MX5, MX10, or MX40 router.

The MX5, MX10, MX40, and MX80 routers support the following types of MICs:

- A built-in 10-Gigabit Ethernet MIC with four 10-Gigabit Ethernet ports
- Two front-pluggable MICs

A feature ID is assigned to every license upgrade for enhancing port capacity. Table 9 on page 86 displays the chassis types and their associated port capacity, I2C ID, base capacity, feature ID, feature name, and the final capacity after a license upgrade.

Copyright © 2016, Juniper Networks, Inc.

Table 9: Upgrade Licenses for Enhancing Port Capacity

Chassis Type	Port Capacity	I2C ID	Base Capacity	Feature ID and Feature Name	Upgrade Capacity
MX5	20G	0x556	Slot 1 • 1/MIC0	f1—MX5 to MX10 upgrade	Slot 1 and 2 • 1/MIC0 • 1/MIC1
MX10	40G	0x555	Slot 1 and 2 • 1/MIC0 • 1/MIC1	f2—MX10 to MX40 upgrade	Slot 2 and first 2 ports on Slot 0 • 1/MIC1 • First 2 ports on 0/MIC0
MX40	60G	0x554	Slot 1, SLot 2 and first 2 ports on Slot 0 • 1/MIC0 • 1/MIC1 • First 2 ports on 0/MIC0	f3—MX40 to MX80 upgrade	Slot 2 and all ports on Slot 0 • 1/MIC1 • All 4 ports on 0/MIC0

When installing an upgrade license for enhancing port capacity on MX5, MX10 and MX40 routers, consider the following:

- To upgrade an MX5 router to MX80 router capacity, licenses for all three features (f1, f2, f3) must be installed. All three features can be provided in a single license key.
- To upgrade an MX10 router to MX40 router capacity, installing a license key with f2 feature is sufficient.
- Non-applicable feature IDs in a license key reject the upgrade license. For example:
  - An f1 feature ID on an MX10 upgrade license key rejects the license.
  - Feature IDs f1 and f2 on an MX40 upgrade license key reject the entire license.

Port Activation on MX104 Routers

Starting with Junos OS Release 13.3, license keys are available to activate the ports on the MX104 router. MX104 routers have four built-in ports. By default, in the absence of valid licenses, all four built-in ports are deactivated. By installing licenses, you can activate any two of the four or all of the four built-in ports. For instance, you can install a license to activate the first two built-in ports (xe-2/0/0 and xe-2/0/1) or you can install a license to activate the next two built-in ports (xe-2/0/2 and xe-2/0/3). You can also install a license to activate all four built-in ports (xe-2/0/0, xe-2/0/1, xe-2/0/2, and xe-2/0/3). If you have already activated two of the built-in ports, you can install an additional license to activate the other two built-in ports on the MX104 router.

A feature ID is assigned to every license for activating the built-in ports on the MX104 router. The port license model with the feature ID is described in Table 10 on page 87.

 Copyright © 2016, Juniper Networks, Inc.

Table 10: Port Activation License Model for MX104 Routers

Feature ID	Feature Name	Functionality
F1	MX104 2X10G Port Activate (0 and 1)	Ability to activate first two built-in ports (xe-2/0/0 and xe-2/0/1)
F2	MX104 2X10G Port Activate (2 and 3)	Ability to activate next two built-in ports (xe-2/0/2 and xe-2/0/3)

Both the features are also provided in a single license key for ease of use. To activate all four ports, you must either install the licenses for both the features listed in Table 10 on page 87 or the single license key for both features. If you install the single license key when feature IDs F1 and F2 are already installed, the license does not get rejected. Also, MX104 routers do not support the graceful license expiry policy. A graceful license expiry policy allows the use of a feature for a certain period of time (usually a grace period of 30 days), and reverts if the license for that feature is not installed after the grace period.

Related Documentation

- Junos OS Feature Licenses on page 83
- *License Enforcement*
- *Software Feature Licenses*
- Verifying Junos OS License Installation on page 92
- **show system license on page 439**

Generating License Keys

When you purchase a Junos OS software feature license for a device, you receive an e-mail containing an authorization code for the feature license from Juniper Networks. You can use the authorization code to generate a unique license key (a combination of the authorization code and the device's serial number) for the device, and then add the license key on the device.

Before generating the license keys for a device:

- Purchase the required licenses for the device. See *Software Features That Require Licenses on the QFX Series* and *Disaggregated Software Features That Require Licenses on the QFX Series*.
- Note down the authorization code in the e-mail you received from Juniper Networks when you purchased the license.
- Determine the serial number of the device. For instructions, see *Locating the Serial Number on a QFX3500 Device or Component*.

Copyright © 2016, Juniper Networks, Inc.

To generate the license keys for a device:

NOTE: This procedure shows you how to generate license keys on a QFX Series device, but you can follow the same procedure for any device.

1. In a browser, log in to the Juniper Networks License Management System at https://www.juniper.net/lcrs/license.do.

   The Manage Product Licenses page appears.

   NOTE: To access the licensing site, you must have a service contract with Juniper Networks and an access account. If you need help obtaining an account, complete the registration form at the Juniper Networks website https://www.juniper.net/registration/Register.jsp .

2. On the Generate Licenses tab, select **QFX Series Product** from the drop-down list, and click **Go**.

   The Generate Licenses - QFX Series Product page appears.

3. Select the **QFX Series Product Device** option button, and click **Continue**.

   The Generate Licenses - QFX Series Product Devices page appears.

4. In the **Device Serial Number** field, enter the serial number for the device.

5. In the **Authorization Code** field, enter the authorization code in the e-mail you received from Juniper Networks when you purchased the license.

6. (Optional) If you want to enter another authorization code for the same device, click **Enter More Authorization Codes** to display a new authorization code field. Enter the authorization code in this field.

7. Click **Confirm**.

   The Confirm License Information page appears, displaying a summary of the information you submitted to the License Management System.

8. Review the information to ensure everything is correct and then click **Generate License**.

   The Generate Licenses - QFX Series Product Devices page appears, displaying a summary of your license keys, including a link that displays the details of your new license keys.

9. Select the file format in which you want to obtain your new license keys.

10. Select the delivery method you want to use to obtain your new license keys.

Copyright © 2016, Juniper Networks, Inc.

To download the license keys:

- Select the **Download to this computer** option button, and click **OK**.

To e-mail the license keys:

- Select the **Send e-mail to *e-mail ID*** option button, and click **OK**.

Related Documentation

- *Software Features That Require Licenses on the QFX Series*
- Adding New Licenses (CLI Procedure) on page 89
- *Locating the Serial Number on a QFX3500 Device or Component*

Adding New Licenses (CLI Procedure)

Before adding new licenses, complete the following tasks:

- Purchase the required licenses.
- Establish basic network connectivity with the router or switch. For instructions on establishing basic connectivity, see the *Getting Started Guide* or *Quick Start Guide* for your device.

NOTE: **On QFabric systems, install your licenses in the default partition of the QFabric system and not on the individual components (Node devices and Interconnect devices).**

To add a new license key to the device using the CLI:

1. From the CLI operational mode, enter one of the following CLI commands:
   - To add a license key from a file or URL, enter the following command, specifying the filename or the URL where the key is located:

     user@host> **request system license add *filename* | *url***
   - To add a license key from the terminal, enter the following command:

     user@host> **request system license add terminal**
2. When prompted, enter the license key, separating multiple license keys with a blank line.

   If the license key you enter is invalid, an error appears in the CLI output when you press Ctrl+d to exit license entry mode.
3. Go on to "Verifying Junos OS License Installation" on page 92.

On routers that have graceful Routing Engine switchover (GRES) enabled, after successfully adding the new license on the master Routing Engine, the license keys are automatically synchronized on the backup Routing Engine as well. However, in case GRES is not enabled, the new license is added on each Routing Engine separately. This ensures

that the license key is enabled on the backup Routing Engine during changeover of mastership between the Routing Engines.

To add a new license key to a router with dual Routing Engines without GRES:

1. After adding the new license key on the master Routing Engine, use the **request chassis routing-engine master switch** command to have the backup Routing Engine become the master Routing Engine.
2. Log in to the active Routing Engine and add the new license key, repeat the same step.

NOTE: **Adding a license key to the router or switch might be delayed if a kernel resynchronization operation is in progress at that time. The following message is displayed on the CLI when the license-adding operation is about to be delayed:**
A kernel re-sync operation is in progress. License update may take several minutes to complete.

Related Documentation

- Deleting a License (CLI Procedure) on page 90
- Junos OS Feature Licenses on page 83
- Verifying Junos OS License Installation on page 92
- **request system license add on page 436**

Deleting a License (CLI Procedure)

Before deleting a license, establish basic network connectivity with the router or switch. For instructions on establishing basic connectivity, see the *Getting Started Guide* or *Quick Start Guide* for your router or switch.

You have the options to delete a single license, delete all licenses, or delete a list of licenses enclosed in brackets.

1. Display the licenses available to be deleted.

```
user@host> request system license delete license-identifier-list ?
Possible completions:
  E00468XXX4           License key identifier
  JUNOS10XXX1          License key identifier
  JUNOS10XXX2          License key identifier
  JUNOS10XXX3          License key identifier
  JUNOS10XXX4          License key identifier
  [                    Open a set of values
```

2. To delete a license key or keys from a device using the CLI operational mode, select one of the following methods:
   - Delete a single license by specifying the license ID. Using this option, you can delete only one license at a time.

     user@host> **request system license delete *license-identifier***

 Copyright © 2016, Juniper Networks, Inc.

- Delete all license keys from the current device.

  user@host> **request system license delete all**

- Delete multiple license keys from the current device. Specify the license identifier for each key and enclose the list of identifiers in brackets.

  user@host> **request system license delete license-identifier-list [*JUNOS10XXX1 JUNOS10XXX3 JUNOS10XXX4 ...*]**

```
Delete license(s) ?
 [yes,no] (no) yes
```

3. Go on to "Verifying Junos OS License Installation" on page 92.

NOTE: **Deleting a license key from the router or switch might be delayed if a kernel resynchronization operation is in progress at that time. The following message is displayed on the CLI when the license-deleting operation is about to be delayed:**
A kernel re-sync operation is in progress. License update may take several minutes to complete.

Related Documentation

- Adding New Licenses (CLI Procedure) on page 89
- Saving License Keys on page 91
- Junos OS Feature Licenses on page 83
- Verifying Junos OS License Installation on page 92
- **request system license delete on page 437**

Saving License Keys

Before saving a license, establish basic network connectivity with the router or switch. For instructions on establishing basic connectivity, see the *Getting Started Guide* or *Quick Start Guide* for your router or switch.

To save the licenses installed on a device to a file using the CLI:

1. From the CLI operational mode, enter one of the following CLI commands:

   - To save the installed license keys to a file or URL, enter the following command:

     user@host> **request system license save *filename* | *url***

     For example, the following command saves the installed license keys to a file named **license.config**:

   - To save a license key from the terminal, enter the following command:

     user@host> **request system license save ftp://user@host/license.config**

2. Go on to "Verifying Junos OS License Installation" on page 92.

Related Documentation

- Adding New Licenses (CLI Procedure) on page 89
- Deleting a License (CLI Procedure) on page 90
- Junos OS Feature Licenses on page 83
- Verifying Junos OS License Installation on page 92

Verifying Junos OS License Installation

To verify Junos OS license management, perform the following tasks:

- Displaying Installed Licenses on page 92
- Displaying License Usage on page 93

Displaying Installed Licenses

Purpose Verify that the expected licenses are installed and active on the router or switch.

Action From the CLI, enter the **show system license** command.

Sample Output

```
user@host> show system license
License usage:
                   Licenses     Licenses    Licenses    Expiry
  Feature name         used    installed      needed
  subscriber-acct         0            1           0    permanent
  subscriber-auth         0            1           0    permanent
  subscriber-addr         0            1           0    permanent
  subscriber-vlan         0            1           0    permanent
  subscriber-ip           0            1           0    permanent
  scale-subscriber        0         1000           0    permanent
  scale-l2tp              0         1000           0    permanent
  scale-mobile-ip         0         1000           0    permanent

Licenses installed:
  License identifier: E000185416
  License version: 2
  Features:
    subscriber-acct  - Per Subscriber Radius Accounting
      permanent
    subscriber-auth  - Per Subscriber Radius Authentication
      permanent
    subscriber-addr  - Address Pool Assignment
      permanent
    subscriber-vlan  - Dynamic Auto-sensed Vlan
      permanent
    subscriber-ip    - Dynamic and Static IP
      permanent
```

Meaning The output shows a list of the license usage and a list of the licenses installed on the router or switch. Verify the following information:

 Copyright © 2016, Juniper Networks, Inc.

- Each license is present. Licenses are listed in ascending alphanumeric order by license ID.
- The state of each license is **permanent**.

NOTE: **A state of invalid indicates that the license key is not a valid license key. Either it was entered incorrectly or it is not valid for the specific device.**

- The feature for each license is the expected feature. The features enabled are listed by license. An all-inclusive license has all features listed.
- All configured features have the required licenses installed. The Licenses needed column must show that no licenses are required.

Displaying License Usage

Purpose Verify that the licenses fully cover the feature configuration on the router or switch.

Action From the CLI, enter the **show system license usage** command.

Sample Output

```
user@host> show system license usage
            Licenses     Licenses    Licenses    Expiry
  Feature name         used    installed      needed
  subscriber-addr         1            0           1    29 days
  scale-subscriber        0         1000           0    permanent
  scale-l2tp              0         1000           0    permanent
  scale-mobile-ip         0         1000           0    permanent
```

Meaning The output shows any licenses installed on the router or switch and how they are used. Verify the following information:

- Any configured licenses appear in the output. The output lists features in ascending alphabetical order by license name. The number of licenses appears in the third column. Verify that you have installed the appropriate number of licenses.
- The number of licenses used matches the number of configured features. If a licensed feature is configured, the feature is considered used. The sample output shows that the subscriber address pooling feature is configured.
- A license is installed on the router or switch for each configured feature. For every feature configured that does not have a license, one license is needed.

  For example, the sample output shows that the subscriber address feature is configured but that the license for the feature has not yet been installed. The license must be installed within the remaining grace period to be in compliance.

Copyright © 2016, Juniper Networks, Inc.

Copyright © 2016, Juniper Networks, Inc.

PART 8

Login Classes

- Understanding Login Classes on page 97

Copyright © 2016, Juniper Networks, Inc.

CHAPTER 8

Understanding Login Classes

- Configuring Junos OS User Accounts on page 97
- Configuring the Junos OS to Display a System Login Announcement on page 98
- Configuring Junos OS to Display a System Login Message on page 98

Configuring Junos OS User Accounts

User accounts provide one way for users to access the router or switch. For each account, you define the login name for the user and, optionally, information that identifies the user. After you have created an account, the software creates a home directory for the user.

To create user accounts, include the **user** statement at the **[edit system login]** hierarchy level:

```
[edit system login]
user username {
  class class-name;
    class {
    (encrypted-password "password" | plain-text-password);
    ssh-rsa "public-key";
    ssh-dsa "public-key";
  }
  full-name complete-name;
  uid uid-value;
  class class-name;
}
```

Related Documentation

- *Example: Configuring User Accounts*
- *Configuring a Local Administrator Account*
- *Junos OS User Accounts Overview*
- *Limiting the Number of User Login Attempts for SSH and Telnet Sessions*

Configuring the Junos OS to Display a System Login Announcement

By default, no login announcement is displayed. To configure a system login announcement, include the **announcement** statement at the **[edit system login]** hierarchy level:

```
[edit system login]
announcement text;
```

If the announcement text contains any spaces, enclose the text in quotation marks.

A system login *announcement* appears after the user logs in. A system login *message* appears before the user logs in.

TIP: You can use the same special characters described to format your system login announcement.

Related Documentation

- *Defining Junos OS Login Classes*
- *Configuring the Junos OS to Display a System Login Message*

Configuring Junos OS to Display a System Login Message

By default, no login message is displayed on the router or switch. To configure a system login message, include the **message** statement at the **[edit system login]** hierarchy level:

```
[edit system login]
message text;
```

If the message text contains any spaces, enclose it in quotation marks.

You can format the message using the following special characters:

- \n—New line
- \t—Horizontal tab
- \'—Single quotation mark
- \"—Double quotation mark
- \\—Backslash

The following is a sample login message configuration:

```
[edit]
system {
    login {
        message "\n\n\n\tUNAUTHORIZED USE OF THIS SYSTEM\n
                 \tIS STRICTLY PROHIBITED!\n\n\tPlease contact
                 \'company-noc@company.com\' to gain\naccess
                 to this equipment if you need authorization.\n\n\n";
        }
```


Copyright © 2016, Juniper Networks, Inc.

```
    }
}
```

The preceding login message configuration example produces a login message similar to the following:

```
server% telnet router1
Trying 1.1.1.1...
Connected to router1.
Escape character is '^]'.


          UNAUTHORIZED USE OF THIS SYSTEM
          IS STRICTLY PROHIBITED!

          Please contact 'company-noc@company.com' to gain
          access to this equipment if you need authorization.



router1 (ttyp0)

login:
```

A system login message appears before the user logs in. A system login announcement appears after the user logs in.

Related Documentation

- *Defining Junos OS Login Classes*
- message on page 259

Copyright © 2016, Juniper Networks, Inc.

PART 9

Network Time Protocol (NTP)

- Understanding NTP on page 103

Copyright © 2016, Juniper Networks, Inc.

CHAPTER 9

Understanding NTP

- Understanding NTP Time Servers on page 103
- Configuring NTP Authentication Keys on page 104
- Configuring the NTP Time Server and Time Services on page 105
- Configuring the Switch to Listen for Broadcast Messages Using NTP on page 107
- Configuring the Switch to Listen for Multicast Messages Using NTP on page 108
- Setting the Date and Time on page 108
- Synchronizing and Coordinating Time Distribution Using NTP on page 109
- Example: Configuring NTP on page 111
- Example: Configuring NTP as a Single Time Source for Router and Switch Clock Synchronization on page 114

Understanding NTP Time Servers

The IETF defined the Network Time Protocol (NTP) to synchronize the clocks of computer systems connected to each other over a network. Most large networks have an NTP server that ensures that time on all devices is synchronized, regardless of the device location. If you use one or more NTP servers on your network, ensure you include the NTS server addresses in your Junos OS configuration.

When configuring the NTP, you can specify which system on the network is the authoritative time source, or time server, and how time is synchronized between systems on the network. To do this, you configure the router, switch, or security device to operate in one of the following modes:

- Client mode—In this mode, the local router or switch can be synchronized with the remote system, but the remote system can never be synchronized with the local router or switch.
- Symmetric active mode—In this mode, the local router or switch and the remote system can synchronize with each other. You use this mode in a network in which either the local router or switch or the remote system might be a better source of time.

Copyright © 2016, Juniper Networks, Inc.

NOTE: Symmetric active mode can be initiated by either the local or the remote system. Only one system needs to be configured to do so. This means that the local system can synchronize with any system that offers symmetric active mode without any configuration whatsoever. However, we strongly encourage you to configure authentication to ensure that the local system synchronizes only with known time servers.

- Broadcast mode—In this mode, the local router or switch sends periodic broadcast messages to a client population at the specified broadcast or multicast address. Normally, you include this statement only when the local router or switch is operating as a transmitter.
- Server mode—In this mode, the local router or switch operates as an NTP server.

NOTE: In NTP server mode, the Junos OS supports authentication as follows:

- If the NTP request from the client comes with an authentication key (such as a key ID and message digest sent with the packet), the request is processed and answered based on the authentication key match.
- If the NTP request from the client comes without any authentication key, the request is processed and answered without authentication.

Related Documentation

- Example: Configuring NTP as a Single Time Source for Router and Switch Clock Synchronization on page 114

Configuring NTP Authentication Keys

Time synchronization can be authenticated to ensure that the switch obtains its time services only from known sources. By default, network time synchronization is unauthenticated. The switch will synchronize to whatever system appears to have the most accurate time. We strongly encourage you to configure authentication of network time services.

To authenticate other time servers, include the **trusted-key** statement at the **[edit system ntp]** hierarchy level. Only time servers that transmit network time packets containing one of the specified key numbers are eligible to be synchronized. Additionally, the key needs to match the value configured for that key number. Other systems can synchronize to the local switch without being authenticated.

```
[edit system ntp]
trusted-key [ key-numbers ];
```

Each key can be any 32-bit unsigned integer except 0. Include the **key** option in the **peer**, **server**, or **broadcast** statements to transmit the specified authentication key when

Copyright © 2016, Juniper Networks, Inc.

transmitting packets. The key is necessary if the remote system has authentication enabled so that it can synchronize to the local system.

To define the authentication keys, include the **authentication-key** statement at the **[edit system ntp]** hierarchy level:

```
[edit system ntp]
authentication-key key-number type type value password;
```

number is the key number, ***type*** is the authentication type (only Message Digest 5 [MD5] is supported), and ***password*** is the password for this key. The key number, type, and password must match on all systems using that particular key for authentication.

Related Documentation

- Understanding NTP Time Servers on page 103
- Example: Configuring NTP as a Single Time Source for Router and Switch Clock Synchronization on page 114
- **trusted-key on page 270**
- *authentication-key*

Configuring the NTP Time Server and Time Services

When you use NTP, configure the switch to operate in one of the following modes:

- Client mode
- Symmetric active mode
- Broadcast mode
- Server mode

The following topics describe how to configure these modes of operation:

1. Configuring the Switch to Operate in Client Mode on page 105
2. Configuring the Router or Switch to Operate in Symmetric Active Mode on page 106
3. Configuring the Router or Switch to Operate in Broadcast Mode on page 106
4. Configuring the Router or Switch to Operate in Server Mode on page 107

Configuring the Switch to Operate in Client Mode

To configure the local router or switch to operate in client mode, include the **server** statement and other optional statements at the **[edit system ntp]** hierarchy level:

```
[edit system ntp]
server address <key key-number> <version value> <prefer>;
authentication-key key-number type type value password;
boot-server address;
trusted-key [ key-numbers ];
```

Specify the address of the system acting as the time server. You must specify an address, not a hostname.

To include an authentication key in all messages sent to the time server, include the **key** option. The key corresponds to the key number you specify in the **authentication-key** statement, as described in .

By default, the router or switch sends NTP version 4 packets to the time server. To set the NTP version level to 1, 2, or 3, include the **version** option.

If you configure more than one time server, you can mark one server preferred by including the **prefer** option.

The following example shows how to configure the router or switch to operate in client mode:

```
[edit system ntp]
authentication-key 1 type md5 value "$ABC123";
boot-server 10.1.1.1;
server 10.1.1.1 key 1 prefer;
trusted-key 1;
```

Configuring the Router or Switch to Operate in Symmetric Active Mode

To configure the local router or switch to operate in symmetric active mode, include the **peer** statement at the **[edit system ntp]** hierarchy level:

```
[edit system ntp]
peer address <key key-number> <version value> <prefer>;
```

Specify the address of the remote system. You must specify an address, not a hostname.

To include an authentication key in all messages sent to the remote system, include the **key** option. The key corresponds to the key number you specify in the **authentication-key** statement.

By default, the router or switch sends NTP version 4 packets to the remote system. To set the NTP version level to 1, 2 or 3, include the **version** option.

If you configure more than one remote system, you can mark one system preferred by including the **prefer** option:

```
peer address <key key-number> <version value> prefer;
```

Configuring the Router or Switch to Operate in Broadcast Mode

To configure the local router or switch to operate in broadcast mode, include the **broadcast** statement at the **[edit system ntp]** hierarchy level:

```
[edit system ntp]
broadcast address <key key-number> <version value> <ttl value>;
```

Specify the broadcast address on one of the local networks or a multicast address assigned to NTP. You must specify an address, not a hostname. If the multicast address is used, it must be **224.0.1.1**.

Copyright © 2016, Juniper Networks, Inc.

To include an authentication key in all messages sent to the remote system, include the **key** option. The key corresponds to the key number you specify in the **authentication-key** statement.

By default, the router or switch sends NTP version 4 packets to the remote system. To set the NTP version level to 1, 2, or 3, include the **version** option.

Configuring the Router or Switch to Operate in Server Mode

In server mode, the router or switch acts as an NTP server for clients when the clients are configured appropriately. The only prerequisite for " server mode" is that the router or switch must be receiving time from another NTP peer or server. No other configuration is necessary on the router or switch.

To configure the local router or switch to operate as an NTP server, include the following statements at the **[edit system ntp]** hierarchy level:

```
[edit system ntp]
authentication-key key-number type type value password;
server address <key key-number> <version value> <prefer>;
trusted-key [ key-numbers ];
```

Specify the address of the system acting as the time server. You must specify an address, not a hostname.

To include an authentication key in all messages sent to the time server, include the **key** option. The key corresponds to the key number you specify in the **authentication-key** statement.

By default, the router or switch sends NTP version 4 packets to the time server. To set the NTP version level to 1,or 2, or 3, include the **version** option.

If you configure more than one time server, you can mark one server preferred by including the **prefer** option.

The following example shows how to configure the router or switch to operate in server mode:

```
[edit system ntp]
authentication-key 1 type md5 value "$ABC123";
server 172.17.27.46 prefer;
trusted-key 1;
```

Related Documentation

- Understanding NTP Time Servers on page 103
- Example: Configuring NTP as a Single Time Source for Router and Switch Clock Synchronization on page 114

Configuring the Switch to Listen for Broadcast Messages Using NTP

When you are using NTP, you can configure the local switch to listen for broadcast messages on the local network to discover other servers on the same subnet by including the **broadcast-client** statement at the **[edit system ntp]** hierarchy level:

```
[edit system ntp]
broadcast-client;
```

When the switch detects a broadcast message for the first time, it measures the nominal network delay using a brief client-server exchange with the remote server. It then enters *broadcast client* mode, in which it listens for, and synchronizes to, succeeding broadcast messages.

To avoid accidental or malicious disruption in this mode, both the local and remote systems must use authentication and the same trusted key and key identifier.

Related Documentation

- Configuring the Switch to Listen for Multicast Messages Using NTP on page 108
- Configuring the NTP Time Server and Time Services on page 105
- Example: Configuring NTP as a Single Time Source for Router and Switch Clock Synchronization on page 114

Configuring the Switch to Listen for Multicast Messages Using NTP

When you are using NTP, you can configure the local switch to listen for multicast messages on the local network to discover other servers on the same subnet by including the **multicast-client** statement at the **[edit system ntp]** hierarchy level:

```
[edit system ntp]
multicast-client <address>;
```

When the switch receives a multicast message for the first time, it measures the nominal network delay using a brief client-server exchange with the remote server. It then enters *multicast client* mode, in which it listens for, and synchronizes to, succeeding multicast messages.

You can specify one or more IP addresses. (You must specify an address, not a hostname.) If you do, the router or switch joins those multicast groups. If you do not specify any addresses, the software uses **224.0.1.1**.

To avoid accidental or malicious disruption in this mode, both the local and remote systems must use authentication and the same trusted key and key identifier.

Related Documentation

- Configuring the Switch to Listen for Broadcast Messages Using NTP on page 107
- Configuring the NTP Time Server and Time Services on page 105
- Example: Configuring NTP as a Single Time Source for Router and Switch Clock Synchronization on page 114

Setting the Date and Time

1. Enter operational mode in the CLI.
2. Enter the following command:

   user@switch> **set date** ***YYYYMMDDHHMM.ss source-address***

Copyright © 2016, Juniper Networks, Inc.

For example, the following command sets the date and time.

```
user@switch# set date 201102151010.55
```

3. To set the date and time from an NTP server, enter the following command:

```
user@switch# set date ntp servers
```

For example, the following command sets the date and time from an NTP server:

```
user@switch# set date ntp 200.40.40.1
```

4. To set the date and time from more than one NTP server, enter the same command:

```
user@switch# set date ntp servers
```

For example, the following command sets the date and time from more than one NTP server:

```
user@switch# set date ntp 200.40.40.1 200.40.40.2
```

Related Documentation

- *set date*

Synchronizing and Coordinating Time Distribution Using NTP

Using NTP to synchronize and coordinate time distribution in a large network involves these tasks:

1. Configuring NTP on page 109
2. Configuring the NTP Boot Server on page 109
3. Specifying a Source Address for an NTP Server on page 110

Configuring NTP

- To configure NTP on the switch, include the **ntp** statement at the **[edit system]** hierarchy level:

```
[edit system]
ntp {
    authentication-key number type type value password;
    boot-server (address | hostname);
    broadcast <address> <key key-number> <version value> <ttl value>;
    broadcast-client;
    multicast-client <address>;
    peer address <key key-number> <version value> <prefer>;
    server address <key key-number> <version value> <prefer>;
    source-address source-address;
    trusted-key [ key-numbers ];
}
```

Configuring the NTP Boot Server

When you boot the switch, it issues an **ntpdate** request, which polls a network server to determine the local date and time. You need to configure a server that the switch uses to determine the time when the switch boots. Otherwise, NTP will not be able to

synchronize to a time server if the server's time appears to be very far off of the local switch's time.

- To configure the NTP boot server, include the **boot-server** statement at the **[edit system ntp]** hierarchy level:

```
[edit system ntp]
boot-server (address | hostname);
```

Specify either the IP address or the hostname of the network server.

Specifying a Source Address for an NTP Server

For IP version 4 (IPv4), you can specify that if the NTP server configured at the **[edit system ntp]** hierarchy level is contacted on one of the loopback interface addresses, the reply always uses a specific source address. This is useful for controlling which source address NTP uses to access your network when it is either responding to or sending an NTP client request from your network.

To configure the specific source address that the reply will always use, and the source address that requests initiated by NTP server will use, include the **source-address** statement at the **[edit system ntp]** hierarchy level:

```
[edit system ntp]
source-address source-address;
```

source-address is a valid IP address configured on one of the switch interfaces.

NOTE: If a firewall filter is applied on the loopback interface, ensure that the source address specified for the NTP server at the **[edit system ntp]** hierarchy level is explicitly included as one of the match criteria in the firewall filter. This enables the Junos OS to accept traffic on the loopback interface from the specified source address.

The following example shows a firewall filter with the source address **10.0.10.100** specified in the **from** statement included at the **[edit firewall filter *firewall-filter-name*]** hierarchy:

```
[edit firewall filter Loopback-Interface-Firewall-Filter]
term Allow-NTP {
  from {
    source-address {
      172.17.27.46/32; // IP address of the NTP server
      10.0.10.100/32; // Source address specified for the NTP server
      }
    then accept;
  }
}
```

If no source address is configured for the NTP server, include the primary address of the loopback interface in the firewall filter.

Copyright © 2016, Juniper Networks, Inc.

Related Documentation

- Understanding NTP Time Servers on page 103
- Example: Configuring NTP as a Single Time Source for Router and Switch Clock Synchronization on page 114

Example: Configuring NTP

The Network Time Protocol (NTP) provides the mechanisms to synchronize time and coordinate time distribution in a large, diverse network. NTP uses a returnable-time design in which a distributed subnet of time servers operating in a self-organizing, hierarchical primary-secondary configuration synchronizes local clocks within the subnet and to national time standards by means of wire or radio. The servers also can redistribute reference time using local routing algorithms and time daemons.

This example shows how to configure NTP:

- Requirements on page 111
- Overview on page 111
- Configuration on page 111
- Verification on page 112

Requirements

This example uses the following software and hardware components:

- Junos OS Release 11.1 or later
- A switch connected to a network on which an NTP boot server and NTP server reside

Overview

Debugging and troubleshooting are much easier when the timestamps in the log files of all switches are synchronized, because events that span a network can be correlated with synchronous entries in multiple logs. We recommend using the Network Time Protocol (NTP) to synchronize the system clocks of your switch and other network equipment.

In this example, an administrator wants to synchronize the time in a switch to a single time source. We recommend using authentication to make sure that the NTP peer is trusted. The **boot-server** statement identifies the server from which the initial time of day and date are obtained when the switch boots. The **server** statement identifies the NTP server used for periodic time synchronization. The **authentication-key** statement specifies that an HMAC-Message Digest 5 (MD5) scheme is used to hash the key value for authentication, which prevents the switch from synchronizing with an attacker's host that is posing as the time server.

Configuration

To configure NTP:

CLI Quick Configuration

To quickly configure NTP, copy the following commands and paste them into the switch's terminal window:

```
[edit system]
set ntp boot-server 10.1.4.1
set ntp server 10.1.4.2
set ntp authentication-key 2 type md5 value "$ABC123"
```

Step-by-Step Procedure

To configure NTP :

1. Specify the boot server:

   ```
   [edit system]
   user@switch# set ntp boot-server 10.1.4.1
   ```

2. Specify the NTP server:

   ```
   [edit system]
   user@switch# set ntp server 10.1.4.2
   ```

3. Specify the key number, authentication type (MD5), and key for authentication:

   ```
   [edit system]
   user@switch# set ntp authentication-key 2 type md5 value "$ABC123"
   ```

Results

Check the results:

```
[edit system]
user@switch# show
ntp {
   boot-server 10.1.4.1;
   authentication-key 2 type md5 value "$ABC123"; ## SECRET-DATA
   server 10.1.4.2;
}
```

Verification

To confirm that the configuration is correct, perform these tasks:

- Checking the Time on page 112
- Displaying the NTP Peers on page 113
- Displaying the NTP Status on page 113

Checking the Time

Purpose

Check the time that has been set on the switch.

Action

Enter the **show system uptime** operational mode command to display the time.

```
user@switch> show system uptime
fpc0:
--------------------------------------------------------------------------
Current time: 2009-06-12 12:49:03 PDT
System booted: 2009-05-15 06:24:43 PDT (4w0d 06:24 ago)
Protocols started: 2009-05-15 06:27:08 PDT (4w0d 06:21 ago)
Last configured: 2009-05-27 14:57:03 PDT (2w1d 21:52 ago) by admin1
12:49PM  up 28 days,  6:24, 1 user, load averages: 0.05, 0.06, 0.01
```


Copyright © 2016, Juniper Networks, Inc.

Meaning The output shows that the current date and time are June 12, 2009 and 12:49:03 PDT. The switch booted 4 weeks, 6 hours, and 24 minutes ago, and its protocols were started approximately 3 minutes before it booted. The switch was last configured by user **admin1** on May 27, 2009, and there is currently one user logged in to the switch.

The output also shows that the load average is 0.05 seconds for the last minute, 0.06 seconds for the last 5 minutes, and 0.01 seconds for the last 15 minutes.

Displaying the NTP Peers

Purpose Verify that the time has been obtained from an NTP server.

Action Enter the **show ntp associations** operational mode command to display the NTP server from switch obtained its time.

```
user@switch> show ntp associations
     remote           refid      st t when poll reach   delay   offset  jitter
==============================================================================
*ntp5.domain1.ne .GPS.            1 u  414 1024  377    3.435    4.002   0.765
```

Meaning The asterisk (*) in front of the NTP server name, or peer, indicates that the time is synchronized and obtained from this server. The delay, offset, and jitter are displayed in milliseconds.

Displaying the NTP Status

Purpose View the configuration of the NTP server and the status of the system.

Action Enter the **show ntp status** operational mode command to view the status of the NTP.

```
user@switch> show ntp status
status=0644 leap_none, sync_ntp, 4 events, event_peer/strat_chg,
version="ntpd 4.2.0-a Mon Apr 13 19:09:05 UTC 2009 (1)",
processor="powerpc", system="JUNOS9.5R1.8", leap=00, stratum=2,
precision=-18, rootdelay=2.805, rootdispersion=42.018, peer=48172,
refid=172.17.28.5,
reftime=cddd397a.60e6d7bf  Fri, Jun 12 2009 13:30:50.378, poll=10,
clock=cddd3b1b.ec5a2bb4  Fri, Jun 12 2009 13:37:47.923, state=4,
offset=3.706, frequency=-23.018, jitter=1.818, stability=0.303
```

Meaning The output shows status information about the switch and the NTP.

Related Documentation

- Understanding NTP Time Servers on page 103
- ntp on page 266
- Configuring the NTP Time Server and Time Services on page 105
- CLI Explorer
- *Junos OS Baseline Network Operations Guide*

Example: Configuring NTP as a Single Time Source for Router and Switch Clock Synchronization

Debugging and troubleshooting are much easier when the timestamps in the log files of all the routers or switches are synchronized, because events that span the network can be correlated with synchronous entries in multiple logs. We strongly recommend using the Network Time Protocol (NTP) to synchronize the system clocks of routers, switches, and other network equipment.

By default, NTP operates in an entirely unauthenticated manner. If a malicious attempt to influence the accuracy of a router or switch's clock succeeds, it could have negative effects on system logging, make troubleshooting and intrusion detection more difficult, and impede other management functions.

The following sample configuration synchronizes all the routers or switches in the network to a single time source. We recommend using authentication to make sure that the NTP peer is trusted. The **boot-server** statement identifies the server from which the initial time of day and date is obtained when the router boots. The **server** statement identifies the NTP server used for periodic time synchronization. The **authentication-key** statement specifies that an HMAC-Message Digest 5 (MD5) scheme should be used to hash the key value for authentication, which prevents the router or switch from synchronizing with an attacker's host posing as the time server.

```
[edit]
system {
  ntp {
    authentication-key 2 type md5 value "$ABC123"; # SECRET-DATA
    boot-server 10.1.4.1;
    server 10.1.4.2;
  }
}
```

Related Documentation

- *NTP Overview*
- Understanding NTP Time Servers on page 103
- **show ntp associations on page 462**
- **show ntp status on page 464**

Copyright © 2016, Juniper Networks, Inc.

PART 10

Non-Stop Software Upgrade (NSSU)

- Understanding NSSU on page 117

Copyright © 2016, Juniper Networks, Inc.

CHAPTER 10

Understanding NSSU

- Understanding Nonstop Software Upgrade on a Virtual Chassis Fabric on page 117
- Upgrading Software on a Virtual Chassis Fabric Using Nonstop Software Upgrade on page 120

Understanding Nonstop Software Upgrade on a Virtual Chassis Fabric

Nonstop software upgrade (NSSU) enables you to upgrade the software running on all member switches on a Virtual Chassis Fabric with minimal network traffic disruption during the upgrade. A Virtual Chassis Fabric can contain up to 20 members—up to 2 members can be in the routing engine role, and up to 18 members can be configured in the line card role. You can upgrade software for a fixed configuration or for a mixed mode of switches in a Virtual Chassis Fabric. For information on performing a nonstop software upgrade on a Virtual Chassis, see *Understanding Nonstop Software Upgrade on a Virtual Chassis and Mixed Virtual Chassis*.

Performing an NSSU provides these benefits:

- No disruption to the control plane—NSSU uses graceful Routing Engine switchover (GRES) and nonstop active routing (NSR) to ensure no disruption to the control plane. During the upgrade process, interface, kernel, and routing protocol information is preserved.
- Minimal disruption to network traffic—An NSSU minimizes network traffic disruption by:
  - Upgrading line cards one at a time, or in groups, permits traffic to continue to flow through the line cards that are not being upgraded.
  - Upgrading member switches one at a time enables the master and backup to maintain their master and backup roles (although mastership will change) without disruption to traffic.

  To achieve minimal disruption to traffic, you must configure link aggregation groups (LAGs) such that the member links of each LAG reside on different line cards or Virtual Chassis Fabric members. When one member link of a LAG is down, the remaining links are up, and traffic continues to flow through the LAG.

Copyright © 2016, Juniper Networks, Inc.

NOTE: Because NSSU upgrades the software on each line card or on each Virtual Chassis Fabric member one at a time, an upgrade using NSSU can take longer than an upgrade using the **request system software add** command.

You can reduce the amount of time an upgrade takes by configuring line-card upgrade groups. The line cards in an upgrade group are upgraded simultaneously, reducing the amount of time it takes to complete an upgrade. See *Configuring Line-Card Upgrade Groups for Nonstop Software Upgrade (CLI Procedure)*.

This topic covers:

- Requirements for Performing an NSSU on page 118
- How an NSSU Works on page 119
- NSSU Limitations on page 120
- NSSU and Junos OS Release Support on page 120
- Overview of NSSU Configuration and Operation on page 120

Requirements for Performing an NSSU

The following requirements apply to Virtual Chassis Fabric:

- Graceful Routing Engine switchover (GRES) must be enabled.
- Nonstop active routing (NSR) and nonstop bridging (NSB) must be enabled.

  NOTE: Using NSB is recommended for any mode of VCF (pre-provisioned, auto-provisioned, and non-provisioned to avoid loss of Layer 2 control protocol adjacency during a routing engine switchover..

  NOTE: Issue the **commit synchronize** command to enable NSB and NSR.

- For minimal traffic disruption, you must define link aggregation groups (LAGs) such that the member links reside on different Virtual Chassis Fabric members.

The following are requirements for Virtual Chassis Fabric members:

- Only two pre-provisioned members in the routing engine role are supported. If more than two routing engines are configured, a warning will be issued, and NSSU will stop.
- The Virtual Chassis Fabric members are connected in a spine and leaf topology. A spine and leaf topology prevents the Virtual Chassis Fabric from splitting during an NSSU. Each leaf device must be connected to both spine devices.
- The Virtual Chassis Fabric must be preprovisioned so that the line card role has been explicitly assigned to member switches acting in a line card role, and that the routing engine role has been explicitly assigned to member switches acting in a routing engine

Copyright © 2016, Juniper Networks, Inc.

role. During an NSSU, the Virtual Chassis Fabric members must maintain their roles—the master and backup must maintain their master and backup roles (although mastership will change), the member switches must remain their routing engine roles, and the remaining switches must maintain their linecard roles.

- A two-member Virtual Chassis Fabric must have **no-split-detection** configured so that the Virtual Chassis Fabric does not split when an NSSU upgrades a member.

How an NSSU Works

This section describes what happens when you request an NSSU on a Virtual Chassis Fabric:

- Virtual Chassis Fabric on page 119

Virtual Chassis Fabric

When you request an NSSU on an a Virtual Chassis Fabric:

1. The Virtual Chassis Fabric master verifies that:
   - The backup is online.
   - Graceful Routing Engine switchover (GRES) , nonstop active routing (NSR), and nonstop bridging (NSB) is enabled.
   - The Virtual Chassis Fabric has a preprovisioned configuration.
2. The master installs the new software image on the backup and reboots it.
3. The backup resynchronizes with the master.
4. The master installs the new software image on member switches that are in the linecard role and reboots them, one at a time. The master waits for each member to become online and active before starting the software upgrade on the next member.
5. If you have configured upgrade groups, the line cards in the first upgrade group (or the line card in slot 0, if no upgrade groups are defined) download the new image and then restart. Traffic continues to flow through the line cards in the other upgrade groups during this process.
6. When line cards restarted are online again, the line cards in the next upgrade group download the new image and restart. This process continues until all online line cards have restarted with the new software.
7. The master becomes the backup, and the upgraded backup becomes the master.
8. The software on the original master is upgraded and the original master is automatically rebooted. After the original master has rejoined the Virtual Chassis Fabric, you can optionally return control to it by requesting a graceful Routing Engine switchover.

Copyright © 2016, Juniper Networks, Inc.

NSSU Limitations

You cannot use an NSSU to downgrade the software—that is, to install an earlier version of the software than is currently running on the switch. To install an earlier software version, use the **request system software add** command.

You cannot roll back to the previous software version after you perform an upgrade using NSSU. If you need to rollback to the previous software version, you can do so by rebooting from the alternate root partition if you have not already copied the new software version into the alternate root partition.

NSSU and Junos OS Release Support

A Virtual Chassis Fabric must be running a Junos OS release that supports NSSU before you can perform an NSSU. If a Virtual Chassis Fabric is running a software version that does not support NSSU, use the **request system software add** command.

Table 11 on page 120 lists the QFX Series switches and Virtual Chassis that support NSSU and the Junos OS release at which they began supporting it.

Table 11: Platform and Release Support for NSSU on a Virtual Chassis Fabric

Platform	Junos OS Release
Virtual Chassis Fabric	13.2X51-D20 or later

Overview of NSSU Configuration and Operation

You must ensure that the configuration meets the requirements described in "Requirements for Performing an NSSU" on page 118. NSSU requires no additional configuration.

You perform an NSSU by executing the **request system software nonstop-upgrade** command. For detailed instructions on how to perform an NSSU, see the topics in Related Documentation.

Related Documentation

- Upgrading Software on a Virtual Chassis Fabric Using Nonstop Software Upgrade on page 120
- *Configuring Graceful Routing Engine Switchover in a Virtual Chassis (CLI Procedure)*
- *Configuring Nonstop Bridging on Switches (CLI Procedure)*
- *Example: Configuring Nonstop Active Routing on Switches*
- *Configuring Line-Card Upgrade Groups for Nonstop Software Upgrade (CLI Procedure)*

Upgrading Software on a Virtual Chassis Fabric Using Nonstop Software Upgrade

Nonstop software upgrade (NSSU) enables you to upgrade the software running on all member switches on a Virtual Chassis Fabric with minimal network traffic disruption

 Copyright © 2016, Juniper Networks, Inc.

during the upgrade. A Virtual Chassis Fabric can contain 32 members—up to 2 members can be in the routing engine role, and up to 30 line cards can be configured in the line card role. You can upgrade software for a fixed configuration of switches or for a mixed mode of switches in a Virtual Chassis Fabric.

This topic covers:

- Preparing the Switch for Software Installation on page 121
- Upgrading the Software Using NSSU on page 122

Preparing the Switch for Software Installation

Before you begin software installation using NSSU:

- Ensure that the Virtual Chassis Fabric is configured correctly to support NSSU. Verify that:
  - The Virtual Chassis Fabric members are connected in a spine and leaf topology. A spine and leaf topology prevents the Virtual Chassis from splitting during an NSSU. Each leaf device must be connected to both spine devices.
  - The Virtual Chassis Fabric must be preprovisioned so that the line card role has been explicitly assigned to member switches acting in a line card role, and that the routing engine role has been explicitly assigned to member switches acting in a routing engine role. During an NSSU, the Virtual Chassis Fabric members must maintain their roles—the master and backup must maintain their master and backup roles (although mastership will change), the member switches must remain their routing engine roles, and the remaining switches must maintain their line card roles.
  - Only two pre-provisioned members in the routing engine role are supported. If more than two routing engines are configured, a warning will be issued, and NSSU will stop.
  - A two-member Virtual Chassis has **no-split-detection** configured so that the Virtual Chassis Fabric does not split when an NSSU upgrades a member.
- Verify that the members are running the same version of the software:

  user@switch> show version

  If you are going to perform an NSSU on a fixed configuration of switches or a mixed mode configuration of switches that are not running the same version of the software, use the request system software nonstop-upgrade **force-host <set [*package-name package-name*]> reboot** command to upgrade the software on the inconsistent members.

  NOTE: This command can require up to three software images depending on devices configured in the Virtual Chassis Fabric.

  For example:

  user@switch> **request system software nonstop-upgrade add force-host set [jinstall-qfx5100.tgz jinstall-qfx3500.tgz jinsall-ex-4300.tgz] reboot**

- Ensure that graceful Routing Engine switchover (GRES) is enabled. To verify that they are enabled, you need to check only the state of nonstop active routing—if nonstop active routing is enabled, then graceful Routing Engine switchover is enabled.

  To verify that nonstop active routing is enabled:

  ```
  user@switch> show task replication
          Stateful Replication: Enabled
          RE mode: Master

      Protocol                Synchronization Status
      OSPF                    Complete
      BGP                     Complete
      PIM                     Complete
  ```

  If nonstop active routing is not enabled (**Stateful Replication** is **Disabled**), see*Example: Configuring Nonstop Active Routing on Switches* for information on how to enable it.

- Enable nonstop bridging (NSB). Enabling NSB ensures that all NSB-supported Layer 2 protocols operate seamlessly during the Routing Engine switchover that is part of the NSSU.

- (Optional) Back up the system software—Junos OS, the active configuration, and log files—on each member to an external storage device with the **request system snapshot** command.

Upgrading the Software Using NSSU

This procedure describes how to upgrade the software running on all Virtual Chassis Fabric members using NSSU. When the upgrade completes, all members are running the new version of the software. Because a graceful Routing Engine switchover occurs during the upgrade, the original Virtual Chassis Fabric backup is the new master.

NOTE: **Junos OS software images with enhanced automation are only supported on a non-mixed Virtual Chassis Fabric with QFX5100 switches. Also, performing an NSSU from a standard Junos OS software image to a Junos OS software image with enhanced automation or from a Junos OS software image with enhanced automation to a standard Junos OS software image is not supported.**

To upgrade all members using NSSU:

1. Download the software package by following the procedure in the Downloading Software Files with a Browser section in "Upgrading Software" on page 168 and *Downloading Software Packages from Juniper Networks*. If you are upgrading the software running on a mixed mode Virtual Chassis Fabric, download the software packages for each switch type.

2. Copy the software package or packages to the Virtual Chassis Fabric. We recommend that you copy the file to the **/var/tmp** directory on the master.

3. Log in to the Virtual Chassis Fabric using the console connection of the master or the virtual management Ethernet (VME) interface. Without the console connection, you

 Copyright © 2016, Juniper Networks, Inc.

will not be able to view any CLI output during an NSSU reboot. The console connection enables you to view CLI output during an NSSU reboot and monitor the progress of the master switch reboot.

4. Start the NSSU:

   - To perform an NSSU on a fixed configuration of switches (QFX3500/QFX3600, QFX5100, or EX4300 switches), enter:

     user@switch> request system software nonstop-upgrade **force-host /var/tmp/*package-name*.tgz**

     where ***package-name*.tgz** is, for example, **jinstall-qfx5100.tgz**.

   - To perform an NSSU on a mixed mode configuration of switches (QFX3500/QFX3600, QFX5100, or EX4300 switches), enter:

     user@switch> request system software nonstop-upgrade **force-host set [*package-name package-name package-name*]**

     where **[*package-name*.tgz *package-name*.tgz *package-name*.tgz** is, for example, **[jinstall-qfx5100.tgz jinstall-qfx3500.tgz jinsall-ex-4300.tgz]**.

   The switch displays status messages similar to the following messages as the upgrade executes:

```
switch# request system software nonstop-upgrade force-host[
jinstall-qfx-3-mixed_vc-1-domestic.tgz jinstall-qfx-5-mixed_vc-1-domestic-img.tgz
jinstall-ex-4300-mixed_vc-1-domestic.tgz ]

Chassis ISSU Check Done
ISSU: Validating Image
ISSU: Preparing Backup RE
Installing image on other FPC's along with the backup

Retrieving software images. This process can take several minutes. Please be
patient..

Retrieving version and model information from
/var/tmp/jinstall-qfx-3-mixed_vc-1-domestic.tgz

Retrieving version and model information from
/var/tmp/jinstall-qfx-5-mixed_vc-1-domestic-img.tgz

Retrieving version and model information from
/var/tmp/jinstall-ex-4300-mixed_vc-1-domestic.tgz
Starting with package /var/tmp/jinstall-qfx-3-mixed_vc-1-domestic.tgz

Download done for package /var/tmp/jinstall-qfx-3-mixed_vc-1-domestic.tgz
Pushing bundle to fpc5
WARNING:     The software that is being installed has limited support.
WARNING:     Run 'file show /etc/notices/unsupported.txt' for details.

Setting up /var/shared/v for validation ...
Checking compatibility with configuration
Initializing...
Using jbase-qfx-mixed_vc
Using /var/tmp/jinstall-qfx-3-mixed_vc-1-domestic.tgz
Using jbundle-qfx-3-mixed_vc-1-domestic.tgz
Using jkernel-qfx-3-mixed_vc
```

```
Using jroute-qfx-3-mixed_vc
Using jcrypto-qfx-mixed_vc
Using jswitch-qfx-3-mixed_vc
Hardware Database regeneration succeeded
Validating against /config/juniper.conf.gz
mgd: commit complete
Validation succeeded
fpc5
WARNING:     The software that is being installed has limited support.
WARNING:     Run 'file show /etc/notices/unsupported.txt' for details.

Image name:      /var/tmp/jinstall-qfx-3-mixed_vc-1-domestic.tgz
Package name:    jinstall-qfx-3
Junos revision:  mixed_vc-1

==> STEP #1 of 20: Creating temporary file system <==
*** Fri Apr  4 16:28:23 PDT 2014 ***

==> STEP #2 of 20: Determining installation source <==
*** Fri Apr  4 16:28:23 PDT 2014 ***
Interactive installation: yes
Boot media formatting option: disabled
Installing packages from internal drive da0
Packages will be installed to da0, media size: 8G

==> STEP #3 of 20: Processing format options <==
*** Fri Apr  4 16:28:24 PDT 2014 ***
Formatting of boot media is not supported in this form of installation

==> STEP #4 of 20: Determining installation slice <==
*** Fri Apr  4 16:28:24 PDT 2014 ***
Physmem correction sectors: 0
Dump partition sectors: 4161792
package: INFO: Dump partition da0s3b size sufficient for kernel dumps.
package: INFO: da0s3b will be retained as dump partition.

==> STEP #5 of 20: Creating and labeling new slices <==
*** Fri Apr  4 16:28:25 PDT 2014 ***
Primary partition - /: /dev/da0s1a, /var: /dev/da0s1f
Shared partition - /var/tmp: /dev/da0s3d, /config: /dev/da0s3e, /var/shared:
/dev/da0s3f, recovery: /dev/da0s3a, /var/rundb: /dev/da0s3g
Checking integrity on da0s3

==> STEP #6 of 20: Create and mount new file system <==
*** Fri Apr  4 16:28:25 PDT 2014 ***
/dev/da0s1a: 464.0MB (950192 sectors) block size 16384, fragment size 2048
        using 4 cylinder groups of 116.00MB, 7424 blks, 14848 inodes.
super-block backups (for fsck -b #) at:
32, 237600, 475168, 712736
tunefs: soft updates set
/dev/da0s1f: 249.8MB (511656 sectors) block size 16384, fragment size 2048
        using 4 cylinder groups of 62.47MB, 3998 blks, 8064 inodes.
super-block backups (for fsck -b #) at:
32, 127968, 255904, 383840
tunefs: soft updates remains unchanged as disabled
Size of staging area: 1006M
Staging area setup in /instrootmnt/var/tmp ...

==> STEP #7 of 20: Getting OS bundles <==
*** Fri Apr  4 16:28:35 PDT 2014 ***
```


Copyright © 2016, Juniper Networks, Inc.

```
==> STEP #8 of 20: Updating recovery media <==
*** Fri Apr  4 16:28:35 PDT 2014 ***
System recovery media update option is disabled - skipping
set update_recovery_on_install="YES" in /etc/rc.conf.platform

==> STEP #9 of 20: Extracting incoming image <==
*** Fri Apr  4 16:28:35 PDT 2014 ***
install bundle source /var/tmp:jinstall-qfx-3-mixed_vc-1-domestic.tgz
Enabling platform watchdog
Starting pkg_add on /var/tmp/tmp - Fri Apr  4 16:29:09 PDT 2014

WARNING:     The software that is being installed has limited support.
WARNING:     Run 'file show /etc/notices/unsupported.txt' for details.

Completed pkg_add - Fri Apr  4 16:29:37 PDT 2014
Enabling platform watchdog

==> STEP #10 of 20: Unpacking OS packages <==
*** Fri Apr  4 16:29:37 PDT 2014 ***
Enabling platform watchdog

==> STEP #11 of 20: Mounting jbase package <==
*** Fri Apr  4 16:29:39 PDT 2014 ***
Mounted jbase package on /dev/md17...

==> STEP #12 of 20: Creating base OS symbolic links <==
*** Fri Apr  4 16:29:54 PDT 2014 ***

==> STEP #13 of 20: Creating fstab <==
*** Fri Apr  4 16:30:49 PDT 2014 ***

==> STEP #14 of 20: Creating new system files <==
*** Fri Apr  4 16:30:49 PDT 2014 ***

==> STEP #15 of 20: Adding jbundle package <==
*** Fri Apr  4 16:30:49 PDT 2014 ***
Checking package integrity...
Verified SHA1 checksum of jbase-qfx-mixed_vc-1.tgz
Verified SHA1 checksum of jboot-qfx-mixed_vc-1.tgz
Verified SHA1 checksum of jcrypto-qfx-mixed_vc-1.tgz
Verified SHA1 checksum of jdocs-qfx-mixed_vc-1.tgz
Verified SHA1 checksum of jkernel-qfx-3-mixed_vc-1.tgz
Verified SHA1 checksum of jpfe-qfx-3-mixed_vc-1.tgz
Verified SHA1 checksum of jroute-qfx-3-mixed_vc-1.tgz
Verified SHA1 checksum of jswitch-qfx-3-mixed_vc-1.tgz
Verified SHA1 checksum of py-base-xlr-mixed_vc-1.tgz
Running requirements check first for jbundle-qfx-3-mixed_vc-1-domestic...
Setting up alternate devfs for installation

WARNING:     The software that is being installed has limited support.
WARNING:     Run 'file show /etc/notices/unsupported.txt' for details.

Running pre-install for jbundle-qfx-3-mixed_vc-1-domestic...
Installing jbundle-qfx-3-mixed_vc-1-domestic in
/var/tmp/tmp/pa8070.50/jbundle-qfx-3-mixed_vc-1-domestic.x8070...
Running post-install for jbundle-qfx-3-mixed_vc-1-domestic...
Adding jkernel-qfx-3...
Registering jkernel as unsupported
Adding jcrypto-qfx...
Registering jcrypto as unsupported
Adding jdocs-qfx...
```

```
Registering jdocs as unsupported
Adding jswitch-qfx-3...
Registering jswitch as unsupported
Adding jpfe-qfx-3...
Registering jpfe as unsupported
Adding jroute-qfx-3...
Registering jroute as unsupported
Adding py-base-xlr...
Registering py-base-xlr as unsupported
Setting up shared filesystem (/dev/da0s3f) ...

==> STEP #16 of 20: Backing up system data <==
*** Fri Apr  4 16:33:18 PDT 2014 ***
Backup configuration file: /config/install_backup.conf
Files to be backed up: /var/db/scripts /var/home /root
Backup file saved at /var/tmp/install_backup.tar
Restoring system backed up data on new partition - Fri Apr  4 16:33:18 PDT
2014
Done - Fri Apr  4 16:33:19 PDT 2014

==> STEP #17 of 20: Setting up shared partition data <==
*** Fri Apr  4 16:33:19 PDT 2014 ***
Creating directories in /dev/da0s3f

==> STEP #18 of 20: Checking package sanity in installation <==
*** Fri Apr  4 16:33:19 PDT 2014 ***

==> STEP #19 of 20: Unmounting and cleaning up temporary file systems <==
*** Fri Apr  4 16:33:19 PDT 2014 ***
tunefs: soft updates remains unchanged as disabled
tunefs: soft updates cleared
Enabling platform watchdog

==> STEP #20 of 20: Setting da0s1 as new active partition <==
*** Fri Apr  4 16:33:26 PDT 2014 ***
WARNING: NOTE: A reboot is required to start using the new software
WARNING:       Use the 'request system reboot' command when ready

Installation log saved at /var/sw/install-04042014162823.log
Starting with package /var/tmp/jinstall-ex-4300-mixed_vc-1-domestic.tgz

Download done for package /var/tmp/jinstall-ex-4300-mixed_vc-1-domestic.tgz
Pushing bundle to fpc2
WARNING:     The software that is being installed has limited support.
WARNING:     Run 'file show /etc/notices/unsupported.txt' for details.
fpc2
WARNING:     The software that is being installed has limited support.
WARNING:     Run 'file show /etc/notices/unsupported.txt' for details.

WARNING: A reboot is required to install the software
WARNING:     Use the 'request system reboot' command immediately
Starting with package /var/tmp/jinstall-qfx-5-mixed_vc-1-domestic-img.tgz

Download done for package /var/tmp/jinstall-qfx-5-mixed_vc-1-domestic-img.tgz
Pushing bundle to fpc1
Pushing bundle to fpc4
WARNING:     The software that is being installed has limited support.
WARNING:     Run 'file show /etc/notices/unsupported.txt' for details.
WARNING:     The software that is being installed has limited support.
WARNING:     Run 'file show /etc/notices/unsupported.txt' for details.
fpc1
```


Copyright © 2016, Juniper Networks, Inc.

```
WARNING:     The software that is being installed has limited support.
WARNING:     Run 'file show /etc/notices/unsupported.txt' for details.

Image name:      /var/tmp/jinstall-qfx-5-mixed_vc-1-domestic-img.tgz
Package name:    jinstall-qfx-5-img
Junos revision:  mixed_vc-1
NOTE: A reboot is required to install the software
      Use the 'request system reboot' command immediately
fpc4
WARNING:     The software that is being installed has limited support.
WARNING:     Run 'file show /etc/notices/unsupported.txt' for details.

Image name:      /var/tmp/jinstall-qfx-5-mixed_vc-1-domestic-img.tgz
Package name:    jinstall-qfx-5-img
Junos revision:  mixed_vc-1
NOTE: A reboot is required to install the software
      Use the 'request system reboot' command immediately
Backup upgrade done
Rebooting Backup RE

Rebooting fpc1
ISSU: Backup RE Prepare Done
Waiting for Backup RE reboot
GRES operational
Initiating Chassis In-Service-Upgrade
Chassis ISSU Started
ISSU: Preparing Daemons
ISSU: Daemons Ready for ISSU
ISSU: Starting Upgrade for FRUs
.
.
.
.
.
.
FPC 2 is undergoing a software upgrade
.
.
.
.
.
.
.
.
.
.
.
.
.
.
.
.
.
.
.
.
.
.
.
.
.
```

```
FPC 2 has come up after a software upgrade
.
.
.
.
.
.
FPC 4 is undergoing a software upgrade
.
.
.
.
.
FPC 4 has come up after a software upgrade
.
.
.
.
.
.
.
.
FPC 5 is undergoing a software upgrade
.
.
.
.
.
.
.
.
.
.
FPC 5 has come up after a software upgrade
.
.
.
.
ISSU: Preparing for Switchover
ISSU: Ready for Switchover
Checking In-Service-Upgrade status
  Item           Status                  Reason
  FPC 0          Online
  FPC 1          Online (ISSU)
  FPC 2          Online (ISSU)
  FPC 4          Online (ISSU)
  FPC 5          Online (ISSU)
Going to install image on master

WARNING:     The software that is being installed has limited support.
WARNING:     Run 'file show /etc/notices/unsupported.txt' for details.

Image name:      /var/tmp/jinstall-qfx-5-mixed_vc-1-domestic-img.tgz
Package name:    jinstall-qfx-5-img
Junos revision:  mixed_vc-1



Going to install image on master
```


Copyright © 2016, Juniper Networks, Inc.

```
WARNING:     The software that is being installed has limited support.
WARNING:     Run 'file show /etc/notices/unsupported.txt' for details.

Image name:      /var/tmp/jinstall-qfx-5-mixed_vc-1-domestic-img.tgz
Package name:    jinstall-qfx-5-img
Junos revision:  mixed_vc-1
NOTE: A reboot is required to install the software
      Use the 'request system reboot' command immediately
failover links
Rebooting Old master
ISSU: IDLE


*** FINAL System shutdown message from root@vcf ***

System going down IMMEDIATELY




Shutdown NOW!
[pid 5290]
```

5. Log in after the reboot of the original master switch completes. To verify that the software on all Routing Engines in the Virtual Chassis Fabric members has been upgraded, enter the following command:

   user@switch> **show version**

Related Documentation

- request system software nonstop-upgrade on page 448
- show chassis nonstop-upgrade on page 458
- *Configuring Graceful Routing Engine Switchover in a Virtual Chassis (CLI Procedure)*
- Understanding Nonstop Software Upgrade on a Virtual Chassis Fabric on page 117
- *Configuring Nonstop Bridging on Switches (CLI Procedure)*
- *Example: Configuring Nonstop Active Routing on Switches*
- *Example: Configuring Line-Card Upgrade Groups for Nonstop Software Upgrade on EX Series Switches*
- *Understanding Resilient Dual-Root Partitions on Switches*

Copyright © 2016, Juniper Networks, Inc.

PART 11

Passwords

- Understanding Passwords on page 133

Copyright © 2016, Juniper Networks, Inc.

CHAPTER 11

Understanding Passwords

- Configuring the Root Password on page 133
- Recovering the Root Password on page 135
- Example: Changing the Requirements for Junos OS Plain-Text Passwords on page 136

Configuring the Root Password

The Junos OS is preinstalled on the router or switch. When the router or switch is powered on, it is ready to be configured. Initially, you log in as the user **root** with no password. The root directory of a UNIX device is the entry point to all other folders and files on that device. As a result, access to the root directory is restricted by default to a predefined user account known as the *root user*. The root user (also referred to as *superuser*) has unrestricted access and full permissions within the system. The expression "log in as root" is commonly used when an action requires the user to log into the device as the root user.

NOTE: If you configure a blank password using the **encrypted-password** statement at the **[edit system root-authentication]** hierarchy level for root authentication, you can commit a configuration but you *cannot* log in as the root user and gain root level access to the router or switch.

After you log in, you should configure the root (superuser) password by including the **root-authentication** statement at the **[edit system]** hierarchy level and configuring one of the password options:

```
[edit system]
root-authentication {
   (encrypted-password "password"| plain-text-password);
   load-key-file URL filename;
   ssh-dsa "public-key" <from hostname>;
   ssh-ecdsa "public-key" <from hostname>;
   ssh-rsa "public-key" <from hostname>;
}
```

If you configure the **plain-text-password** option, you are prompted to enter and confirm the password:

```
[edit system]
```

```
user@host# set root-authentication plain-text-password
New password: type password here
Retype new password: retype password here
```

The default requirements for plain-text passwords are:

- The password must be between 6 and 128 characters long
  - You can include most character classes in a password (uppercase letters, lowercase letters, numbers, punctuation marks, and other special characters). Control characters are not recommended.
  - Valid passwords must contain at least one change of case or character class.

You can use the **load-key-file** *URL filename* statement to load an SSH key file that was previously generated using **ssh-keygen**. The *URL filename* is the path to the file's location and name. When using this option, the contents of the key file are copied into the configuration immediately after entering the **load-key-file** *URL* statement. This command loads RSA (SSH version 1 and SSH version 2) and DSA (SSH version 2) public keys.

Optionally, you can use the **ssh-dsa**, **ssh-ecdsa**, or **ssh-rsa** statements to directly configure SSH RSA, DSA, or ECDSA keys to authenticate root logins. You can configure more than one public key for SSH authentication of root logins as well as for user accounts. When a user logs in as root, the public keys are referenced to determine whether the private key matches any of them.

To view the SSH keys entries, use the configuration mode **show** command. For example:

```
[edit system]
user@host# set root-authentication load-key-file my-host:.ssh/id_dsa.pub
.file.19692 | 0 KB | 0.3 kB/s | ETA: 00:00:00 | 100%
[edit system]
user@host# show
root-authentication {
   ssh-rsa "$ABC123"; # SECRET-DATA
}
```

Junos-FIPS software has special password requirements. FIPS passwords must be between 10 and 20 characters in length. Passwords must use at least three of the five defined character sets (uppercase letters, lowercase letters, digits, punctuation marks, and other special characters). If Junos-FIPS is installed on the router or switch, you cannot configure passwords unless they meet this standard. If you use the **encrypted-password** option, then a null-password (empty) is not permitted.

You cannot configure a blank password for **encrypted-password** using blank quotation marks (" "). You must configure a password whose number of characters range from 1 through 128 characters and enclose the password in quotation marks.

Related Documentation

- *Protecting Network Security by Configuring the Root Password*
- *Example: Configuring a Plain-Text Password for Root Logins*
- *Example: Configuring SSH Authentication for Root Logins*
- Example: Changing the Requirements for Junos OS Plain-Text Passwords on page 136

 Copyright © 2016, Juniper Networks, Inc.

- *Recovering the Root Password*

Recovering the Root Password

If you forget the root password, you can use the password recovery procedure to reset the root password.

NOTE: **The root password cannot be recovered on a QFabric system.**

NOTE: **You need console access to the switch to recover the root password.**

To recover the root password:

1. Power off the switch by switching off the AC power outlet of the device or, if necessary, by pulling the power cords out of the device's power supplies.
2. Turn off the power to the management device, such as a PC or laptop computer, that you want to use to access the CLI.
3. Plug one end of the Ethernet rollover cable supplied with the device into the RJ-45–to–DB-9 serial port adapter supplied with the device.
4. Plug the RJ-45–to–DB-9 serial port adapter into the serial port on the management device.
5. Connect the other end of the Ethernet rollover cable to the console port on the device.
6. Turn on the power to the management device.
7. On the management device, start your asynchronous terminal emulation application (such as Microsoft Windows Hyperterminal) and select the appropriate **COM** port to use (for example, **COM1**).
8. Configure the port settings as follows:
   - Bits per second: 9600
   - Data bits: 8
   - Parity: None
   - Stop bits: 1
   - Flow control: None
9. Power on the device by (if necessary) plugging the power cords into the device's power supply, or turning on the power to the device by switching on the AC power outlet the device is plugged into.

   The terminal emulation screen on your management device displays the device's boot sequence.

Copyright © 2016, Juniper Networks, Inc.

10. When the following prompt appears, press the Spacebar to access the device's bootstrap loader command prompt:

    ```
    Hit [Enter] to boot immediately, or space bar for command prompt.
    Booting [kernel] in 9 seconds...
    ```

11. At the following prompt, enter **boot -s** to start up the system in single-user mode.

    ```
    ok boot -s
    ```

12. At the following prompt, enter **recovery** to start the root password recovery procedure.

    ```
    Enter full pathname of shell or 'recovery' for root password recovery or RETURN
    for /bin/sh: recovery
    ```

13. Enter configuration mode in the CLI.

14. Set the root password. For example:

    ```
    user@switch# set system root-authentication plain-text-password
    ```

15. At the following prompt, enter the new root password. For example:

    ```
    New password: test1
    Retype new password:
    ```

16. At the second prompt, reenter the new root password.

17. After you have finished configuring the password, commit the configuration.

    ```
    root@host# commit
    commit complete
    ```

18. Exit configuration mode in the CLI.

19. Exit operational mode in the CLI.

20. At the prompt, enter **y** to reboot the device.

    ```
    Reboot the system? [y/n] y
    ```

Related Documentation

- *Configuring the Root Password*

Example: Changing the Requirements for Junos OS Plain-Text Passwords

This example shows how to set various maximum and minimum requirements for plain-text passwords to increase password strength.

- Requirements on page 137
- Overview on page 137
- Configuration on page 137

Copyright © 2016, Juniper Networks, Inc.

Requirements

This example requires a device running Junos 12.2 or greater. The **minimum-length** and **maximum-length** password requirements statements are available in earlier releases, however, you must have Junos OS Release 12.2 or greater to configure **minimum-lower-cases**, **minimum-numerics**, **minimum-punctuations**, or **minimum-upper-cases**.

Overview

You can use a variety of requirements to strengthen plain-text passwords for greater security. Junos OS provides a number of possible configurations at the **[edit system login password]** hierarchy level that allow you to require users to create plain-text passwords that conform to a particular set of requirements that may include such things as length, number of changes, type of characters, numbers, or letter case.

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the **[edit]** hierarchy level.

```
set system login password minimum-length 12
set system login password maximum-length 22
set system login password minimum-numerics 1
set system login password minimum-upper-cases 1
set system login password minimum-lower-cases 1
set system login password minimum-punctuations 1
```

Configuring Requirements for Plain-Text Passwords

Step-by-Step Procedure

This example configures password requirements that require the user to creat a password that has a minimum length of 12 characters, a maximum length of 22 characters, and that includes at least one lower-case letter, at least one upper-case letter, at least one punctuation character, and at least one numeric character.

1. Navigate to configuration mode in the [system login password] hierarchy level.

   ```
   user@host> edit
   [edit]
   user@host# edit system login password
   ```

2. Set a minimum length requirement of 12 characters and a maximum length requirement of 22 characters for user passwords.

   ```
   [edit system login password]
   user@host# set minimum-length 12
   [edit system login password]
   user@host# set maximum-length 22
   ```

3. Require users to set a password that has at least one lower-case letter and at least one upper-case letter.

   ```
   [edit system login password]
   ```

```
user@host# set minimum-lower-cases 1
[edit system login password]
user@host# set minimum-upper-cases 1
```

4. Require users to set a password that has at least one punctuation-class character and at least one number.

```
[edit system login password]
user@host# set minimum-punctuations 1
[edit system login password]
user@host# set minimum-numerics 1
```

Results

From configuration mode, confirm your configuration by entering the show command at the edit system login password hierarchy level. if the output does not display the intended configuration, repeat the instructions in this example to correct the configuration.

```
[edit system login password]
user@host# show
minimum-length 12;
maximum-length 22;
minimum-numerics 1;
minimum-upper-cases 1;
minimum-lower-cases 1;
```

Related Documentation

- *Special Requirements for Junos OS Plain-Text Passwords*
- *password (Login)*

Copyright © 2016, Juniper Networks, Inc.

PART 12

RADIUS and TACACS+ System Accounting

- Understanding RADIUS and TACACS+ System Accounting on page 141

Copyright © 2016, Juniper Networks, Inc.

CHAPTER 12

Understanding RADIUS and TACACS+ System Accounting

- Configuring RADIUS System Accounting on page 141
- Configuring TACACS+ System Accounting on page 144

Configuring RADIUS System Accounting

With RADIUS accounting enabled, Juniper Networks routers or switches, acting as RADIUS clients, can notify the RADIUS server about user activities such as software logins, configuration changes, and interactive commands. The framework for RADIUS accounting is described in RFC 2866.

Tasks for configuring RADIUS system accounting are:

1. Configuring Auditing of User Events on a RADIUS Server on page 141
2. Specifying RADIUS Server Accounting and Auditing Events on page 142
3. Configuring RADIUS Server Accounting on page 142

Configuring Auditing of User Events on a RADIUS Server

To audit user events, include the following statements at the **[edit system accounting]** hierarchy level:

```
[edit system accounting]
destination {
  radius {
    server {
      server-address {
        accounting-port port-number;
        max-outstanding-requests value;
        port port-number;
        retry value;
        secret password;
        source-address address;
        timeout seconds;
      }
    }
  }
}
```

Specifying RADIUS Server Accounting and Auditing Events

To specify the events you want to audit when using a RADIUS server for authentication, include the **events** statement at the **[edit system accounting]** hierarchy level:

```
[edit system accounting]
events [ events ];
```

events is one or more of the following:

- **login**—Audit logins
- **change-log**—Audit configuration changes
- **interactive-commands**—Audit interactive commands (any command-line input)

Configuring RADIUS Server Accounting

To configure RADIUS server accounting, include the **server** statement at the **[edit system accounting destination radius]** hierarchy level:

```
server {
  server-address {
     accounting-port port-number;
     max-outstanding-requests value;
     port port-number;
     retry value;
     secret password;
     source-address address;
     timeout seconds;
  }
}
```

server-address specifies the address of the RADIUS server. To configure multiple RADIUS servers, include multiple **server** statements.

NOTE: If no RADIUS servers are configured at the **[edit system accounting destination radius]** statement hierarchy level, the Junos OS uses the RADIUS servers configured at the **[edit system radius-server]** hierarchy level.

accounting-port *port-number* specifies the RADIUS server accounting port number.

The default port number is 1813.

NOTE: If you enable RADIUS accounting at the **[edit access profile *profile-name* accounting-order]** hierarchy level, accounting is triggered on the default port of 1813 even if you do not specify a value for the **accounting-port** statement.

You must specify a secret (password) that the local router or switch passes to the RADIUS client by including the **secret** statement. If the password contains spaces, enclose the entire password in quotation marks (" ").

Copyright © 2016, Juniper Networks, Inc.

In the **source-address** statement, specify a source address for the RADIUS server. Each RADIUS request sent to a RADIUS server uses the specified source address. The source address is a valid IPv4 address (in case if radius-server address is IPv4) or IPv6 address (in case if radius-server address is IPv6) configured on one of the router or switch interfaces.

Optionally, you can specify the number of times that the router or switch attempts to contact a RADIUS authentication server by including the **retry** statement. By default, the router or switch retries three times. You can configure the router or switch to retry from 1 through 10 times.

Optionally, you can specify the length of time that the local router or switch waits to receive a response from a RADIUS server by including the **timeout** statement. By default, the router or switch waits 3 seconds. You can configure the timeout to be from 1 through 90 seconds.

If you use the **enhanced-accounting** statement at the **[edit system radius-options]** hierarchy level, the RADIUS attributes such as access method, remote port, and access privileges can be audited. You can limit the number of attribute values to be displayed for auditing by using the **enhanced-avs-max** *<number>* statement at the **[edit system accounting]** hierarchy level.

```
[edit system radius-options]
enhanced-accounting;
```

```
[edit system accounting]
enhanced-avs-max <number>;
```

When a Juniper Networks router or switch is configured with RADIUS accounting, it sends **Accounting-Start** and **Accounting-Stop** messages to the RADIUS server. These messages contain information about user activities such as software logins, configuration changes, and interactive commands. This information is typically used for monitoring a network, collecting usage statistics, and ensuring that users are billed properly.

The following example shows three servers (10.5.5.5, 10.6.6.6, and 10.7.7.7) configured for RADIUS accounting:

```
system {
  accounting {
    events [ login change-log interactive-commands ];
    destination {
      radius {
        server {
          10.5.5.5 {
            accounting-port 3333;
            secret $ABC123;
            source-address 10.1.1.1;
            retry 3;
            timeout 3;
          }
          10.6.6.6 secret $ABC123;
          10.7.7.7 secret $ABC123;
        }
      }
```

```
        }
      }
    }
```

Configuring TACACS+ System Accounting

You can use TACACS+ to track and log software logins, configuration changes, and interactive commands. To audit these events, include the following statements at the **[edit system accounting]** hierarchy level:

```
[edit system accounting]
events [ events ];
destination {
  tacplus {
    server {
      server-address {
        port port-number;
        secret password;
        single-connection;
        timeout seconds;
      }
    }
  }
}
```

Tasks for configuring TACACS+ system accounting are:

1. Specifying TACACS+ Auditing and Accounting Events on page 144
2. Configuring TACACS+ Server Accounting on page 144

Specifying TACACS+ Auditing and Accounting Events

To specify the events you want to audit when using a TACACS+ server for authentication, include the **events** statement at the **[edit system accounting]** hierarchy level:

```
[edit system accounting]
events [ events ];
```

events is one or more of the following:

- **login**—Audit logins
- **change-log**—Audit configuration changes
- **interactive-commands**—Audit interactive commands (any command-line input)

Configuring TACACS+ Server Accounting

To configure TACACS+ server accounting, include the **server** statement at the **[edit system accounting destination tacplus]** hierarchy level:

```
[edit system accounting destination tacplus]
server {
  server-address {
    port port-number;
    secret password;
```


Copyright © 2016, Juniper Networks, Inc.

```
        single-connection;
        timeout seconds;
      }
    }
```

server-address specifies the address of the TACACS+ server. To configure multiple TACACS+ servers, include multiple **server** statements.

NOTE: If no TACACS+ servers are configured at the **[edit system accounting destination tacplus]** statement hierarchy level, Junos OS uses the TACACS+ servers configured at the **[edit system tacplus-server]** hierarchy level.

port-number specifies the TACACS+ server port number.

You must specify a secret (password) by using the **secret** statement. The local router or switch passes the **secret** to the TACACS+ client. If the password contains spaces, enclose the entire password in quotation marks (“ ”). The password used by the local router or switch must match that used by the server.

Optionally, you can specify the length of time that the local router or switch waits to receive a response from a TACACS+ server by including the **timeout** statement. By default, the router or switch waits 3 seconds. You can configure this to be a value in the range from 1 through 90 seconds.

Optionally, you can maintain one open TCP connection to the server for multiple requests, rather than opening a connection for each connection attempt, by including the **single-connection** statement.

To ensure that start and stop requests for accounting of login events are correctly logged in the Accounting file instead of the Administration log file on a TACACS+ server, include either the **no-cmd-attribute-value** statement or the **exclude-cmd-attribute** at the **[edit system tacplus-options]** hierarchy level.

If you use the **no-cmd-attribute-value** statement, the value of the **cmd** attribute is set to a null string in the start and stop requests. If you use the **exclude-cmd-attribute** statement, the **cmd** attribute is totally excluded from the start and stop requests. Both statements support the correct logging of accounting requests in the Accounting file, instead of the Administration file.

```
[edit system tacplus-options]
(no-cmd-attribute-value | exclude-cmd-attribute);
```

Related Documentation

- *Configuring TACACS+ Authentication (QFX Series)*

Copyright © 2016, Juniper Networks, Inc.

PART 13

Recovery Installation

- Understanding Recovery Installation on page 149

Copyright © 2016, Juniper Networks, Inc.

CHAPTER 13

Understanding Recovery Installation

- Creating an Emergency Boot Device on page 149
- Creating a Snapshot and Using It to Boot a Device on page 150
- Performing a Recovery Installation Using an Emergency Boot Device on page 153
- Recovering from a Failed Software Installation on page 154

Creating an Emergency Boot Device

If Junos OS on the device is damaged in some way that prevents the software from loading properly, you can use an emergency boot device to repartition the primary disk and load a fresh installation of Junos OS. Use the following procedure to create an emergency boot device.

Before you begin, you need to download the installation media image for your device and Junos OS release from http://www.juniper.net/customers/support/ .

NOTE: You can create the emergency boot device on another Juniper Networks switch or router, or any PC or laptop that supports Linux. The steps you take to create the emergency boot device vary, depending on the device.

To create an emergency boot device:

1. Use FTP to copy the installation media image into the **/var/tmp** directory on the device.
2. Insert a USB device into the USB port.
3. From the Junos OS command-line interface (CLI), start the shell:

   ```
   user@device> start shell
   %
   ```

4. Switch to the root account using the **su** command:

   ```
   % su
   Password: password
   ```

   NOTE: The password is the root password for the device. If you logged in to the device as root, you do not need to perform this step.

5. Enter the following command on the device:

   root@device% **dd if=/var/tmp/*filename* of=/dev/da1 bs=16k**

   The device writes the installation media image to the USB device:

```
root@device% dd if=install-media-qfx-5e-15.1X53-D30.5-domestic.imgof=/dev/da0
 bs=1m
1399+0 records in
1399+0 records out
1466957824 bytes transferred in 394.081902 secs (3722469 bytes/sec)
```

6. Enter the following command:

   root@device% **dd if=/var/tmp/*filename* of=/dev/da0 bs=1048576**

   The device writes the installation media image to the USB device:

```
root@device% dd if=/var/tmp/jinstall-vjunos-usb-13.2.img of=/dev/da0 bs=1048576
11006+1 records in
11006+1 records out
180332544 bytes transferred in 71.764266 secs (2512846 bytes/sec)
```

   NOTE: The device automatically create a recovery Junos OS image.

   The "Select a recovery image" menu appears on the console when one of these switches is booted and unable to load a version of Junos OS. You can follow the instructions in the "Select a recovery image" menu to load the Junos OS image for one of these switches.

7. Log out of the shell:

```
root@device% exit
% exit
user@device>
```

Related Documentation

- *USB Port Specifications for the QFX Series*
- *Performing a Recovery Installation*
- *Performing a QFabric System Recovery Installation on the Director Group*
- Performing a Recovery Installation Using an Emergency Boot Device on page 153

Creating a Snapshot and Using It to Boot a Device

The system snapshot feature takes a "snapshot" of the files currently used to run the device—the complete contents of the **/config** directories, which include the running Juniper Networks Junos OS, the active configuration, and the rescue configuration, as well as the host OS—and copies all of these files into an external USB flash drive.

You can use the snapshot to boot the device at the next bootup or as a backup boot option.

The system snapshot feature is especially effective as a bootup option after a partition corruption, as it is the only recovery option that allows you to completely restore the Junos OS and configuration in the event of a corrupted partition on a switch.

 Copyright © 2016, Juniper Networks, Inc.

NOTE: System snapshot is not supported on QFX10000 switches.

This topic includes the following tasks:

- Creating a Snapshot on an External USB Flash Drive and Using It to Boot the Device on page 151

Creating a Snapshot on an External USB Flash Drive and Using It to Boot the Device

A snapshot can be created on an external USB flash drive after a device is booted using files stored in internal memory.

Ensure that you have the following tools and parts available before creating a snapshot on an external USB flash drive:

- An external USB flash drive that meets the device USB port specifications. See *USB Port Specifications for the QFX Series*.

To create a snapshot on the external USB flash drive and use it to boot the device:

1. Insert the external USB flash drive.
2. Issue the **request system snapshot** command.

   ```
   user@device> request system snapshot
   fpc0:
   --------------------------------------------------------------------------
   Starting snapshot to usb (/dev/da0)
   Creating snapshot on the host ..
   Copying bootable disk image from host ..
   Writing to usb (/dev/da0) ..
   Copying 'Host OS' to '/dev/da0s1' .. (this may take a few minutes)
   Copying 'JUNOS' to '/dev/da0s1' .. (this may take a few minutes)
   The following filesystems were archived: / /config Host-OS
   ```

3. (Optional) Perform this step if you want to boot the device now using the snapshot stored on the external USB flash drive. If you created the snapshot as a backup, do not perform this step.

   - Insert the external USB flash drive.
   - Power cycle the device.

     The external USB flash drive is detected.
   - The software prompts you with the following options:

     ```
     Junos Snapshot Installer - (c) Juniper Networks 2013
     Reboot
     Install Junos Snapshot [13.2-20131115_x_132_x51_vjunos.0
     Boot to host shell [debug]
     ```
   - Select **Install Junos Snapshot** to install the snapshot located on the external USB flash drive to the device.

     The device copies the software from the external USB flash drive, occasionally displaying status messages. When the software is finished being copied from the

external USB flash drive to the device, the device then reboots from the internal flash storage on which the software was just installed. When the reboot is complete, the device displays the Junos OS login prompt:

```
root@device#
```

Related Documentation

- *Verifying That a System Snapshot Was Created on a QFX Series Switch*
- Understanding System Snapshot on page 177

Copyright © 2016, Juniper Networks, Inc.

Performing a Recovery Installation Using an Emergency Boot Device

If Junos OS on your device is damaged in some way that prevents the software from loading correctly, you may need to perform a recovery installation using an emergency boot device (for example, a USB flash drive) to restore the default factory installation. Once you have recovered the software, you need to restore the device configuration. You can either create a new configuration as you did when the device was shipped from the factory, or if you saved the previous configuration, you can simply restore that file to the device.

If at all possible, you should try to perform the following steps before you perform the recovery installation:

1. Ensure that you have an emergency boot device to use during the installation. See "Creating an Emergency Boot Device" on page 149 for information on how to create an emergency boot device.
2. Copy the existing configuration in the file **/config/juniper.conf.gz** from the device to a remote system, such as a server, or to an emergency boot device. For extra safety, you can also copy the backup configurations (the files named **/config/juniper.conf.*n***, where *n* is a number from 0 through 9) to a remote system or to an emergency boot device.

   You can use the system snapshot feature to complete this step. The system snapshot feature takes a "snapshot" of the files currently used to run the QFX Series switch—the complete contents of the **/config** and **/var** directories, which include the running Juniper Networks Junos OS, the active configuration, and the rescue configuration—and copies all of these files into a memory source. See "Creating a Snapshot and Using It to Boot a Device" on page 150.

   NOTE: **System snapshot is not supported on the QFX10000 and QFX5200 switches.**

   WARNING: **The recovery installation process completely overwrites the entire contents of the internal flash storage.**

3. Copy any other stored files to a remote system as desired.

To reinstall Junos OS:

1. Insert the emergency boot device into the device.
2. Power cycle the device.

   The emergency boot device is detected. At this time, you can load the Junos OS from the emergency boot device onto the internal flash storage.
3. The software prompts you with the following option if you have a snapshot saved on the emergency boot device:

```
Junos Snapshot Installer - (c) Juniper Networks 2013
          Reboot
          Install Junos Snapshot [14.1X53-D11_vjunos.61]
          Boot to host shell [debug]
```

Select **Install Junos Snapshot** install the snapshot.

The software prompts you with the following option if you have Junos OS software from the factory installed on the emergency boot device.

```
Juniper Linux Installer - (c) Juniper Networks 2014
            Reboot
            Install Juniper Linux Platform
            Boot to host shell [debug]
```

Select **Install Juniper Linux Platform** to install the Junos OS software from the emergency boot device.

4. The device copies the software from the emergency boot device, occasionally displaying status messages. Copying the software can take up to 12 minutes.

   When the software is finished being copied from the emergency device to the device, the device reboots from the internal flash storage on which the software was just installed. When the reboot is complete, the device displays the Junos OS login prompt:

   ```
   root@switch#
   ```

5. Create a new configuration as you did when the device was shipped from the factory, or restore the previously saved configuration file to the device.

6. Remove the emergency boot device.

Related Documentation

- Creating an Emergency Boot Device on page 149

Recovering from a Failed Software Installation

Problem

Description: If the Junos OS appears to have been installed but the CLI does not work, or if the switch has no software installed, you can use this recovery installation procedure to install the Junos OS.

Solution

If a Junos OS image already exists on the switch, you can either install the new Junos OS package in a separate partition, in which case both Junos OS images remain on the switch, or you can remove the existing Junos OS image before you start the new installation process.

Copyright © 2016, Juniper Networks, Inc.

NOTE: QFX5100, EX4600, and OCX Series switches do not have a separate partition to reinstall a Junos OS image.

A recovery image is created automatically on these switches. If a previously-running switch is powered on and unable to boot using a Junos OS image, you can boot the switch using the recovery Junos OS image by selecting an option in the "Select a recovery image" menu.

We suggest creating a system snapshot on your switch onto the external USB flash drive, and using the snapshot for recovery purposes. The system snapshot feature takes a "snapshot" of the files currently used to run the device—the complete contents of the **/config** directories, which include the running Juniper Networks Junos OS, the active configuration, and the rescue configuration, as well as the host OS—and copies all of these files into an external USB flash drive. See *Creating a Snapshot and Using It to Boot a QFX3500 and QFX3600 Switch* or "Creating a Snapshot and Using It to Boot a Device" on page 150.

System snapshot is not supported on QFX10002 switches.

To perform a recovery installation:

1. Power on the switch. The loader script starts.
2. After the message **Loading /boot/defaults/loader.conf** appears, you are prompted with the following message:

   Hit [Enter] to boot immediately, or space bar for command prompt.

   Press the Spacebar to enter the manual loader. The **loader>** prompt appears.

   NOTE: The loader prompt does not appear on QFX5100, QFX5200, EX4600, and OCX Series switches.

   On QFX5100, QFX5200, EX4600, and OCX Series switches only, a recovery image is automatically saved if a previously-running switch is powered on and unable to boot using a Junos OS image.

   The "Select a recovery image" menu appears on the console when one of these switches is booted and unable to load a version of Junos OS. Follow the instructions in the "Select a recovery image" menu to load the recovery version of Junos OS for one of these switches.

   You can ignore the remainder of this procedure if you are using a QFX5100, QFX5200, EX4600, or OCX Series switch.

3. Enter the following command:

   `loader>` **install [– –format] [– –external]** ***source***

where:

- **format**—Enables you to erase the installation media before installing the installation package. If you do not include this option, the system installs the new Junos OS in a different partition from that of the most recently installed Junos OS.
- **external**—Installs the installation package onto external media (a USB stick, for example).
- ***source***—Represents the name and location of the Junos OS package, either on a server on the network or as a file on an external media, as shown in the following two examples:
  - Network address of the server and the path on the server; for example, **tftp://192.17.1.28/junos/jinstall-qfx-5e-flex-15.1X53-D30.5-domestic-signed.tgz**
  - Junos OS package on a USB device (commonly stored in the root drive as the only file), for example, **file:///jinstall-qfx-5e-flex-15.1X53-D30.5-domestic-signed.tgz**).

The installation now proceeds normally and ends with a login prompt.

Related Documentation

- *Creating a Snapshot and Using It to Boot a QFX3500 and QFX3600 Switch*
- Creating a Snapshot and Using It to Boot a Device on page 150

Copyright © 2016, Juniper Networks, Inc.

PART 14

Routine Monitoring

- Understanding Routine Monitoring on page 159

Copyright © 2016, Juniper Networks, Inc.

CHAPTER 14

Understanding Routine Monitoring

- Monitoring System Process Information on page 159
- Monitoring System Properties on page 160
- Monitoring Interface Status and Traffic on page 161
- Other Tools to Configure and Monitor Devices Running Junos OS on page 162

Monitoring System Process Information

Purpose View the processes running on the device.

Action To view the software processes running on the device:

[edit system]

user@switch> **show system processes**

Meaning Table 12 on page 159 summarizes the output fields in the system process information display.

The display includes the total CPU load and total memory utilization.

Table 12: Summary of System Process Information Output Fields

Field	Values
PID	Identifier of the process.
Name	Owner of the process.
State	Current state of the process.
CPU Load	Percentage of the CPU that is being used by the process.
Memory Utilization	Amount of memory that is being used by the process.
Start Time	Time of day when the process started.

Copyright © 2016, Juniper Networks, Inc.

Related Documentation

- Monitoring System Properties on page 160
- show system uptime on page 1123

Monitoring System Properties

Purpose View system properties such as the name, IP address, and resource usage.

Action To monitor system properties in the CLI, enter the following commands:

- show system uptime
- show system users
- show system storage

Meaning Table 13 on page 160 summarizes key output fields in the system properties display.

Table 13: Summary of Key System Properties Output Fields

Field	Values	Additional Information
General Information		
Serial Number	Serial number of device.	
Junos OS Version	Version of Junos OS active on the switch, including whether the software is for domestic or export use.	Export software is for use outside the USA and Canada.
Hostname	Name of the device.	
IP Address	IP address of the device.	
Loopback Address	Loopback address.	
Domain Name Server	Address of the domain name server.	
Time Zone	Time zone on the device.	
Time		
Current Time	Current system time, in Coordinated Universal Time (UTC).	
System Booted Time	Date and time when the device was last booted and how long it has been running.	
Protocol Started Time	Date and time when the protocols were last started and how long they have been running.	

Copyright © 2016, Juniper Networks, Inc.

Table 13: Summary of Key System Properties Output Fields *(continued)*

Field	Values	Additional Information
Last Configured Time	Date and time when a configuration was last committed. This field also shows the name of the user who issued the last **commit** command.	
Load Average	CPU load average for 1, 5, and 15 minutes.	
Storage Media		
Internal Flash Memory	Usage details of internal flash memory.	
External Flash Memory	Usage details of external USB flash memory.	
Logged in Users Details		
User	Username of any user logged in to the switch.	
Terminal	Terminal through which the user is logged in.	
From	System from which the user has logged in. A hyphen indicates that the user is logged in through the console.	
Login Time	Time when the user logged in.	This is the **user@switch** field in **show system users** command output.
Idle Time	How long the user has been idle.	

Related Documentation

- Monitoring System Process Information on page 159
- **show system processes on page 1035**

Monitoring Interface Status and Traffic

Purpose View interface status to monitor interface bandwidth utilization and traffic statistics.

Action

- To view interface status for all the interfaces, enter ***show interfaces xe***.
- To view status and statistics for a specific interface, enter ***show interfaces xe interface-name***.
- To view status and traffic statistics for all interfaces, enter either ***show interfaces xe*** **detail** or ***show interfaces xe*** **extensive**.

Meaning For details about output from the CLI commands, see *show interfaces xe*.

Other Tools to Configure and Monitor Devices Running Junos OS

Apart from the command-line interface, Junos OS also supports the following applications, scripts, and utilities that enable you to configure and monitor devices running Junos OS:

- Junos XML Management Protocol Application Programming Interface (API)—Application programmers can use the Junos XML Management Protocol API to monitor and configure Juniper Networks devices. Juniper Networks provides a Perl module with the API to help you more quickly and easily develop custom Perl scripts for configuring and monitoring the devices.
- NETCONF Application Programming Interface (API)—Application programmers can also use the NETCONF API to monitor and configure Juniper Networks devices.
- Junos OS commit scripts—You can define scripts to enforce custom configuration tasks, enforce consistency, prevent common mistakes, and more. Every time you commit a new candidate configuration, the active commit scripts are called to inspect the new candidate configuration. If a configuration violates your custom rules, the script can instruct the Junos OS to perform various actions, including making changes to the configuration and generating custom, warning, and system log messages.
- Junos OS Op scripts—You can add your own commands to the operation-mode CLI. You can use these scripts to automate troubleshooting of known network problems and correct them.
- Junos OS event scripts—You can use event scripts to diagnose and fix issues, monitor the overall status of the system, and examine errors periodically. Event scripts are similar to op scripts except that certain events on the switch will trigger these scripts.
- CHEF—You can use CHEF automate the provisioning and management of compute, networking, and storage resources. Chef for Junos OS provides support for Chef on selected Junos OS devices, allowing you to automate common switching network configurations.
- Puppet—You can use PUPPET for configuration management. Puppet provides an efficient and scalable solution for managing the configurations of large numbers of devices. System administrators take advantage of Puppet to manage compute resources such as physical and virtual servers.

Related Documentation

- CLI User Interface Overview on page 37
- *NETCONF XML Management Protocol Developer Guide*
- *Understanding Device and Network Management Features*

 Copyright © 2016, Juniper Networks, Inc.

PART 15

Standard Software Installation and Upgrade

- Understanding Standard Software Installation and Upgrade on page 165

Copyright © 2016, Juniper Networks, Inc.

CHAPTER 15

Understanding Standard Software Installation and Upgrade

- Junos OS Package Names on page 165
- Software Installation Overview on page 166
- Creating an Emergency Boot Device on page 166
- Upgrading Software on page 168

Junos OS Package Names

You upgrade the Juniper Networks Junos OS on the switch by copying a software package to your switch or another system on your local network and then installing the new software package on the switch.

A software package name is in the following format:

NOTE: A signed domestic package is used as an example only. Other types of software packages might be available in future releases.

***package-name-m.nZx.y*-domestic-signed.tgz**

where:

- ***package-name*** is the name of the package—for example, **jinstall-qfx**.
- ***m.n*** is the software release, with ***m*** representing the major release number and ***n*** representing the minor release number—for example, **15.1**.
- ***Z*** indicates the type of software release, where **R** indicates released software and **B** indicates beta-level software.
- ***x.y*** represents the maintenance software release, with ***x*** representing the maintenance software release number and ***y*** representing the maintenance software spin number—for example, **1.5**.

A sample switch software package name is:

```
jinstall-qfx-5e-flex-15.1X53-D30.5-domestic-signed.tgz
```

Copyright © 2016, Juniper Networks, Inc.

NOTE: The image in the .tgz file is not automatically cleaned up after the image is successfully installed. If necessary, you can free up the storage space by using the **request system storage cleanup** command.

Related Documentation

- Upgrading Software on page 168
- *Installing and Recovering Software Using the Open Network Install Environment (ONIE)*
- *Upgrading Software on a QFabric System*
- Software Installation Overview on page 166

Software Installation Overview

A device is delivered with the Junos OS preinstalled. As new features and software fixes become available, you can upgrade your software to use them.

When you power on the switch, it starts (boots) using the installed software.

You upgrade the Junos OS on a switch by copying a software package to a switch or other system on your local network and then using the CLI to install the new software on the switch. You then reboot the switch, which boots from the upgraded software. After a successful upgrade, you should back up the new current configuration to a secondary device.

During a successful upgrade, the installation package removes all files from the **/var/tmp** directory of the switch and completely reinstalls the existing software. It retains configuration files, and similar information, such as secure shell and host keys, from the previous version. The previous software package is preserved in a separate disk partition, and you can manually revert to it if necessary. If the software installation fails for any reason, such as loss of power during the installation process, the system returns to the originally active installation when you reboot.

If you encounter any difficulties during software installation or an upgrade, you can use the recovery installation procedure to install the Junos OS on the switch.

Related Documentation

- Upgrading Software on page 168
- Recovering from a Failed Software Installation on page 154
- *Performing a Recovery Installation*

Creating an Emergency Boot Device

If Junos OS on the device is damaged in some way that prevents the software from loading properly, you can use an emergency boot device to repartition the primary disk and load a fresh installation of Junos OS. Use the following procedure to create an emergency boot device.

Copyright © 2016, Juniper Networks, Inc.

Before you begin, you need to download the installation media image for your device and Junos OS release from http://www.juniper.net/customers/support/ .

NOTE: You can create the emergency boot device on another Juniper Networks switch or router, or any PC or laptop that supports Linux. The steps you take to create the emergency boot device vary, depending on the device.

To create an emergency boot device:

1. Use FTP to copy the installation media image into the **/var/tmp** directory on the device.
2. Insert a USB device into the USB port.
3. From the Junos OS command-line interface (CLI), start the shell:

   ```
   user@device> start shell
   %
   ```

4. Switch to the root account using the **su** command:

   ```
   % su
   Password: password
   ```

   NOTE: The password is the root password for the device. If you logged in to the device as root, you do not need to perform this step.

5. Enter the following command on the device:

   `root@device%` **dd if=/var/tmp/*filename* of=/dev/da1 bs=16k**

   The device writes the installation media image to the USB device:

   ```
   root@device% dd if=install-media-qfx-5e-15.1X53-D30.5-domestic.imgof=/dev/da0
    bs=1m
   1399+0 records in
   1399+0 records out
   1466957824 bytes transferred in 394.081902 secs (3722469 bytes/sec)
   ```

6. Enter the following command:

   `root@device%` **dd if=/var/tmp/*filename* of=/dev/da0 bs=1048576**

   The device writes the installation media image to the USB device:

   ```
   root@device% dd if=/var/tmp/jinstall-vjunos-usb-13.2.img of=/dev/da0 bs=1048576
   11006+1 records in
   11006+1 records out
   180332544 bytes transferred in 71.764266 secs (2512846 bytes/sec)
   ```

NOTE: The device automatically create a recovery Junos OS image.

The "Select a recovery image" menu appears on the console when one of these switches is booted and unable to load a version of Junos OS. You can follow the instructions in the "Select a recovery image" menu to load the Junos OS image for one of these switches.

7. Log out of the shell:

```
root@device% exit
% exit
user@device>
```

Related Documentation

- *USB Port Specifications for the QFX Series*
- *Performing a Recovery Installation*
- *Performing a QFabric System Recovery Installation on the Director Group*
- Performing a Recovery Installation Using an Emergency Boot Device on page 153

Upgrading Software

To upgrade Junos OS, you need to install the appropriate upgrade package on the device. Upgrading involves these tasks:

NOTE: If you want to use the Open Network Install Environment (ONIE) to install software, see *Installing and Recovering Software Using the Open Network Install Environment (ONIE)*.

1. Downloading Software Files with a Browser on page 169
2. Accessing Software Downloaded to a Remote Location on page 170
3. Connecting to the Console Port on page 170
4. Backing Up the Current Configuration Files on page 170
5. Installing a Standard Software Package on page 170
6. Installing a Standard Software Package on a QFX10008 Switch on page 172

Copyright © 2016, Juniper Networks, Inc.

Downloading Software Files with a Browser

To download the software package from the Juniper Networks Support website, go to http://www.juniper.net/support/ .

NOTE: To access the download site, you must have a service contract with Juniper Networks and an access account. If you need help obtaining an account, complete the registration form at the Juniper Networks website https://www.juniper.net/registration/Register.jsp .

This procedure shows you how to upgrade software on a QFX Series device, but you can follow the same procedure for any device unless otherwise specified.

1. Using a Web browser, navigate to the http://www.juniper.net/support .
2. Click **Download Software**.
3. In the **Switching** box, click **Junos OS Platforms**.
4. In the **QFX Series** section, click the name of the platform for which you want to download software.
5. Click the **Software** tab and select the release number from the **Release** drop-down list.
6. In the **Install Package** section of the **Software** tab, select the **Install Package** for the release.

   A login screen appears.
7. Enter your name and password and press **Enter**.
8. Read the End User License Agreement, click the **I agree** radio button, and then click **Proceed**.
9. Save the **jinstall-qfx-<*version*>-domestic-signed.tgz** file on your computer.
10. Open or save the installation package either to the local system in the **var/tmp** directory or to a remote location. If you are saving the installation package to a remote system, make sure that you can access it using HTTP, TFTP, FTP, or scp.

Copyright © 2016, Juniper Networks, Inc.

Accessing Software Downloaded to a Remote Location

To access the installation package if you downloaded it to a remote location (for example, any system other than the switch):

1. From the command line, make sure you are in the **/var/tmp** directory of the switch.
2. Start the shell interface:

   `user@switch>` **start shell**
3. Initiate an FTP, TFTP, or scp session.

   In this example, FTP is used.

   >**ftp**
4. Use FTP to access the remote location where the installation package resides.

   For example:

   ftp ftp://*<hostname>/<pathname>/<package-name-m.mZx-distribution>*.tgz.

   where *<package-name-m.mZx-distribution>*.tgz is jinstall-qfx-5e-flex-15.1X53-D30.5-domestic-signed.tgz
5. When prompted, enter your username and password.
6. Use the **get** command to transfer the installation package from the remote location to your **/var/tmp** directory on your switch.

   get *<package-name-m.mZx-distribution>*.tgz
7. Close the FTP session:

   bye

Connecting to the Console Port

We recommend that you connect to the console port while installing the installation package so you can respond to any required user input and detect any errors that may occur.

Backing Up the Current Configuration Files

Before you install the new installation package, we strongly recommend that you back up your current configuration files because the upgrade process removes all of the stored files on the switch.

To back up your current configuration files, enter the **save** command:

`user@switch#` **save *filename***

Executing this command saves a copy of your configuration files to a remote location such as an external USB device.

Installing a Standard Software Package

NOTE: **Before you install the software, back up any critical files in /var/home. For more information regarding how to back up critical files, contact Customer Support at** http://www.juniper.net/support.

Copyright © 2016, Juniper Networks, Inc.

NOTE: On QFX10000 switches, if you want to downgrade from Junos OS Release 15.1X53-D60 to a previous release, pay attention to these caveats:

Table 14: Caveats for Downgrading from Junos OS Release 15.1X53-D60 to Previous Software Releases

Junos OS Software Releases	Using the CLI	Using a USB Stick
15.1X53-D33	Yes, but the configuration is lost, and there is no workaround. We recommend that you save the configuration to an external location, such as a remote server, and then load the configuration after you have successfully downgraded.	Yes
15.1X53-D32	Yes, but the configuration is lost, and there is no workaround. We recommend that you save the configuration to an external location, such as a remote server, and then load the configuration after you have successfully downgraded. NOTE: You must downgrade to Junos OS Release 15.1X53-D33 before you downgrade to Junos OS Release 15.1X53-D30.	Yes, but you must downgrade to Junos OS Release 15.1X53-D33 before you downgrade to Junos OS Release 15.1X53-D32.
15.1X53-D30	No	Yes, but you must downgrade to Junos OS Release 15.1X53-D33 before you downgrade to Junos OS Release 15.1X53-D30.
Releases prior to 15.1X53-D30	No	Yes

Install the software in one of two ways:

NOTE: On the switch, use the **force-host** option to force installing the latest version of the Host OS. However, by default, if the Host OS version is different from the one that is already installed on the switch, the latest version is installed without using the **force-host** option.

If the installation package resides locally on the switch, execute the **request system software add** *<pathname><source>* **reboot** command.

For example:

```
user@switch> request system software add
/var/tmp/jinstall-qfx-5e-flex-15.1X53-D60-domestic.tgz reboot
```

If the Install Package resides remotely, execute the **request system software add** *<pathname><source>* **reboot** command.

For example:

```
user@switch> request system software add
ftp://ftpserver/directory/jinstall-qfx-5e-flex-15.1X53-D60-domestic.tgz reboot
```

After the reboot has finished, verify that the new version of software has been properly installed by executing the **show version** command.

```
user@switch> show version
```

Installing a Standard Software Package on a QFX10008 Switch

Copyright © 2016, Juniper Networks, Inc.

NOTE: Before you install the software, back up any critical files in **/var/home**. For more information regarding how to back up critical files, contact Customer Support at http://www.juniper.net/support.

NOTE: On the switch, use the **force-host** option to force-install the latest version of the Host OS. However, by default, if the Host OS version is different from the one that is already installed on the switch, the latest version is installed without using the **force-host** option.

NOTE: If you want to downgrade from Junos OS Release 15.1X53-D60 to a previous release, pay attention to these caveats:

Table 15: Caveats for Downgrading from Junos OS Release 15.1X53-D60 to Previous Software Releases

Junos OS Software Releases	Using the CLI	Using a USB Stick
15.1X53-D33	Yes, but the configuration is lost, and there is no workaround. We recommend that you save the configuration to an external location, such as a remote server, and then load the configuration after you have successfully downgraded.	Yes
15.1X53-D32	Yes, but the configuration is lost, and there is no workaround. We recommend that you save the configuration to an external location, such as a remote server, and then load the configuration after you have successfully downgraded. NOTE: You must downgrade to Junos OS Release 15.1X53-D33 before you downgrade to Junos OS Release 15.1X53-D30.	Yes, but you must downgrade to Junos OS Release 15.1X53-D33 before you downgrade to Junos OS Release 15.1X53-D32.
15.1X53-D30	No	Yes, but you must downgrade to Junos OS Release 15.1X53-D33 before you downgrade to Junos OS Release 15.1X53-D30.
Releases prior to 15.1X53-D30	No	Yes

The switch contains two routing engines, so you will need to install the software on each routing engine (re0 and re1).

If the installation package resides locally on the switch, execute the **request system software add <*pathname*><*source*> (re0 | re1)** command.

To install the software on re0:

```
user@switch> request system software add
/var/tmp/jinstall-qfx-10-m-flex-15.1X53-D60-secure-domestic-signed.tgz re0
```

If the Install Package resides remotely from the switch, execute the **request system software add <*pathname*><*source*> re0** command.

For example:

```
user@switch> request system software add
ftp://ftpserver/directory/jinstall-qfx-10-m-flex-15.1X53-D60-secure-domestic-signed.tgz re0
```

To install the software on re1:

```
user@switch> request system software add
/var/tmp/jinstall-qfx-10-m-flex-15.1X53-D60-secure-domestic-signed.tgz re1
```

If the Install Package resides remotely from the switch, execute the **request system software add <*pathname*><*source*> re1** command.

For example:

```
user@switch> request system software add
ftp://ftpserver/directory/jinstall-qfx-10-m-flex-15.1X53-D60-secure-domestic-signed.tgz re1
```

Reboot both routing engines.

For example:

```
user@switch> request system reboot both-routing-engines
```

After the reboot has finished, verify that the new version of software has been properly installed by executing the **show version** command.

```
user@switch> show version
```

Related Documentation

- *Installing and Recovering Software Using the Open Network Install Environment (ONIE)*
- Software Installation Overview on page 166
- Recovering from a Failed Software Installation on page 154
- *Upgrading Jloader Software on QFX Series Devices*
- **request system software add on page 1214**
- *Installation and Upgrade Guide*

Copyright © 2016, Juniper Networks, Inc.

PART 16

System Snapshot

- Understanding System Snapshot on page 177

Copyright © 2016, Juniper Networks, Inc.

CHAPTER 16

Understanding System Snapshot

- Understanding System Snapshot on page 177
- Creating a Snapshot and Using It to Boot a Device on page 178

Understanding System Snapshot

NOTE: On QFX3500 and QFX3600 switches running Enhanced Layer 2 Software, all of the directories that reside in the "/" partition are read only.

NOTE: System snapshot is not supported on QFX10002 switches.

You can create copies of the software running on a switch using the system snapshot feature. The system snapshot feature takes a "snapshot" of the files currently used to run the switch—the complete contents of the **/config** and **/var** directories, which include the running Junos OS, the active configuration, and the rescue configuration—and copies all of these files into an alternate (internal, meaning internal flash, or an external, meaning USB flash) memory source. You can then use this snapshot to boot the switch at the next boot up or as a backup boot option.

You can only use snapshots to move files to external memory if the switch was booted from internal memory, or to move files to internal memory if the switch was booted from external memory. You cannot create a snapshot in the memory source that booted the switch even if the snapshot is being created on a different partition in the same memory source.

Snapshots are particularly useful for moving files onto USB flash drives. You cannot use the **copy** command or any other file-moving technique to move files from an internal memory source to USB memory on the switch.

System snapshots on the switch have the following limitations:

- You cannot use snapshots to move files to any destination outside of the switch other than an installed external USB flash drive.
- Snapshot commands are always executed on a local switch.

Copyright © 2016, Juniper Networks, Inc.

Related Documentation

- *Creating a Snapshot and Using It to Boot a QFX3500 and QFX3600 Switch*

Creating a Snapshot and Using It to Boot a Device

The system snapshot feature takes a "snapshot" of the files currently used to run the device—the complete contents of the **/config** directories, which include the running Juniper Networks Junos OS, the active configuration, and the rescue configuration, as well as the host OS—and copies all of these files into an external USB flash drive.

You can use the snapshot to boot the device at the next bootup or as a backup boot option.

The system snapshot feature is especially effective as a bootup option after a partition corruption, as it is the only recovery option that allows you to completely restore the Junos OS and configuration in the event of a corrupted partition on a switch.

NOTE: **System snapshot is not supported on QFX10000 switches.**

This topic includes the following tasks:

- Creating a Snapshot on an External USB Flash Drive and Using It to Boot the Device on page 178

Creating a Snapshot on an External USB Flash Drive and Using It to Boot the Device

A snapshot can be created on an external USB flash drive after a device is booted using files stored in internal memory.

Ensure that you have the following tools and parts available before creating a snapshot on an external USB flash drive:

- An external USB flash drive that meets the device USB port specifications. See *USB Port Specifications for the QFX Series*.

To create a snapshot on the external USB flash drive and use it to boot the device:

1. Insert the external USB flash drive.
2. Issue the **request system snapshot** command.

```
user@device> request system snapshot
fpc0:
--------------------------------------------------------------------------
Starting snapshot to usb (/dev/da0)
Creating snapshot on the host ..
Copying bootable disk image from host ..
Writing to usb (/dev/da0) ..
Copying 'Host OS' to '/dev/da0s1' .. (this may take a few minutes)
Copying 'JUNOS' to '/dev/da0s1' .. (this may take a few minutes)
The following filesystems were archived: / /config Host-OS
```


Copyright © 2016, Juniper Networks, Inc.

3. (Optional) Perform this step if you want to boot the device now using the snapshot stored on the external USB flash drive. If you created the snapshot as a backup, do not perform this step.

   - Insert the external USB flash drive.
   - Power cycle the device.

     The external USB flash drive is detected.
   - The software prompts you with the following options:

     ```
     Junos Snapshot Installer - (c) Juniper Networks 2013
     Reboot
     Install Junos Snapshot [13.2-20131115_x_132_x51_vjunos.0
     Boot to host shell [debug]
     ```
   - Select **Install Junos Snapshot** to install the snapshot located on the external USB flash drive to the device.

     The device copies the software from the external USB flash drive, occasionally displaying status messages. When the software is finished being copied from the external USB flash drive to the device, the device then reboots from the internal flash storage on which the software was just installed. When the reboot is complete, the device displays the Junos OS login prompt:

     ```
     root@device#
     ```

Related Documentation

- *Verifying That a System Snapshot Was Created on a QFX Series Switch*
- Understanding System Snapshot on page 177

Copyright © 2016, Juniper Networks, Inc.

PART 17

Zero Touch Provisioning (ZTP)

- Understanding ZTP on page 183

Copyright © 2016, Juniper Networks, Inc.

CHAPTER 17

Understanding ZTP

- Understanding Zero Touch Provisioning on page 183
- Configuring Zero Touch Provisioning on page 190
- Monitoring Zero Touch Provisioning on page 195

Understanding Zero Touch Provisioning

- Understanding Zero Touch Provisioning on page 183
- Zero Touch Provisioning Process on page 185
- Zero Touch Provisioning Restart Process Triggers on page 188

Understanding Zero Touch Provisioning

NOTE: To see which platforms support Zero Touch Provisioning(ZTP) in a browser, go to Feature Explorer. In the **Explore Features** section of the Feature Explorer page, select **All Features**. In the **Features Grouped by Feature Family** box, select Zero Touch Provisioning. You can also type the name of the feature in the **Search for Features** edit box. In previous Junos OS releases on EX Series switches, ZTP was called EZ Touchless Provisioning.

NOTE: QFX5200 switches only work with HTTP in 15.1X53-D30. FTP and TFTP protocols are not supported.

ZTP allows you to provision new Juniper Networks switches in your network automatically, without manual intervention. When you physically connect a switch to the network and boot it with a default factory configuration, it attempts to upgrade the Junos OS software automatically and autoinstall a configuration file from the network.

The switch uses information that you configure on a Dynamic Host Configuration Protocol (DHCP) server to locate the necessary software image and configuration files on the network. If the DHCP server does not respond or provide the software image and configuration files, the switch boots with the preinstalled software and default factory configuration. On switches running Enhanced Layer 2 Software, Junos Extended Dynamic Host Configuration Protocol (JDHCP) is used instead of legacy DHCP. JDHCP supports

Copyright © 2016, Juniper Networks, Inc.

the same functionality as DHCP, and all configuration options remain the same. JDHCP is an enhanced version of legacy DHCP software.

NOTE: For detailed information regarding the DHCP and DHCP options, refer to RFC2131 (http://www.ietf.org/rfc/rfc2131.txt) and RFC2132 (www.ietf.org/rfc/rfc2132.txt). Also, this document refers to Internet Systems Consortium (ISC) DHCP version 4.2. For more information regarding this version, refer to http://www.isc.org/software/dhcp/documentation.

The Zero Touch Provisioning process will either upgrade or downgrade the Junos OS version. During a downgrade:

- On an EX Series switch, If you downgrade to a software version earlier than Junos OS Release 12.2, in which ZTP is not supported, the configuration file autoinstall phase of the Zero Touch Provisioning process does not happen.
- On an EX Series switch, to downgrade to a software version that does not support resilient dual-root partitions (Junos OS Release 10.4R2 or earlier), you must perform some manual work on the switch. For more information, see *Understanding Resilient Dual-Root Partitions on Switches*.

NOTE: On QFX3500 and QFX3600 switches running the original CLI, you cannot use ZTP to upgrade from Junos OS Release 12.2 or later to Junos OS Release 13.2X51-D15 or later.

Copyright © 2016, Juniper Networks, Inc.

Zero Touch Provisioning Process

When you boot a switch with the default factory configuration, the following process happens:

NOTE: If you are performing Zero Touch Provisioning (ZTP) with a Junos OS image that contains enhanced automation for the QFX5100 switch, configure root authentication, and the provider name, license type, and deployment scope for Chef and Puppet at the **[edit system]** hierarchy in the configuration file that is fetched from the server:

```
{master:0}
root# set root-authentication (encrypted-password password | plain-text-password
password | ssh-dsa public-key | ssh-rsa public-key)
root# set extensions providers juniper license-type customer deployment-scope
commercial
root# set extensions providers chef license-type customer deployment-scope
commercial
```

1. If DHCP option 43, suboption 00 (the name of the software image file on the FTP, HTTP, or TFTP server) is configured, the switch compares the version of the provided software image to the version of the software installed on the switch.

   NOTE: When the DHCP server cannot use suboption 00, configure the image file using suboption 04. If both suboption 00 and suboption 4 are defined, suboption 04 is ignored.

2. If DHCP option 43, suboption 02 (a symbolic link to the software image file on the FTP, HTTP, or TFTP server), the switch compares the version of the provided software image to the version of the software installed on the switch.

   - If the Junos OS versions are different, the switch downloads the software image from the FTP, HTTP, or TFTP server, installs the Junos OS, and reboots using the default factory configuration.
   - If the software versions are the same, the switch does not upgrade the software.

3. If DHCP option 43, suboption 01 (the name of the configuration file on the FTP, TFTP, or HTTP server) is configured:

   If DHCP option 43 suboption 01 is not specified, the switch uses the default factory configuration.

   If both DHCP option 43 suboption 01 and suboption 2 are specified, suboption 01 is processed before suboption 02. The Junos OS is upgraded, and then the configuration file is applied.

   NOTE: On EX4300 and QFX5100 switches running Enhanced Layer 2 Software, and QFX5100 switches running a Junos OS image that contains enhanced automation, you can specify the name of a script file or a configuration file in suboption 01. ZTP determines if the file is a script file based on the first line that is included in the file. If the first line contains

Copyright © 2016, Juniper Networks, Inc.

#! characters followed by an interpreter path—for example, #!/usr/libexec/ui/cscript—ZTP determines that the file is a script file, and executes the script file with the specified interpreter path. If the script returns an error, ZTP will fetch the script file and execute the script file until the script executes successfully. If the file does not contain special characters or an interpreter path, ZTP determines that the file is a configuration file.

4. If DHCP option 43, suboption 03 (the transfer mode setting) is configured, the switch accesses the FTP, HTTP, or TFTP server using the specified transfer mode setting—for example, FTP.

   If DHCP option 43, suboption 03, is not configured, TFTP becomes the transfer mode automatically.

5. If DHCP option 43, suboption 04 (the name of the software image file on the FTP, HTTP, or TFTP server) is configured, the switch compares the version of the provided software image to the version of the software installed on the switch.

   NOTE: When the DHCP server cannot use suboption 00, configure the image file using suboption 04. If both suboption 00 and suboption 4 are defined, suboption 04 is ignored.

   NOTE: DHCP option 43 suboptions 05 through 255 are reserved.

6. If DHCP option 150 or option 66 is specified, the IP address of the FTP, HTTP, or TFTP server is configured.

   NOTE: You must configure either option 150 or option 66. If you configure both option 150 and option 66, option 150 takes precedence, and option 66 is ignored. Also, make sure you specify an IP address, not a hostname, because name resolution is not supported.

7. (Optional) If DHCP option 7 is specified, you can configure one or more system log (syslog) servers.

Copyright © 2016, Juniper Networks, Inc.

8. (Optional) If DHCP option 42 is specified, you can configure one or more NTP servers.
9. (Optional) If DHCP option 12 is specified, you can configure the hostname of the switch.

Zero Touch Provisioning Restart Process Triggers

Copyright © 2016, Juniper Networks, Inc.

ZTP restarts when any of the following events occur:

- Request for configuration file, script file, or image file fails.
- Configuration file is incorrect, and commit fails.
- No configuration file and no image file is available.
- Image file is corrupted, and installation fails.
- No file server information is available.
- DHCP client does not have valid ZTP parameters configured.
- When none of the DHCP client interfaces goes to a bound state.
- ZTP transaction fails after six attempts to fetch configuration file or image file.

When any of these events occur, ZTP resets the DHCP client state machine on all of the DHCP client-configured interfaces (management and network) and then restarts the state machine. Restarting the state machine enables the DHCP client to get the latest DHCP server-configured parameters.

Before ZTP restarts, approximately 15 to 30 seconds must elapse to allow enough time to build a list of bound and unbound DHCP client interfaces.

The list of bound and unbound DHCP client interfaces can contain:

- No entries.
- Multiple DHCP client interfaces.

  Priority is given to the DHCP client interfaces that have received all ZTP parameters (software image file, configuration file, and file server information) from the DHCP server.

After the lists of bound and unbound client interfaces are created, and a DHCP client gets selected for ZTP activity, then any existing default route is deleted, and the DHCP client interface that was selected adds a new default route. In order to add a new default route, only one ZTP instance can be active.

After ZTP restarts, the DHCP client attempts fetching files from the DHCP server for up to six times, with ten to fifteen seconds elapsing between attempts. Every attempt, whether successful or not, is logged and can be seen on the console.

If there is a failure, or the number of attempts exceeds the limit, ZTP stops. ZTP then clears the DHCP client bindings and restarts state machine on the DHCP-configured interfaces.

The ZTP restart process continues until there is either a successful software upgrade, or an operator manually commits a user configuration and deletes the ZTP configuration.

Related Documentation

- Configuring Zero Touch Provisioning on page 190
- Monitoring Zero Touch Provisioning on page 195

Configuring Zero Touch Provisioning

NOTE: To see which platforms support Zero Touch Provisioning (ZTP), in a browser, go to Feature Explorer. In the **Explore Features** section of the Feature Explorer page, select **All Features**. In the **Features Grouped by Feature Family** box, select Zero Touch Provisioning. You can also type the name of the feature in the **Search for Features** edit box. In previous Junos OS releases on EX Series switches, Zero Touch Provisioning was called EZ Touchless Provisioning.

Zero Touch Provisioning allows you to provision new devices in your network automatically, without manual intervention. When you physically connect a device to the network and boot it with a default configuration, it attempts to upgrade the Junos OS software automatically and autoinstall a configuration file from the network.

The device uses information that you configure on a Dynamic Host Configuration Protocol (DHCP) server to locate the necessary software image and configuration files on the network. If the DHCP server does not respond or provide the software image and configuration files, the device continues using the preinstalled Junos OS software and default factory configuration. On switches running Enhanced Layer 2 Software, Junos Extended Dynamic Host Configuration Protocol (JDHCP) is used instead of legacy DHCP. JDHCP supports the same functionality as DHCP, and all configuration options remain the same. JDHCP is an enhanced version of legacy DHCP software. If you are performing Zero Touch Provisioning with a Junos OS image that contains enhanced automation for the QFX5100 switch, you can use DHCP option 43 suboption 01 to run script files, not just load configuration files. Using scripts, you can create device-specific configuration files, and perform HTTP request operations to web servers to download specific configuration files or Junos OS software.

NOTE: If the ZTP configuration is enabled, the switch broadcasts DHCP DISCOVER packets on its interfaces. If the DHCP server on the network responds with DHCP vendor options set with the necessary values to initiate ZTP, then ZTP proceeds. To disable broadcasting the DHCP DISCOVER packets without performing the ZTP process, manually delete the **auto-image-upgrade** statement located at the **[edit chassis]** hierarchy. If ZTP completes without errors, the **auto-image-upgrade** statement is automatically deleted.

Before you begin, ensure that the switch has access to the following network resources:

- A DHCP server to lease IP addresses and information on software images and configuration files on the network.

  Refer to your DHCP server documentation for configuration instructions.

- The File Transfer Protocol (anonymous FTP), Hypertext Transfer Protocol (HTTP), Trivial File Transfer Protocol (TFTP) server on which the software image and configuration files are stored

Copyright © 2016, Juniper Networks, Inc.

NOTE: Although TFTP is supported, we recommend that you use FTP or HTTP instead, because these transport protocols are more reliable.

- A Domain Name System (DNS) server to perform reverse DNS lookup
- (Optional) An NTP server to perform time synchronization on the network
- (Optional) A system log (syslog) server to manage system log messages and alerts

CAUTION: We recommend that you do not commit a user configuration while the device is performing ZTP activity—for example, updating the software image or applying a configuration file.

Perform the following steps to configure ZTP:

1. Boot the device.

   The device continues to use the preinstalled Junos OS software and default factory configuration.

2. Issue the **request system zeroize** command on the device.

3. Download the software image file and the configuration file to the FTP, HTTP, TFTP server that the device will download these files from.

   You can download either one or both of these files.

   NOTE: If you are performing Zero Touch Provisioning with a Junos OS image that contains enhanced automation for the QFX5100 device, configure root authentication, and the provider name, license type, and deployment scope for Chef and Puppet at the **[edit system]** hierarchy in the configuration file that is fetched from the server:

   ```
   {master:0}
   root#  set root-authentication (encrypted-password password |
   plain-text-password password | ssh-dsa public-key | ssh-rsa public-key)
   root#  set extensions providers juniper license-type customer deployment-scope
   commercial
   root#  set extensions providers chef license-type customer deployment-scope
   commercial
   ```

4. Configure the DHCP server to provide the necessary information to the device.

   Configure IP address assignment.

   You can configure dynamic or static IP address assignment for the device's management address. To determine the device's management MAC address for static IP address mapping, add 1 to the last byte of the device's MAC address, which you noted before you began this procedure.

5. Define the format of the vendor-specific information for DHCP option 43 in the dhcpd.conf file.

Here is an example of an ISC DHCP 4.2 server dhcpd.conf file:

```
option space NEW_OP; option;
  option NEW_OP.image-file-name code 0 = text;
  option NEW_OP.config-file-name code 1 = text;
  option NEW_OP.image-file-type code 2 = text;
  option NEW_OP.transfer-mode code 3 = text;
  option NEW_OP.alt-image-file-name code 4= text;
  option NEW_OP-encapsulation code 43 = encapsulate NEW_OP;
```

6. Configure the following DHCP option 43 suboptions:

   - Suboption 00: The name of the software image file to install

     NOTE: When the DHCP server cannot use suboption 00, configure the image file using suboption 04. If both suboption 00 and suboption 4 are defined, suboption 04 is ignored.

     ```
     option NEW_OP.image-file-name
       "/dist/images/jinstall-ex-4300-13.2R1.1-domestic-signed.tgz";
     ```

   - Suboption 01: The name of the configuration file to install

     NOTE: On EX4300 and QFX5100 devices running Enhanced Layer 2 Software, and QFX5100 devices running a Junos OS image that contains enhanced automation, you can specify the name of a script file or a configuration file. ZTP determines if the file is a script file based on the first line that is included in the file. If the first line contains #! characters followed by an interpreter path, ZTP determines that the file is a script file, and executes the script file with the specified interpreter path. In order for a script to execute, the script file must provide the ability to fetch and load a valid configuration file on the device during the ZTP process.

     The following list provides the types of scripts and their associated interpreter paths:

     - Shell script interpreter path: #!/bin/sh
     - SLAX script interpreter path: #!/usr/libexec/ui/cscript
     - Python script interpreter path: #!/usr/bin/python

       Unsigned Python scripts are only supported on limited platforms, such as the QFX5100 device. If you try to execute unsigned Python scripts on devices that do not provide support, error messages will be issued.

     If the file does not contain special characters (#!) , ZTP determines that the file is a configuration file and loads the configuration file.

     ```
     option NEW_OP.config-file-name "/dist/config/jn-switch35.config";
     ```


Copyright © 2016, Juniper Networks, Inc.

- Suboption 02: The symbolic link to the software image file to install

  option NEW_OP.image-file-type "symlink";

  NOTE: If you do not specify suboption 2, the Zero Touch Provisioning process handles the software image as a filename, not a symbolic link.

- Suboption 03: The transfer mode that the device uses to access the TFTP/FTP/HTTP server

  option NEW_OP.transfer-mode "ftp";

  NOTE: If suboption 03 is not configured, TFTP becomes the transfer mode by default.

- Suboption 04: The name of the software image file to install

  NOTE: When the DHCP server cannot use suboption 00, configure the image file using suboption 04. If both suboption 00 and suboption 4 are defined, suboption 04 is ignored.

  NOTE: DHCP option 43 suboptions 05 through 255 are reserved.

  option NEW_OP.alt-image-file-name "/dist/images/jinstall-ex-4300-13.2R1.1-domestic-signed.tgz";

7. NOTE: You must configure either option 150 or option 66. If you configure both option 150 and option 66, option 150 takes precedence, and option 66 is ignored. Also, make sure you specify an IP address, not a hostname, because name resolution is not supported.

   Configure DHCP option 150 to specify the IP address of the FTP, HTTP, or TFTP server.

   option option-150 code 150 "10.100.31.71";

8. Configure DHCP option 66 to specify the IP address of the FTP, HTTP, or TFTP server.

   option tftp-server-name "10.100.31.71";

9. (Optional) Configure DHCP option 7 to specify one or more system log (syslog) servers.

   option log-servers 10.100.31.72;

10. (Optional) Configure DHCP option 42 to specify one or more NTP servers.

    option ntp-servers 10.100.31.73;

11. (Optional) Configure DHCP option 12 to specify the hostname of the device.

    option hostname "switch35";

The following sample configuration shows the DHCP options you just configured:

```
host switch35 {
  hardware ethernet ac:4b:c8:29:5d:02;
  fixed-address 10.100.31.36;
  option tftp-server-name "10.100.31.71";
  option host-name "switch35";
  option log-servers 10.100.31.72;
  option ntp-servers 10.100.31.73;
  option NEW_OP.image-file-name
    "/dist/images/jinstall-ex-4300-13.2R1.1-domestic-signed.tgz";
  option NEW_OP.transfer-mode "ftp";
  option NEW_OP.config-file-name "/dist/config/switch35.config";
}
```

Based on the DHCP options you just configured, the following statements are appended to the Junos OS configuration file (for example, **switch35.config**):

```
system {
  host-name switch35;
  syslog {
    host 10.100.31.72 {
      any any;
    }
  }
  ntp {
    server 10.100.31.73;
  }
}
```

12. Connect the device to the network that includes the DHCP server and the FTP, HTTP, or TFTP server.
13. Boot the device with the default configuration.
14. Monitor the ZTP process by looking at the following log files.

NOTE: **When SLAX (live operating system based on Linux) scripts are issued, the op-script.log and event-script.log files are produced.**

- /var/log/dhcp_logfile
- /var/log/event-script.log
- /var/log/image_load_log
- /var/log/messages
- /var/log/op-script.log
- /var/log/script_output

You can also monitor the ZTP process by looking at error messages and issuing operational commands. See "Monitoring Zero Touch Provisioning" on page 195 for more information.

Copyright © 2016, Juniper Networks, Inc.

Related Documentation

- Understanding Zero Touch Provisioning on page 183
- Understanding NTP Time Servers on page 103
- *Op Script Overview*
- Monitoring Zero Touch Provisioning on page 195
- Understanding DHCP Services for Switches on page 57
- Reverting to the Default Factory Configuration by Using the request system zeroize Command on page 28

Monitoring Zero Touch Provisioning

You can use the console and operational commands to monitor Zero Touch Provisioning.

1. Using the Console to Monitor Zero Touch Provisioning on page 195
2. Using System Log Alerts to Monitor Zero Touch Provisioning on page 196
3. Using Error Messages to Monitor Zero Touch Provisioning on page 196
4. Using System Log Files to Monitor Zero Touch Provisioning on page 196
5. Using the show dhcp client binding Command on page 197
6. Using the show dhcp client statistics Command on page 197

Using the Console to Monitor Zero Touch Provisioning

The following Zero Touch Provisioning (ZTP) activities are displayed on the console during the ZTP process:

- Starting and ending times of ZTP process.
- Lists of bound and unbound DHCP client interfaces.
- DHCP options that DHCP servers send to DHCP clients.
- Logs indicating which interfaces are used for ZTP.
- ZTP parameters that DHCP clients obtain from DHCP servers.
- File names of configuration and image files, names of file servers, protocols used to fetch files, and times when DHCP servers fetch configuration and image files.
- Failure states caused by files not being on servers, or unreachable servers, and time outs.
- Number of attempts made, and number of attempts remaining, for retry in current ZTP cycle.
- Completion of file transfers.
- Installation, reboot, and state of ZTP process.
- Internal state errors and termination of ZTP process.
- Logs for when default routes were added or deleted.

Copyright © 2016, Juniper Networks, Inc.

Using System Log Alerts to Monitor Zero Touch Provisioning

Purpose In this example, the system log alert alerts you that the auto-image upgrade will start.

Action Use the following system log alert to monitor the auto-image upgrade process.

```
"ALERT:Auto-image upgrade will start. This can terminate config CLI session(s).
Modified configuration will be lost. To stop Auto-image, in CLI do the
following: 'edit; delete chassis auto-image-upgrade; commit'."

"Checking whether image upgrade is already invoked"
```

Meaning This system log alert indicates that the auto-image upgrade will start, and provides information on how to stop the auto-image upgrade process.

Using Error Messages to Monitor Zero Touch Provisioning

Purpose Error messages provide information on which DHCP options are not configured.

Action Use the information in the following error message to find out which DHCP options are not configured.

```
"DHCP Log Server Option"
"DHCP Host Name Option"
"DHCP NTP Server Option"
```

Meaning The error message indicates that the DHCP log server, hostname, and NTP server options are not configured.

Using System Log Files to Monitor Zero Touch Provisioning

Purpose System log files provide information on the state of the auto-upgrade process, lists of bound and unbound DHCP client interfaces, IP addresses of file servers, names and locations of image and configuration files, and successful and failed attempts at fetching configuration and image files.

Action Use the information in the following system log files to monitor the auto-upgrade process.

```
Auto Image Upgrade: Start fetching config-file file from server 1.1.1.1 through
irb using ftp


Auto Image Upgrade: Tried [2] attempts to fetch config-file file from server
1.1.1.1 through irb. Summary: "Retrieving /config-file
:: Failed to open file.". To retry [4] times.


Auto Image Upgrade: Tried [4] attempts to fetch config-file file from server
1.1.1.1 through irb. Summary: "Retrieving /config-fileconfig-file
:: Failed to open file.". To retry [2] times.

Auto Image Upgrade: Tried [6] attempts to fetch config-file file from server
1.1.1.1 through irb. Summary: "Retrieving /config-file
:: Failed to open file.". To retry [0] times.
```

 Copyright © 2016, Juniper Networks, Inc.

```
Auto Image Upgrade: All [6] attempts to fetch config-file file from server 1.1.1.1
 through irb FAILED. Start retry again in few minutes.
```

Meaning These system log files indicate that there were six failed attempts to fetch the configuration file from the file server, the IP address of the file server, the DHCP client interface name, and the number of times the retry process occurred.

Using the show dhcp client binding Command

Purpose Issue the **show dhcp client binding** command to display DHCP client binding information

Action Issue the **show dhcp client binding** command to display the IP address of the DHCP client, the hardware address of the DHCP client, number of seconds in which the DHCP client's IP address lease expires, state of the DHCP client IP address in the binding table, and the name of the interface that has active client bindings.

show dhcp client binding

```
user@switch# show dhcp client binding
IP address        Hardware address   Expires     State      Interface
0.0.0.0           00:22:83:2a:db:dc  0           SELECTING  irb.0
10.6.6.13          00:22:83:2a:db:dd  49201       BOUND      vme.0
0.0.0.0           00:22:83:2a:db:df  0           SELECTING  xe-0/0/0.0
0.0.0.0           00:22:83:2a:db:e0  0           SELECTING  xe-0/0/1.0
```

Meaning The output of this command shows that there is one client interface that is bound, and that there are three interfaces that are receiving DHCP offers from the DHCP server.

Using the show dhcp client statistics Command

Purpose Issue the **show dhcp client statistics** command to display DHCP client statistics.

Action Issue the **show dhcp client statistics** command to display DHCP client statistics, such as the number of packets dropped, and the number DHCP and BOOTP messages sent and received.

show dhcp client statistics

```
user@switch# show dhcp client statistics
Packets dropped:
    Total                      14
    Send error                 14
Messages received:
    BOOTREPLY                  5
    DHCPOFFER                  1
    DHCPACK                    4
    DHCPNAK                    0
    DHCPFORCERENEW             0
Messages sent:
    BOOTREQUEST                6751
    DHCPDECLINE                0
    DHCPDISCOVER               6747
    DHCPREQUEST                4
    DHCPINFORM                 0
    DHCPRELEASE                0
```

```
DHCPRENEW                    0
DHCPREBIND                   0
```

Meaning The output of this command displays how many packets were dropped with errors, the number of BOOTREPLY and DHCPOFFER messages that were received, and the number of BOOTREQUEST and DHCPREQUEST messages that were sent.

Related Documentation

- Understanding Zero Touch Provisioning on page 183
- Configuring Zero Touch Provisioning on page 190

 Copyright © 2016, Juniper Networks, Inc.

PART 18

Configuration Statements and Operational Commands

- Basic System Management Configuration Statements on page 201
- DHCP Configuration Statements on page 237
- ICMP Configuration Statements on page 245
- Login Classes Configuration Statements on page 247
- NTP Configuration Statements on page 261
- Password Configuration Statements on page 271
- RADIUS and TACACS+ Accounting Configuration Statements on page 289
- Autoinstallation Operational Commands on page 299
- Basic System Management Operational Commands on page 303
- CLI Operational Commands on page 407
- ISSU Operational Commands on page 417
- Licensing Operational Commands on page 435
- NSSU Operational Commands on page 447
- NTP Operational Commands on page 461
- Routine Monitoring Operational Commands on page 467
- Standard Software Installation and Upgrade Operational Commands on page 1213
- System Snapshot Operational Commands on page 1243

Copyright © 2016, Juniper Networks, Inc.

Copyright © 2016, Juniper Networks, Inc.

CHAPTER 18

Basic System Management Configuration Statements

- arp (System) on page 203
- auxiliary on page 204
- checksum on page 205
- compress-configuration-files (System) on page 206
- console (Physical Port) on page 207
- default-address-selection on page 208
- domain-name on page 209
- domain-search on page 209
- ethernet (Alarm) on page 210
- host-name on page 210
- icmpv4-rate-limit on page 211
- internet-options on page 212
- link-down on page 213
- location on page 214
- login-alarms on page 215
- management-ethernet (Alarm) on page 216
- max-configurations-on-flash on page 217
- name-server on page 217
- no-ping-record-route on page 218
- no-ping-time-stamp on page 218
- no-redirects (IPv4 Traffic) on page 219
- optional on page 220
- ports on page 220
- retry on page 221
- saved-core-context on page 222
- saved-core-files on page 222

Copyright © 2016, Juniper Networks, Inc.

- source-port (Port Addresses) on page 223
- static-host-mapping on page 224
- system on page 225
- time-format on page 230
- time-zone on page 231
- traceoptions (Layer 2 Learning) on page 233
- uid on page 235
- use-imported-time-zones on page 235

 Copyright © 2016, Juniper Networks, Inc.

arp (System)

Syntax

```
arp {
   aging-timer minutes;
   gratuitous-arp-delayseconds;
   gratuitous-arp-on-ifup;
   interfaces {
      interface-name {
         aging-timer minutes;
      }
   }
   passive-learning;
   purging;
}
```

For EX-Series switches:

```
arp {
   aging-timer minutes;
}
```

Hierarchy Level

[edit system]

Release Information

Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Specify ARP options. You can enable backup VRRP routers to learn ARP requests for VRRP-IP to VRRP-MAC address translation. You can also set the time interval between ARP updates.

For EX-Series switches, set only the time interval between ARP updates.

Options

aging-timer—Time interval in minutes between ARP updates. In environments where the number of ARP entries to update is high (for example, on routers only, metro Ethernet environments), increasing the time between updates can improve system performance.

passive-learning (QFX-Series only)—Configure switches to learn the ARP mappings (IP-to-MAC address) for hosts sending the requests.

Default: 20 minutes

Range: 1 to 240 minutes

The remaining statements are explained separately.

Required Privilege Level

system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Configuring Junos OS ARP Learning and Aging Options for Mapping IPv4 Network Addresses to MAC Addresses*
- *Junos OS Network Interfaces Library for Routing Devices*

- *Junos OS System Basics Configuration Guide* .

auxiliary

Syntax

```
auxiliary {
   disable;
   insecure;
   type terminal-type;
}
```

Hierarchy Level [edit system ports]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure the characteristics of the auxiliary port.

Default The auxiliary port is disabled.

Options **disable**—Disable the port.

insecure—Disable superuser access or root logins to establish a terminal connection.

type *terminal-type*—Type of terminal that is connected to the port.

Range: **ansi**, **vt100**, **small-xterm**, **xterm**

Default: The terminal type is unknown, and the user is prompted for the terminal type.

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

Related Documentation

- Configuring Console and Auxiliary Port Properties on page 15

 Copyright © 2016, Juniper Networks, Inc.

checksum

Syntax checksum (md5 | sha-256 | sha1) *hash*;

Hierarchy Level [edit event-options event-script file*filename*],
[edit system scripts commit file *filename*],

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description For Junos commit scripts and op scripts, specify the MD5, SHA-1, or SHA-256 checksum hash. When it executes a local event or commit script, the Junos OS verifies the authenticity of the script by using the configured checksum hash.

Options **md5** ***hash***—MD5 checksum of this script.

sha-256 ***hash***—SHA-256 checksum of this script.

sha1 ***hash***—SHA-1 checksum of this script.

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

Related Documentation

- *Configuring Checksum Hashes for a Commit Script*
- *Configuring Checksum Hashes for an Event Script*
- *Configuring Checksum Hashes for an Op Script*
- file checksum md5 on page 323
- file checksum sha-256 on page 325
- file checksum sha1 on page 324

Copyright © 2016, Juniper Networks, Inc.

compress-configuration-files (System)

Syntax (compress-configuration-files | no-compress-configuration-files);

Hierarchy Level [edit system]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Compress the current operational configuration file. The file is stored in the file **juniper.conf**, in the **/config** file system, along with the last three committed versions of the configuration. However, with large networks, the current configuration file might exceed the available space in the **/config** file system. Compressing the current configuration file allows the file to fit in the file system, typically reducing the size of the file by 90 percent. The current configuration file is compressed on the second commit of the configuration after the first commit is made to include the **compress-configuration-files** statement.

NOTE: We recommend that you enable compression of the configuration files to minimize the amount of disk space that they require.

Default The current operational configuration file is uncompressed.

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

Related Documentation

- Compressing the Current Configuration File on page 14

 Copyright © 2016, Juniper Networks, Inc.

console (Physical Port)

Syntax

```
console {
   disable;
   insecure;
   log-out-on-disconnect;
   type terminal-type;
}
```

Hierarchy Level [edit system ports]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure the characteristics of the console port.

Default The console port is enabled and its speed is 9600 baud.

Options

disable—Disable console login connections.

insecure—Disable root login connections to the console and auxiliary ports. Configuring the console port as insecure also prevents superusers and anyone with a user identifier (UID) of 0 from establishing terminal connections in multiuser mode. This option can be used to prevent a user from attempting password recovery by booting into single-user mode, if the user does not know the root password.

log-out-on-disconnect—Log out the session when the data carrier on the console port is lost.

type *terminal-type*—Type of terminal that is connected to the port: **ansi**, **vt100**, **small-xterm**, or **xterm**.

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

Related Documentation

- Configuring Console and Auxiliary Port Properties on page 15

default-address-selection

Syntax default-address-selection;

Hierarchy Level [edit system]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Use the loopback interface, **lo0**, as the source address for all locally generated IP packets when the packet is sent through a routed interface, but not when the packet is sent through a local interface such as **fxp0**. The **lo0** interface is the interface to the switch's Routing Engine.

Default The default address is used as the source address for all locally generated IP packets on outgoing interfaces that are unnumbered. If an outgoing interface is numbered, the default address is chosen using the following sequence:

- The primary address on the loopback interface **lo0** that is *not* **127.0.0.1** is used.
- The primary address for the primary interface or the preferred address (if configured) for the primary interface is used.

  By default, the primary address on an interface is selected as the numerically lowest local address configured on the interface.

  An interface's *primary address* is used by default as the local address for broadcast and multicast packets sourced locally and sent out through the interface. An interface's *preferred address* is the default local address used for packets sourced by the local switch to destinations on the subnet. By default, the numerically lowest local address configured for the interface is chosen as the preferred address on the subnet.

  To configure a different primary address or preferred address, include the **primary** or **preferred** statement at the **[edit interfaces *interface-name* unit *logical-unit-number* family *family* address *address*]** or **[edit logical-systems *logical-system-name* interfaces *interface-name* unit *logical-unit-number* family *family* address *address*]** hierarchy levels.

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

Related Documentation

- Configuring the Junos OS to Select a Fixed Source Address for Locally Generated TCP/IP Packets on page 20
- *Junos OS Network Interfaces Library for Routing Devices*

 Copyright © 2016, Juniper Networks, Inc.

domain-name

Syntax domain-name *domain-name*;

Hierarchy Level [edit system]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure the name of the domain in which the switch is located. This is the default domain name that is appended to hostnames that are not fully qualified.

Options ***domain-name***—Name of the domain.

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

Related Documentation
- Reaching a Domain Name System Server on page 26

domain-search

Syntax domain-search *domain-list*;

Hierarchy Level [edit system]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure a list of domains to be searched.

Options ***domain-list***—List of domain names to search. The list can contain up to 6 domain names, with a total of up to 256 characters.

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

Related Documentation
- Reaching a Domain Name System Server on page 26

ethernet (Alarm)

Syntax

```
ethernet {
  link-down (red | yellow | ignore);
}
```

Hierarchy Level

[edit chassis alarm],
[edit chassis interconnect-device *name* alarm],
[edit chassis node-group *name* alarm]

Release Information

Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Configure alarms for an Ethernet interface.

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

- *Understanding Alarms*
- *Interface Alarm Messages*

host-name

Syntax

host-name *hostname*;

Hierarchy Level

[edit system]

Release Information

Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Set the hostname of the switch.

Options

hostname—Name of the switch.

Required Privilege Level

system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- Configuring the Hostname of a Router or Switch by Using a Configuration Group on page 16

Copyright © 2016, Juniper Networks, Inc.

icmpv4-rate-limit

Syntax

```
icmpv4-rate-limit {
   bucket-size seconds;
   packet-rate pps;
}
```

Hierarchy Level [edit system internet-options]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure rate-limiting parameters for ICMPv4 messages sent.

Options

bucket-size *seconds*—Number of seconds in the rate-limiting bucket.

Range: 0 through 4294967295 seconds

Default: 5

packet-rate *pps*—Rate-limiting packets earned per second.

Range: 0 through 4294967295 pps

Default: 1000

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

Related Documentation

- *Configuring Junos OS ICMPv4 Rate Limit for ICMPv4 Routing Engine Messages*
- *Configuring Junos OS ICMPv6 Rate Limit for ICMPv6 Routing Engine Messages*

internet-options

Syntax

```
internet-options {
   icmpv4-rate-limit bucket-size bucket-size packet-rate packet-rate;
   source-port upper-limit upper-limit;
}
```

Hierarchy Level

[edit system]

Release Information

Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Configure system IP options to protect against certain types of denial-of-service (DoS) attacks.

The remaining statements are explained separately.

Required Privilege Level

admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS ICMPv4 Rate Limit for ICMPv4 Routing Engine Messages on page 70
- Configuring Junos OS to Extend the Default Port Address Range on page 19

Copyright © 2016, Juniper Networks, Inc.

link-down

Syntax link-down (red | yellow | ignore);

Hierarchy Level [edit chassis alarm ethernet],
[edit chassis alarm fibre-channel],
[edit chassis interconnect-device *name* alarm ethernet],
[edit chassis node-group *name* alarm fibre-channel]

Release Information Statement introduced in Junos OS Release 11.3 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Specify either red, yellow, or ignore to display when the link is down.

Options

red—Indicates that one or more hardware components have failed or exceeded temperature thresholds, or an alarm condition configured on an interface has triggered a critical warning.

yellow—Indicates a noncritical condition on the device that, if left unchecked, might cause an interruption in service or degradation in performance. A yellow alarm condition requires monitoring or maintenance.

ignore—Suppresses or ignores the alarm.

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

location

Syntax

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

Hierarchy Level [edit system]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure the system location.

Options

altitude *feet*—Number of feet above sea level.

building *name*—Name of the building. The name of the building can be 1 to 28 characters in length. If the string contains spaces, enclose it in quotation marks (" ").

country-code *code*—Two-letter country code.

floor *number*—Floor in the building.

hcoord *horizontal-coordinate*—Bellcore Horizontal Coordinate.

lata *service-area*—Long-distance service area.

latitude *degrees*—Latitude in degree format.

longitude *degrees*—Longitude in degree format.

npa-nxx *number*—First six digits of the phone number (area code and exchange).

postal-code *postal-code*—Postal code.

rack *number*—Rack number.

vcoord *vertical-coordinate*—Bellcore Vertical Coordinate.

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

Copyright © 2016, Juniper Networks, Inc.

Related Documentation

- Specifying the Physical Location of the Switch on page 29

login-alarms

Syntax

login-alarms;

Hierarchy Level

[edit system login class *class-name*]

Release Information

Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Show system alarms automatically when an **admin** user logs in to the router or switch.

Options

class-name—Login class name.

Required Privilege Level

admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration.

Related Documentation

- Configuring System Alarms to Appear Automatically Upon Login on page 20

management-ethernet (Alarm)

Syntax

```
management-ethernet {
  link-down (red | yellow | ignore);
}
```

Hierarchy Level

[edit chassis alarm],
[edit chassis interconnect-device *name* alarm],
[edit chassis node-group *name* alarm]

Release Information

Statement introduced in Junos OS Release 12.2 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Configure alarms for a management Ethernet interface.

NOTE: If you configure a yellow alarm on the Interconnect device, it will be handled as a red alarm.

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

- *Understanding Alarms*
- *Interface Alarm Messages*

Copyright © 2016, Juniper Networks, Inc.

max-configurations-on-flash

Syntax max-configurations-on-flash *number*;

Hierarchy Level [edit system]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Specify the number of configurations stored on the internal fixed media storage (for example, USB device).

Options ***number***—The number of configurations stored on the CompactFlash card.

Range: 0 through 49. The most recently saved configuration is number 0, and the oldest saved configuration is number 49.

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

Related Documentation

- *Saving a Configuration to a File*
- *Setting or Deleting the Rescue Configuration*
- *Uploading a Configuration File*
- *Uploading a Configuration File*

name-server

Syntax

```
name-server {
  address;
}
```

Hierarchy Level [edit system]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure one or more Domain Name System (DNS) name servers.

Options ***address***—Address of the name server. To configure multiple name servers, include multiple ***address*** options.

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

Related Documentation

- Configuring a DNS Name Server for Resolving a Hostname into Addresses on page 15

no-ping-record-route

Syntax no-ping-record-route;

Hierarchy Level [edit system]

Release Information Statement introduced in Junos OS Release 9.4.
Statement introduced in Junos OS Release 9.4 for EX Series switches.
Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure the Junos OS to disable the reporting of the IP address in ping responses.

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

Related Documentation
- Configuring Junos OS to Disable the Reporting of IP Address and Timestamps in Ping Responses on page 19

no-ping-time-stamp

Syntax no-ping-time-stamp;

Hierarchy Level [edit system]

Release Information Statement introduced in Junos OS Release 9.4.
Statement introduced in Junos OS Release 9.4 for EX Series switches.
Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure the Junos OS to disable the recording of timestamps in ping responses.

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

Related Documentation
- Configuring Junos OS to Disable the Reporting of IP Address and Timestamps in Ping Responses on page 19

 Copyright © 2016, Juniper Networks, Inc.

no-redirects (IPv4 Traffic)

Syntax

no-redirects;

Hierarchy Level

[edit system],
[edit interfaces *interface-name* unit *logical-unit-number* family *family*]

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 12.3 for EX Series switches.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Stop protocol redirect messages for IPv4 traffic from being sent on the entire switch or on an interface on the router or switch.

To disable the sending of protocol redirect messages for the entire router or switch, include the **no-redirects** statement at the **[edit system]** hierarchy level.

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

Default

The router or switch sends redirect messages.

Required Privilege Level

system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- Configuring Junos OS to Disable Protocol Redirect Messages on the Router or Switch on page 18
- *Understanding the Protocol Redirect Mechanism on EX Series Switches*
- *Configuring Junos OS to Disable Sending Protocol Redirect Messages on EX Series Switches (CLI Procedure)*
- *Junos OS Network Interfaces Library for Routing Devices*

Copyright © 2016, Juniper Networks, Inc.

optional

Syntax optional;

Hierarchy Level [edit system scripts commit file *filename*]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description For Junos OS commit scripts, allow a commit operation to succeed even if the script specified in the **file** statement is missing from the **/var/db/scripts/commit** directory on the router.

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

Related Documentation
- *Controlling Execution of Commit Scripts During Commit Operations*

ports

Syntax

```
ports {
  auxiliary {
    disable;
    insecure;
    type terminal-type;
  }
  console {
    disable;
    insecure;
    log-out-on-disconnect;
    type terminal-type;
  }
}
```

Hierarchy Level [edit system]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure the properties of the console and auxiliary ports. The ports are located on the craft interface.

See the switch hardware documentation for port locations.

The remaining statements are explained separately.

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

Related Documentation
- Configuring Console and Auxiliary Port Properties on page 15

 Copyright © 2016, Juniper Networks, Inc.

retry

Syntax retry *number*;

Hierarchy Level [edit system radius server *server-address*],
[edit system accounting destination radius server *server-address*]

Release Information Statement introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.
Statement introduced in Junos OS Release 11.1 for the QFX Series.

Description Number of times the router or switch is allowed to try to contact a RADIUS authentication or accounting server.

Options ***number***—Number of retries allowed for contacting a RADIUS server.

Range: 1 through 10

Default: 3

NOTE: The **[edit system accounting]** hierarchy is not available on QFabric systems.

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

Related Documentation

- *Configuring RADIUS Authentication (QFX Series or OCX Series)*
- *Configuring RADIUS Accounting*
- timeout on page 297

saved-core-context

Syntax (saved-core-context | no-saved-core-context);

Hierarchy Level [edit system]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure whether the switch saves core files generated by internal Junos OS processes, along with contextual information (system log files and a copy of the current configuration):

- **saved-core-context**—The switch saves each core file and its associated context in a compressed tar file named **/var/tmp/*process-name*.core.*core-number*.tgz**.
- **no-saved-core-context**—The switch does not save core files and their associated context.

Default The switch saves core files.

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

Related Documentation
- *Saving Core Files from Junos OS Processes*
- saved-core-files on page 222

saved-core-files

Syntax saved-core-files *number*;

Hierarchy Level [edit system]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Save core files generated by internal Junos OS processes, but not the associated contextual information (configuration and system log files).

Options *number*—Maximum number of core files to save.
Range: 1 through 10

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

Related Documentation
- *Saving Core Files from Junos OS Processes*
- saved-core-context on page 222

 Copyright © 2016, Juniper Networks, Inc.

source-port (Port Addresses)

Syntax source-port upper-limit <*upper-limit*>;

Hierarchy Level [edit system internet-options]

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 14.1X53-D20 for the OCX Series.

Description Configure the range of port addresses.

Options **upper-limit** ***upper-limit***—(Optional) The range of port addresses and can be a value from 5000 through 65,355.

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

Related Documentation

- Configuring Junos OS to Extend the Default Port Address Range on page 19

static-host-mapping

Syntax

```
static-host-mapping {
  hostname {
    alias [ alias ];
    inet [ address ];
    sysid system-identifier;
  }
}
```

Hierarchy Level [edit system]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Map a hostname to one or more IP addresses and aliases, and configure an International Organization for Standardization (ISO) system identifier (system ID).

Options

alias ***alias***—Alias for the hostname.

hostname—Fully qualified hostname.

inet ***address***—IP address. You can specify one or more IP addresses for the host.

sysid ***system-identifier***—ISO system identifier (system ID). This is the 6-byte portion of the Intermediate System-to-Intermediate System (IS-IS) network service access point (NSAP). We recommend that you use the host's IP address represented in binary-coded decimal (BCD) format. For example, the IP address **208.197.169.18** is **2081.9716.9018** in BCD.

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

Related Documentation

- Configuring the Hostname of a Router or Switch by Using a Configuration Group on page 16

 Copyright © 2016, Juniper Networks, Inc.

system

Syntax

```
system {
  accounting {
    events [ login change-log interactive-commands ];
    destination {
      radius {
        server {
          server-address {
            accounting-port port-number;
            retry number;
            secret password;
            source-address address;
            timeout seconds;
          }
        }
      }
      tacplus {
        server {
          server-address {
            port port-number;
            secret password;
            single-connection;
            timeout seconds;
          }
        }
      }
    }
  }
  archival {
    configuration {
      archive-sites {
        ftp://<username>:<password>@<host>:<port>/<url-path>;
        ftp://<username>:<password>@<host>:<port>/<url-path>;
      }
      transfer-interval interval;
      transfer-on-commit;
    }
  }
  arp {
    aging-timer minutes;
    interfaces;
  }
  authentication-order [ authentication-methods ];
  (compress-configuration-files | no-compress-configuration-files);
  default-address-selection;
  domain-name domain-name;
  domain-search [ domain-list ];
  host-name hostname;
  internet-options {
    icmpv4-rate-limitbucket-size bucket-size packet-rate packet-rate;
    source-port upper-limit <upper-limit>;
  }
  location {
```

```
    altitude feet;
    building name;
    country-code code;
    floor number;
    hcoord horizontal-coordinate;
    lata service-area;
    latitude degrees;
    longitude degrees;
    npa-nxx number;
    postal-code postal-code;
    rack number;
    vcoord vertical-coordinate;
  }
  login {
    announcementtext;
    class class-name {
      access-end;
      access-start;
      allow-configuration “regular-expression”;
      allowed-days “regular-expression”;
      deny-commands “regular-expression”;
      deny-configuration “regular-expression”;
      idle-timeout minutes;
      login-tip;
      permissions [ permissions ];
    }
    message text;
    password {
      change-type (set-transitions | character-set);
      format (md5 | sha1 | des);
      maximum-length length;
      minimum-changes number;
      minimum-length length;
    }
    retry-options {
      backoff-factor seconds;
      backoff-threshold number;
      minimum-time seconds;
      tries-before-disconnect number;
    }
    user username {
      authentication {
        (encrypted-password "password" | plain-text-password);
        load-key-file URL;
        remote-debug-permission (qfabric-admin | qfabric-operator |qfabric-user);
        ssh-rsa "public-key";
        ssh-dsa "public-key";
      }
      uid uid-value;
      class class-name;
      full-name complete-name;
    }
  }
  name-server {
    address;
  }
```


Copyright © 2016, Juniper Networks, Inc.

```
no-multicast-echo;
no-redirects;
no-ping-record-route;
no-ping-time-stamp;
ntp {
   authentication-key number type type value password;
   serveraddress <key key-number> <version value> <prefer>;
}
ports {
   auxiliary {
      disable;
      insecure;
      type terminal-type;
   }
   console {
      disable;
      insecure;
      log-out-on-disconnect;
      type terminal-type;
   }
}
radius-server server-address {
   accounting-port port-number;
   port number;
   retry number;
   secret password;
   source-address source-address;
   timeout seconds;
   }
}
radius-options {
   password-protocol mschap-v2;
   }
   attributes {
      nas-ip-address ip-address;
root-authentication {
   (encrypted-password "password" | plain-text-password);
   ssh-rsa "public-key";
   ssh-dsa "public-key";
}
(saved-core-context | no-saved-core-context);
saved-core-files saved-core-files;
services {
   finger {
      connection-limit limit;
      rate-limit limit;
   }
   flow-tap-dtcp {
      ssh {
         connection-limit limit;
         rate-limit limit;
      }
   }
   ftp {
      connection-limit limit;
      rate-limit limit;
```

```
    }
    service-deployment {
        servers server-address {
            port port-number;
        }
        source-address source-address;
    }
    ssh {
        root-login (allow | deny | deny-password);
        protocol-version [v1 v2];
        connection-limit limit;
        rate-limit limit;
    }
    telnet {
        connection-limit limit;
        rate-limit limit;
    }
    web-management {
        http {
            interfaces [ interface-names ];
            port port;
        }
        https {
            interfaces [ interface-names ];
            local-certificate name;
            port port;
        }
        session {
            idle-timeout [ minutes ];
            session-limit [ session-limit ];
        }
    }
    xnm-clear-text {
        connection-limit limit;
        rate-limit limit;
    }
    xnm-ssl {
        connection-limit limit;
        local-certificate name;
        rate-limit limit;
    }
}
static-host-mapping {
    hostname {
        alias [ alias ];
        inet [ address ];
        sysid system-identifier;
    }
}
syslog {
    archive {
        files number;
        size maximum-file-size;
        start-time "YYYY-MM-DD.hh:mm";
        transfer-interval minutes;
        (world-readable | no-world-readable);
```


Copyright © 2016, Juniper Networks, Inc.

```
        }
        console {
          facility severity;
        }
        file filename {
          archive {
            files number;
            size maximum-file-size;
            start-time "YYYY-MM-DD.hh:mm";
            transfer-interval minutes;
            (world-readable | no-world-readable);
          }
          explicit-priority;
          facility severity;
          match "regular-expression";
          structured-data {
            brief;
          }
        }
        host (hostname | other-routing-engine | scc-master) {
          explicit-priority;
          facility-override facility;
          facility severity;
          log-prefix string;
          match "regular-expression";
        }
        source-address source-address;
        time-format (millisecond | year | year millisecond);
        user (username | *) {
          facility severity;
          match "regular-expression";
        }
      }
      tacplus-options {
        service-name service-name;
        (no-cmd-attribute-value | exclude-cmd-attribute);
      }
      tacplus-server server-address {
        port
        secret password;
        single-connection;
        source-address source-address;
        timeout seconds;
      }
      time-zone (GMThour-offset | time-zone);
      }
      tracing {
        destination-override {
        syslog host;
        }
      }
      use-imported-time-zones;
    }
```

Hierarchy Level [edit]

Release Information Statement introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.
Statement introduced in Junos OS Release 11.1 for the QFX Series.

Description Configure system management properties.

NOTE: The **radius-server source-address** and **radius-options** statements are not available on the QFabric system.

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

time-format

Syntax time-format (year | millisecond | year millisecond);

Hierarchy Level [edit system syslog]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Include the year, the millisecond, or both, in the timestamp on every standard-format system log message. The additional information is included for messages directed to each destination configured by a **file**, **console**, or **user** statement at the **[edit system syslog]** hierarchy level, but not to destinations configured by a **host** statement.

Default The timestamp specifies the month, date, hour, minute, and second when the message was logged—for example, **Aug 21 12:36:30**.

NOTE: When the **structured-data** statement is included at the **[edit system syslog file *filename*]** hierarchy level, this statement is ignored for the file.

Options **millisecond**—Include the millisecond in the timestamp.

year—Include the year in the timestamp.

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

Related Documentation

- Including the Year or Millisecond in Timestamps on page 22

 Copyright © 2016, Juniper Networks, Inc.

time-zone

Syntax time-zone (GMT *hour-offset* | *time-zone*);

Hierarchy Level [edit system]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Set the local time zone. To have the time zone change take effect for all processes running on the switch, you must reboot the switch.

Default UTC

Options **GMT *hour-offset***—Set the time zone relative to UTC time.

Range: –14 through +12

Default: 0

time-zone—Specify the time zone as **UTC**, which is the default time zone, or as a string such as PDT (Pacific Daylight Time), or use one of the following continents and major cities:

Africa/Abidjan, Africa/Accra, Africa/Addis_Ababa, Africa/Algiers, Africa/Asmera, Africa/Bamako, Africa/Bangui, Africa/Banjul, Africa/Bissau, Africa/Blantyre, Africa/Brazzaville, Africa/Bujumbura, Africa/Cairo, Africa/Casablanca, Africa/Ceuta, Africa/Conakry, Africa/Dakar, Africa/Dar_es_Salaam, Africa/Djibouti, Africa/Douala, Africa/El_Aaiun, Africa/Freetown, Africa/Gaborone, Africa/Harare, Africa/Johannesburg, Africa/Kampala, Africa/Khartoum, Africa/Kigali, Africa/Kinshasa, Africa/Lagos, Africa/Libreville, Africa/Lome, Africa/Luanda, Africa/Lubumbashi, Africa/Lusaka, Africa/Malabo, Africa/Maputo, Africa/Maseru, Africa/Mbabane, Africa/Mogadishu, Africa/Monrovia, Africa/Nairobi, Africa/Ndjamena, Africa/Niamey, Africa/Nouakchott, Africa/Ouagadougou, Africa/Porto-Novo, Africa/Sao_Tome, Africa/Timbuktu, Africa/Tripoli, Africa/Tunis, Africa/Windhoek

America/Adak, America/Anchorage, America/Anguilla, America/Antigua, America/Aruba, America/Asuncion, America/Barbados, America/Belize, America/Bogota, America/Boise, America/Buenos_Aires, America/Caracas, America/Catamarca, America/Cayenne, America/Cayman, America/Chicago, America/Cordoba, America/Costa_Rica, America/Cuiaba, America/Curacao, America/Dawson, America/Dawson_Creek, America/Denver, America/Detroit, America/Dominica, America/Edmonton, America/El_Salvador, America/Ensenada, America/Fortaleza, America/Glace_Bay, America/Godthab, America/Goose_Bay, America/Grand_Turk, America/Grenada, America/Guadeloupe, America/Guatemala, America/Guayaquil, America/Guyana, America/Halifax, America/Havana, America/Indiana/Knox, America/Indiana/Marengo, America/Indiana/Vevay, America/Indianapolis, America/Inuvik, America/Iqaluit, America/Jamaica, America/Jujuy, America/Juneau, America/La_Paz, America/Lima, America/Los_Angeles, America/Louisville, America/Maceio, America/Managua, America/Manaus, America/Martinique, America/Mazatlan, America/Mendoza, America/Menominee, America/Mexico_City, America/Miquelon, America/Montevideo, America/Montreal, America/Montserrat, America/Nassau, America/New_York, America/Nipigon, America/Nome, America/Noronha, America/Panama, America/Pangnirtung, America/Paramaribo, America/Phoenix, America/Port-au-Prince, America/Port_of_Spain, America/Porto_Acre, America/Puerto_Rico, America/Rainy_River,

America/Rankin_Inlet, America/Regina, America/Rosario, America/Santiago, America/Santo_Domingo, America/Sao_Paulo, America/Scoresbysund, America/Shiprock, America/St_Johns, America/St_Kitts, America/St_Lucia, America/St_Thomas, America/St_Vincent, America/Swift_Current, America/Tegucigalpa, America/Thule, America/Thunder_Bay, America/Tijuana, America/Tortola, America/Vancouver, America/Whitehorse, America/Winnipeg, America/Yakutat, America/Yellowknife

Antarctica/Casey, Antarctica/DumontDUrville, Antarctica/Mawson, Antarctica/McMurdo, Antarctica/Palmer, Antarctica/South_Pole

Arctic/Longyearbyen

Asia/Aden, Asia/Alma-Ata, Asia/Amman, Asia/Anadyr, Asia/Aqtau, Asia/Aqtobe, Asia/Ashkhabad, Asia/Baghdad, Asia/Bahrain, Asia/Baku, Asia/Bangkok, Asia/Beirut, Asia/Bishkek, Asia/Brunei, Asia/Calcutta, Asia/Chungking, Asia/Colombo, Asia/Dacca, Asia/Damascus, Asia/Dubai, Asia/Dushanbe, Asia/Gaza, Asia/Harbin, Asia/Hong_Kong, Asia/Irkutsk, Asia/Ishigaki, Asia/Jakarta, Asia/Jayapura, Asia/Jerusalem, Asia/Kabul, Asia/Kamchatka, Asia/Karachi, Asia/Kashgar, Asia/Katmandu, Asia/Krasnoyarsk, Asia/Kuala_Lumpur, Asia/Kuching, Asia/Kuwait, Asia/Macao, Asia/Magadan, Asia/Manila, Asia/Muscat, Asia/Nicosia, Asia/Novosibirsk, Asia/Omsk, Asia/Phnom_Penh, Asia/Pyongyang, Asia/Qatar, Asia/Rangoon, Asia/Riyadh, Asia/Saigon, Asia/Seoul, Asia/Shanghai, Asia/Singapore, Asia/Taipei, Asia/Tashkent, Asia/Tbilisi, Asia/Tehran, Asia/Thimbu, Asia/Tokyo, Asia/Ujung_Pandang, Asia/Ulan_Bator, Asia/Urumqi, Asia/Vientiane, Asia/Vladivostok, Asia/Yakutsk, Asia/Yekaterinburg, Asia/Yerevan

Atlantic/Azores, Atlantic/Bermuda, Atlantic/Canary, Atlantic/Cape_Verde, Atlantic/Faeroe, Atlantic/Jan_Mayen, Atlantic/Madeira, Atlantic/Reykjavik, Atlantic/South_Georgia, Atlantic/St_Helena, Atlantic/Stanley

Australia/Adelaide, Australia/Brisbane, Australia/Broken_Hill, Australia/Darwin, Australia/Hobart, Australia/Lindeman, Australia/Lord_Howe, Australia/Melbourne, Australia/Perth, Australia/Sydney

Europe/Amsterdam, Europe/Andorra, Europe/Athens, Europe/Belfast, Europe/Belgrade, Europe/Berlin, Europe/Bratislava, Europe/Brussels, Europe/Bucharest, Europe/Budapest, Europe/Chisinau, Europe/Copenhagen, Europe/Dublin, Europe/Gibraltar, Europe/Helsinki, Europe/Istanbul, Europe/Kaliningrad, Europe/Kiev, Europe/Lisbon, Europe/Ljubljana, Europe/London, Europe/Luxembourg, Europe/Madrid, Europe/Malta, Europe/Minsk, Europe/Monaco, Europe/Moscow, Europe/Oslo, Europe/Paris, Europe/Prague, Europe/Riga, Europe/Rome, Europe/Samara, Europe/San_Marino, Europe/Sarajevo, Europe/Simferopol, Europe/Skopje, Europe/Sofia, Europe/Stockholm, Europe/Tallinn, Europe/Tirane, Europe/Vaduz, Europe/Vatican, Europe/Vienna, Europe/Vilnius, Europe/Warsaw, Europe/Zagreb, Europe/Zurich

Indian/Antananarivo, Indian/Chagos, Indian/Christmas, Indian/Cocos, Indian/Comoro, Indian/Kerguelen, Indian/Mahe, Indian/Maldives, Indian/Mauritius, Indian/Mayotte, Indian/Reunion

Pacific/Apia, Pacific/Auckland, Pacific/Chatham, Pacific/Easter, Pacific/Efate, Pacific/Enderbury, Pacific/Fakaofo, Pacific/Fiji, Pacific/Funafuti, Pacific/Galapagos, Pacific/Gambier, Pacific/Guadalcanal, Pacific/Guam, Pacific/Honolulu, Pacific/Johnston, Pacific/Kiritimati, Pacific/Kosrae, Pacific/Kwajalein, Pacific/Majuro, Pacific/Marquesas, Pacific/Midway, Pacific/Nauru, Pacific/Niue, Pacific/Norfolk, Pacific/Noumea, Pacific/Pago_Pago, Pacific/Palau, Pacific/Pitcairn, Pacific/Ponape, Pacific/Port_Moresby, Pacific/Rarotonga, Pacific/Saipan, Pacific/Tahiti, Pacific/Tarawa, Pacific/Tongatapu, Pacific/Truk, Pacific/Wake, Pacific/Wallis, Pacific/Yap

Required Privilege Level

system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- Modifying the Default Time Zone for a Router or Switch Running Junos OS on page 24

Copyright © 2016, Juniper Networks, Inc.

traceoptions (Layer 2 Learning)

Syntax

```
traceoptions {
  file filename <files number> <size size> <world-readable | no-world-readable>;
  flag flag (detail | disable | receive | send);
  in-memory-debug;
  level;
  no-remote-trace;
}
```

Hierarchy Level [edit protocols l2-learning]

Release Information Statement introduced in Junos OS Release 13.2 for the QFX Series.

Description Define tracing operations for Layer 2 learning.

Default The **traceoptions** feature is disabled by default.

Options **file** ***filename***—Name of the file to receive the output of the tracing operation. Enclose the name within quotation marks. All files are placed in the directory **/var/log**.

You can specify the following options:

- **no-world-readable**—(Optional) Restrict file access to the user who created the file.
- **size** ***size*** —(Optional) Maximum size of each trace file, in kilobytes (KB), megabytes (MB), or gigabytes (GB). When a trace file named **trace-file** reaches its maximum size, it is renamed **trace-file.0**, then **trace-file.1**, and so on, until the maximum number of trace files is reached. Then the oldest trace file is overwritten. If you specify a maximum number of files, you also must specify a maximum file size with the **files** option. Use ***x*k** to specify KB, ***x*m** to specify MB, or ***x*g** to specify gigabytes.
- **world-readable**—(Optional) Enable unrestricted file access.

flag ***flag*** —Tracing operation to perform. To specify more than one tracing operation, include multiple flag statements. You can include the following flags:

- **all**—All tracing operations.
- **bmac-next-hop**—Trace backbone MAC next hop operations.
- **bridge-bmac-next-hop**—Trace backbone MAC next hop bridge operations.
- **bridging-interface**—Trace interface bridge operations.
- **bridging-domain**—Trace bridging domain operations.
- **configuration**—Trace configuration operations.
- **flood-next-hop**—Trace flood next hop operations.
- **initialization**—Trace initialization operations.
- **interface-device**—Trace interface device operations.
- **interface-family**—Trace interface family operations.

- **interface-logical**—Trace logical interface operations.
- **ipc**—Trace inter-process communications operations.
- **irb**—Trace integrated routing and bridging operations.
- **isid**—Trace i-tagged service ID operations.
- **kack**—Trace kernel-acknowledgment.
- **learning-domain**—Trace learning domain operations.
- **logical-system**—Trace logical system operations.
- **mac-learning**—Trace MAC address learning.
- **mc-ae**—Trace multichassis aggregated Ethernet interface operations.
- **redundant-trunk-group**—Trace redundant trunk group operations.
- **routing-instance**—Trace routing instance operations.
- **routing-socket**—Trace routing socket operations.
- **storm-control**—Trace storm control operations.
- **unknown-unicast-forwarding**—Trace unknown unicast forwarding events.
- **vpls-ping**—Trace Virtual Private VLAN Service (VPLS) ping operations.

in-memory-debug—Enable trace parameters in the memory.

level—Specify level of debugging output.

no-remote-trace—Disable remote tracing.

Required Privilege Level

routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Copyright © 2016, Juniper Networks, Inc.

uid

Syntax uid *uid-value*;

Hierarchy Level [edit system login user]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure a user identifier for a login account.

Options ***uid-value***—Number associated with the login account. This value must be unique on the router or switch.

Range: **100** through **64000**

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

Related Documentation
- Configuring Junos OS User Accounts on page 97

use-imported-time-zones

Syntax use-imported-time-zones;

Hierarchy Level [edit system]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure a custom time zone from a locally generated time zone database.

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

Related Documentation
- Updating the IANA Time Zone Database on Junos OS Devices on page 32

Copyright © 2016, Juniper Networks, Inc.

CHAPTER 19

DHCP Configuration Statements

- client-identifier (DHCP Client) on page 237
- lease-time on page 238
- retransmission-attempt on page 239
- retransmission-interval on page 240
- server-address on page 241
- update-server on page 242
- vendor-option on page 243

client-identifier (DHCP Client)

Syntax client-identifier (ascii *ascii* | hexadecimal *hexadecimal*);

Hierarchy Level [edit interfaces *interface-name* unit *logical-unit-number* family inet dhcp]

Release Information Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Specify an ASCII or hexadecimal identifier for the Dynamic Host Configuration Protocol (DHCP) client. The DHCP server identifies a client by a client-identifier value, which must be unique for each client.

Default If you do not include client-identifier in the configuration, the DHCP server uses the client hardware type and MAC address to identify the client.

Options **ascii** ***ascii***—Identifier consisting of ASCII characters, such as a fully qualified domain name.

hexadecimal ***hexadecimal***—Identifier consisting of hexadecimal numbers (0-9, a-f, A-F). Do not use colons.

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

Related Documentation
- Configuring a DHCP Client (CLI Procedure) on page 61

lease-time

Syntax lease-time (*length* | infinite);

Hierarchy Level [edit interfaces *interface-name* unit *logical-unit-number* family inet dhcp]

Release Information Statement introduced in Junos OS Release 9.2.

Description Request a specific lease time for the IP address.

Default Iif no lease time is requested by client, then the server sends the lease time. The default lease time on a Junos OS DHCP server is one day.

Options ***seconds*** —Request a lease time of a specific duration.

Range: 60 through 2147483647 seconds

infinite—Request that the lease never expire.

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

Related Documentation

- *Understanding Interfaces*
- *unit*
- *family*

 Copyright © 2016, Juniper Networks, Inc.

retransmission-attempt

Syntax retransmission-attempt *number*;

Hierarchy Level [edit interfaces *interface-name* unit *logical-unit-number* family inet dhcp]

Release Information Statement introduced in Junos OS Release 8.5 for J Series devices.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 9.2 for SRX Series devices.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Specify the number of times the device retransmits a Dynamic Host Control Protocol (DHCP) packet if a DHCP server fails to respond. After the specified number of attempts, no further attempts at reaching a server are made.

Options ***number***—Number of retransmit attempts.

Range: 0 through 6

Default: 4

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

Related Documentation

- Configuring a DHCP Client (CLI Procedure) on page 61
- *interfaces*
- *unit*
- *family*

retransmission-interval

Syntax retransmission-interval *seconds*;

Hierarchy Level [edit interfaces *interface-name* unit *logical-unit-number* family inet dhcp]

Release Information Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Specify the time between successive retransmissions of the client DHCP request if a DHCP server fails to respond.

Options ***seconds***—Number of seconds between successive retransmissions.

Range: 4 through 64 seconds

Default: 4 seconds

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

Related Documentation

- Configuring a DHCP Client (CLI Procedure) on page 61

 Copyright © 2016, Juniper Networks, Inc.

server-address

Syntax server-address *ip-address*;

Hierarchy Level [edit interfaces *interface-name* unit *logical-unit-number* family inet dhcp]

Release Information Statement introduced in Junos OS Release 8.5 for J Series devices.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 9.2 for SRX Series devices.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Specify the address of the DHCP server that the client should accept DHCP offers from. If this option is included in the DHCP configuration, the client accepts offers only from this server and ignores all other offers.

Default The client accepts the first offer it receives from any DHCP server.

Options ***ip-address***—DHCP server address.

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

Related Documentation

- Configuring a DHCP Client (CLI Procedure) on page 61
- *interfaces*
- *unit*
- *family*

update-server

Syntax update-server;

Hierarchy Level [edit Interfaces *interface-name* unit *logical-unit-number* inet dhcp]

Release Information Statement introduced in Junos OS Release 8.5 for J Series devices.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 9.2 for SRX Series devices.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Propagate TCP/IP settings learned from an external DHCP server to the DHCP server running on the switch, router, or device.

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

Related Documentation

- Configuring a DHCP Client (CLI Procedure) on page 61
- *interfaces*
- *unit*
- *family*

 Copyright © 2016, Juniper Networks, Inc.

vendor-option

Syntax

```
vendor-option {
   default-local-server-group local-server-group-name |
   default-relay-server-group server-group-name
   drop;
   equals
   starts-with
}
```

Hierarchy Level

[edit forwarding-options dhcp-relay relay-option-60]

Release Information

Statement introduced before Junos OS Release 12.1 for EX Series switches.
Statement deprecated in Junos OS Release 12.3 for EX Series switches.

Description

Configure the match criteria when you use the DHCP vendor class identifier option (option 60) in DHCP client packets to forward client traffic to specific DHCP servers. The extended DHCP relay agent compares the option 60 vendor-specific strings received in DHCP client packets against the match criteria that you specify. If there is a match, you can define certain actions for the associated DHCP client packets.

NOTE: The **vendor-option** statement has been deprecated and might be removed from future product releases. We recommend that you phase out its use. See *option-number*.

Required Privilege Level

system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Configuring an Extended DHCP Relay Server on EX Series Switches (CLI Procedure)*
- *Understanding the Extended DHCP Relay Agent for EX Series Switches*

Copyright © 2016, Juniper Networks, Inc.

CHAPTER 20

ICMP Configuration Statements

- no-multicast-echo on page 245

no-multicast-echo

Syntax no-multicast-echo

Hierarchy Level [edit system]

Release Information Statement introduced in Junos OS Release 8.1.

Description Disable the Routing Engine from responding to ICMP echo requests sent to multicast group addresses.

Default The Routing Engine responds to ICMP echo requests sent to multicast group addresses.

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

Related Documentation
- Configuring Junos OS to Disable the Routing Engine Response to Multicast Ping Packets on page 70

Copyright © 2016, Juniper Networks, Inc.

CHAPTER 21

Login Classes Configuration Statements

- access-end on page 248
- access-start on page 248
- allow-commands on page 249
- allow-configuration on page 250
- allowed-days on page 250
- announcement on page 251
- authentication (Login) on page 252
- class (Defining Login Classes) on page 253
- class (Assigning a Class to an Individual User) on page 254
- deny-commands on page 254
- deny-configuration on page 255
- idle-timeout on page 256
- load-key-file on page 257
- login on page 258
- login-tip on page 259
- message on page 259
- user (Access) on page 260

Copyright © 2016, Juniper Networks, Inc.

access-end

Syntax access-end *HH:MM*;

Hierarchy Level [edit system login class]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure the end time for login access.

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

Related Documentation
- Configuring Time-Based User Access on page 20

access-start

Syntax access-start *HH:MM*;

Hierarchy Level [edit system login class]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure the start time for login access.

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

Related Documentation
- Configuring Time-Based User Access on page 20

 Copyright © 2016, Juniper Networks, Inc.

allow-commands

Syntax allow-commands "*regular-expression*";

Hierarchy Level [edit system login class *class-name*]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Specify the operational mode commands that members of a login class can use.

Default If you omit this statement and the **deny-commands** statement, users can issue only those commands for which they have access privileges through the **permissions** statement.

Options ***regular-expression***—Extended (modern) regular expression as defined in POSIX 1003.2. If the regular expression contains any spaces, operators, or wildcard characters, enclose it in quotation marks.

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

Related Documentation

- Specifying Access Privileges for Junos OS Operational Mode Commands on page 30
- deny-commands on page 254
- user on page 260

allow-configuration

Syntax allow-configuration "*regular-expression*";

Hierarchy Level [edit system login class *class-name*]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Explicitly allow configuration access to the specified levels in the hierarchy even if the permissions set with the **permissions** statement do not grant such access by default.

Default If you omit this statement and the **deny-configuration** statement, users can edit only those commands for which they have access privileges through the **permissions** statement.

Options ***regular-expression***—Extended (modern) regular expression as defined in POSIX 1003.2. If the regular expression contains any spaces, operators, or wildcard characters, enclose it in quotation marks.

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

Related Documentation

- *Specifying Access Privileges for Junos OS Configuration Mode Hierarchies*
- *Regular Expressions for Allowing and Denying Junos OS Configuration Mode Hierarchies*
- deny-configuration on page 255
- user on page 260

allowed-days

Syntax allowed-days [*days-of-the-week*];

Hierarchy Level [edit system login class *class-name*]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Specify the days of the week when users can log in.

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

Related Documentation

- Configuring Time-Based User Access on page 20

 Copyright © 2016, Juniper Networks, Inc.

announcement

Syntax announcement *text*;

Hierarchy Level [edit system login]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure a system login announcement. This announcement appears after a user logs in.

Options ***text***—Text of the announcement. If the text contains any spaces, enclose it in quotation marks.

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

Related Documentation

- *Configuring the Junos OS to Display a System Login Announcement*
- Configuring Junos OS to Display a System Login Message on page 98
- **message on page 259**

authentication (Login)

Syntax

```
authentication {
   encrypted-password password;
   load-key-file URL;
   plain-text-password password;
   remote-debug-permission (qfabric-admin | qfabric-operator |qfabric-user);
   ssh-dsa "public-key";
   ssh-rsa "public-key";
}
```

Hierarchy Level

[edit system login user *username*]

Release Information

Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Authentication methods that a user can use to log in to the switch. You can assign multiple authentication methods to a single user.

Options

encrypted-password "*password*"—Message Digest 5 (MD5) or other encrypted authentication. Specify the MD5 or other password. You can specify only one encrypted password for each user.

You cannot configure a blank password for **encrypted-password** using blank quotation marks (" "). You must configure a password of 1 through 128 characters and enclose the password in quotation marks.

load-key-file—Load RSA (SSH version 1 and SSH version 2) and DSA (SSH version 2) public keys from a file. The file is a URL containing one or more SSH keys.

plain-text-password—Plain-text password. The command-line interface (CLI) prompts you for the password and then encrypts it.

remote-debug-permission (QFabric systems only)—QFabric component authentication. Specifies permission levels for users to access individual components in a QFabric system.

ssh-dsa "*public-key*"—SSH version 2 authentication. Specify the SSH public key. You can specify one or more public keys for each user.

ssh-rsa "*public-key*"—SSH version 1 and SSH version 2 authentication. Specify the SSH public key. You can specify one or more public keys for each user.

Required Privilege Level

admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration.

Related Documentation

- Configuring Junos OS User Accounts on page 97
- root-authentication on page 285

Copyright © 2016, Juniper Networks, Inc.

class (Defining Login Classes)

Syntax

```
class class-name {
   access-end;
   access-start;
   allow-commands "regular-expression";
   allow-configuration "regular-expression";
   deny-commands "regular-expression";
   deny-configuration "regular-expression";
   idle-timeout minutes;
   login-tip;
   permissions [ permissions ];
}
```

Hierarchy Level

[edit system login]

Release Information

Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Define a login class.

Options

class-name—A name you choose for the login class.

The remaining statements are explained separately.

Required Privilege Level

admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration.

Related Documentation

- *Defining Junos OS Login Classes*
- user on page 260

class (Assigning a Class to an Individual User)

Syntax

```
class class-name {
   operator;
   read-only;
   super-user;
   unauthorized;
}
```

Hierarchy Level [edit system login user *username*]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure a user's login class. You must configure one class for each user.

Options ***class-name***—One of the classes defined at the **[edit system login class]** hierarchy level.

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

Related Documentation

- Configuring Junos OS User Accounts on page 97

deny-commands

Syntax deny-commands "*regular-expression*";

Hierarchy Level [edit system login class]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Specify the operational mode commands that the user is denied permission to issue even though the permissions set with the **permissions** statement would allow their use.

Default If you omit this statement and the **allow-commands** statement, users can issue only those commands for which they have access privileges through the **permissions** statement.

Options ***regular-expression***—Extended (modern) regular expression as defined in POSIX 1003.2. If the regular expression contains any spaces, operators, or wildcard characters, enclose it in quotation marks.

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

Related Documentation

- Specifying Access Privileges for Junos OS Operational Mode Commands on page 30
- allow-commands on page 249
- user on page 260

Copyright © 2016, Juniper Networks, Inc.

deny-configuration

Syntax deny-configuration "*regular-expression*";

Hierarchy Level [edit system login class]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Explicitly deny configuration access to the specified levels in the hierarchy even if the permissions set with the **permissions** statement grant such access by default.

Default If you omit this statement and the **allow-configuration** statement, users can edit those levels in the configuration hierarchy for which they have access privileges through the **permissions** statement.

Options ***regular-expression***—Extended (modern) regular expression as defined in POSIX 1003.2. If the regular expression contains any spaces, operators, or wildcard characters, enclose it in quotation marks.

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

Related Documentation

- *Specifying Access Privileges Using allow/deny-configuration Statements*
- allow-configuration on page 250
- user on page 260

idle-timeout

Syntax idle-timeout *minutes*;

Hierarchy Level [edit system login class *class-name*]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description For a login class, configure the maximum time that a session can be idle before the user is logged off the switch. The session times out after remaining at the CLI operational mode prompt for the specified time.

Default If you omit this statement, a user is never forced off the system after extended idle times.

Options ***minutes***—Maximum idle time.

Range: 0 through 4294967295 minutes

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

Related Documentation

- Configuring the Timeout Value for Idle Login Sessions on page 22

 Copyright © 2016, Juniper Networks, Inc.

load-key-file

Syntax

load-key-file *URL filename*;

Hierarchy Level

[edit system root-authentication],
[edit system login user *username* authentication]

Release Information

Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

NOTE: ECDSA is not supported on the QFabric system.

Load RSA (SSH version 1 and SSH version 2) and DSA or ECDSA (SSH version 2) public keys from a previously-generated named file at a specified URL location or local path. The file contains one or more SSH keys that are copied into the configuration when the command is issued.

Required Privilege Level

admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration.

Related Documentation

- Configuring the Root Password on page 133
- *Configuring the Root Password*
- *Configuring Junos OS User Accounts by Using a Configuration Group*

login

Syntax

```
login {
  announcement text;
  class class-name {
    access-end "regular-expression";
    access-start "regular-expression";
    allow-commands "regular-expression";
    allow-configuration "regular-expression";
    deny-commands "regular-expression";
    deny-configuration "regular-expression";
    idle-timeout minutes;
    login-tip;
    permissions [ permissions ];
  }
  message text;
  password {
    change-type (set-transitions | character-set);
    format (md5 | sha1 | des);
    maximum-length length;
    minimum-changes number;
    minimum-length length;
  }
  retry-options {
    backoff-factor seconds;
    backoff-threshold number;
    minimum-time seconds;
    tries-before-disconnect number;
  }
  user username {
    authentication authentication;
      (encrypted-password "password" | plain-text-password);
      load-key-file URL;
      remote-debug-permission (qfabric-admin | qfabric-operator |qfabric-user);
      ssh-dsa "public-key";
      ssh-rsa "public-key";
    }
    class class-name;
    full-name complete-name;
    uid uid-value;
  }
}
```

Hierarchy Level [edit system]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure user access to the switch.

Options The remaining statements are explained separately.

 Copyright © 2016, Juniper Networks, Inc.

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

Related Documentation
- *Defining Junos OS Login Classes*

login-tip

Syntax
login-tip;

Hierarchy Level
[edit system login class *class-name*]

Release Information
Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description
Enable CLI tips at login.

Default
Disabled.

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

Related Documentation
- Configuring Login Tips on page 40

message

Syntax
message *text*;

Hierarchy Level
[edit system login]

Release Information
Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description
Configure a system login message. This message appears before a user logs in.

Options
text—Text of the message.

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

Related Documentation
- Configuring Junos OS to Display a System Login Message on page 98
- **announcement on page 251**

user (Access)

Syntax

```
user username {
  authentication {
    (encrypted-password "password" | plain-text-password);
    load-key-file URL;
    remote-debug-permission (qfabric-admin | qfabric-operator |qfabric-user);
    ssh-dsa "public-key" <from hostname>;
    ssh-rsa "public-key" <from hostname>;
  }
  class class-name;
  full-name "complete-name";
  uid uid-value;
}
```

Hierarchy Level

[edit system login]

Release Information

Statement introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.
Statement introduced in Junos OS Release 11.1 for the QFX Series.

Description

Configure access permission for individual users.

Options

The remaining statements are explained separately.

Required Privilege Level

admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration.

Related Documentation

- Configuring Junos OS User Accounts on page 97
- class on page 253

Copyright © 2016, Juniper Networks, Inc.

CHAPTER 22

NTP Configuration Statements

- authentication-key on page 262
- boot-server (NTP) on page 263
- broadcast on page 264
- broadcast-client on page 265
- multicast-client on page 265
- ntp on page 266
- peer on page 267
- server (NTP) on page 268
- source-address (NTP, RADIUS, System Logging, or TACACS+) on page 269
- trusted-key on page 270

authentication-key

Syntax authentication-key *key-number* type *type* value *password*;

Hierarchy Level [edit system ntp]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure Network Time Protocol (NTP) authentication keys so that the router or switch can send authenticated packets. If you configure the router or switch to operate in authenticated mode, you must configure a key.

Both the keys and the authentication scheme (MD5) must be identical between a set of peers sharing the same key number.

Options ***key-number***—An integer in the range of 1 to 65533.

type *type*—Authentication type. It can only be **md5**.

value *password*—Key itself, consisting of 1 through 8 ASCII characters. If the key contains spaces, enclose it in quotation marks.

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

Related Documentation

- Understanding NTP Time Servers on page 103
- Configuring NTP Authentication Keys on page 104

 Copyright © 2016, Juniper Networks, Inc.

boot-server (NTP)

Syntax boot-server (*address* | *hostname*);

Hierarchy Level [edit system ntp]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure the server that NTP queries when the router or switch boots to determine the local date and time.

When you boot the router or switch, it issues an **ntpdate** request, which polls a network server to determine the local date and time. You need to configure a server that the router or switch uses to determine the time when the router or switch boots. Otherwise, NTP cannot synchronize to a time server if the server time significantly differs from the local router's or switch's time. You can configure either an IP address or a hostname for the boot server. If you configure a hostname instead of an IP address, the **ntpdate** request resolves the hostname to an IP address when the router or switch boots up.

Options

- ***address***—IP address of an NTP boot server.
- ***hostname***—Hostname of an NTP boot server.

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

Related Documentation

- Understanding NTP Time Servers on page 103
- Configuring NTP Authentication Keys on page 104
- Synchronizing and Coordinating Time Distribution Using NTP on page 109

broadcast

Syntax broadcast *address* <key *key-number*> <version *value*> <ttl *value*>;

Hierarchy Level [edit system ntp]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure the local router or switch to operate in broadcast mode with the remote system at the specified address to send periodic broadcast messages to a client population. Normally, you include this statement only when the local router or switch is operating as a transmitter.

Options ***address***—Broadcast address on one of the local networks or a multicast address assigned to NTP. You must specify an address, not a hostname. If the multicast address is used, it must be **224.0.1.1**.

key ***key-number***—(Optional) All packets sent to the address include authentication fields that are encrypted using the specified key number (any unsigned 32-bit integer).

ttl ***value***—(Optional) Time-to-live (TTL) value to use.

Range: 1 through 255

Default: 1

version ***value***—(Optional) Specify the version number to be used in outgoing NTP packets.

Range: 1 through 4

Default: 4

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

Related Documentation

- Understanding NTP Time Servers on page 103
- Configuring NTP Authentication Keys on page 104
- Configuring the NTP Time Server and Time Services on page 105

 Copyright © 2016, Juniper Networks, Inc.

broadcast-client

Syntax broadcast-client;

Hierarchy Level [edit system ntp]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure the local switch to listen for broadcast messages on the local network to discover other servers on the same subnet.

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

Related Documentation

- Understanding NTP Time Servers on page 103
- Configuring NTP Authentication Keys on page 104
- Configuring the Switch to Listen for Broadcast Messages Using NTP on page 107

multicast-client

Syntax multicast-client <*address*>;

Hierarchy Level [edit system ntp]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description For Network Time Protocol (NTP), configure the local router or switch to listen for multicast messages on the local network to discover other servers on the same subnet.

Options *address*—(Optional) One or more IP addresses. If you specify addresses, the router or switch joins those multicast groups.

Default: 224.0.1.1.

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

Related Documentation

- Understanding NTP Time Servers on page 103
- Configuring NTP Authentication Keys on page 104
- Configuring the Switch to Listen for Multicast Messages Using NTP on page 108

ntp

Syntax

```
ntp {
   authentication-key number type type value password;
   boot-server address;
   broadcast <address> <key key-number> <version value> <ttl value>;
   broadcast-client;
   multicast-client <address>;
   peer address <key key-number> <version value> <prefer>;
   server address <key key-number> <version value> <prefer>;
   source-address source-address;
   trusted-key [ key-numbers ];
}
```

Hierarchy Level

[edit system]

Release Information

Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Configure Network Time Protocol (NTP) on the switch.

The remaining statements are explained separately.

Required Privilege Level

system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- Understanding NTP Time Servers on page 103
- Configuring NTP Authentication Keys on page 104
- Synchronizing and Coordinating Time Distribution Using NTP on page 109

Copyright © 2016, Juniper Networks, Inc.

peer

Syntax peer *address* <key *key-number*> <version *value*> <prefer>;

Hierarchy Level [edit system ntp]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description For NTP, configure the local router or switch to operate in symmetric active mode with the remote system at the specified address. In this mode, the local router or switch and the remote system can synchronize with each other. This configuration is useful in a network in which either the local router or switch or the remote system might be a better source of time.

Options ***address***—Address of the remote system. You must specify an address, not a hostname.

key *key-number*—(Optional) All packets sent to the address include authentication fields that are encrypted using the specified key number.

Range: Any unsigned 32-bit integer

prefer—(Optional) Mark the remote system as the preferred host, which means that if all other factors are equal, this remote system is chosen for synchronization among a set of correctly operating systems.

version *value*—(Optional) Specify the NTP version number to be used in outgoing NTP packets.

Range: 1 through 4

Default: 4

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

Related Documentation

- Understanding NTP Time Servers on page 103
- Configuring NTP Authentication Keys on page 104
- Configuring the NTP Time Server and Time Services on page 105

server (NTP)

Syntax server *address* <key *key-number*> <version *value*> <prefer>;

Hierarchy Level [edit system ntp]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description For NTP, configure the switch to operate in client mode with the remote system at the specified server address. In this mode, the local switch can be synchronized with the remote system, but the remote system can never be synchronized with the local switch.

Options ***address***—Address of the remote system. You must specify an address, not a hostname.

key *key-number*—(Optional) Use the specified key number to encrypt authentication fields in all packets sent to the specified address.

Range: Any unsigned 32-bit integer

prefer—(Optional) Mark the remote system as preferred host, which means that if all other things are equal, this remote system is chosen for synchronization among a set of correctly operating systems.

version *value*—(Optional) Specify the version number to be used in outgoing NTP packets.

Range: 1 through 4

Default: 4

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

Related Documentation

- Understanding NTP Time Servers on page 103
- Configuring NTP Authentication Keys on page 104

 Copyright © 2016, Juniper Networks, Inc.

source-address (NTP, RADIUS, System Logging, or TACACS+)

Syntax

source-address *source-address*;

Hierarchy Level

[edit system accounting destination radius server *server-address*],
[edit system accounting destination tacplus server *server-address*],
[edit system ntp],
[edit system radius-server *server-address*],
[edit system syslog],
[edit system tacplus-server *server-address*]

Release Information

Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Specify a source address for each configured TACACS+ server, RADIUS server, NTP server, or the source address to record in system log messages that are directed to a remote machine.

Options

source-address—Valid IP address configured on one of the switch interfaces. For system logging, the address is recorded as the message source in messages sent to the remote machines specified in all **host *hostname*** statements at the **[edit system syslog]** hierarchy level.

Required Privilege Level

system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Configuring RADIUS Authentication (QFX Series or OCX Series)*
- Synchronizing and Coordinating Time Distribution Using NTP on page 109
- *Specifying an Alternative Source Address for System Log Messages Directed to a Remote Destination*

trusted-key

Syntax trusted-key [*key-numbers*];

Hierarchy Level [edit system ntp]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description For NTP, configure the keys to use when you configure the switch to synchronize its time with other systems on the network.

Options ***key-numbers***—One or more key numbers. Each key can be any 32-bit unsigned integer except 0.

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

Related Documentation

- Configuring NTP Authentication Keys on page 104
- *authentication-key*
- server on page 268

 Copyright © 2016, Juniper Networks, Inc.

CHAPTER 23

Password Configuration Statements

- authentication (Login) on page 272
- change-type on page 273
- format on page 274
- maximum-length on page 275
- minimum-changes on page 276
- minimum-length on page 277
- minimum-lower-cases on page 278
- minimum-numerics on page 279
- minimum-punctuations on page 280
- minimum-upper-cases on page 281
- password (Login) on page 282
- permissions on page 282
- retry-options on page 283
- root-authentication on page 285
- ssh-dsa on page 286
- ssh-rsa on page 286
- user (Access) on page 287

Copyright © 2016, Juniper Networks, Inc.

authentication (Login)

Syntax

```
authentication {
   encrypted-password password;
   load-key-file URL;
   plain-text-password password;
   remote-debug-permission (qfabric-admin | qfabric-operator |qfabric-user);
   ssh-dsa "public-key";
   ssh-rsa "public-key";
}
```

Hierarchy Level

[edit system login user *username*]

Release Information

Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Authentication methods that a user can use to log in to the switch. You can assign multiple authentication methods to a single user.

Options

encrypted-password "*password*"—Message Digest 5 (MD5) or other encrypted authentication. Specify the MD5 or other password. You can specify only one encrypted password for each user.

You cannot configure a blank password for **encrypted-password** using blank quotation marks (" "). You must configure a password of 1 through 128 characters and enclose the password in quotation marks.

load-key-file—Load RSA (SSH version 1 and SSH version 2) and DSA (SSH version 2) public keys from a file. The file is a URL containing one or more SSH keys.

plain-text-password—Plain-text password. The command-line interface (CLI) prompts you for the password and then encrypts it.

remote-debug-permission (QFabric systems only)—QFabric component authentication. Specifies permission levels for users to access individual components in a QFabric system.

ssh-dsa "*public-key*"—SSH version 2 authentication. Specify the SSH public key. You can specify one or more public keys for each user.

ssh-rsa "*public-key*"—SSH version 1 and SSH version 2 authentication. Specify the SSH public key. You can specify one or more public keys for each user.

Required Privilege Level

admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration.

Related Documentation

- Configuring Junos OS User Accounts on page 97
- root-authentication on page 285

Copyright © 2016, Juniper Networks, Inc.

change-type

Syntax change-type (character-sets | set-transitions);

Hierarchy Level [edit system login password]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Set requirements for using character sets in plain-text passwords. When you combine this statement with the **minimum-changes** statement, you can check for the total number of character sets included in the password or for the total number of character-set changes in the password. Newly created passwords must meet these requirements.

Options Specify one of the following:

- **character-sets**—Number of character sets in the password. Valid character sets include uppercase letters, lowercase letters, numbers, punctuation, and other special characters.
- **set-transitions**—Number of transitions between character sets.

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

Related Documentation

- *Special Requirements for Junos OS Plain-Text Passwords*
- minimum-changes on page 276

format

Syntax format (des | md5 | sha1);

Hierarchy Level [edit system login password]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure the authentication algorithm for plain-text passwords.

Default For Junos OS, the default encryption format is **md5**. For Junos OS-FIPS software, the default encryption format is **sha1**.

Options The hash algorithm that authenticates the password can be one of three algorithms:

- **des**—Has a block size of 8 bytes; its key size is 48 bits long.
- **md5**—Produces a 128-bit digest.
- **sha1**—Produces a 160-bit digest.

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

Related Documentation
- *Special Requirements for Junos OS Plain-Text Passwords*

 Copyright © 2016, Juniper Networks, Inc.

maximum-length

Syntax maximum-length *length*;

Hierarchy Level [edit system login passwords]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Specify the maximum number of characters allowed in plain-text passwords. Newly created passwords must meet this requirement.

Default For Junos OS-FIPS software, the maximum number of characters for plain-text passwords is **20**. For Junos OS, no maximum is set.

Options **length**—Maximum number of characters the password can include.

Range: 1 to 64 characters

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

Related Documentation

- *Special Requirements for Junos OS Plain-Text Passwords*
- minimum-length on page 277

minimum-changes

Syntax minimum-changes *number*;

Hierarchy Level [edit system login passwords]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Specify the minimum number of character sets (or character set changes) required in plain-text passwords. Newly created passwords must meet this requirement.

This statement is used in combination with the **change-type** statement. If the change type is **character-sets**, then the number of character sets included in the password is checked against the specified minimum. If the change type is **set-transitions**, then the number of character set changes in the password is checked against the specified minimum.

Default For Junos OS, the minimum number of changes is 1. For Junos-FIPS software, the minimum number of changes is 3.

Options ***number***—Minimum number of character sets (or character set changes) required for the password.

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

Related Documentation

- *Special Requirements for Junos OS Plain-Text Passwords*
- change-type on page 273

 Copyright © 2016, Juniper Networks, Inc.

minimum-length

Syntax minimum-length *length*;

Hierarchy Level [edit system login password]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Specify the minimum number of characters required in plain-text passwords. Newly created passwords must meet this requirement.

Default For Junos OS, the minimum number of characters for plain-text passwords is six. For Junos-FIPS software, the minimum number of characters for plain-text passwords is 10.

Options **length**—Minimum number of characters the password must include.

Range: 6 to 20 characters

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

Related Documentation

- *Special Requirements for Junos OS Plain-Text Passwords*
- maximum-length on page 275

minimum-lower-cases

Syntax minimum-lower-cases *number*;

Hierarchy Level [edit system login password]

Release Information Statement introduced in Junos OS Release 12.1.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Specify the minimum number of lower-case letters required in plain-text passwords. Newly created passwords must meet this requirement.

This statement can be used in combination with all of the other requirement options for plain-text passwords, such as **minimum-length**, **minimum-punctuations**, **minimum-upper-cases,** and so on.

Using several password minimum requirement options will cause the **minimum-length** to be reset if the total sum of the required minimums exceeds the **minimum-length** setting.

Options ***number***—The minimum number of lower-case letters required for the password.

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

Related Documentation

- *Special Requirements for Junos OS Plain-Text Passwords*
- Example: Changing the Requirements for Junos OS Plain-Text Passwords on page 136
- *password (Login)*

 Copyright © 2016, Juniper Networks, Inc.

minimum-numerics

Syntax minimum-numerics *number*;

Hierarchy Level [edit system login password]

Release Information Statement introduced in Junos OS Release 12.1.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Specify the minimum number of numeric class characters required in plain-text passwords. Newly created passwords must meet this requirement.

This statement can be used in combination with all of the other requirement options for plain-text passwords, such as **minimum-length**, **minimum-punctuations**, **minimum-lower-cases,** and so on.

Using several password minimum requirement options will cause the **minimum-length** to be reset if the total sum of the required minimums exceeds the **minimum-length** setting.

Options ***number***—The minimum number of numeric class characters required for the password.

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

Related Documentation

- *Special Requirements for Junos OS Plain-Text Passwords*
- Example: Changing the Requirements for Junos OS Plain-Text Passwords on page 136
- *password (Login)*

minimum-punctuations

Syntax minimum-punctuations *number*;

Hierarchy Level [edit system login password]

Release Information Statement introduced in Junos OS Release 12.1.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Specify the minimum number of punctuation class characters required in plain-text passwords. Newly created passwords must meet this requirement.

This statement can be used in combination with all of the other requirement options for plain-text passwords, such as **minimum-length**, **minimum-upper-cases**, **minimum-lower-cases,** and so on.

Using several password minimum requirement options will cause the **minimum-length** to be reset if the total sum of the required minimums exceeds the **minimum-length** setting.

Options ***number***—The minimum number of punctuation class characters required for the password.

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

Related Documentation

- *Special Requirements for Junos OS Plain-Text Passwords*
- Example: Changing the Requirements for Junos OS Plain-Text Passwords on page 136
- *password (Login)*

 Copyright © 2016, Juniper Networks, Inc.

minimum-upper-cases

Syntax minimum-upper-cases *number*;

Hierarchy Level [edit system login password]

Release Information Statement introduced in Junos OS Release 12.1.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Specify the minimum number of upper-case letters required in plain-text passwords. Newly created passwords must meet this requirement.

This statement can be used in combination with all of the other requirement options for plain-text passwords, such as **minimum-length**, **minimum-punctuations**, **minimum-lower-cases,** and so on.

Using several password minimum requirement options will cause the **minimum-length** to be reset if the total sum of the required minimums exceeds the **minimum-length** setting.

Options ***number***—The minimum number of upper-case letters required for the password.

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

Related Documentation

- *Special Requirements for Junos OS Plain-Text Passwords*
- Example: Changing the Requirements for Junos OS Plain-Text Passwords on page 136
- *password (Login)*

password (Login)

Syntax

```
password {
  change-type (set-transitions | character-set);
  format (md5 | sha1 | des);
  maximum-length length;
  minimum-changes number;
  minimum-length length;
}
```

Hierarchy Level [edit system login]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure special requirements such as character length and encryption format for plain-text passwords. Newly created passwords must meet these requirements.

The remaining statements are explained separately.

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

Related Documentation

- *Special Requirements for Junos OS Plain-Text Passwords*

permissions

Syntax

```
permissions {
  storage;
  storage-control;
}
```

Hierarchy Level [edit system login class]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure the login access privileges to be provided on the switch.

Options ***permissions***—Privilege type.

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

Related Documentation

- *Configuring Access Privilege Levels*
- *Understanding Junos OS Access Privilege Levels*
- user on page 260

 Copyright © 2016, Juniper Networks, Inc.

retry-options

Syntax

```
retry-options {
   backoff-threshold number;
   backoff-factor seconds;
   maximum-time seconds;
   minimum-time seconds;
   tries-before-disconnect number;
}
```

Hierarchy Level [edit system login]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Maximum number of times a user can attempt to enter a password while logging in through SSH or Telnet before being disconnected.

Options

backoff-threshold *number*—Threshold for the number of failed login attempts before the user experiences a delay when attempting to reenter a password. Use the **backoff-factor** option to specify the length of delay, in seconds.

Range: 1 through 3

Default: 2

backoff-factor *seconds*—Length of delay after each failed login attempt. The length of delay increases by this value for each subsequent login attempt after the value specified in the **backoff-threshold** option.

Range: 5 through 10

Default: 5

maximum-time *seconds*—Maximum length of time that the connection remains open for the user to enter a username and password to log in. If the user remains idle and does not enter a username and password within the configured **maximum-time**, the connection is closed.

Range: 20 through 300

Default: 120

minimum-time *seconds*—Minimum length of time that the connection remains open while the user is attempting to enter a password to log in.

Range: 20 through 60

Default: 20

tries-before-disconnect *number*—Maximum number of times a user is allowed to attempt to enter a password to log in through SSH or Telnet.

Range: 1 through 10

Default: 10

Copyright © 2016, Juniper Networks, Inc.

Required Privilege Level

admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration.

Related Documentation

- *Limiting the Number of User Login Attempts for SSH and Telnet Sessions*

Copyright © 2016, Juniper Networks, Inc.

root-authentication

Syntax

```
root-authentication {
   (encrypted-password "password" | load-key-password URL | plain-text-password);
   ssh-dsa "public-key";
   ssh-rsa "public-key";
}
```

Hierarchy Level [edit system]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure the authentication methods for the root-level user, whose username is **root**.

Options

encrypted-password "*password*"— Specify the MD5 or other encrypted authentication password. You can specify only one encrypted password.

You cannot configure a blank password for the **encrypted-password** option using blank quotation marks (" "). You must configure a password of 1 through 128 characters and enclose the password in quotation marks.

CAUTION: Do not use the **encrypted-password** option unless the password is *already* encrypted, and you are entering the encrypted version of the password. If you commit the **encrypted-password** option with a plain-text password or with blank quotation marks (" "), you will not be able to log in to the device as root, and you will need to use the password recovery process.

plain-text-password—Plain-text password. The CLI prompts you for the password and then encrypts it. The CLI displays the encrypted version, and the software places the encrypted version in its user database. You can specify only one plain-text password.

ssh-dsa "*public-key*"—SSH version 2 authentication. Specify the DSA (SSH version 2) public key. You can specify one or more public keys.

ssh-rsa "*public-key*"—SSH version 1 authentication. Specify the RSA (SSH version 1 and SSH version 2) public key. You can specify one or more public keys.

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

Related Documentation

- *Configuring the Root Password*
- *Recovering the Root Password*
- authentication on page 252

ssh-dsa

Syntax ssh-dsa "*public-key*";

Hierarchy Level [edit system root-authentication]
[edit system login user authentication]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Specify the DSA (SSH version 2) public key. You can specify one or more public keys.

Options **ssh-dsa "*public-key*"**—SSH version 2 authentication.

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

Related Documentation
- Configuring the Root Password on page 133
- **authentication on page 252**
- *root-authentication*

ssh-rsa

Syntax ssh-dsa "*public-key*";

Hierarchy Level [edit system root-authentication]
[edit system login user authentication]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Specify the RSA (SSH version 1) public key. You can specify one or more public keys.

Options **ssh-rsa "*public-key*"**—SSH version 1 authentication. Specify the RSA (SSH version 1 and SSH version 2) public key. You can specify one or more public keys.

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

Related Documentation
- *Configuring the Root Password*
- **authentication on page 252**
- *root-authentication*

 Copyright © 2016, Juniper Networks, Inc.

user (Access)

Syntax

```
user username {
  authentication {
    (encrypted-password "password" | plain-text-password);
    load-key-file URL;
    remote-debug-permission (qfabric-admin | qfabric-operator |qfabric-user);
    ssh-dsa "public-key" <from hostname>;
    ssh-rsa "public-key" <from hostname>;
  }
  class class-name;
  full-name "complete-name";
  uid uid-value;
}
```

Hierarchy Level

[edit system login]

Release Information

Statement introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.
Statement introduced in Junos OS Release 11.1 for the QFX Series.

Description

Configure access permission for individual users.

Options

The remaining statements are explained separately.

Required Privilege Level

admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration.

Related Documentation

- Configuring Junos OS User Accounts on page 97
- class on page 253

Copyright © 2016, Juniper Networks, Inc.

CHAPTER 24

RADIUS and TACACS+ Accounting Configuration Statements

- accounting-port (RADIUS Server) on page 290
- destination (Accounting) on page 291
- events on page 292
- port (TACACS+ Server) on page 292
- radius (System) on page 293
- secret on page 294
- server (RADIUS Accounting) on page 295
- server (TACACS+ Accounting) on page 295
- single-connection on page 296
- tacplus on page 296
- timeout on page 297

accounting-port (RADIUS Server)

Syntax accounting-port *port-number*;

Hierarchy Level [edit system accounting destination radius server *server-address*],
[edit system radius-server *server-address*]

Release Information Statement introduced in Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure the accounting port number on which to contact the RADIUS server.

Options ***number***—Port number on which to contact the RADIUS server.

Default: 1813

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

Related Documentation

- *Configuring RADIUS Server Authentication*
- Configuring RADIUS System Accounting on page 141

 Copyright © 2016, Juniper Networks, Inc.

destination (Accounting)

Syntax

```
destination {
  radius {
    server {
      server-address {
        accounting-port port-number;
        retry number;
        secret password;
        source-address address;
        source-address-inet6 IPv6-source-address;
        timeout seconds;
      }
    }
  }
  tacplus {
    server {
      server-address {
        port port-number;
        secret password;
        single-connection;
        timeout seconds;
      }
    }
  }
}
```

Hierarchy Level

[edit system accounting]

Release Information

Statement introduced before Junos OS Release 7.4.
radius statement added in Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Configure the authentication server.

Options

source-address-inet6 ***IPv6-source-address***—A valid IPv6 address configured on one of the routers or switch interfaces.

The remaining statements are explained separately.

Required Privilege Level

system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- Configuring RADIUS System Accounting on page 141
- *Configuring TACACS+ System Accounting*

events

Syntax events [*events*];

Hierarchy Level [edit system accounting]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure the types of events to track and log.

Options ***events***—Event types; can be one or more of the following:

- **change-log**—Audit configuration changes.
- **interactive-commands**—Audit interactive commands (any command-line input).
- **login**—Audit logins.

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

Related Documentation
- Configuring TACACS+ System Accounting on page 144

port (TACACS+ Server)

Syntax port *port-number*;

Hierarchy Level [edit system accounting destination tacplus server *server-address*]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure the port number on which to contact the TACACS+ server.

Options ***number***—Port number on which to contact the TACACS+ server.

Default: 49

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

Related Documentation
- Configuring TACACS+ System Accounting on page 144

 Copyright © 2016, Juniper Networks, Inc.

radius (System)

Syntax

```
radius {
  server {
    server-address {
      accounting-port port-number;
      secret password;
      source-address address;
      retry number;
      timeout seconds;
    }
  }
}
```

Hierarchy Level [edit system accounting destination]

Release Information

Statement introduced in Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure the RADIUS accounting server.

Options

server-address—Address of the RADIUS accounting server.

The remaining statements are explained separately.

Required Privilege Level

system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- Configuring RADIUS System Accounting on page 141

secret

Syntax secret *password*;

Hierarchy Level [edit system accounting destination radius server *server-address*],
[edit system accounting destination tacplus server *server-address*],
[edit system radius-server *server-address*],
[edit system tacplus-server *server-address*]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure the password to use with the RADIUS or TACACS+ server. The secret password used by the local switch must match that used by the server.

Options ***password***—Password to use; can include spaces included in quotation marks.

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

Related Documentation

- *Configuring RADIUS Accounting*
- *Configuring RADIUS Authentication (QFX Series or OCX Series)*
- Configuring TACACS+ System Accounting on page 144

 Copyright © 2016, Juniper Networks, Inc.

server (RADIUS Accounting)

Syntax

```
server {
  server-address {
    accounting-port port-number;
    retry number
    secret password;
    source-address address;
    timeout seconds;
  }
}
```

Hierarchy Level [edit system accounting destination radius]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure RADIUS logging.

The remaining statements are explained separately.

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

Related Documentation

- Configuring RADIUS System Accounting on page 141

server (TACACS+ Accounting)

Syntax

```
server {
  server-address {
    port port-number;
    secret password;
    single-connection;
    timeout seconds;
  }
}
```

Hierarchy Level [edit system accounting destination tacplus]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure TACACS+ logging.

The remaining statements are explained separately.

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

Related Documentation

- Configuring TACACS+ System Accounting on page 144

single-connection

Syntax single-connection;

Hierarchy Level [edit system accounting destination tacplus server *server-address*],
[edit system tacplus *server-address*]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Optimize attempts to connect to a TACACS+ server. The software maintains one open TCP connection to the server for multiple requests rather than opening a connection for each connection attempt.

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

Related Documentation
- *Configuring TACACS+ Authentication (QFX Series)*
- Configuring TACACS+ System Accounting on page 144

tacplus

Syntax

```
tacplus {
  server {
    server-address {
      port port-number;
      secret password;
      single-connection;
      timeout seconds;
    }
  }
}
```

Hierarchy Level [edit system accounting destination]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure TACACS+.

Options ***server-address***—Address of the TACACS+ authentication server.

The remaining statements are explained separately.

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

Related Documentation
- Configuring TACACS+ System Accounting on page 144

 Copyright © 2016, Juniper Networks, Inc.

timeout

Syntax timeout *seconds*;

Hierarchy Level [edit system radius-server *server-address*],
[edit system tacplus-server *server-address*],
[edit system accounting destination radius server server-address],
[edit system accounting destination tacplus server server-address]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure the length of time that the local router or switch waits to receive a response from a RADIUS or TACACS+ server.

Options ***seconds***—Length of time to wait.

Range: 1 through 90 seconds

Default: 3 seconds

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

Related Documentation

- *Configuring RADIUS Accounting*
- Configuring TACACS+ System Accounting on page 144
- **retry on page 221**

Copyright © 2016, Juniper Networks, Inc.

CHAPTER 25

Autoinstallation Operational Commands

- show system autoinstallation status

show system autoinstallation status

Syntax show system autoinstallation status

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command supported in Junos OS Release 12.2 for ACX Series Universal Access Routers.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description (ACX Series routers, and EX Series switches only) Display autoinstallation status information.

Options This command has no options.

Required Privilege Level view

Related Documentation

- *ACX Series Autoinstallation Overview*
- *Before You Begin Autoinstallation on an ACX Series Universal Access Router*
- *Autoinstallation Configuration of ACX Series Universal Access Routers*
- *USB Autoinstallation on ACX Series Routers*
- *Autoinstalling a Configuration File from a Disk-on-Key USB Memory Stick onto an EX2200 or EX3300 Switch*
- *Verifying Autoinstallation on ACX Series Universal Access Routers*
- *autoinstallation*

List of Sample Output show system autoinstallation status on page 301

Output Fields Table 16 on page 300 describes the output fields for the **show system autoinstallation status** command. Output fields are listed in the approximate order in which they appear.

Table 16: show system autoinstallation status Output Fields

Field Name	Field Description

Autoinstallation status	Display autoinstallation status information:
	• **Last committed file**—File last committed for autoinstallation configuration.
	• **Configuration server of last committed file**—IP address or URL of the server configured to retrieve configuration information for the last committed configuration file.
	• **Interface**—Interface configured for autoinstallation.
	  ◦ **Name**—Name of the interface.
	  ◦ **State**—Interface state.
	• **Address acquisition**—Display IP address acquired and protocol used for acquisition upon startup.
	  ◦ **Protocol**—Protocol used for acquisition: BOOTP/DHCP or RARP.
	  ◦ **Acquired address**—IP address acquired from the DHCP server.

 Copyright © 2016, Juniper Networks, Inc.

Sample Output

show system autoinstallation status

```
user@host> show system autoinstallation status
Autoinstallation status:
Master state: Active
Last committed file: None
Configuration server of last committed file: 0.0.0.0
Interface:
  Name: ge-0/0/1
  State: None
  Address acquisition:
    Protocol: DHCP Client
    Acquired address: None
    Protocol: RARP Client
    Acquired address: None
```

Copyright © 2016, Juniper Networks, Inc.

CHAPTER 26

Basic System Management Operational Commands

- commit
- clear log
- clear chassis display message
- clear system commit
- clear system reboot
- file
- file archive
- file checksum md5
- file checksum sha1
- file checksum sha-256
- file compare
- file delete
- file list
- file rename
- file show
- load
- ping
- request chassis beacon
- request chassis fpc
- request chassis pic
- request chassis routing-engine master
- request message
- request system configuration rescue delete
- request system configuration rescue save
- request system halt
- request system logout

Copyright © 2016, Juniper Networks, Inc.

- request system power-off
- request system reboot
- request system storage cleanup
- request system zeroize
- restart
- save

Copyright © 2016, Juniper Networks, Inc.

commit

Syntax

commit <<*at* <"string">> <and-quit> <check> <comment <"*comment-string*">> <confirmed> <display detail> <**fast-synchronize**> <*minutes*> <peers-synchronize > <synchronize <force> <scripts>>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Option **fast-synchronize** added in Junos OS Release 12.2.
Option **synchronize scripts** introduced in Junos OS Release 13.2.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
Option **peers-synchronize** introduced in Junos OS Release 14.2R6.

Description

Commit the set of changes to the database and cause the changes to take operational effect.

NOTE: The **fast-synchronize** option is not supported in a QFX Series Virtual Chassis.

NOTE: Beginning in Junos OS 12.3, it is possible that FPCs brought offline using the **request chassis fpc slot** *fpc-slot* **offline** operational-mode CLI command can come online during a configuration commit or power-supply replacement procedure. As an alternative, use the **set fpc** *fpc-slot* **power off** configuration-mode command at the **[edit chassis]** hierarchy level to ensure that the FPCs remain offline.

Options

at <"string">—(Optional) Save software configuration changes and activate the configuration at a future time, or upon reboot.

string is **reboot** or the future time to activate the configuration changes. Enclose the ***string*** value (including **reboot**) in quotation marks (“ ”). You can specify time in two formats:

- A time value in the form ***hh:mm***[**:*ss***] (hours, minutes, and optionally seconds)—Commit the configuration at the specified time, which must be in the future but before 11:59:59 PM on the day the **commit at** configuration command is issued. Use 24-hour time for the ***hh*** value; for example, **04:30:00** is 4:30:00 AM, and **20:00** is 8:00 PM. The time is interpreted with respect to the clock and time zone settings on the router.

- A date and time value in the form ***yyyy-mm-dd hh:mm***[**:*ss***] (year, month, date, hours, minutes, and, optionally, seconds)—Commit the configuration at the specified day and time, which must be after the **commit at** command is issued. Use 24-hour time for the ***hh*** value. For example, **2003-08-21 12:30:00** is 12:30 PM on August 21, 2003. The time is interpreted with respect to the clock and time zone settings on the router.

For example, **commit at "18:00:00"**. For date and time, include both values in the same set of quotation marks. For example, **commit at "2005-03-10 14:00:00"**.

A *commit check* is performed when you issue the **commit at** configuration mode command. If the result of the check is successful, then the current user is logged out of configuration mode, and the configuration data is left in a read-only state. No other commit can be performed until the scheduled commit is completed.

NOTE: If Junos OS fails before the configuration changes become active, all configuration changes are lost.

You cannot enter the **commit at** configuration command when there is a pending reboot.

You cannot enter the **request system reboot** command once you schedule a commit operation for a specific time in the future.

You cannot commit a configuration when a scheduled commit is pending. For information about how to use the **clear** command to cancel a scheduled configuration, see the CLI Explorer.

and-quit—(Optional) Commit the configuration and, if the configuration contains no errors and the commit succeeds, exit from configuration mode.

check—(Optional) Verify the syntax of the configuration, but do not activate it.

comment <"***comment-string***">—(Optional) Add a comment that describes the committed configuration. The comment can be as long as 512 bytes and must be typed on a single line. You cannot include a comment with the **commit check** command. Enclose ***comment-string*** in quotation marks (" "). For example, **commit comment "Includes changes recommended by SW Lab".**

confirmed <*minutes*>—(Optional) Require that the commit be confirmed within the specified amount of time. To confirm a commit, enter either a **commit** or **commit check** command. If the commit is not confirmed within the time limit, the configuration rolls back automatically to the precommit configuration and a broadcast message is sent to

 Copyright © 2016, Juniper Networks, Inc.

all logged-in users. To show when a rollback is scheduled, enter the **show system commit** command. The allowed range is **1** through **65,535** minutes, and the default is **10** minutes.

In Junos OS Release 11.4 and later, you can also use the **commit confirmed** command in the **[edit private]** configuration mode.

display detail—(Optional) Monitors the commit process.

NOTE: In Junos OS Release 10.4 and later, if the number of commit details or messages exceeds a page when used with the **| display detail** pipe option, the **more** pagination option on the screen is no longer available. Instead, the messages roll up on the screen by default, just like using the **commit** command with the **| no more** pipe option.

fast-synchronize—(Optional) Configure the commits to run in parallel on both the master and backup Routing Engines to reduce the time taken for commit synchronization.

NOTE: The **fast-synchronize** statement is not supported on QFX Series devices when used in a Virtual Chassis.

peers-synchronize—(Optional) Automatically synchronizes and commits MC-LAG configurations across the peers. The local peer (the requesting peer) on which you enable the **peers-synchronize** statement copies and loads its configuration to the remote (the responding) peer. Each peer then performs a syntax check on the configuration file being committed. If no errors are found, the configuration is activated and becomes the current operational configuration on both peers.

synchronize <force> <scripts>—(Optional) If your router has two Routing Engines, you can manually direct one Routing Engine to synchronize its configuration with the other by issuing the **commit synchronize** command. The Routing Engine on which you execute this command (the request Routing Engine) copies and loads its candidate configuration to the other Routing Engine (the responding Routing Engine). Both Routing Engines then perform a syntax check on the candidate configuration file being committed. If no errors are found, the configuration is activated and becomes the current operational configuration on both Routing Engines.

It can happen that the **commit synchronize** command is initiated at the same time from both Routing Engines, which causes the process to hang. As of Junos OS Release 15.1, this is a temporary (20 seconds) anomaly, after which the user can try the **commit sychronize** command again.

The **commit synchronize** command does not work if the responding Routing Engine has uncommitted configuration changes. However, you can enforce commit synchronization on the Routing Engines by using the **force** option. When you issue the **commit synchronize** command with the **force** option from one Routing Engine, the configuration sessions on

the other Routing Engine are terminated and its configuration synchronized with that on the Routing Engine from which you issued the command.

When you issue the **commit synchronize** command with the **scripts** option, the device synchronizes all commit, event, lib, op, and SNMP scripts from the requesting Routing Engine to the responding Routing Engine and also commits and synchronizes the configuration. If the commit check operation fails for the requesting Routing Engine, the process stops, and the scripts are not copied to the responding Routing Engine. If the commit check or commit operation fails for the responding Routing Engine, the scripts are still synchronized, since the synchronization occurs prior to the commit check operation on the responding Routing Engine.

If the **load-scripts-from-flash** statement is configured for the requesting Routing Engine, the device synchronizes the scripts from flash memory on the requesting Routing Engine to flash memory on the responding Routing Engine. Otherwise, the device synchronizes the scripts from the hard disk on the requesting Routing Engine to the hard disk on the responding Routing Engine. The device synchronizes all scripts regardless of whether they are enabled in the configuration or have been updated since the last synchronization.

NOTE: When you issue the **commit synchronize** command, you must use the **apply-groups re0** and **re1** commands. For information about how to use groups, see *Disabling Inheritance of a Junos OS Configuration Group*.

The responding Routing Engine must use Junos OS Release 5.0 or later.

Required Privilege Level

configure—To enter configuration mode.

NOTE: If you are using Junos OS in a Common Criteria environment, system log messages are created whenever a **secret** attribute is changed (for example, password changes or changes to the RADIUS shared secret). These changes are logged during the following configuration load operations:

```
load merge
load replace
load override
load update
```

For more information, see the *Secure Configuration Guide for Common Criteria and Junos-FIPS*

Related Documentation

- *Verifying a Junos OS Configuration*, *Committing a Junos OS Configuration*
- *Scheduling a Junos OS Commit Operation*
- *Deactivating and Reactivating Statements and Identifiers in a Junos OS Configuration*
- *Monitoring the Junos OS Commit Process*

Copyright © 2016, Juniper Networks, Inc.

- *Adding a Comment to Describe the Committed Configuration*
- *Committing Configurations on a Routing Matrix with a TX Matrix Plus Router*

Sample Output

commit | display detail

```
user@host> commit | display detail
--------------
2011-08-24 01:08:08.00691 PDT: begin creating snapshots
2011-08-24 01:08:09.00210 PDT: end creating snapshots
2011-08-24 01:08:09.00211 PDT: begin preparing metadata
2011-08-24 01:08:09.00228 PDT: end preparing metadata
2011-08-24 01:08:09.00229 PDT: begin computing dcf root changes
2011-08-24 01:08:09.00236 PDT: end computing dcf root changes
2011-08-24 01:08:09.00244 PDT: begin computing additions
2011-08-24 01:08:09.00251 PDT: end computing additions
2011-08-24 01:08:09.00251 PDT: begin local object validation
2011-08-24 01:08:09.00251 PDT: end local object validation
2011-08-24 01:08:09.00252 PDT: begin update instances
2011-08-24 01:08:09.00252 PDT: end update instances
2011-08-24 01:08:09.00252 PDT: begin adjust metadata
2011-08-24 01:08:09.00252 PDT: end adjust metadata
2011-08-24 01:08:09.00253 PDT: begin validate metadata
2011-08-24 01:08:09.00253 PDT: end validate metadata
2011-08-24 01:08:09.00253 PDT: begin adjust allocations
2011-08-24 01:08:09.00254 PDT: end adjust allocations
2011-08-24 01:08:09.00254 PDT: begin adjust dependencies
2011-08-24 01:08:09.00254 PDT: end adjust dependencies
2011-08-24 01:08:09.00255 PDT: begin instance validation
2011-08-24 01:08:09.00255 PDT: end instance validation
2011-08-24 01:08:09.00255 PDT: begin opening all sessions eagerly
2011-08-24 01:08:09.00277 PDT: begin request #1 [login]
2011-08-24 01:08:09.00278 PDT: end request #1 [login]
2011-08-24 01:08:09.00325 PDT: begin processing globals
2011-08-24 01:08:09.00330 PDT: begin waiting for stamp check
(qfabric-default---node0)
2011-08-24 01:08:09.00334 PDT: end reply #1 [login]
2011-08-24 01:08:09.00351 PDT: end reply #1 [login]
2011-08-24 01:08:09.00451 PDT: begin request #2 [open]
2011-08-24 01:08:09.00451 PDT: end request #2 [open]
2011-08-24 01:08:09.00451 PDT: begin request #3 [get commit history]
2011-08-24 01:08:09.00452 PDT: end request #3 [get commit history]
2011-08-24 01:08:09.00452 PDT: begin request #4 [load]
2011-08-24 01:08:09.00453 PDT: end request #4 [load]
2011-08-24 01:08:09.00453 PDT: begin request #5 [load]
2011-08-24 01:08:09.00454 PDT: begin reply #2 [open]
2011-08-24 01:08:09.00456 PDT: end reply #2 [open]
2011-08-24 01:08:09.00457 PDT: begin reply #3 [get commit history]
2011-08-24 01:08:09.00475 PDT: end reply #3 [get commit history]
2011-08-24 01:08:09.00476 PDT: begin reply #4 [load]
2011-08-24 01:08:09.00499 PDT: begin reply #5 [load]
2011-08-24 01:08:09.00501 PDT: end waiting for stamp check
(qfabric-default---node0)
2011-08-24 01:08:09.00501 PDT: begin waiting for open (qfabric-default---node0)
2011-08-24 01:08:09.00502 PDT: end waiting for open (qfabric-default---node0)
2011-08-24 01:08:09.00504 PDT: end processing globals
2011-08-24 01:08:09.00617 PDT: end request #5 [load]
2011-08-24 01:08:09.00617 PDT: begin request #6 [check]
```

```
2011-08-24 01:08:09.00617 PDT: end request #6 [check]
2011-08-24 01:08:09.00619 PDT: end reply #5 [load]
2011-08-24 01:08:09.00619 PDT: begin reply #6 [check]
2011-08-24 01:08:09.00730 PDT: end session
2011-08-24 01:08:09.00752 PDT: end request #5 [load]
2011-08-24 01:08:09.00754 PDT: begin request #6 [check]
2011-08-24 01:08:09.00755 PDT: end request #6 [check]
2011-08-24 01:08:09.00881 PDT: end request #5 [load]
2011-08-24 01:08:09.00961 PDT: begin commit to devices
2011-08-24 01:08:10.00668 PDT: begin request #8 [get commit history]
2011-08-24 01:08:10.00669 PDT: end request #8 [get commit history]
2011-08-24 01:08:10.00721 PDT: end session
2011-08-24 01:08:10.00727 PDT: end commit to devices
2011-08-24 01:08:10.00733 PDT: begin committing metadata
2011-08-24 01:08:10.00772 PDT: end committing metadata
2011-08-24 01:08:10.00772 PDT: begin calling commit callbacks
2011-08-24 01:08:10.00773 PDT: end calling commit callbacks
commit complete
```


Copyright © 2016, Juniper Networks, Inc.

clear log

Syntax

clear log *filename*
<all>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description

Remove contents of a log file.

Options

filename—Name of the specific log file to delete.

all—(Optional) Delete the specified log file and all archived versions of it.

Required Privilege Level

clear

Related Documentation

- show log on page 941

List of Sample Output

clear log on page 311

Output Fields

See file list for an explanation of output fields.

Sample Output

clear log

The following sample commands list log file information, clear the contents of a log file, and then display the updated log file information:

```
user@host> file list lcc0-re0:/var/log/sampled detail
lcc0-re0:
--------------------------------------------------------------------------
-rw-r-----  1 root  wheel      26450 Jun 23 18:47 /var/log/sampled
total 1

user@host> clear log lcc0-re0:sampled
lcc0-re0:
--------------------------------------------------------------------------

user@host> file list lcc0-re0:/var/log/sampled detail
lcc0-re0:
--------------------------------------------------------------------------
-rw-r-----  1 root  wheel         57 Sep 15 03:44 /var/log/sampled
total 1
```

clear chassis display message

List of Syntax

Syntax on page 312
Syntax (TX Matrix Router) on page 312
Syntax (TX Matrix Plus Router) on page 312
Syntax (QFabric Systems) on page 312

Syntax

clear chassis display message

Syntax (TX Matrix Router)

clear chassis display message
<lcc *number* | scc>

Syntax (TX Matrix Plus Router)

clear chassis display message
<lcc *number* | sfc *number*>

Syntax (QFabric Systems)

clear chassis display message
<node-device *name* | interconnect-device *name*>

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.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX 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 *name*—(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 *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.

Copyright © 2016, Juniper Networks, Inc.

- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

node-device ***name***—(QFabric systems only) (Optional) On a QFabric system, clear or stop a text message on the LCD panel display on the specified Node device in a Node group.

scc—(TX Matrix routers only) (Optional) Clear or stop a text message on the craft interface on the TX Matrix router (switch-card chassis).

sfc ***number***—(TX Matrix Plus routers only) (Optional) Clear or stop a text message on the craft interface on the TX Matrix Plus router (or switch-fabric chassis). Replace ***number*** with 0.

Required Privilege Level clear

Related Documentation
- *Configuring the LCD Panel on EX Series Switches (CLI Procedure)*
- *set chassis display message*
- *show chassis craft-interface*

List of Sample Output clear chassis display message on page 313

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      |
     +--------------------+
```


Copyright © 2016, Juniper Networks, Inc.

clear system commit

Syntax clear system commit

Release Information
Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Clear any pending commit operation.

Options This command has no options.

Required Privilege Level maintenance (or the actual user who scheduled the commit)

Related Documentation
- show system commit on page 992

List of Sample Output
clear system commit on page 315
clear system commit (None Pending) on page 315
clear system commit (User Does Not Have Required Privilege Level) on page 315

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear system commit

```
user@host> clear system commit
Pending commit cleared.
```

clear system commit (None Pending)

```
user@host> clear system commit
No commit scheduled.
```

clear system commit (User Does Not Have Required Privilege Level)

```
user@host> clear system commit
error: Permission denied
```

clear system reboot

List of Syntax

Syntax on page 316
Syntax (EX Series Switches) on page 316
Syntax (TX Matrix Router) on page 316
Syntax (TX Matrix Plus Router) on page 316
Syntax (QFX Series) on page 316

Syntax

clear system reboot
<both-routing-engines>

Syntax (EX Series Switches)

clear system reboot
<all-members>
<both-routing-engines>
<local>
<member *member-id*>

Syntax (TX Matrix Router)

clear system reboot
<both-routing-engines>
<all-chassis | all-lcc | lcc *number* | scc>

Syntax (TX Matrix Plus Router)

clear system reboot
<both-routing-engines>
<all-chassis | all-lcc | lcc *number* | sfc *number*>

Syntax (QFX Series)

clear system reboot
<infrastructure *name*>
<interconnect-device *name*>
<node-group *name*>

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.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Clear any pending system software reboots or halts. When issued on a TX Matrix router without any options, the default behavior clears all pending system software reboots or halts on all T640 routers connected to the TX Matrix router. When issued on a TX Matrix Plus router without any options, the default behavior clears all pending system software reboots or halts on all T1600 or T4000 routers connected to the TX Matrix Plus router.

Options

none—Clear all pending system software reboots or halts.

all-chassis—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Clear all halt or reboot requests for all the Routing Engines in the chassis.

all-lcc—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, clear all halt or reboot requests for all T640 routers (or line-card chassis) connected to the TX Matrix router. On a TX Matrix Plus router, clear all halt or reboot requests on the l connected T1600 or T4000 LCCs.

Copyright © 2016, Juniper Networks, Inc.

all-members—(EX4200 switches only) (Optional) Clear all halt or reboot requests on all members of the Virtual Chassis configuration.

both-routing-engines—(Systems with multiple Routing Engines) (Optional) Clear all halt or reboot requests on both Routing Engines. On a TX Matrix router, clear both Routing Engines on all chassis connected to the TX Matrix router. Likewise, on a TX Matrix Plus router, clear both Routing Engines on all chassis connected to the TX Matrix Plus router.

infrastructure *name*—(QFabric systems) (Optional) Clear all halt or reboot requests on the fabric control Routing Engines or fabric manager Routing Engines.

interconnect-device *name*—(QFabric systems) (Optional) Clear all halt or reboot requests on the Interconnect device.

lcc *number*—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, clear all halt or reboot requests for a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, clear all halt or reboot requests for a specific router that is connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(EX4200 switches only) (Optional) Clear all halt or reboot requests on the local Virtual Chassis member.

member *member-id*—(EX4200 switches only) (Optional) Clear all halt or reboot requests on the specified member of the Virtual Chassis configuration. Replace ***member-id*** with a value from 0 through 9.

node-group *name*—(QFabric systems) (Optional) Clear all halt or reboot requests on the Node group.

scc—(TX Matrix routers only) (Optional) Clear all halt or reboot requests for the TX Matrix router (or switch-card chassis).

sfc *number*—(TX Matrix Plus routers only) (Optional) Clear all halt or reboot requests for the TX Matrix Plus router. Replace ***number*** with 0.

Required Privilege Level maintenance

Related Documentation

- *request system reboot*
- *Routing Matrix with a TX Matrix Plus Router Solutions Page*

List of Sample Output

clear system reboot on page 319
clear system reboot (TX Matrix Router) on page 319
clear system reboot (QFX Series) on page 319

Output Fields

When you enter this command, you are provided feedback on the status of your request.

Copyright © 2016, Juniper Networks, Inc.

Sample Output

clear system reboot

```
user@host> clear system reboot
reboot requested by root at Sat Dec 12 19:37:34 1998
[process id 17855]
Terminating...
```

clear system reboot (TX Matrix Router)

```
user@host> clear system reboot
scc-re0:
--------------------------------------------------------------------------
No shutdown/reboot scheduled.
lcc0-re0:
--------------------------------------------------------------------------
No shutdown/reboot scheduled.
lcc2-re0:
--------------------------------------------------------------------------
No shutdown/reboot scheduled.
```

clear system reboot (QFX Series)

```
user@switch> clear system reboot node-group node1
No shutdown/reboot scheduled.
```

file

Syntax file <archive | checksum | compare | copy | delete | list | rename | show | source address>

Release Information Command introduced before Junos OS Release 7.4.

Description Archive files from the device, copy files to and from the router or switch, calculate the file checksum, compare files, delete a file from the device, list files on the device, rename a file, show file contents, or show the local address to initiate a connection.

Options

archive (Optional)—Archive, and optionally compress, one or multiple local system files as a single file, locally or at a remote location.

checksum (Optional)—Calculate the Message Digest 5 (MD5) checksum of a file.

compare (Optional)—Compare two local files and describe the differences between them in default, context, or unified output styles.

copy (Optional)—Copy files from one place to another on the local switch or between the local switch and a remote system.

delete (Optional)—Delete a file on the local switch.

list (Optional)—Display a list of files on the local switch.

rename (Optional)—Rename a file on the local switch.

show (Optional)—Display the contents of a file.

source address (Optional)—Specify the source address of the local file.

Required Privilege Level maintenance

Related Documentation

- *Viewing Files and Directories on a Device Running Junos OS*

 Copyright © 2016, Juniper Networks, Inc.

file archive

Syntax

file archive destination *destination* source *source*
<compress>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description

Archive, and optionally compress, one or multiple local system files as a single file, locally or at a remote location.

Options

destination ***destination***—Destination of the archived file or files. Specify the destination as a URL or filename. The Junos OS adds one of the following suffixes if the destination filename does not already have it:

- For archived files—The suffix **.tar**
- For archived and compressed files—The suffix **.tgz**

source ***source***—Source of the original file or files. Specify the source as a URL or filename.

compress—(Optional) Compress the archived file with the GNU zip (gzip) compression utility. The compressed files have the suffix **.tgz**.

Required Privilege Level

maintenance

Related Documentation

- Format for Specifying Filenames and URLs in Junos OS CLI Commands on page 40

List of Sample Output

file archive (Multiple Files) on page 321
file archive (Single File) on page 321
file archive (with Compression) on page 322

Output Fields

When you enter this command, you are provided feedback on the status of your request.

Sample Output

file archive (Multiple Files)

The following sample command archives all message files in the local directory **/var/log/messages** as the single file **messages-archive.tar**.

```
user@host> file archive source /var/log/messages* destination /var/log/messages-archive.tar
/usr/bin/tar: Removing leading / from absolute path names in the archive.

user@host>
```

file archive (Single File)

The following sample command archives one message file in the local directory **/var/log/messages** as the single file **messages-archive.tar**.

```
user@host> file archive source /var/log/messages destination /var/log/messages-archive.tar
/usr/bin/tar: Removing leading / from absolute path names in the archive.
user@host
```

file archive (with Compression)

The following sample command archives and compresses all message files in the local directory **/var/log/messages** as the single file **messages-archive.tgz**.

```
user@host> file archive compress source /var/log/messages* destination
/var/log/messages-archive.tgz
/usr/bin/tar: Removing leading / from absolute path names in the archive.
```


Copyright © 2016, Juniper Networks, Inc.

file checksum md5

Syntax file checksum md5 <*pathname*> *filename*

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description Calculate the Message Digest 5 (MD5) checksum of a file.

Options ***pathname***—(Optional) Path to a filename.

filename—Name of a local file for which to calculate the MD5 checksum.

Required Privilege Level maintenance

Related Documentation

- *Configuring Checksum Hashes for a Commit Script*
- *Configuring Checksum Hashes for an Event Script*
- *Configuring Checksum Hashes for an Op Script*
- *Configuring Checksum Hashes for an SNMP Script*
- *Executing an Op Script from a Remote Site*
- file checksum sha-256 on page 325
- file checksum sha1 on page 324

List of Sample Output file checksum md5 on page 323

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

file checksum md5

```
user@host> file checksum md5 jbundle-5.3R2.4-export-signed.tgz
MD5 (jbundle-5.3R2.4-export-signed.tgz) = 2a3b69e43f9bd4893729cc16f505a0f5
```

file checksum sha1

Syntax file checksum sha1 <*pathname*> *filename*

Release Information
Command introduced in Junos OS Release 9.5.
Command introduced in Junos OS Release 9.5 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description Calculate the Secure Hash Algorithm (SHA-1) checksum of a file.

Options ***pathname***—(Optional) Path to a filename.

filename—Name of a local file for which to calculate the SHA-1 checksum.

Required Privilege Level maintenance

Related Documentation

- *Configuring Checksum Hashes for a Commit Script*
- *Configuring Checksum Hashes for an Event Script*
- *Configuring Checksum Hashes for an Op Script*
- *Configuring Checksum Hashes for an SNMP Script*
- *Executing an Op Script from a Remote Site*
- file checksum md5 on page 323
- file checksum sha-256 on page 325

List of Sample Output file checksum sha1 on page 324

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

file checksum sha1

```
user@host> file checksum sha1 /var/db/scripts/opscript.slax

SHA1 (/var/db/scripts/commitscript.slax) = ba9e47120c7ce55cff29afd73eacd370e162c676
```

 Copyright © 2016, Juniper Networks, Inc.

file checksum sha-256

Syntax file checksum sha-256 <*pathname*> *filename*

Release Information
Command introduced in Junos OS Release 9.5.
Command introduced in Junos OS Release 9.5 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description Calculate the Secure Hash Algorithm 2 family (SHA-256) checksum of a file.

Options ***pathname***—(Optional) Path to a filename.

filename—Name of a local file for which to calculate the SHA-256 checksum.

Required Privilege Level maintenance

Related Documentation

- *Configuring Checksum Hashes for a Commit Script*
- *Configuring Checksum Hashes for an Event Script*
- *Configuring Checksum Hashes for an Op Script*
- *Configuring Checksum Hashes for an SNMP Script*
- *Executing an Op Script from a Remote Site*
- file checksum md5 on page 323
- file checksum sha1 on page 324

List of Sample Output file checksum sha-256 on page 325

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

file checksum sha-256

```
user@host> file checksum sha-256 /var/db/scripts/commitscript.slax

SHA256 (/var/db/scripts/commitscript.slax) =
94c2b061fb55399e15babd2529453815601a602b5c98e5c12ed929c9d343dd71
```

file compare

Syntax

file compare (files *filename filename*)
<context | unified>
<ignore-white-space>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description

Compare two local files and describe the differences between them in default, context, or unified output styles:

- **Default**—In the first line of output, **c** means lines were changed between the two files, **d** means lines were deleted between the two files, and **a** means lines were added between the two files. The numbers preceding this alphabetical marker represent the first file, and the lines after the alphabetical marker represent the second file. A left angle bracket (**<**) in front of output lines refers to the first file. A right angle bracket (**>**) in front of output lines refers to the second file.
- **Context**—The display is divided into two parts. The first part is the first file; the second part is the second file. Output lines preceded by an exclamation point (**!**) have changed. Additions are marked with a plus sign (**+**), and deletions are marked with a minus sign (**-**).
- **Unified**—The display is preceded by the line number from the first and the second file (*xx,xxx,x*). Before the line number, additions to the file are marked with a plus sign (**+**), and deletions to the file are marked with a minus sign (**-**). The body of the output contains the affected lines. Changes are viewed as additions plus deletions.

Options

files *filename*—Names of two local files to compare.

context—(Optional) Display output in context format.

ignore-white-space—(Optional) Ignore changes in the amount of white space.

unified—(Optional) Display output in unified format.

Required Privilege Level

none

Related Documentation

- Format for Specifying Filenames and URLs in Junos OS CLI Commands on page 40
- Viewing Core Files from Junos OS Processes on page 34

List of Sample Output

file compare files on page 328
file compare files context on page 328
file compare files unified on page 328
file compare files unified ignore-white-space on page 328

Copyright © 2016, Juniper Networks, Inc.

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

file compare files

```
user@host> file compare files /tmp/one /tmp/two
100c100
<             full-name "File 1";
---
>             full-name "File 2";
102c102
<             class foo; # 'foo' is not defined
---
>             class super-user;
```

file compare files context

```
user@host> file compare files /tmp/one /tmp/two context
*** /tmp/one    Wed Dec  3 17:12:50 2003
--- /tmp/two    Wed Dec  3 09:13:14 2003
***************
*** 97,104 ****
              }
          }
          user bill {
!             full-name "Bill Smith";
!             class foo; # 'foo' is not defined
              authentication {
                  encrypted-password SECRET;
              }
--- 97,105 ----
              }
          }
          user bill {
!             full-name "Bill Smith";
!             uid 1089;
!             class super-user;
              authentication {
                  encrypted-password SECRET;
              }
```

file compare files unified

```
user@host> file compare files /tmp/one /tmp/two unified
--- /tmp/one    Wed Dec  3 17:12:50 2003
+++ /tmp/two    Wed Dec  3 09:13:14 2003
@@ -97,8 +97,9 @@
             }
         }
         user bill {
-            full-name "Bill Smith";
-            class foo; # 'foo' is not defined
+            full-name "Bill Smith";
+            uid 1089;
+            class super-user;
             authentication {
                 encrypted-passwordSECRET;
             }
```

file compare files unified ignore-white-space

```
user@host> file compare files /tmp/one /tmp/two unified ignore-white-space
```


Copyright © 2016, Juniper Networks, Inc.

```
--- /tmp/one    Wed Dec  3 09:13:10 2003
+++ /tmp/two    Wed Dec  3 09:13:14 2003
@@ -99,7 +99,7 @@
         user bill {
             full-name "Bill Smith";
             uid 1089;
-            class foo; # 'foo' is not defined
+            class super-user;
             authentication {
                  encrypted-password <SECRET>; # SECRET-DATA
             }
```

file delete

Syntax

file delete *filename*
<purge>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description

Delete a file on the local router or switch.

Options

filename—Name of the file to delete. For a routing matrix, include chassis information in the filename if the file to be deleted is not local to the Routing Engine from which the command is issued.

purge—(Optional) Overwrite regular files before deleting them.

Required Privilege Level

maintenance

List of Sample Output

file delete on page 330
file delete (Routing Matrix) on page 330

Output Fields

When you enter this command, you are provided feedback on the status of your request.

Sample Output

file delete

```
user@host> file list /var/tmp
dcd.core
rpd.core
snmpd.core

user@host> file delete /var/tmp/snmpd.core
user@host> file list /var/tmp
dcd.core
rpd.core
```

file delete (Routing Matrix)

```
user@host> file list lcc0-re0:/var/tmp
dcd.core
rpd.core
snmpd.core

user@host> file delete lcc0-re0:/var/tmp/snmpd.core
user@host> file list /var/tmp
dcd.core
rpd.core
```


Copyright © 2016, Juniper Networks, Inc.

file list

Syntax

file list
<detail | recursive>
<*filename*>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.

Description

Display a list of files on the local router or switch.

Options

none—Display a list of all files for the current directory.

detail | recursive—(Optional) Display detailed output or descend recursively through the directory hierarchy, respectively.

filename—(Optional) Display a list of files. For a routing matrix, the filename must include the chassis information.

Additional Information

The default directory is the home directory of the user logged in to the router or switch. To view available directories, enter a space and then a backslash (/) after the **file list** command. To view files within a specific directory, include a backslash followed by the directory and, optionally, subdirectory name after the **file list** command.

Required Privilege Level

maintenance

List of Sample Output

file list on page 331
file list (Routing Matrix) on page 331

Output Fields

When you enter this command, you are provided feedback on the status of your request.

Sample Output

file list

```
user@host> file list /var/tmp
dcd.core
rpd.core
snmpd.core
```

file list (Routing Matrix)

```
user@host> file list lcc0-re0:var/tmp
lcc0-re0:
--------------------------------------------------------------------------
/var/tmp/:
.gdbinit
.pccardd
Test/
chassisd*
chassisd.user1*
check_time*
```

```
cores/
diagTestPrep*
diagtest*
diagtest.user*
do_switchovers*
dump_test*
err.user2.log
esw_clearstats*
esw_counter*
esw_debug*
esw_debug_ge*
esw_filt_test*
esw_filter_tnp_addr*
esw_getstats*
esw_phy*
esw_stats*
```


Copyright © 2016, Juniper Networks, Inc.

file rename

Syntax file rename *source destination*

Release Information
Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description Rename a file on the local router or switch.

Options ***destination***—New name for the file.

source—Original name of the file. For a routing matrix, the filename must include the chassis information.

Required Privilege Level maintenance

List of Sample Output
file rename on page 333
file rename (Routing Matrix) on page 333

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

file rename

The following example lists the files in **/var/tmp**, renames one of the files, and then displays the list of files again to reveal the newly named file.

```
user@host> file list /var/tmp
dcd.core
rpd.core
snmpd.core

user@host> file rename /var/tmp/dcd.core /var/tmp/dcd.core.990413
user@host> file list /var/tmp
dcd.core.990413
rpd.core
snmpd.core
```

file rename (Routing Matrix)

The following example lists the files in **/var/tmp**, renames one of the files, and then displays the list of files again to reveal the newly named file.

```
user@host> file list lcc0-re1:/var/tmp
lcc0-re1:
--------------------------------------------------------------------------

/var/tmp:
.pccardd
sartre.conf
snmpd
syslogd.core-tarball.0.tgz
```

```
user@host> file rename lcc0-re0:/var/tmp/snmpd /var/tmp/snmpd.rr
user@host> file list lcc0-re1:/var/tmp
lcc0-re1:
--------------------------------------------------------------------------

/var/tmp:
.pccardd
sartre.conf
snmpd.rr
syslogd.core-tarball.0.tgz
```


Copyright © 2016, Juniper Networks, Inc.

file show

Syntax file show *filename*
<encoding (base64 | raw)>

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.

Description Display the contents of a file.

Options *filename*—Name of a file. For a routing matrix, the filename must include the chassis information.

encoding (base64 | raw)—(Optional) Encode file contents with base64 encoding or show raw text.

Required Privilege Level maintenance

List of Sample Output file show on page 335
file show (Routing Matrix) on page 335

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

file show

```
user@host> file show /var/log/messages
Apr 13 21:00:08 dev1 /kernel: so-1/1/2: loopback suspected; going to standby.
Apr 13 21:00:40 dev1 /kernel: so-1/1/2: loopback suspected; going to standby.
Apr 13 21:02:48 dev1 last message repeated 4 times
Apr 13 21:07:04 dev1 last message repeated 8 times
Apr 13 21:07:13 dev1 /kernel: so-1/1/0: Clearing SONET alarm(s) RDI-P
Apr 13 21:07:29 dev1 /kernel: so-1/1/0: Asserting SONET alarm(s) RDI-P
...
```

file show (Routing Matrix)

```
user@host> file show lcc0-re0:/var/tmp/.gdbinit
lcc0-re0:
--------------------------------------------------------------------------
#####################################################################
# Settings
#####################################################################

set print pretty

#####################################################################
# Basic stuff
#####################################################################

define msgbuf
        printf "%s", msgbufp->msg_ptr
end
```

```
# hex dump of a block of memory
# usage: dump address length
define dump
   p $arg0, $arg1
   set $ch = $arg0
   set $j = 0
   set $n = $arg1
   while ($j < $n)
        #printf "%x %x ",&$ch[$j],$ch[$j]
        printf "%x ",$ch[$j]
        set $j = $j + 1
        if (!($j % 16))
                printf "\n"
        end
   end
end
```


Copyright © 2016, Juniper Networks, Inc.

load

Syntax

load (factory-default | merge | override | patch | replace | set | update)
load (*filename* | terminal) <relative>

QFX Series

load (dhcp-snooping *filename*)

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Load a configuration from an ASCII configuration file, from terminal input, or from the factory default. Your current location in the configuration hierarchy is ignored when the load operation occurs.

NOTE: **load can be run from configuration mode only.**

Options

dhcp-snooping—(QFX Series switches) Loads DHCP snooping entries.

factory-default—Loads the factory configuration. The factory configuration contains the manufacturer's suggested configuration settings. The factory configuration is the router or switch's first configuration and is loaded when the router or switch is first installed and powered on.

NOTE: **To load the factory default configuration, you must first *unprotect* any protected hierarchies in the configuration.**

filename—Name of the file to load. For information about specifying the filename, see *Viewing Files and Directories on a Device Running Junos OS*.

merge—Combine the configuration that is currently shown in the CLI with the configuration.

override—Discard the entire configuration that is currently shown in the CLI and load the entire configuration. Marks every object as changed.

patch—Change part of the configuration and mark only those parts as changed.

replace—Look for a **replace** tag in ***filename***, delete the existing statement of the same name, and replace it with the configuration.

set—Merge a set of commands with an existing configuration. This option executes the configuration instructions line by line as they are stored in a file or from a terminal. The instructions can contain any configuration mode command, such as **set**, **edit**, **exit**, and **top**.

relative—(Optional) Execute set of commands until the current edit point.

terminal—Use the text you type at the terminal as input to the configuration. Type Ctrl+d to end terminal input.

update—Discard the entire configuration that is currently shown in the CLI, and load the entire configuration. Marks changed objects only.

NOTE: If you are using Junos OS in a Common Criteria environment, system log messages are created whenever a secret attribute is changed (for example, password changes or changes to the RADIUS shared secret). These changes are logged during the following configuration load operations:

```
load merge
load replace
load override
load update
```

For more information, see the *Secure Configuration Guide for Common Criteria and Junos-FIPS* .

Required Privilege Level

configure—To enter configuration mode, but other required privilege levels depend on where the statement is located in the configuration hierarchy.

Related Documentation

- *Loading a Configuration from a File*

Copyright © 2016, Juniper Networks, Inc.

ping

List of Syntax

Syntax on page 339
Syntax (QFX Series) on page 339

Syntax

ping *host*
<bypass-routing>
<count *requests*>
<detail>
<do-not-fragment>
<inet | inet6>
<interface *source-interface*>
<interval *seconds*>
<logical-system *logical-system-name*>
<loose-source *value*>
<mac-address *mac-address*>
<no-resolve>
<pattern *string*>
<rapid>
<record-route>
<routing-instance *routing-instance-name*>
<size *bytes*>
<source *source-address*>
<strict >
<strict-source *value*.>
<tos *type-of-service*>
<ttl *value*>
<verbose>
<vpls *instance-name*>
<wait *seconds*>

Syntax (QFX Series)

ping *host*
<bypass-routing>
<count *requests*>
<detail>
<do-not-fragment>
<inet>
<interface *source-interface*>
<interval *seconds*>
<logical-system *logical-system-name*>
<loose-source *value*>
<mac-address *mac-address*>
<no-resolve>
<pattern *string*>
<rapid>
<record-route>
<routing-instance *routing-instance-name*>
<size *bytes*>
<source *source-address*>
<strict>
< strict-source *value*>
<tos *type-of-service*>
<ttl *value*>
<verbose>

<wait *seconds*>

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Check host reachability and network connectivity. The **ping** command sends Internet Control Message Protocol (ICMP) ECHO_REQUEST messages to elicit ICMP ECHO_RESPONSE messages from the specified host. Press Ctrl+c to interrupt a ping command.

Options ***host***—IP address or hostname of the remote system to ping.

bypass-routing—(Optional) Bypass the normal routing tables and send ping requests directly to a system on an attached network. If the system is not on a directly attached network, an error is returned. Use this option to ping a local system through an interface that has no route through it.

count *requests*—(Optional) Number of ping requests to send. The range of values is **1** through **2,000,000,000**. The default value is an unlimited number of requests.

detail—(Optional) Include in the output the interface on which the ping reply was received.

do-not-fragment—(Optional) Set the do-not-fragment (DF) flag in the IP header of the ping packets. For IPv6 packets, this option disables fragmentation.

NOTE: In Junos OS Release 11.1 and later, when issuing the **ping** command for an IPv6 route with the **do-not-fragment** option, the maximum ping packet size is calculated by subtracting 48 bytes (40 bytes for the IPV6 header and 8 bytes for the ICMP header) from the MTU. Therefore, if the ping packet size (including the 48-byte header) is greater than the MTU, the ping operation might fail.

inet—(Optional) Ping Packet Forwarding Engine IPv4 routes.

inet6—(Optional) Ping Packet Forwarding Engine IPv6 routes.

interface *source-interface*—(Optional) Interface to use to send the ping requests.

interval *seconds*—(Optional) How often to send ping requests. The range of values, in seconds, is **1** through infinity. The default value is **1**.

logical-system *logical-system-name*—(Optional) Name of logical system from which to send the ping requests.

Alternatively, enter the **set cli logical-system *logical-system-name*** command and then run the **ping** command. To return to the main router or switch, enter the **clear cli logical-system** command.

 Copyright © 2016, Juniper Networks, Inc.

loose-source ***value***—(Optional) Intermediate loose source route entry (IPv4). Open a set of values.

mac-address ***mac-address***—(Optional) Ping the physical or hardware address of the remote system you are trying to reach.

no-resolve—(Optional) Do not attempt to determine the hostname that corresponds to the IP address.

pattern ***string***—(Optional) Specify a hexadecimal fill pattern to include in the ping packet.

rapid—(Optional) Send ping requests rapidly. The results are reported in a single message, not in individual messages for each ping request. By default, five ping requests are sent before the results are reported. To change the number of requests, include the **count** option.

record-route—(Optional) Record and report the packet's path (IPv4).

routing-instance ***routing-instance-name***—(Optional) Name of the routing instance for the ping attempt.

size ***bytes***—(Optional) Size of ping request packets. The range of values, in bytes, is **0** through **65,468**. The default value is **56**, which is effectively 64 bytes because 8 bytes of ICMP header data are added to the packet.

source ***source-address***—(Optional) IP address of the outgoing interface. This address is sent in the IP source address field of the ping request. If this option is not specified, the default address is usually the loopback interface (**lo.0**).

strict—(Optional) Use the strict source route option (IPv4).

strict-source ***value***—(Optional) Intermediate strict source route entry (IPv4). Open a set of values.

tos ***type-of-service***—(Optional) Set the type-of-service (ToS) field in the IP header of the ping packets. The range of values is **0** through **255**.

If the device configuration includes the **dscp-code-point** ***value*** statement at the **[edit class-of-service host-outbound-traffic]** hierarchy level, the configured DSCP value overrides the value specified in this command option. In this case, the ToS field of ICMP echo request packets sent on behalf of this command carries the DSCP value specified in the **dscp-code-point** configuration statement instead of the value you specify in this command option.

ttl ***value***—(Optional) Time-to-live (TTL) value to include in the ping request (IPv6). The range of values is **0** through **255**.

verbose—(Optional) Display detailed output.

vpls ***instance-name***—(Optional) Ping the instance to which this VPLS belongs.

wait ***seconds***—(Optional) Maximum wait time, in seconds, after the final packet is sent. If this option is not specified, the default delay is **10** seconds. If this option is used without the count option, a default count of **5** packets is used.

Copyright © 2016, Juniper Networks, Inc.

Required Privilege Level network

Related Documentation
- *Configuring Junos OS ICMPv4 Rate Limit for ICMPv4 Routing Engine Messages*

List of Sample Output
ping hostname on page 342
ping hostname rapid on page 342
ping hostname size count on page 342

Output Fields When you enter this command, you are provided feedback on the status of your request. An exclamation point (**!**) indicates that an echo reply was received. A period (**.**) indicates that an echo reply was not received within the timeout period. An **x** indicates that an echo reply was received with an error code. These packets are not counted in the received packets count. They are accounted for separately.

Sample Output

ping hostname

```
user@host> ping device
PING device.net (192.168.169.254): 56 data bytes
64 bytes from 192.168.169.254: icmp_seq=0 ttl=253 time=1.028 ms
64 bytes from 192.168.169.254: icmp_seq=1 ttl=253 time=1.053 ms
64 bytes from 192.168.169.254: icmp_seq=2 ttl=253 time=1.025 ms
64 bytes from 192.168.169.254: icmp_seq=3 ttl=253 time=1.098 ms
64 bytes from 192.168.169.254: icmp_seq=4 ttl=253 time=1.032 ms
64 bytes from 192.168.169.254: icmp_seq=5 ttl=253 time=1.044 ms
^C [abort]
```

ping hostname rapid

```
user@host> ping device rapid
PING dev;ice.net (192.168.169.254): 56 data bytes
!!!!!
--- device.net ping statistics ---
5 packets transmitted, 5 packets received, 0% packet loss
round-trip min/avg/max/stddev = 0.956/0.974/1.025/0.026 ms
```

ping hostname size count

```
user@host> ping device size 200 count 5
PING skye.net (192.168.169.254): 200 data bytes
208 bytes from 192.168.169.254: icmp_seq=0 ttl=253 time=1.759 ms
208 bytes from 192.168.169.254: icmp_seq=1 ttl=253 time=2.075 ms
208 bytes from 192.168.169.254: icmp_seq=2 ttl=253 time=1.843 ms
208 bytes from 192.168.169.254: icmp_seq=3 ttl=253 time=1.803 ms
208 bytes from 192.168.169.254: icmp_seq=4 ttl=253 time=17.898 ms

--- device.net ping statistics ---
5 packets transmitted, 5 packets received, 0% packet loss
round-trip min/avg/max = 1.759/5.075/17.898 ms
```

 Copyright © 2016, Juniper Networks, Inc.

request chassis beacon

Syntax (QFX Series)

request chassis beacon
<all (off | on)>
<fpc *slot-number* (off | on)>
<interconnect-device *name* (cb *slot-number* | fpc *slot-number* | (off | on)>
<node-device *name* (off | on)>

Release Information

Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

(QFX Series only) Enable or disable the beacon LED on a QFX Series device.

Options

all—Turn the beacon LED either **on** or **off** on all QFabric system Interconnect and Node devices.

cb *slot-number*—Turn the beacon LED either **on** or **off** on the Control Board of the QFX3008-I Interconnect device.

fpc *slot-number*—Turn the beacon LED either **on** or **off** on the Flexible PIC Concentrator on the standalone QFX3500 switch or the Interconnect device.

interconnect-device *name*—Turn the beacon LED either **on** or **off** on the Interconnect device.

node-device *name*—Turn the beacon LED either **on** or **off** on the Node device.

off—Turn the beacon LED **off**.

on—Turn the beacon LED **on**.

Required Privilege Level

maintenance

Related Documentation

- show chassis beacon on page 484

List of Sample Output

request chassis beacon fpc 0 on (QFX Series) on page 343
request chassis beacon node-device (QFabric System) on page 343
request chassis beacon on interconnect-device fpc (QFabric System) on page 344

Output Fields

When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis beacon fpc 0 on (QFX Series)

```
user@switch> request chassis beacon fpc 0 on

Beacon set to ON
```

request chassis beacon node-device (QFabric System)

```
user@switch> request chassis beacon node-device node1 on
```

```
node1                    ON
```

request chassis beacon on interconnect-device fpc (QFabric System)

```
user@switch> request chassis beacon on interconnect-device fpc 2

FPC 2                   ON
```


Copyright © 2016, Juniper Networks, Inc.

request chassis fpc

List of Syntax

Syntax on page 345
Syntax (TX Matrix and TX Matrix Plus Routers) on page 345
Syntax (MX Series Routers) on page 345
Syntax (MX2020 3D Universal Edge Routers) on page 345
Syntax (MX2010 3D Universal Edge Routers) on page 345
Syntax (QFabric System) on page 345
Syntax (PTX Series Packet Transport Routers) on page 345

Syntax

request chassis fpc (offline | online | restart) slot *slot-number*

Syntax (TX Matrix and TX Matrix Plus Routers)

request chassis fpc (offline | online | restart) slot *slot-number*
<lcc *number*>

Syntax (MX Series Routers)

request chassis fpc (offline | online | restart) slot *slot-number*
<all-members>
<local>
<member *member-id*>

Syntax (MX2020 3D Universal Edge Routers)

request chassis fpc (offline | online | restart) slot *slot-number*

Syntax (MX2010 3D Universal Edge Routers)

request chassis fpc (offline | online | restart) slot *slot-number*

Syntax (QFabric System)

request chassis fpc
<interconnect-device *name* slot *slot-number* (offline | online)>
<(offline | online) interconnect-device *name* slot *slot-number*>
<slot *slot-number* interconnect-device *name* (offline | online)>

Syntax (PTX Series Packet Transport Routers)

request chassis fpc (offline | online | restart) slot *slot-number*

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 11.3 for QFX Series.
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.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

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 *EX Series Switches Hardware and CLI Terminology Mapping*.

NOTE: Beginning in Junos OS Release 12.3, it is possible that FPCs brought offline using the **request chassis fpc slot *fpc-slot* offline** operational-mode CLI command can come online during a configuration commit or power-supply replacement procedure. As an alternative, use the **set fpc *fpc-slot* power off** configuration-mode command at the **[edit chassis]** hierarchy level to ensure that the FPCs remain offline.

NOTE: In releases before Junos OS Release 15.1F3, offline FPCs in the PTX5000 router might be powered on by the router during a reboot, or when triggered by other power management events on the router, such as when you take another FPC offline.

Beginning in Junos OS Release 15.1F3 offline FPCs do not come online during reboots or other power management events. To bring such an FPC online:

1. Delete the **fpc *fpc-slot* power off** statement from the **[edit chassis]** hierarchy level, if that statement is configured, and commit the configuration.
2. Either issue the **request chassis fpc online slot *fpc-slot*** operational-mode CLI command or press and hold the FPC **ONLINE/OFFLINE** button for about 5 seconds until the green **OK** LED next to the button lights steadily.

NOTE: If a CLI-based firmware upgrade is in progress, it prevents the specified FPC from restarting. Starting in Junos OS Release 15.1, the following message is displayed:

```
user@host> request chassis fpc slot 0 restart
FPC 0 Firmware update in progress. Wait!!!
```

NOTE: The command **request chassis fpc (offline | online | restart) slot *slot-number*** is not supported on PTX1000 router.

Options

offline—Take the FPC offline.

online—Bring the FPC online.

interconnect-device *name*—(QFabric systems only) Bring the Flexible Port Concentrator (FPC) on the QFX3008-I Interconnect device either offline or online:

Copyright © 2016, Juniper Networks, Inc.

- (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 616
- *show chassis fpc-feb-connectivity*
- *show chassis fabric fpcs*
- *Configuring the Junos OS to Make a Flexible PIC Concentrator Stay Offline*
- *Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online*

Copyright © 2016, Juniper Networks, Inc.

- *MX960 Flexible PIC Concentrator Description*

List of Sample Output

request chassis fpc on page 349
request chassis fpc (MX Series Routers with Media Services Blade [MSB]) on page 349
request chassis fpc (MX2020 Router) on page 349
request chassis fpc (MX2010 Router) on page 349

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis fpc

```
user@host> request chassis fpc online slot 0
FPC 0 already online
```

request chassis fpc (MX Series Routers with Media Services Blade [MSB])

```
user@host> request chassis fpc slot 0
Possible completions:
  offline              Take FPC offline
  online               Bring FPC online
  restart              Restart FPC
```

request chassis fpc (MX2020 Router)

```
user@host >request chassis fpc online slot 2
FPC 2 already online
```

request chassis fpc (MX2010 Router)

```
user@host >request chassis fpc offline slot 5
Offline initiated, use "show chassis fpc" to verify
```

request chassis pic

List of Syntax

Syntax on page 350
Syntax (ACX4000 Series Routers) on page 350
Syntax (MX Series Routers) on page 350
Syntax (TX Matrix and TX Matrix Plus Routers) on page 350

Syntax

request chassis pic (offline | online) fpc-slot *slot-number* pic-slot *slot-number*

Syntax (ACX4000 Series Routers)

request chassis pic (offline | online) fpc-slot *slot-number* pic-slot *slot-number*

Syntax (MX Series Routers)

request chassis pic (offline | online) fpc-slot *slot-number* pic-slot *slot-number* <member *member-id*>

Syntax (TX Matrix and TX Matrix Plus Routers)

request chassis pic (offline | online) fpc-slot *slot-number* pic-slot *slot-number* <lcc *number*>

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.
Command introduced in Junos OS Release 13.2 for the QFX Series.
Option **member** introduced in Junos OS Release 14.2 for MX Series 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: This command is not supported on MX960 and MX2020 routers with MPC5EQ.

NOTE: T1600 routers and TX Matrix Plus routers with 100-Gigabit Ethernet PICs require two adjacent PIC slots, 0 and 1, for each PIC. Therefore, only **online** and **offline** command options to PIC slot 0 are allowed. Use of the **online** and **offline** command options for PIC slot 1 with the described router and PIC combination is not allowed.

Copyright © 2016, Juniper Networks, Inc.

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.
```

NOTE: If a CLI-based firmware upgrade is in progress, it prevents the specified PIC from restarting. Starting in Junos OS Release 15.1, the following message is displayed:

```
user@host>  request chassis pic fpc-slot 0 pic-slot 1 offline
PIC's Firmware update in progress. Wait!!!
```

NOTE: The command **request chassis pic (offline | online) fpc-slot** ***slot-number*** **pic-slot** ***slot-number*** is not supported on PTX1000 routers.

Options

offline—Take the PIC offline.

online—Bring the PIC online.

fpc-slot ***slot-number***—Flexible PIC Concentrator (FPC) slot number. Replace ***slot-number*** with a value appropriate for your router or switch:

- ACX4000 routers—1 or 2.
- EX Series switches:
  - EX3200 switches and EX4200 standalone switches—0.
  - EX4200 switches in a Virtual Chassis configuration—0 through 9 (switch's member ID).
  - EX8208 switches—0 through 7 (line card).
  - EX8216 switches—0 through 15 (line card).
- M5, M7i, M10, and M10i routers—0 or 1.
- M20 routers—0 through 3.

- M40 and M40e routers—0 through 7.
- M120 routers—0 through 5.
- M160 routers—0 through 7.
- M320 routers—0 through 7.
- MX 5, MX10, and MX40 routers—0 or 1.
- MX80 routers—0 or 1.
- MX240 routers—0 through 2
- MX480 routers—0 through 5
- MX2020 routers—0 through 19.
- MX2010 routers—0 through 9.
- MX960 routers—0 through 11.
- PTX5000 routers—0 or 1.
- T Series routers—0 through 7.
- TX Matrix and TX Matrix Plus routers only—On a TX Matrix router, if you specify the number of the T640 router by using the **lcc** ***number*** option (the recommended method), replace ***slot-number*** with a value from 0 through 7. Otherwise, replace ***slot-number*** with a value from 0 through 31.

  Likewise, on a TX Matrix Plus router, if you specify the ***number*** of the T1600 or T4000 router by using the lcc number option (the recommended method), replace ***slot-number*** with a value from 0 through 7. Otherwise, for the FPC slot number, replace ***slot-number*** with a value from 0 through 31. On a TX Matrix Plus router with 3D SIBs to assign the FPC slot number, replace *slot-number* with a value from **0** through **63**. For example, the following commands have the same result:

  ```
  user@host> request chassis pic fpc-slot 1 lcc 1 pic-slot 0 offline
  user@host> request chassis pic fpc-slot 9 pic-slot 0 offline
  ```

- QFX5100 standalone switches—0.

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.

 Copyright © 2016, Juniper Networks, Inc.

member ***member-id***—(MX Series routers only) (Optional) Change the PIC status on the specified member of the Virtual Chassis configuration. Replace *member-id* with the value that is assigned to the specified member.

offline—Take the PIC offline.

online—Bring the PIC online.

pic-slot ***slot-number***—PIC slot number.

- EX3200 and EX4200 switches—0 for built-in network interfaces and 1 for interfaces on uplink modules.
- EX8208 and EX8216 switches—0.
- M Series routers—0, 1, 2, or 3
- MX960 router—***slot-number*** corresponds to the slot number of the Packet Forwarding Engine.
- PTX5000 routers—0 or 1.
- T320 router—0 or 1.
- T640 router—0, 1, 2, or 3.
- T1600 router —0, 1, 2, or 3.
- T4000 router—0, 1, 2, or 3.
- QFX5100 standalone switches—0, 1, or 2. PIC 0 is used for all interfaces that are not configured on expansion modules, and PIC 1 and PIC 2 are used for interfaces configured on expansion modules.

Required Privilege Level maintenance

Related Documentation

- show chassis hardware on page 656
- show chassis pic on page 871

List of Sample Output

request chassis pic on page 353
request chassis pic online member (MX Series Routers) on page 353
request chassis pic offline member (MX Series Routers) on page 354

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 pic online member (MX Series Routers)

```
user@host> request chassis pic online member 1 fpc-slot 11 pic-slot 3
```

```
fpc 11 pic 3 online initiated
```

request chassis pic offline member (MX Series Routers)

```
user@host> request chassis pic offline member 1 fpc-slot 11 pic-slot 3
fpc 11 pic 3 offline initiated
```


Copyright © 2016, Juniper Networks, Inc.

request chassis routing-engine master

List of Syntax

Syntax on page 355
Syntax (M Series, MX Series, T Series Routers) on page 355
Syntax (TX Matrix Routers) on page 355
Syntax (TX Matrix Plus Routers) on page 355
Syntax (MX Series Virtual Chassis) on page 355
Syntax (QFX Series) on page 355

Syntax

```
request chassis routing-engine master (acquire | release | switch)
<no-confirm>
```

Syntax (M Series, MX Series, T Series Routers)

```
request chassis routing-engine master (acquire | release | switch)
<no-confirm>
<check>
```

Syntax (TX Matrix Routers)

```
request chassis routing-engine master (acquire | release | switch) (lcc number |
  scc | all-chassis)
<no-confirm>
```

Syntax (TX Matrix Plus Routers)

```
request chassis routing-engine master (acquire | release | switch) (lcc number |
  sfc | all-chassis | all-lcc)
<no-confirm>
```

Syntax (MX Series Virtual Chassis)

```
request chassis routing-engine master (acquire | release | switch)
<all-members>
<check>
<local>
<member member-id>
<no-confirm>
```

Syntax (QFX Series)

```
request chassis routing-engine master (release | switch)
<check>
<interconnect-device name>
<node-group name>
<no-confirm>
```

Release Information

Command introduced before Junos OS Release 7.4.
all-chassis option added in Junos OS Release 8.0.
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 11.3 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.
Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

For routers or switches with multiple Routing Engines, control which Routing Engine is the master.

CAUTION: (Routing matrix based on the TX Matrix or TX Matrix Plus routers only) Within the routing matrix, we recommend that all Routing Engines run the same Junos OS Release. If you run different releases on the Routing Engines and a change in mastership occurs on any backup Routing Engine in the routing matrix, one or all routers (in a routing matrix based on the TX Matrix router or in a routing matrix based on a TX Matrix Plus router) might become logically disconnected from the TX Matrix router and cause data loss. For more information, see the *TX Matrix Router Hardware Guide* or the *Junos OS High Availability Library for Routing Devices*.

NOTE: Successive graceful Routing Engine switchover events must be a minimum of 240 seconds (4 minutes) apart after both Routing Engines have come up.

If the router or switch displays a warning message similar to "Standby Routing Engine is not ready for graceful switchover. Packet Forwarding Engines that are not ready for graceful switchover might be reset," do not attempt switchover. If you choose to proceed with switchover, only the Packet Forwarding Engines that were not ready for graceful switchover are reset. None of the Flexible PIC concentrators (FPCs) should spontaneously restart. We recommend that you wait until the warning no longer appears and then proceed with the switchover.

You will receive an error message stating "Command aborted. Not ready for mastership switch, try after n seconds" when this command is re-entered before 240 seconds have elapsed on EX Series switches.

NOTE: On a QFabric system, to avoid traffic loss on the network Node group, switch mastership of the routing engine to the backup routing engine, and then reboot.

Options

acquire—Attempt to become the master Routing Engine.

release—Request that the other Routing Engine become the master.

switch—Toggle mastership between Routing Engines.

NOTE: The **acquire** option should be used with caution because acquiring a Routing Engine may result in a corrupted database. If possible, use the **switch** option instead.

Copyright © 2016, Juniper Networks, Inc.

The **acquire**, **release**, and **switch** options have the following suboptions:

all-chassis—(TX Matrix and TX Matrix Plus routers only) On a routing matrix composed of a TX Matrix router and the attached T640 routers, switch mastership on all the Routing Engines in the routing matrix. Likewise, on a routing matrix composed of a TX Matrix Plus router and the attached T1600 or T4000 routers, switch mastership on all the Routing Engines in the routing matrix.

all-lcc—(TX Matrix Plus routers only) Request to acquire mastership for all line-card chassis (LCC).

all-members—(MX Series routers only) (Optional) Control Routing Engine mastership on the Routing Engines in all member routers of the Virtual Chassis configuration.

check—(QFabric systems, MX104, MX480, MX960, MX2010, and MX2020 routers, and PTX5000 routers only) (Optional) Available with the **switch**, **release**, and **acquire** options. 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).

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 888
- *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 358
request chassis routing-engine master switch on page 358
request chassis routing-engine master switch check on page 359

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
```


Copyright © 2016, Juniper Networks, Inc.

```
warning: Traffic will be interrupted while the PFE is re-initialized
Toggle mastership between Routing Engines ? [yes,no] (no) yes

Resolving mastership...
Complete. The other Routing Engine becomes the master.
```

Switch mastership back to the local Routing Engine:

```
user@host> request chassis routing-engine master switch

warning: Traffic will be interrupted while the PFE is re-initialized
Toggle mastership between routing engines ? [yes,no] (no) yes

Resolving mastership...
Complete. The local routing engine becomes the master.
```

request chassis routing-engine master switch check

Usage shown for M Series, MX Series, and T Series routers.

```
{master}[edit]

user@host> request chassis routing-engine master switch check

warning: Standby Routing Engine is not ready for graceful switchover.

{master}[edit]

user@host> request chassis routing-engine master switch check
Switchover Ready
```

You can similarly check the backup Routing Engine.

request message

Syntax

request message all message "*text*"
request message message "*text*" (terminal *terminal-name* | user *user-name*)

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display a message on the screens of all users who are logged in to the router or switch or on specific screens.

Options

all—Display a message on the terminal of all users who are currently logged in.

message "*text*"—Message to display.

terminal *terminal-name*—Name of the terminal on which to display the message.

user *user-name*—Name of the user to whom to direct the message.

Required Privilege Level

maintenance

List of Sample Output

request message message on page 360

Output Fields

When you enter this command, you are provided feedback on the status of your request.

Sample Output

request message message

```
user@host> request message message "Maintenance window in 10 minutes" user maria
Message from user@host on ttyp0 at 20:27 ...
Maintenance window in 10 minutes
EOF
```


Copyright © 2016, Juniper Networks, Inc.

request system configuration rescue delete

Syntax request system configuration rescue delete

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description Delete an existing rescue configuration.

NOTE: The **[edit system configuration]** hierarchy is not available on QFabric systems.

Options This command has no options.

Required Privilege Level maintenance

Related Documentation

- request system configuration rescue save on page 362
- request system software rollback on page 1230
- show system commit on page 992

List of Sample Output request system configuration rescue delete on page 361

Output Fields This command produces no output.

Sample Output

request system configuration rescue delete

```
user@host> request system configuration rescue delete
```

request system configuration rescue save

Syntax request system configuration rescue save

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description Save the most recently committed configuration as the rescue configuration so that you can return to it at any time by using the **rollback** command.

NOTE: The **[edit system configuration]** hierarchy is not available on QFabric systems.

Options This command has no options.

Required Privilege Level maintenance

Related Documentation

- request system software delete on page 1224
- request system software rollback on page 1230
- show system commit on page 992

List of Sample Output request system configuration rescue save on page 362

Output Fields This command produces no output.

Sample Output

request system configuration rescue save

```
user@host> request system configuration rescue save
```

 Copyright © 2016, Juniper Networks, Inc.

request system halt

List of Syntax

Syntax on page 363
Syntax (EX Series Switches) on page 363
Syntax (PTX Series) on page 363
Syntax (TX Matrix Router) on page 363
Syntax (TX Matrix Plus Router) on page 363
Syntax (MX Series Router) on page 364
Syntax (QFX Series) on page 364

Syntax

```
request system halt
<at time>
<backup-routing-engine>
<both-routing-engines>
<other-routing-engine>
<in minutes>
<media (compact-flash | disk | removable-compact-flash | usb)>
<message "text">
```

Syntax (EX Series Switches)

```
request system halt
<all-members>
<at time>
<backup-routing-engine>
<both-routing-engines>
<in minutes>
<local>
<media (external | internal)>
<member member-id>
<message "text">
<other-routing-engine>
<slice slice>
```

Syntax (PTX Series)

```
request system halt
<at time>
<backup-routing-engine>
<both-routing-engines>
<other-routing-engine>
<in minutes>
<media (compact-flash | disk)>
<message "text">
```

Syntax (TX Matrix Router)

```
request system halt
<all-lcc | lcc number | scc>
<at time>
<backup-routing-engine>
<both-routing-engines>
<other-routing-engine>
<in minutes>
<media (compact-flash | disk)>
<message "text">
```

Syntax (TX Matrix Plus Router)

```
request system halt
<all-chassis | all-lcc | lcc number | sfc number>
```

<at *time*>
<backup-routing-engine>
<both-routing-engines>
<other-routing-engine>
<in *minutes*>
<media (compact-flash | disk)>
<message "*text*">

Syntax (MX Series Router)

request system halt
<all-members>
<at *time*>
<backup-routing-engine>
<both-routing-engines>
<in *minutes*>
<local>
<media (external | internal)>
<member *member-id*>
<message "*text*">
<other-routing-engine>

Syntax (QFX Series)

request system halt
<all-members>
<at *time*>
<both-routing-engines>
<director-device *director-device-id*>
<in *minutes*>
<local>
<media >
<member *member-id*>
<message "*text*">
<other-routing-engine>
<slice *slice*>

Release Information

Command introduced before Junos OS Release 7.4.
other-routing-engine option introduced in Junos OS Release 8.0.
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.
director-device option introduced for QFabric systems in Junos OS Release 12.2.
backup-routing-engine option introduced in Junos OS Release 13.1.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Stop the router or switch software.

Copyright © 2016, Juniper Networks, Inc.

NOTE: When you issue this command on an individual component—for example, a Node device—in a QFabric system, you will receive a warning that says "Hardware-based members will halt, Virtual Junos Routing Engines will reboot." If you want to halt only one member of a Node group, issue this command with the **member** option on the Node device CLI, because you cannot issue this command from the QFabric CLI. Also, issuing this command might cause traffic loss on an individual component.

When you issue this command on a QFX5100 switch, you are not prompted to reboot. You must power cycle the switch to reboot.

Options

none—Stop the router or switch software immediately.

all-chassis—(TX Matrix and TX Matrix Plus routers only) (Optional) Halt all chassis.

all-lcc—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, halt all T640 routers (or line-card chassis) connected to the TX Matrix router. On a TX Matrix Plus router, halt all T1600 routers (or line-card chassis) connected to the TX Matrix Plus router.

all-members—(EX4200 switches and MX Series routers only) (Optional) Halt all members of the Virtual Chassis configuration.

at ***time*** —(Optional) Time at which to stop the software, specified in one of the following ways:

- **now**—Stop the software immediately. This is the default.
- ***+minutes***—Number of minutes from now to stop the software.
- ***yymmddhhmm***—Absolute time at which to stop the software, specified as year, month, day, hour, and minute.
- ***hh:mm***—Absolute time on the current day at which to stop the software.

backup-routing-engine—(Optional) Halt the backup Routing Engine. This command halts the backup Routing Engine, regardless from which Routing Engine the command is executed. For example, if you issue the command from the master Routing Engine, the backup Routing Engine is halted. If you issue the command from the backup Routing Engine, the backup Routing Engine is halted.

both-routing-engines—(Optional) Halt both Routing Engines at the same time.

director-device ***director-device-id***—(QFabric systems only) Halt a specific Director device.

lcc ***number***—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, halt a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, halt a specific router that is connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(EX4200 switches and MX Series routers only) (Optional) Halt the local Virtual Chassis member.

in *minutes*—(Optional) Number of minutes from now to stop the software. This option is an alias for the at +*minutes* option.

media (compact-flash | disk)—(Optional) Boot medium for the next boot.

media (external | internal)—(EX Series and QFX Series switches and MX Series routers only) (Optional) Halt the boot media:

- **external**—Halt the external mass storage device.
- **internal**—Halt the internal flash device.

member *member-id*—(EX4200 switches and MX Series routers only) (Optional) Halt the specified member of the Virtual Chassis configuration. For EX4200 switches, replace ***member-id*** with a value from 0 through 9. For an MX Series Virtual Chassis, replace ***member-id*** with a value of 0 or 1.

message "*text*"—(Optional) Message to display to all system users before stopping the software.

other-routing-engine—(Optional) Halt the other Routing Engine from which the command is issued. For example, if you issue the command from the master Routing Engine, the backup Routing Engine is halted. Similarly, if you issue the command from the backup Routing Engine, the master Routing Engine is halted.

scc—(TX Matrix routers only) (Optional) Halt the TX Matrix router (or switch-card chassis).

sfc *number*—(TX Matrix Plus routers only) (Optional) Halt the TX Matrix Plus router (or switch-fabric chassis). Replace *number* with 0.

slice *slice*—(EX Series and QFX Series switches only) (Optional) Halt a partition on the boot media. This option has the following suboptions:

- 1—Halt partition 1.
- 2—Halt partition 2.
- **alternate**—Reboot from the alternate partition.

 Copyright © 2016, Juniper Networks, Inc.

Additional Information

On the M7i router, the **request system halt** command does not immediately power down the Packet Forwarding Engine. The power-down process can take as long as 5 minutes.

On a TX Matrix router and TX Matrix Plus router if you issue the **request system halt** command on the master Routing Engine, all the master Routing Engines connected to the routing matrix are halted. If you issue this command on the backup Routing Engine, all the backup Routing Engines connected to the routing matrix are halted.

NOTE: If you have a router or switch with two Routing Engines and you want to shut the power off to the router or switch or remove a Routing Engine, you must first halt the backup Routing Engine (if it has been upgraded), and then halt the master Routing Engine. To halt a Routing Engine, issue the **request system halt** command. You can also halt both Routing Engines at the same time by issuing the **request system halt both-routing-engines** command.

Required Privilege Level

maintenance

Related Documentation

- clear system reboot on page 316
- request system power-off on page 370
- *Routing Matrix with a TX Matrix Plus Router Solutions Page*

List of Sample Output

request system halt on page 368
request system halt (In 2 Hours) on page 368
request system halt (Immediately) on page 368
request system halt (At 1:20 AM) on page 368

Output Fields

When you enter this command, you are provided feedback on the status of your request.

Sample Output

request system halt

```
user@host> request system halt
Halt the system ? [yes,no] (no) yes

*** FINAL System shutdown message from root@section2 ***
System going down IMMEDIATELY
Terminated
...
syncing disks... 11 8 done
The operating system has halted.
Please press any key to reboot.
```

request system halt (In 2 Hours)

The following example, which assumes that the time is 5 PM (1700), illustrates three different ways to request that the system stop 2 hours from now:

```
user@host> request system halt at +120
user@host> request system halt in 120
user@host> request system halt at 19:00
```

request system halt (Immediately)

```
user@host> request system halt at now
```

request system halt (At 1:20 AM)

To stop the system at 1:20 AM, enter the following command. Because 1:20 AM is the next day, you must specify the absolute time.

```
user@host> request system halt at yymmdd120
request system halt at 120
Halt the system at 120? [yes,no] (no) yes
```


Copyright © 2016, Juniper Networks, Inc.

request system logout

Syntax

request system logout (pid *pid* | terminal *terminal* | user *username*)
<all>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Log out users from the router or switch and the configuration database. If a user held the **configure exclusive** lock, this command clears the exclusive lock.

Options

all—(Optional) Log out all sessions owned by a particular PID, terminal session, or user. (On a TX Matrix or TX Matrix Plus router, this command is broadcast to all chassis.)

pid *pid*—Log out the user session using the specified management process identifier (PID). The PID type must be management process.

terminal *terminal*—Log out the user for the specified terminal session.

user *username*—Log out the specified user.

Required Privilege Level

configure

Related Documentation

- *Log a User Out of the Router*

List of Sample Output

request system logout on page 369

Output Fields

When you enter this command, you are provided feedback on the status of your request.

Sample Output

request system logout

```
user@host> request system logout user tammy all
Connection closed by foreign host.
```

request system power-off

List of Syntax

Syntax on page 370
Syntax (EX Series Switches) on page 370
Syntax (TX Matrix Router) on page 370
Syntax (TX Matrix Plus Router) on page 370
Syntax (MX Series Router) on page 370
Syntax (QFX Series) on page 371

Syntax

```
request system power-off
<both-routing-engines>
<other-routing-engine>
<at time>
<in minutes>
<media (compact-flash | disk | removable-compact-flash | usb)>
<message "text">
```

Syntax (EX Series Switches)

```
request system power-off
<all-members>
<at time>
<both-routing-engines>
<in minutes>
<local>
<media (external | internal)>
<member member-id>
<message "text">
<other-routing-engine>
<slice slice>
```

Syntax (TX Matrix Router)

```
request system power-off
<all-chassis | all-lcc | lcc number |  scc>
<both-routing-engines>
<other-routing-engine>
<at time>
<in minutes>
<media (compact-flash | disk)>
<message "text">
```

Syntax (TX Matrix Plus Router)

```
request system power-off
<all-chassis | all-lcc | lcc number |  sfc number>
<both-routing-engines>
<other-routing-engine>
<at time>
<in minutes>
<media (compact-flash | disk)>
<message "text">
```

Syntax (MX Series Router)

```
request system power-off
<all-members>
<at time>
<both-routing-engines>
<in minutes>
<local>
```


Copyright © 2016, Juniper Networks, Inc.

<media (external | internal)>
<member *member-id*>
<message "*text*">
<other-routing-engine>

Syntax (QFX Series)

request system power-off
<at *time*>
<in *minutes*>
<media (external | internal)>
<message "*text*">
<slice *slice*>

Release Information

Command introduced in Junos OS Release 8.0.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Power off the software.

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

NOTE: For a standalone chassis (such as MX Series, PTX Series, and T Series routers), the request to power off the system is applicable only to the Routing Engines. When you request to power off both Routing Engines, all the FPCs in the chassis shut down after approximately 10 minutes and the chassis fans run at full speed. The FPCs shut down because they no longer have communication with the Routing Engines and an Inter-Integrated Circuit (I2C) timeout occurred.

Options

none—Power off the router or switch software immediately.

all-chassis—(Optional) (TX Matrix and TX Matrix Plus router only) Power off all Routing Engines in the chassis.

all-lcc—(Optional) (TX Matrix and TX Matrix Plus router only) On a TX Matrix router, power off all T640 routers (or line-card chassis) connected to the TX Matrix router. On a TX Matrix Plus router, power off all T1600 routers (or line-card chassis) connected to the TX Matrix Plus router.

all-members—(EX4200 switches and MX Series routers only) (Optional) Power off all members of the Virtual Chassis configuration.

at *time*—(Optional) Time at which to power off the software, specified in one of the following ways:

- **now**—Power off the software immediately. This is the default.
- ***+minutes***—Number of minutes from now to power off the software.
- ***yymmddhhmm***—Absolute time at which to power off the software, specified as year, month, day, hour, and minute.
- ***hh:mm***—Absolute time on the current day at which to power off the software.

both-routing-engines—(Optional) Power off both Routing Engines at the same time.

in *minutes*—(Optional) Number of minutes from now to power off the software. This option is an alias for the **at *+minutes*** option.

lcc *number*—(Optional) (TX Matrix and TX Matrix Plus router only) On a TX Matrix router, power off a T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, power off a specific router that is connected to the TX Matrix Plus router. Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(EX4200 switches and MX Series routers only) (Optional) Power off the local Virtual Chassis member.

media (compact-flash | disk)—(Optional) Boot medium for the next boot.

media (external | internal)—(EX Series and QFX Series switches and MX Series routers only) (Optional) Power off the boot media:

- **external**—Power off the external mass storage device.
- **internal**—Power off the internal flash device.

member *member-id*—(EX4200 switches and MX Series routers only) (Optional) Power off the specified member of the Virtual Chassis configuration. For EX4200 switches, replace ***member-id*** with a value from 0 through 9. For an MX Series Virtual Chassis, replace ***member-id*** with a value of 0 or 1.

message "*text*"—(Optional) Message to display to all system users before powering off the software.

 Copyright © 2016, Juniper Networks, Inc.

other-routing-engine—(Optional) Power off the other Routing Engine from which the command is issued. For example, if you issue the command from the master Routing Engine, the backup Routing Engine is halted. Similarly, if you issue the command from the backup Routing Engine, the master Routing Engine is halted.

scc—(Optional) (TX Matrix router only) Power off only the master Routing Engine or the backup Routing Engine on the TX Matrix router (or switch-card chassis). If you issue the command from the master Routing Engine, the master SCC is powered off. If you issue the command from the backup Routing Engine, the backup SCC is powered off.

sfc *number*—(Optional) (TX Matrix Plus router only) Power off only the master Routing Engine or the backup Routing Engine on the TX Matrix Plus router (or switch-fabric chassis). If you issue the command from the master Routing Engine, the master SFC is powered off. If you issue the command from the backup Routing Engine, the backup SFC is powered off. Replace *number* with zero.

slice *slice*—(EX Series and QFX Series switches only) (Optional) Power off a partition on the boot media. This option has the following suboptions:

- **1**—Power off partition 1.
- **2**—Power off partition 2.
- **alternate**—Reboot from the alternate partition.

Additional Information

On a routing matrix composed of a TX Matrix router and T640 routers, if you issue the **request system power-off** command on the TX Matrix master Routing Engine, all the master Routing Engines connected to the routing matrix are powered off. If you issue this command on the backup Routing Engine, all the backup Routing Engines connected to the routing matrix are powered off.

Likewise, on a routing matrix composed of a TX Matrix Plus router and T1600 routers, if you issue the **request system power-off** command on the TX Matrix Plus master Routing Engine, all the master Routing Engines connected to the routing matrix are powered off. If you issue this command on the backup Routing Engine, all the backup Routing Engines connected to the routing matrix are powered off.

If you issue the **request system power-off both-routing-engines** command on the TX Matrix or TX Matrix Plus router, all the Routing Engines on the routing matrix are powered off.

Required Privilege Level

maintenance

List of Sample Output

request system power-off on page 374

Output Fields

When you enter this command, you are provided feedback on the status of your request.

Sample Output

request system power-off

```
user@host> request system power-off message "This router will be powered off in 30 minutes.
Please save your data and log out immediately."
warning: This command will not halt the other routing-engine.
If planning to switch off power, use the both-routing-engines option.
Power Off the system ? [yes,no] (no) yes

*** FINAL System shutdown message from remote@nutmeg ***
System going down IMMEDIATELY

This router will be powered off in 30 minutes. Please save your data and log out
immediately.

Shutdown NOW!
[pid 5177]
```


Copyright © 2016, Juniper Networks, Inc.

request system reboot

Syntax (QFX Series)

request system reboot
<all <graceful>>
<at **time**>
<director-device *name*>
<director-group <graceful>>
<fabric <graceful>>
<fast-boot>
<in **minutes**>
<hypervisor>
<media >
<message "**text**">
<node-group *name*>
<slice (1 | 2 | alternate)>

Release Information

Command introduced in Junos OS Release 11.1 for the QFX Series.

Description

Reboot the Junos OS.

NOTE: **On a QFabric system, to avoid traffic loss on the network Node group, switch mastership of the Routing Engine to the backup Routing Engine, and then reboot.**

Reboot requests are recorded in the system log files, which you can view with the **show log messages** command. You can view the process names with the **show system processes** command.

Options

none—Reboots the software immediately.

all—(QFabric systems only) (Optional) Reboots the software on the Director group, fabric control Routing Engines, fabric manager Routing Engines, Interconnect devices, and network and server Node groups.

at time—(Optional) Time at which to reboot the software, specified in one of the following ways:

- ***+minutes***—Number of minutes from now to reboot the software.
- ***hh:mm***—Absolute time on the current day at which to reboot the software, specified in 24-hour time.
- **now**—Stop or reboot the software immediately. This is the default.
- ***yymmddhhmm***—Absolute time at which to reboot the software, specified as year, month, day, hour, and minute.

director-device *name*—(QFabric systems only) (Optional) Reboots the software on the Director device and the default partition (QFabric CLI).

director-group—(QFabric systems only) (Optional) Reboots the software on the Director group and the default partition (QFabric CLI).

fabric—(QFabric systems only) (Optional) Reboots the fabric control Routing Engines and the Interconnect devices.

fast-boot—(QFX5100 switches only) (Optional) Enable fast reboot.

graceful—(QFabric systems only) (Optional) Allows the QFabric component to reboot with minimal impact to network traffic. This option is only available for the **all**, **fabric**, and **director-group** options.

in minutes—(Optional) Number of minutes from now to reboot the software. This option is an alias for the **at +*minutes*** option.

hypervisor—(Optional)Reboot Junos OS, host OS, and any installed guest VMs.

media (external | internal)—(Optional) Boot medium for the next boot. The external option reboots the switch using a software package stored on an external boot source, such as a USB flash drive. The internal option reboots the switch using a software package stored in an internal memory source.

message "text"—(Optional) Message to display to all system users before rebooting the software.

node-group *name*—(QFabric systems only) (Optional) Reboots the software on a server Node group or a network Node group.

routing-engine—(Optional) Reboot the Routing Engine.

slice (1 | 2 | alternate)—(Optional) Reboot using the specified partition on the boot media. This option has the following suboptions:

NOTE: **The slice option is not supported on the QFX5100 switch, because there is no alternate slice when Junos OS boots as a Virtual Machine (VM). To switch to previous version of Junos OS, issue the request system software rollback command.**

- **1**—Reboot from partition 1.
- **2**—Reboot from partition 2.
- **alternate**—Reboot from the alternate partition, which is the partition that did not boot the switch at the last bootup.

Required Privilege Level

maintenance

Related Documentation

- clear system reboot on page 316
- Rebooting and Halting a Device on page 25

Copyright © 2016, Juniper Networks, Inc.

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request system reboot

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

request system reboot (At 2300)

```
user@switch> request system reboot at 2300 message ?Maintenance time!?
Reboot the system ? [yes,no] (no) yes

shutdown: [pid 186]
*** System shutdown message from root@berry.network.net ***
System going down at 23:00
```

request system reboot (In 2 Hours)

The following example, which assumes that the time is 5 PM (1700), illustrates three different ways to request the system to reboot in 2 hours:

```
user@switch> request system reboot at +120
user@switch> request system reboot in 120
user@switch> request system reboot at 19:00
```

request system reboot (Immediately)

```
user@switch> request system reboot at now
```

request system reboot (At 1:20 AM)

To reboot the system at 1:20 AM, enter the following command. Because 1:20 AM is the next day, you must specify the absolute time.

```
user@switch> request system reboot at 06060120
request system reboot at 120
Reboot the system at 120? [yes,no] (no) yes
```

request system reboot director-device

```
user@switch> request system reboot director-device Node1
Issuing this command may interrupt traffic forwarding.
Continue? [yes,no] (no)
```

request system reboot director-group

```
user@switch> request system reboot director-group
Issuing this command may interrupt traffic forwarding.
Continue? [yes,no] (no)
```

request system reboot director-group graceful

```
user@switch> request system reboot director-group graceful
Issuing this command may interrupt traffic forwarding.
Continue? [yes,no] (no)
```

request system storage cleanup

List of Syntax

Syntax on page 378
Syntax (EX Series Switches) on page 378
Syntax (MX Series Router) on page 378
Syntax (QFX Series) on page 378
Syntax (SRX Series) on page 378

Syntax

request system storage cleanup <dry-run>

Syntax (EX Series Switches)

request system storage cleanup
<all-members>
<dry-run>
<local>
<member *member-id*>
<satellite [slot-id *slot-id* |device-alias *alias-name*]>

Syntax (MX Series Router)

request system storage cleanup
<all-members>
<dry-run>
<local>
<member *member-id*>
<satellite [slot-id *slot-id* |device-alias *alias-name*]>

Syntax (QFX Series)

request system storage cleanup
<component (*serial number* | *UUID* | all)>
<director-group *name*>
<dry-run>
<infrastructure *name*>
<interconnect-device *name*>
<name-tag *name-tag*>
<node-group *name*>
<prune>
<qfabric (component *name*) | dry-run | name-tag | repository)>
<repository (core | log)>

Syntax (SRX Series)

request system storage cleanup
<dry-run>

Release Information

Command introduced in Junos OS Release 7.4.
dry-run option introduced in Junos OS Release 7.6.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 9.2 for SRX Series.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
satellite option introduced in Junos OS Release 14.2R3.

Description

Free storage space on the router or switch by rotating log files and proposing a list of files for deletion. User input is required for file deletion. On a QFabric system, you can delete debug files located on individual devices or on the entire QFabric system.

Copyright © 2016, Juniper Networks, Inc.

Options

all-members—(EX4200 switches and MX Series routers only) (Optional) Delete files on the Virtual Chassis master Routing Engine only.

NOTE: **To delete files on the other members of the Virtual Chassis configuration, log in to each backup Routing Engine and delete the files using the request system storage cleanup local command.**

component (*UUID* | *serial number* | all)—(QFabric systems only) (Optional) Delete files located on individual QFabric system devices or on the entire QFabric system.

director-group *name*—(QFabric systems only) (Optional) Delete files on the Director group.

dry-run—(Optional) List files proposed for deletion (without deleting them).

infrastructure *name*—(QFabric systems only) (Optional) Delete files on the fabric control Routing Engine and fabric manager Routing Engine.

interconnect-device *name*—(QFabric systems only) Optional) Delete files on the Interconnect device.

local—(EX4200 switches and MX Series routers only) (Optional) Delete files on the local Virtual Chassis member.

member *member-id*—(EX4200 switches and MX Series routers only) (Optional) Delete files on the specified member of the Virtual Chassis configuration. For EX4200 switches, replace ***member-id*** with a value from 0 through 9. For an MX Series Virtual Chassis, replace ***member-id*** with a value of 0 or 1.

name-tag *name-tag*—(QFabric systems only) (Optional) Delete debug files that match a specific regular expression.

node-group *name*—(QFabric systems only) (Optional) Delete files on the Node group.

prune—(QFabric systems only) (Optional) Delete debug files located in either the core or log debug repositories of a QFabric system device.

qfabric component *name*—(QFabric systems only) (Optional) Delete debug files located in the debug repositories of a QFabric system device.

repository (core | log)—(QFabric systems only) (Optional) Specify the repository on the QFabric system device for which you want to delete debug files.

satellite [slot-id *slot-id* | device-alias *alias-name*]—(Junos Fusion only) (Optional) Specify the satellite device in the Junos Fusion by FPC ID or device alias name for which you want to delete debug files.

Additional Information

If logging is configured and being used, the **dry-run** option rotates the log files. In that case, the output displays the message “Currently rotating log files, please wait.” If no logging is currently under way, the output displays only a list of files to delete.

Required Privilege Level maintenance

List of Sample Output

request system storage cleanup dry-run on page 381
request system storage cleanup on page 381
request system storage cleanup director-group (QFabric Systems) on page 381
request system storage cleanup infrastructure device-name (QFabric Systems) on page 383
request system storage cleanup interconnect-device device-name (QFabric Systems) on page 384
request system storage cleanup node-group group-name (QFabric Systems) on page 385
request system storage cleanup qfabric component device-name (QFabric Systems) on page 386
request system storage cleanup qfabric component device-name repository core (QFabric Systems) on page 386
request system storage cleanup qfabric component all (QFabric Systems) on page 387

Output Fields Table 17 on page 380 describes the output fields for the **request system storage cleanup** command. Output fields are listed in the approximate order in which they appear.

Table 17: request system storage cleanup Output Fields

Field Name	Field Description
List of files to delete:	Shows list of files available for deletion.
Size	Size of the core-dump file.
Date	Last core-dump file modification date and time.
Name	Name of the core-dump file.
Directory to delete:	Shows list of directories available for deletion.
Repository scope:	Repository where core-dump files and log files are stored. The core-dump files are located in the **core** repository, and the log files are located in the **log** repository. The default **Repository scope** is shared since both the **core** and **log** repositories are shared by all of the QFabric system devices.
Repository head:	Name of the top-level repository location.
Repository name:	Name of the repository: **core** or **log**.
Creating list of debug artifacts to be removed under:	Shows location of files available for deletion.
List of debug artifacts to be removed under:	Shows list of files available for deletion.

 Copyright © 2016, Juniper Networks, Inc.

Sample Output

request system storage cleanup dry-run

```
user@host> request system storage cleanup dry-run
Currently rotating log files, please wait.
This operation can take up to a minute.

List of files to delete:

         Size Date         Name
  11.4K Mar  8 15:00 /var/log/messages.1.gz
  7245B Feb  5 15:00 /var/log/messages.3.gz
  11.8K Feb 22 13:00 /var/log/messages.2.gz
  3926B Mar 16 13:57 /var/log/messages.0.gz
  3962B Feb 22 12:47 /var/log/sampled.1.gz
  4146B Mar  8 12:20 /var/log/sampled.0.gz
  4708B Dec 21 11:39 /var/log/sampled.2.gz
  7068B Jan 16 18:00 /var/log/messages.4.gz
  13.7K Dec 27 22:00 /var/log/messages.5.gz
   890B Feb 22 17:22 /var/tmp/sampled.pkts
  65.8M Oct 26 09:10 /var/sw/pkg/jinstall-7.4R1.7-export-signed.tgz
  63.1M Oct 26 09:13 /var/sw/pkg/jbundle-7.4R1.7.tgz
```

request system storage cleanup

```
user@host> request system storage cleanup
Currently rotating log files, please wait.
This operation can take up to a minute.

List of files to delete:

         Size Date         Name
  11.4K Mar  8 15:00 /var/log/messages.1.gz
  7245B Feb  5 15:00 /var/log/messages.3.gz
  11.8K Feb 22 13:00 /var/log/messages.2.gz
  3926B Mar 16 13:57 /var/log/messages.0.gz
  11.6K Mar  8 15:00 /var/log/messages.5.gz
  7254B Feb  5 15:00 /var/log/messages.6.gz
  12.9K Feb 22 13:00 /var/log/messages.8.gz
  3726B Mar 16 13:57 /var/log/messages.7.gz
  3962B Feb 22 12:47 /var/log/sampled.1.gz
  4146B Mar  8 12:20 /var/log/sampled.0.gz
  4708B Dec 21 11:39 /var/log/sampled.2.gz
  7068B Jan 16 18:00 /var/log/messages.4.gz
  13.7K Dec 27 22:00 /var/log/messages.5.gz
   890B Feb 22 17:22 /var/tmp/sampled.pkts
  65.8M Oct 26 09:10 /var/sw/pkg/jinstall-7.4R1.7-export-signed.tgz
  63.1M Oct 26 09:13 /var/sw/pkg/jbundle-7.4R1.7.tgz

Delete these files ? [yes,no] (yes)
```

request system storage cleanup director-group (QFabric Systems)

```
user@switch> request system storage cleanup director-group
List of files to delete:

         Size Date         Name
4.0K   2011-11-07 05:16:29  /tmp/2064.sfcauth
4.0K   2011-11-07 05:07:34  /tmp/30804.sfcauth
4.0K   2011-11-07 04:13:41  /tmp/26792.sfcauth
```

```
4.0K   2011-11-07 04:13:39  /tmp/26432.sfcauth
0      2011-11-07 07:45:40  /tmp/cluster_cleanup.log
1.3M   2011-11-07 07:39:11  /tmp/cn_monitor.20111107-052401.log
4.0K   2011-11-07 07:36:29  /tmp/clustat.28019.log
4.0K   2011-11-07 07:36:29  /tmp/clustat_x.28019.log
9.6M   2011-11-07 05:30:24  /tmp/sfc.2.log
4.0K   2011-11-07 05:28:11  /tmp/mgd-init.1320672491.log
248K   2011-11-07 05:19:24  /tmp/cn_monitor.20111107-045111.log
4.0K   2011-11-07 05:17:18  /tmp/clustat.3401.log
4.0K   2011-11-07 05:17:18  /tmp/clustat_x.3401.log
8.0K   2011-11-07 04:58:25  /tmp/mgd-init.1320670633.log
0      2011-11-07 04:54:01  /tmp/mysql_db_install_5.1.37.log
4.0K   2011-11-07 04:52:08  /tmp/cn_send.log
0      2011-11-07 04:52:00  /tmp/init_eth0.log
4.0K   2011-11-07 04:49:35  /tmp/install_interfaces.sh.log
4.0K   2011-11-07 04:48:15  /tmp/bootstrap.sh.log
160K   2011-11-07 04:47:43  /tmp/bootstrap_cleanup.log
38M    2011-11-07 04:42:42  /tmp/cn_monitor.20111104-110308.log
4.0K   2011-11-07 04:38:47  /tmp/clustat.30913.log
4.0K   2011-11-07 04:38:47  /tmp/clustat_x.30913.log
4.0K   2011-11-07 04:38:03  /tmp/dcf_upgrade.sh.remove.log
4.0K   2011-11-07 04:38:03  /tmp/peer_update.log
4.0K   2011-11-07 04:38:02  /tmp/dcf_upgrade.log
4.0K   2011-11-07 04:38:02  /tmp/perl_mark_upgrade.log
8.0K   2011-11-07 04:13:42  /tmp/install_dcf_rpm.log
4.0K   2011-11-07 04:13:06  /tmp/00_cleanup.sh.1320667986.log
0      2011-11-07 04:13:06  /tmp/ccif_patch_4410_4450.sh.1320667986.log
4.0K   2011-11-07 04:13:06  /tmp/dcf-tools.sh.1320667986.log
0      2011-11-07 04:13:06  /tmp/initial.sh.1320667986.log
0      2011-11-07 04:13:06  /tmp/inventory.sh.1320667986.log
4.0K   2011-11-07 04:13:06  /tmp/qf-db.sh.1320667986.log
4.0K   2011-11-07 04:13:06  /tmp/sfc.sh.1320667986.log
8.0K   2011-11-07 04:13:05  /tmp/jinstall-qfabric.log
8.0K   2011-11-04 11:10:24  /tmp/mgd-init.1320430192.log
4.0K   2011-11-04 11:07:03  /tmp/mysql_dcf_db_install.log
8.0K   2011-11-04 10:55:07  /tmp/ccif_patch_4410_4450.sh.1320429307.log
8.0K   2011-11-04 10:55:07  /tmp/initial.sh.1320429307.log
4.0K   2011-11-04 10:55:07  /tmp/inventory.sh.1320429307.log
8.0K   2011-11-04 10:55:07  /tmp/sfc.sh.1320429307.log
4.0K   2011-11-04 10:54:09  /tmp/ks-script-Ax0tz5.log
4.0K   2011-11-07 04:13:06  /tmp//sfc.sh.1320667986.log
8.0K   2011-11-04 10:55:07  /tmp//sfc.sh.1320429307.log

Directory to delete:
45M    2011-11-08 10:57:43  /tmp/sfc-captures

List of files to delete:

         Size Date         Name
4.0K   2011-11-08 05:47:47  /tmp/5713.sfcauth
4.0K   2011-11-08 05:14:32  /tmp/14494.sfcauth
4.0K   2011-11-08 05:11:47  /tmp/9978.sfcauth
4.0K   2011-11-08 05:09:37  /tmp/6128.sfcauth
4.0K   2011-11-08 05:04:28  /tmp/29703.sfcauth
4.0K   2011-11-07 11:59:10  /tmp/7811.sfcauth
4.0K   2011-11-07 11:36:08  /tmp/32415.sfcauth
4.0K   2011-11-07 11:30:30  /tmp/22406.sfcauth
4.0K   2011-11-07 11:24:37  /tmp/12131.sfcauth
4.0K   2011-11-07 10:48:42  /tmp/12687.sfcauth
4.0K   2011-11-07 09:27:20  /tmp/31082.sfcauth
4.0K   2011-11-07 07:33:58  /tmp/14633.sfcauth
```


Copyright © 2016, Juniper Networks, Inc.

```
4.0K   2011-11-07 05:08:25  /tmp/15447.sfcauth
4.0K   2011-11-07 04:12:29  /tmp/26874.sfcauth
4.0K   2011-11-07 04:12:27  /tmp/26713.sfcauth
4.0K   2011-11-07 03:49:17  /tmp/17691.sfcauth
4.0K   2011-11-05 01:32:23  /tmp/5716.sfcauth
4.0K   2011-11-07 08:00:17  /tmp/sfcsnmpd.log
4.0K   2011-11-07 07:57:50  /tmp/cluster_cleanup.log
824K   2011-11-07 07:38:37  /tmp/cn_monitor.20111107-053643.log
4.0K   2011-11-07 07:36:30  /tmp/clustat.18399.log
4.0K   2011-11-07 07:36:30  /tmp/clustat_x.18399.log
4.0K   2011-11-07 07:35:47  /tmp/command_lock.log
4.0K   2011-11-07 05:39:54  /tmp/mgd-init.1320673194.log
92K    2011-11-07 05:19:25  /tmp/cn_monitor.20111107-050412.log
4.0K   2011-11-07 05:17:20  /tmp/clustat.30115.log
4.0K   2011-11-07 05:17:20  /tmp/clustat_x.30115.log
8.0K   2011-11-07 05:08:07  /tmp/mgd-init.1320671241.log
4.0K   2011-11-07 05:04:57  /tmp/cn_send.log
0      2011-11-07 05:04:52  /tmp/init_eth0.log
4.0K   2011-11-07 05:02:38  /tmp/install_interfaces.sh.log
4.0K   2011-11-07 05:01:19  /tmp/bootstrap.sh.log
160K   2011-11-07 05:00:47  /tmp/bootstrap_cleanup.log
28M    2011-11-07 04:42:27  /tmp/cn_monitor.20111104-112954.log
4.0K   2011-11-07 04:38:49  /tmp/clustat.6780.log
4.0K   2011-11-07 04:38:49  /tmp/clustat_x.6780.log
4.0K   2011-11-07 04:38:05  /tmp/issue_event.log
4.0K   2011-11-07 04:38:05  /tmp/peer_upgrade_reboot.log
12K    2011-11-07 04:38:05  /tmp/primary_update.log
4.0K   2011-11-07 04:38:04  /tmp/dcf_upgrade.sh.remove.log
4.0K   2011-11-07 04:38:04  /tmp/peer_rexec_upgrade.log
4.0K   2011-11-07 04:13:42  /tmp/peer_install_dcf_rpm.log
4.0K   2011-11-07 04:11:57  /tmp/dcf-tools.sh.1320667917.log
0      2011-11-07 04:11:57  /tmp/initial.sh.1320667917.log
0      2011-11-07 04:11:57  /tmp/inventory.sh.1320667917.log
4.0K   2011-11-07 04:11:57  /tmp/qf-db.sh.1320667917.log
4.0K   2011-11-07 04:11:57  /tmp/sfc.sh.1320667917.log
4.0K   2011-11-07 04:11:56  /tmp/00_cleanup.sh.1320667916.log
0      2011-11-07 04:11:56  /tmp/ccif_patch_4410_4450.sh.1320667916.log
8.0K   2011-11-07 04:11:56  /tmp/jinstall-qfabric.log
4.0K   2011-11-07 04:11:33  /tmp/dcf_upgrade.log
8.0K   2011-11-04 11:53:12  /tmp/mgd-init.1320432782.log
8.0K   2011-11-04 11:06:17  /tmp/ccif_patch_4410_4450.sh.1320429977.log
8.0K   2011-11-04 11:06:17  /tmp/initial.sh.1320429977.log
4.0K   2011-11-04 11:06:17  /tmp/inventory.sh.1320429977.log
8.0K   2011-11-04 11:06:17  /tmp/sfc.sh.1320429977.log
4.0K   2011-11-04 11:05:19  /tmp/ks-script-_tnWeb.log
4.0K   2011-11-07 04:11:57  /tmp//sfc.sh.1320667917.log
8.0K   2011-11-04 11:06:17  /tmp//sfc.sh.1320429977.log

Directory to delete:
49M    2011-11-08 10:45:20  /tmp/sfc-captures
```

request system storage cleanup infrastructure device-name (QFabric Systems)

```
user@switch> request system storage cleanup infrastructure FC-0
re0:
--------------------------------------------------------------------------

List of files to delete:

         Size Date         Name
   139B Nov  8 19:03 /var/log/default-log-messages.0.gz
```

```
  5602B Nov  8 19:03 /var/log/messages.0.gz
  28.4K Nov  8 10:15 /var/log/messages.1.gz
  35.2K Nov  7 13:45 /var/log/messages.2.gz
   207B Nov  7 16:02 /var/log/wtmp.0.gz
    27B Nov  7 12:14 /var/log/wtmp.1.gz
 184.4M Nov  7 12:16
/var/sw/pkg/jinstall-dc-re-11.3I20111104_1216_dc-builder-domestic-signed.tgz
 124.0K Nov  7 15:59 /var/tmp/gres-tp/env.dat
     0B Nov  7 12:57 /var/tmp/gres-tp/lock
   155B Nov  7 16:02 /var/tmp/krt_gencfg_filter.txt
     0B Nov  7 12:35 /var/tmp/last_ccif_update
  1217B Nov  7 12:15 /var/tmp/loader.conf.preinstall
 184.4M Nov  6 07:11 /var/tmp/mchassis-install.tgz
  10.8M Nov  7 12:16
/var/tmp/preinstall/bootstrap-install-11.3I20111104_1216_dc-builder.tar
  57.4K Nov  7 12:16 /var/tmp/preinstall/configs-11.3I20111104_1216_dc-builder.tgz

   259B Nov  7 12:16 /var/tmp/preinstall/install.conf
 734.3K Nov  4 13:46
/var/tmp/preinstall/jboot-dc-re-11.3I20111104_1216_dc-builder.tgz
 177.8M Nov  7 12:16
/var/tmp/preinstall/jbundle-dc-re-11.3I20111104_1216_dc-builder-domestic.tgz
   124B Nov  7 12:15 /var/tmp/preinstall/metatags
  1217B Nov  7 12:16 /var/tmp/preinstall_boot_loader.conf
     0B Nov  7 16:02 /var/tmp/rtsdb/if-rtsdb
```

request system storage cleanup interconnect-device device-name (QFabric Systems)

```
user@switch> request system storage cleanup interconnect IC-WS001
re1:
--------------------------------------------------------------------------

List of files to delete:

         Size Date         Name
    11B Nov  7 15:55 /var/jail/tmp/alarmd.ts
   128B Nov  8 19:06 /var/log/default-log-messages.0.gz
  9965B Nov  8 19:06 /var/log/messages.0.gz
  15.8K Nov  8 12:30 /var/log/messages.1.gz
  15.8K Nov  8 11:00 /var/log/messages.2.gz
  15.7K Nov  8 07:30 /var/log/messages.3.gz
  15.8K Nov  8 04:00 /var/log/messages.4.gz
  15.7K Nov  8 00:30 /var/log/messages.5.gz
  18.7K Nov  7 21:00 /var/log/messages.6.gz
  17.6K Nov  7 19:00 /var/log/messages.7.gz
  58.3K Nov  7 16:00 /var/log/messages.8.gz
  20.3K Nov  7 15:15 /var/log/messages.9.gz
    90B Nov  7 15:41 /var/log/wtmp.0.gz
    57B Nov  7 12:41 /var/log/wtmp.1.gz
 124.0K Nov  7 15:42 /var/tmp/gres-tp/env.dat
     0B Nov  7 12:40 /var/tmp/gres-tp/lock
     0B Nov  7 12:41 /var/tmp/if-rtsdb/env.lck
  12.0K Nov  7 15:41 /var/tmp/if-rtsdb/env.mem
 132.0K Nov  7 15:55 /var/tmp/if-rtsdb/shm_usr1.mem
2688.0K Nov  7 15:41 /var/tmp/if-rtsdb/shm_usr2.mem
2048.0K Nov  7 15:41 /var/tmp/if-rtsdb/trace.mem
   730B Nov  7 19:57 /var/tmp/juniper.conf+.gz
   155B Nov  7 15:53 /var/tmp/krt_gencfg_filter.txt
     0B Nov  7 15:41 /var/tmp/rtsdb/if-rtsdb

re0:
```


Copyright © 2016, Juniper Networks, Inc.

```
---------------------------------------------------------------------------

List of files to delete:

         Size Date         Name
    11B Nov  7 15:55 /var/jail/tmp/alarmd.ts
   121B Nov  8 19:06 /var/log/default-log-messages.0.gz
  16.7K Nov  8 19:06 /var/log/messages.0.gz
  22.2K Nov  8 17:45 /var/log/messages.1.gz
  18.4K Nov  8 17:00 /var/log/messages.2.gz
  21.6K Nov  8 16:00 /var/log/messages.3.gz
  17.9K Nov  8 14:30 /var/log/messages.4.gz
  19.4K Nov  8 13:30 /var/log/messages.5.gz
  18.2K Nov  8 12:30 /var/log/messages.6.gz
  20.4K Nov  8 11:30 /var/log/messages.7.gz
  21.4K Nov  8 10:15 /var/log/messages.8.gz
  21.0K Nov  8 09:00 /var/log/messages.9.gz
  19.9K Nov  8 08:13 /var/log/snmp-traps.0.gz
   203B Nov  8 15:36 /var/log/wtmp.0.gz
    57B Nov  7 12:41 /var/log/wtmp.1.gz
 124.0K Nov  7 15:42 /var/tmp/gres-tp/env.dat
     0B Nov  7 12:40 /var/tmp/gres-tp/lock
     0B Nov  7 12:41 /var/tmp/if-rtsdb/env.lck
  12.0K Nov  7 15:41 /var/tmp/if-rtsdb/env.mem
 132.0K Nov  7 15:55 /var/tmp/if-rtsdb/shm_usr1.mem
2688.0K Nov  7 15:41 /var/tmp/if-rtsdb/shm_usr2.mem
2048.0K Nov  7 15:41 /var/tmp/if-rtsdb/trace.mem
   727B Nov  7 15:54 /var/tmp/juniper.conf+.gz
   155B Nov  7 15:55 /var/tmp/krt_gencfg_filter.txt
     0B Nov  7 15:41 /var/tmp/rtsdb/if-rtsdb
```

request system storage cleanup node-group group-name (QFabric Systems)

```
user@switch> request system storage cleanup node-group NW-NG-0
BBAK0372:
---------------------------------------------------------------------------

List of files to delete:

         Size Date         Name
   126B Nov  8 19:07 /var/log/default-log-messages.0.gz
   179B Nov  7 13:32 /var/log/install.0.gz
  22.9K Nov  8 19:07 /var/log/messages.0.gz
  26.5K Nov  8 17:30 /var/log/messages.1.gz
  20.5K Nov  8 13:15 /var/log/messages.2.gz
  33.2K Nov  7 17:45 /var/log/messages.3.gz
  35.5K Nov  7 15:45 /var/log/messages.4.gz
   339B Nov  8 17:10 /var/log/wtmp.0.gz
    58B Nov  7 12:40 /var/log/wtmp.1.gz
 124.0K Nov  8 17:08 /var/tmp/gres-tp/env.dat
     0B Nov  7 12:39 /var/tmp/gres-tp/lock
     0B Nov  7 12:59 /var/tmp/if-rtsdb/env.lck
  12.0K Nov  8 17:09 /var/tmp/if-rtsdb/env.mem
2688.0K Nov  8 17:09 /var/tmp/if-rtsdb/shm_usr1.mem
 132.0K Nov  8 17:09 /var/tmp/if-rtsdb/shm_usr2.mem
2048.0K Nov  8 17:09 /var/tmp/if-rtsdb/trace.mem
  1082B Nov  8 17:09 /var/tmp/juniper.conf+.gz
   155B Nov  7 17:39 /var/tmp/krt_gencfg_filter.txt
     0B Nov  8 17:09 /var/tmp/rtsdb/if-rtsdb

EE3093:
```

```
------------------------------------------------------------------------

List of files to delete:

         Size Date         Name
    11B Nov  8 17:33 /var/jail/tmp/alarmd.ts
   119B Nov  8 19:08 /var/log/default-log-messages.0.gz
   180B Nov  7 17:41 /var/log/install.0.gz
   178B Nov  7 13:32 /var/log/install.1.gz
  2739B Nov  8 19:08 /var/log/messages.0.gz
  29.8K Nov  8 18:45 /var/log/messages.1.gz
  31.8K Nov  8 17:15 /var/log/messages.2.gz
  20.6K Nov  8 16:00 /var/log/messages.3.gz
  15.4K Nov  8 10:15 /var/log/messages.4.gz
  15.4K Nov  8 02:15 /var/log/messages.5.gz
  25.5K Nov  7 20:45 /var/log/messages.6.gz
  48.0K Nov  7 17:45 /var/log/messages.7.gz
  32.8K Nov  7 13:45 /var/log/messages.8.gz
   684B Nov  8 17:02 /var/log/wtmp.0.gz
    58B Nov  7 12:40 /var/log/wtmp.1.gz
 124.0K Nov  7 17:34 /var/tmp/gres-tp/env.dat
     0B Nov  7 12:40 /var/tmp/gres-tp/lock
     0B Nov  7 12:59 /var/tmp/if-rtsdb/env.lck
  12.0K Nov  7 17:39 /var/tmp/if-rtsdb/env.mem
2688.0K Nov  7 17:39 /var/tmp/if-rtsdb/shm_usr1.mem
 132.0K Nov  7 17:40 /var/tmp/if-rtsdb/shm_usr2.mem
2048.0K Nov  7 17:39 /var/tmp/if-rtsdb/trace.mem
   155B Nov  7 17:40 /var/tmp/krt_gencfg_filter.txt
     0B Nov  7 17:39 /var/tmp/rtsdb/if-rtsdb
```

request system storage cleanup qfabric component device-name (QFabric Systems)

```
user@switch> request system storage cleanup qfabric component A0001/YA0197
Repository type: regular
Repository head: /pbstorage
Creating list of debug artifacts to be removed under:
/pbstorage/rdumps/A0001/YA0197
Removing debug artifacts ... (press control C to abort)
Removing /pbstorage/rdumps/A0001/YA0197/cosd.core.0.0.05162011123308.gz ... done
Removing /pbstorage/rdumps/A0001/YA0197/cosd.core.1.0.05162011123614.gz ... done
Removing /pbstorage/rdumps/A0001/YA0197/cosd.core.2.0.05162011123920.gz ... done
Removing /pbstorage/rdumps/A0001/YA0197/livekcore.05132011163930.gz ... done
Removing /pbstorage/rdumps/A0001/YA0197/tnetd.core.0.1057.05162011124500.gz ...
done
Removing /pbstorage/rdumps/A0001/YA0197/vmcore.05132011120528.gz ... done
Removing /pbstorage/rdumps/A0001/YA0197/vmcore.kz ... done
Creating list of debug artifacts to be removed under: /pbstorage/rlogs/A0001/YA0197
Removing debug artifacts ... (press control C to abort)
Removing /pbstorage/rlogs/A0001/YA0197/kdumpinfo.05132011120528 ... done
Removing /pbstorage/rlogs/A0001/YA0197/kernel.tarball.0.1039.05122011234415.tgz
... done
Removing /pbstorage/rlogs/A0001/YA0197/kernel.tarball.1.1039.05132011175544.tgz
... done
Removing /pbstorage/rlogs/A0001/YA0197/tnetd.tarball.0.1057.05162011175453.tgz
... done
```

request system storage cleanup qfabric component device-name repository core (QFabric Systems)

```
user@switch> request system storage cleanup qfabric component EE3093 repository core
Repository scope: shared
Repository head: /pbdata/export
```

 Copyright © 2016, Juniper Networks, Inc.

```
Repository name: core
Creating list of debug artifacts to be removed under: /pbdata/export/rdumps/EE3093
NOTE: core repository under /pbdata/export/rdumps/EE3093 empty
```

request system storage cleanup qfabric component all (QFabric Systems)

```
user@switch> request system storage cleanup qfabric component all
Repository scope: shared
Repository head: /pbdata/export
Creating list of debug artifacts to be removed under: /pbdata/export/rdumps
NOTE: core repository under /pbdata/export/rdumps/all empty
Creating list of debug artifacts to be removed under: /pbdata/export/rlogs
List of debug artifacts to clean up ... (press control C to abort)
/pbdata/export/rlogs/73747cd8-0710-11e1-b6a4-00e081c5297e/install-11072011125819.log
/pbdata/export/rlogs/77116f18-0710-11e1-a2a0-00e081c5297e/install-11072011125819.log
/pbdata/export/rlogs/BBAK0372/install-11072011121538.log
/pbdata/export/rlogs/BBAK0394/install-11072011121532.log
/pbdata/export/rlogs/EE3093/install-11072011121536.log
/pbdata/export/rlogs/WS001/YN5999/install-11072011121644.log
/pbdata/export/rlogs/WS001/YW3803/install-11072011122429.log
/pbdata/export/rlogs/cd78871a-0710-11e1-878e-00e081c5297e/install-11072011125932.log
/pbdata/export/rlogs/d0afda1e-0710-11e1-a1d0-00e081c5297e/install-11072011125930.log
/pbdata/export/rlogs/d0afda1e-0710-11e1-a1d0-00e081c5297e/install-11072011133211.log
/pbdata/export/rlogs/d0afda1e-0710-11e1-a1d0-00e081c5297e/install-11072011155302.log
/pbdata/export/rlogs/d31ab7a6-0710-11e1-ad1b-00e081c5297e/install-11072011125931.log
/pbdata/export/rlogs/d4d0f254-0710-11e1-90c3-00e081c5297e/install-11072011125932.log
```

request system zeroize

Syntax

request system zeroize
<media>
<local>

Release Information

Command introduced before Junos OS Release 9.0.
Command introduced in Junos OS Release 11.2 for EX Series switches.
Option **media** added in Junos OS Release 11.4 for EX Series switches.
Command introduced in Junos OS Release 12.2 for MX Series routers.
Command introduced in Junos OS Release 12.3 for the QFX Series.
Option **local** added in Junos OS Release 14.1.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

NOTE: The **media** option is not available on the QFX Series.

Remove all configuration information on the Routing Engines and reset all key values. If the device has dual Routing Engines, the command is broadcast to all Routing Engines on the device. The command removes all data files, including customized configuration and log files, by unlinking the files from their directories. The command removes all user-created files from the system including all plain-text passwords, secrets, and private keys for SSH, local encryption, local authentication, IPsec, RADIUS, TACACS+, and SNMP.

This command reboots the device and sets it to the factory default configuration. After the reboot, you cannot access the device through the management Ethernet interface. Log in through the console as **root** and start the Junos OS CLI by typing **cli** at the prompt.

NOTE: If you configure the **commit synchronize** statement at the **[edit system]** hierarchy level and issue a **commit** in the master Routing Engine, the master configuration is automatically synchronized with the backup. However, if the backup Routing Engine is down when you issue the **commit**, the Junos OS displays a warning and commits the candidate configuration in the master Routing Engine. When the backup Routing Engine comes up, its configuration will automatically be synchronized with the master. A newly inserted backup Routing Engine automatically synchronizes its configuration with the master Routing Engine configuration.

To completely erase user-created data so that it is unrecoverable, use the **media** option.

Options

media—(Optional) In addition to removing all configuration and log files, causes memory and the media to be scrubbed, removing all traces of any user-created files. Every storage device attached to the system is scrubbed, including disks, flash drives, removable USBs, and so on. The duration of the scrubbing process is dependent on the size of the media being erased. As a result, the **request system zeroize media**

Copyright © 2016, Juniper Networks, Inc.

operation can take considerably more time than the **request system zeroize** operation. However, the critical security parameters are all removed at the beginning of the process.

local—(Optional) Remove all the configuration information and restore all the key values on the active Routing Engine.

Required Privilege Level maintenance

Related Documentation

- *request system snapshot*
- *Reverting to the Default Factory Configuration for the EX Series Switch*
- *Reverting to the Rescue Configuration for the EX Series Switch*
- *Reverting to the Default Factory Configuration*
- *Reverting to the Rescue Configuration*
- Reverting to the Default Factory Configuration by Using the request system zeroize Command on page 28

List of Sample Output

request system zeroize on page 389
request system zeroize media on page 390

Sample Output

request system zeroize

```
user@host> request system zeroize
warning: System will be rebooted and may not boot without configuration
Erase all data, including configuration and log files? [yes,no] (no) yes

0 1 1 0 0 0 done

syncing disks... All buffers synced.
Uptime: 5d19h20m26s
recorded reboot as normal shutdown
Rebooting...

U-Boot 1.1.6 (Mar 11 2011 - 04:39:06)

Board: EX4200-24T 2.11
EPLD:  Version 6.0 (0x85)
DRAM:  Initializing (1024 MB)
FLASH: 8 MB

Firmware Version: --- 01.00.00 ---
USB:   scanning bus for devices... 2 USB Device(s) found
       scanning bus for storage devices... 1 Storage Device(s) found

ELF file is 32 bit
Consoles: U-Boot console

FreeBSD/PowerPC U-Boot bootstrap loader, Revision 2.4
(user@host, Fri Mar 11 03:03:36 UTC 2011)
Memory: 1024MB
bootsequencing is enabled
```

```
bootsuccess is set
new boot device = disk0s1:
Loading /boot/defaults/loader.conf
/kernel data=0x915c84+0xa1260 syms=[0x4+0x7cbd0+0x4+0xb1c19]


Hit [Enter] to boot immediately, or space bar for command prompt.
Booting [/kernel]...
Kernel entry at 0x800000e0 ...
GDB: no debug ports present
KDB: debugger backends: ddb
KDB: current backend: ddb
Copyright (c) 1996-2011, Juniper Networks, Inc.
All rights reserved.
Copyright (c) 1992-2006 The FreeBSD Project.
Copyright (c) 1979, 1980, 1983, 1986, 1988, 1989, 1991, 1992, 1993, 1994
        The Regents of the University of California. All rights reserved.
JUNOS 11.1R1.8 #0: 2011-03-09 20:14:25 UTC
    user@host:/volume/build/junos/11.1/release/11.1R1.8/obj-powerpc/bsd/kernels/
  JUNIPER-EX/kernel
Timecounter "decrementer" frequency 50000000 Hz quality 0
cpu0: Freescale e500v2 core revision 2.2
cpu0: HID0 80004080
...
```

request system zeroize media

```
user@host> request system zeroize media
warning: System will be rebooted and may not boot without configuration
Erase all data, including configuration and log files? [yes,no] (no) yes

warning: ipsec-key-management subsystem not running - not needed by configuration.
warning: zeroizing fpc0

{master:0}
root> Waiting (max 60 seconds) for system process `vnlru' to stop...done
. . .
Syncing disks, vnodes remaining...2 4 2 4 3 2 1 1 0 0 0 done

syncing disks... All buffers synced.
Uptime: 14m50s
recorded reboot as normal shutdown
Rebooting...

U-Boot 1.1.6 (Apr 21 2011 - 13:58:42)

Board: EX4200-48PX 1.1
EPLD:  Version 8.0 (0x82)
DRAM:  Initializing (512 MB)
FLASH: 8 MB
NAND:  No NAND device found!!!
0 MiB

Firmware Version: --- 01.00.00 ---
USB:   scanning bus for devices... 2 USB Device(s) found
       scanning bus for storage devices... 1 Storage Device(s) found

ELF file is 32 bit
Consoles: U-Boot console

FreeBSD/PowerPC U-Boot bootstrap loader, Revision 2.2
```

 Copyright © 2016, Juniper Networks, Inc.

```
(user@pool27.device.net, Fri Feb 26 17:48:51 PST 2010)
Memory: 512MB
Loading /boot/defaults/loader.conf
/kernel data=0x9abfdc+0xb06e4 syms=[0x4+0x83b30+0x4+0xbd7c6]

Hit [Enter] to boot immediately, or space bar for command prompt.
Booting [/kernel] in 1 second... Booting [/kernel]...
Kernel entry at 0x800000e0 ...
GDB: no debug ports present
KDB: debugger backends: ddb
KDB: current backend: ddb
Copyright (c) 1996-2011, Juniper Networks, Inc.
All rights reserved.
Copyright (c) 1992-2006 The FreeBSD Project.
Copyright (c) 1979, 1980, 1983, 1986, 1988, 1989, 1991, 1992, 1993, 1994
 The Regents of the University of California. All rights reserved.
JUNOS 11.4R1.2 #0: 2011-10-27 18:05:39 UTC
    user@device.net:/volume/build/device/11.4/release/11.4R1.2/obj/
bsd/kernels/JUNIPER-EX/kernel
can't re-use a leaf (all_slot_serialid)!
Timecounter "decrementer" frequency 50000000 Hz quality 0
cpu0: Freescale e500v2 core revision 2.2
cpu0: HID0 80004080<EMCP,TBEN,EN_MAS7_UPDATE>
real memory  = 511705088 (488 MB)
avail memory = 500260864 (477 MB)
ETHERNET SOCKET BRIDGE initialising
Initializing EXSERIES platform properties ...
. . .
Automatic reboot in progress...
Media check on da0 on ex platforms
** /dev/da0s2a
FILE SYSTEM CLEAN; SKIPPING CHECKS
clean, 20055 free (31 frags, 2503 blocks, 0.0% fragmentation)
zeroizing /dev/da0s1a ...
. . .
zeroizing /dev/da0s3d ...
. . .
zeroizing /dev/da0s3e ...
. . .
zeroizing /dev/da0s4d ...
. . .
zeroizing /dev/da0s4e ...
. . .

syncing disks... All buffers synced.
Uptime: 3m40s
Rebooting...

U-Boot 1.1.6 (Apr 21 2011 - 13:58:42)

Board: EX4200-48PX 1.1
EPLD:  Version 8.0 (0x82)
DRAM:  Initializing (512 MB)
FLASH: 8 MB
NAND:  No NAND device found!!!
0 MiB

Firmware Version: --- 01.00.00 ---
USB:   scanning bus for devices... 2 USB Device(s) found
       scanning bus for storage devices... 1 Storage Device(s) found
```

```
ELF file is 32 bit
Consoles: U-Boot console

FreeBSD/PowerPC U-Boot bootstrap loader, Revision 2.2
(user@device.net, Fri Feb 26 17:48:51 PST 2010)
Memory: 512MB
Loading /boot/defaults/loader.conf
/kernel data=0x9abfdc+0xb06e4 syms=[0x4+0x83b30+0x4+0xbd7c6]

Hit [Enter] to boot immediately, or space bar for command prompt.
Booting [/kernel] in 1 second... Booting [/kernel]...
Kernel entry at 0x800000e0 ...
GDB: no debug ports present
KDB: debugger backends: ddb
KDB: current backend: ddb
Copyright (c) 1996-2011, Juniper Networks, Inc.
All rights reserved.
Copyright (c) 1992-2006 The FreeBSD Project.
Copyright (c) 1979, 1980, 1983, 1986, 1988, 1989, 1991, 1992, 1993, 1994
 The Regents of the University of California. All rights reserved.
JUNOS 11.4R1.2 #0: 2011-10-27 18:05:39 UTC
    user@device.net:/volume/build/junos/11.4/release/11.4R1.2/obj-powerpc/
bsd/kernels/JUNIPER-EX/kernel
can't re-use a leaf (all_slot_serialid)!
Timecounter "decrementer" frequency 50000000 Hz quality 0
cpu0: Freescale e500v2 core revision 2.2
cpu0: HID0 80004080 <EMCP,TBEN,EN_MAS7_UPDATE>
real memory  = 511705088 (488 MB)
avail memory = 500260864 (477 MB)
ETHERNET SOCKET BRIDGE initialising
Initializing EXSERIES platform properties ...
. . .
Automatic reboot in progress...
Media check on da0 on ex platforms
** /dev/da0s1a
FILE SYSTEM CLEAN; SKIPPING CHECKS
clean, 20064 free (48 frags, 2502 blocks, 0.1% fragmentation)
zeroizing /dev/da0s2a ...
. . .
Creating initial configuration...mgd: error: Cannot open configuration file:
/config/juniper.conf
mgd: warning: activating factory configuration
mgd: commit complete
mgd: ---------------------------------------------------------
mgd: Please login as 'root'. No password is required.
mgd: To start Initial Setup, type 'ezsetup' at the JUNOS prompt.
mgd: To start JUNOS CLI, type 'cli' at the JUNOS prompt.
mgd: ---------------------------------------------------------
Setting initial options:  debugger_on_panic=NO debugger_on_break=NO.
Starting optional daemons: .
Doing initial network setup:
. . .

Amnesiac (ttyu0)
```

 Copyright © 2016, Juniper Networks, Inc.

restart

List of Syntax

Syntax on page 393
Syntax (ACX Series Routers) on page 393
Syntax (EX Series Switches) on page 393
Syntax (MX Series Routers) on page 394
Syntax (QFX Series) on page 394
Syntax (Routing Matrix) on page 394
Syntax (TX Matrix Routers) on page 394
Syntax (TX Matrix Plus Routers) on page 395
Syntax (MX Series Routers) on page 395
Syntax (QFX Series) on page 395

Syntax

```
restart
<adaptive-services |ancpd-service | application-identification |audit-process |
   auto-configuration |captive-portal-content-delivery |ce-l2tp-service |chassis-control |
   class-of-service |clksyncd-service |database-replication|datapath-trace-service
   |dhcp-service | diameter-service | disk-monitoring | dynamic-flow-capture |
   ecc-error-logging | ethernet-connectivity-fault-management
   |ethernet-link-fault-management |event-processing | firewall
   |general-authentication-service | gracefully | iccp-service |idp-policy | immediately
   |interface-control | ipsec-key-management | kernel-replication | l2-learning | l2cpd-service
   | l2tp-service | l2tp-universal-edge | lacp | license-service |link-management
   |local-policy-decision-function |mac-validation |mib-process | mountd-service
   |mpls-traceroute |mspd | multicast-snooping |named-service | nfsd-service |
   packet-triggered-subscribers |peer-selection-service |pgm | pic-services-logging | pki-service
   |ppp | ppp-service |pppoe | protected-system-domain-service |
   redundancy-interface-process | remote-operations | root-system-domain-service | routing
   <logical-system logical-system-name> | sampling | sbc-configuration-process | sdk-service
   |service-deployment | services | snmp |soft |static-subscribers |statistics-service|
   subscriber-management | subscriber-management-helper | tunnel-oamd |usb-control|
   vrrp |web-management>
<gracefully | immediately | soft>
```

Syntax (ACX Series Routers)

```
restart
<adaptive-services |audit-process | auto-configuration | autoinstallation |chassis-control |
   class-of-service |clksyncd-service |database-replication| dhcp-service | diameter-service
   | disk-monitoring | dynamic-flow-capture | ethernet-connectivity-fault-management
   |ethernet-link-fault-management |event-processing | firewall
   |general-authentication-service | gracefully | immediately |interface-control |
   ipsec-key-management | l2-learning | lacp |link-management |mib-process | mountd-service
   |mpls-traceroute |mspd | named-service | nfsd-service | pgm | pki-service |ppp | pppoe |
   redundancy-interface-process | remote-operations | routing | sampling | sdk-service
   |secure-neighbor-discovery | service-deployment | services | snmp |soft |statistics-service|
   subscriber-management | subscriber-management-helper | tunnel-oamd | vrrp>
```

Syntax (EX Series Switches)

```
restart
<autoinstallation | chassis-control | class-of-service | database-replication | dhcp |
   dhcp-service | diameter-service | dot1x-protocol | ethernet-link-fault-management |
   ethernet-switching | event-processing | firewall | general-authentication-service |
   interface-control | kernel-replication | l2-learning | lacp | license-service | link-management
   | lldpd-service | mib-process | mountd-service | multicast-snooping | pgm |
```

redundancy-interface-process | remote-operations | routing | secure-neighbor-discovery | service-deployment | sflow-service | snmp | vrrp | web-management>

Syntax (MX Series Routers)

```
restart
<adaptive-services | ancpd-service |application-identification|audit-process |
  auto-configuration |captive-portal-content-delivery |ce-l2tp-service |chassis-control |
  class-of-service |clksyncd-service |database-replication| datapath-trace-service
  |dhcp-service | diameter-service | disk-monitoring | dynamic-flow-capture |
  ecc-error-logging | ethernet-connectivity-fault-management
  |ethernet-link-fault-management |event-processing | firewall |
  general-authentication-service | gracefully |iccp-service |idp-policy |immediately
  |interface-control | ipsec-key-management | kernel-replication | l2-learning |l2cpd-service
  |l2tp-service | l2tp-universal-edge | lacp | license-service |link-management
  |local-policy-decision-function |mac-validation |mib-process | mountd-service
  |mpls-traceroute |mspd | multicast-snooping |named-service | nfsd-service |
  packet-triggered-subscribers |peer-selection-service | pgm | pic-services-logging |
  pki-service |ppp | ppp-service |pppoe | protected-system-domain-service |
  redundancy-interface-process | remote-operations |root-system-domain-service | routing
  |routing <logical-system logical-system-name>  | sampling | sbc-configuration-process |
  sdk-service |service-deployment |services | snmp |soft |static-subscribers |statistics-service|
  subscriber-management | subscriber-management-helper | tunnel-oamd | usb-control|
  vrrp |web-management>
<all-members>
<gracefully | immediately | soft>
<local>
<member member-id>
```

Syntax (QFX Series)

```
restart
<adaptive-services | audit-process | chassis-control | class-of-service | dialer-services |
  diameter-service | dlsw | ethernet-connectivity | event-processing | fibre-channel | firewall
  | general-authentication-service | igmp-host-services | interface-control |
  ipsec-key-management | isdn-signaling | l2ald | l2-learning | l2tp-service | mib-process |
  named-service | network-access-service | nstrace-process | pgm | ppp | pppoe |
  redundancy-interface-process | remote-operations |logical-system-name>  | routing |
  sampling |secure-neighbor-discovery | service-deployment | snmp | usb-control |
  web-management>
<gracefully | immediately | soft>
```

Syntax (Routing Matrix)

```
restart
<adaptive-services | audit-process | chassis-control | class-of-service | disk-monitoring |
  dynamic-flow-capture | ecc-error-logging | event-processing | firewall | interface-control
  | ipsec-key-management | kernel-replication | l2-learning | l2tp-service | lacp |
  link-management | mib-process | pgm | pic-services-logging | ppp | pppoe |
  redundancy-interface-process | remote-operations | routing <logical-system
  logical-system-name>  | sampling | service-deployment | snmp>
<all | all-lcc | lcc number>
<gracefully | immediately | soft>
```

Syntax (TX Matrix Routers)

```
restart
<adaptive-services | audit-process | chassis-control | class-of-service | dhcp-service |
  diameter-service | disk-monitoring | dynamic-flow-capture | ecc-error-logging |
  event-processing | firewall | interface-control | ipsec-key-management | kernel-replication
  | l2-learning | l2tp-service | lacp | link-management | mib-process |pgm | pic-services-logging
  | ppp | pppoe | redundancy-interface-process | remote-operations | routing <logical-system
  logical-system-name>  | sampling | service-deployment | snmp| statistics-service>
```


Copyright © 2016, Juniper Networks, Inc.

<all-chassis | all-lcc | lcc *number* | scc>
<gracefully | immediately | soft>

Syntax (TX Matrix Plus Routers)

restart
<adaptive-services | audit-process | chassis-control | class-of-service | dhcp-service | diameter-service | disk-monitoring | dynamic-flow-capture | ecc-error-logging | event-processing | firewall | interface-control | ipsec-key-management | kernel-replication | l2-learning | l2tp-service | lacp | link-management | mib-process | pgm | pic-services-logging | ppp | pppoe | redundancy-interface-process | remote-operations | routing <logical-system *logical-system-name*> | sampling | service-deployment | snmp| statistics-service>
<all-chassis | all-lcc | all-sfc | lcc *number* | sfc *number*>
<gracefully | immediately | soft>

Syntax (MX Series Routers)

restart
<adaptive-services | ancpd-service |application-identification|audit-process | auto-configuration |captive-portal-content-delivery |ce-l2tp-service |chassis-control | class-of-service |clksyncd-service |database-replication| datapath-trace-service |dhcp-service | diameter-service | disk-monitoring | dynamic-flow-capture | ecc-error-logging | ethernet-connectivity-fault-management |ethernet-link-fault-management |event-processing | firewall | general-authentication-service | gracefully |iccp-service |idp-policy |immediately |interface-control | ipsec-key-management | kernel-replication | l2-learning |l2cpd-service |l2tp-service | l2tp-universal-edge | lacp | license-service |link-management |local-policy-decision-function |mac-validation |mib-process | mobile-ip |mountd-service |mpls-traceroute |mspd | multicast-snooping |named-service | nfsd-service | packet-triggered-subscribers |peer-selection-service | pgcp-service | pgm | pic-services-logging | pki-service |ppp | ppp-service |pppoe | protected-system-domain-service | redundancy-interface-process | remote-operations |root-system-domain-service | routing |routing <logical-system *logical-system-name*> | sampling | sbc-configuration-process | sdk-service |service-deployment |services | services pgcp gateway *gateway-name* |snmp |soft |static-subscribers |statistics-service| subscriber-management | subscriber-management-helper | tunnel-oamd | usb-control| vrrp |web-management>
<all-members>
<gracefully | immediately | soft>
<local>
<member *member-id*>

Syntax (QFX Series)

restart
<adaptive-services | audit-process | chassis-control | class-of-service | dialer-services | diameter-service | dlsw | ethernet-connectivity | event-processing | fibre-channel | firewall | general-authentication-service | igmp-host-services | interface-control | ipsec-key-management | isdn-signaling | l2ald | l2-learning | l2tp-service | mib-process | named-service | network-access-service | nstrace-process | pgm | ppp | pppoe | redundancy-interface-process | remote-operations |*logical-system-name*> | routing | sampling |secure-neighbor-discovery | service-deployment | snmp | usb-control | web-management>
<gracefully | immediately | soft>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 12.2 for ACX Series routers.

Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
Options added:

- **dynamic-flow-capture** in Junos OS Release 7.4.
- **dlsw** in Junos OS Release 7.5.
- **event-processing** in Junos OS Release 7.5.
- **ppp** in Junos OS Release 7.5.
- **l2ald** in Junos OS Release 8.0.
- **link-management** in Release 8.0.
- **pgcp-service** in Junos OS Release 8.4.
- **sbc-configuration-process** in Junos OS Release 9.5.
- **services pgcp gateway** in Junos OS Release 9.6.
- **sfc** and **all-sfc** for the TX Matrix Router in Junos OS Release 9.6.

Description Restart a Junos OS process.

CAUTION: **Never restart a software process unless instructed to do so by a customer support engineer. A restart might cause the router or switch to drop calls and interrupt transmission, resulting in possible loss of data.**

Options **none**—Same as **gracefully**.

adaptive-services—(Optional) Restart the configuration management process that manages the configuration for stateful firewall, Network Address Translation (NAT), intrusion detection services (IDS), and IP Security (IPsec) services on the Adaptive Services PIC.

all-chassis—(TX Matrix and TX Matrix Plus routers only) (Optional) Restart the software process on all chassis.

all-lcc—(TX Matrix and TX Matrix Plus routers only) (Optional) For a TX Matrix router, restart the software process on all T640 routers connected to the TX Matrix router. For a TX Matrix Plus router, restart the software process on all T1600 routers connected to the TX Matrix Plus router.

all-members—(MX Series routers only) (Optional) Restart the software process for all members of the Virtual Chassis configuration.

all-sfc—(TX Matrix Plus routers only) (Optional) For a TX Matrix Plus router, restart the software processes for the TX Matrix Plus router (or switch-fabric chassis).

ancpd-service—(Optional) Restart the Access Node Control Protocol (ANCP) process, which works with a special Internet Group Management Protocol (IGMP) session to collect outgoing interface mapping events in a scalable manner.

 Copyright © 2016, Juniper Networks, Inc.

application-identification—(Optional) Restart the process that identifies an application using intrusion detection and prevention (IDP) to allow or deny traffic based on applications running on standard or nonstandard ports.

audit-process—(Optional) Restart the RADIUS accounting process that gathers statistical data that can be used for general network monitoring, analyzing, and tracking usage patterns, for billing a user based on the amount of time or type of services accessed.

auto-configuration—(Optional) Restart the Interface Auto-Configuration process.

autoinstallation—(EX Series switches only) (Optional) Restart the autoinstallation process.

captive-portal-content-delivery—(Optional) Restart the HTTP redirect service by specifying the location to which a subscriber's initial Web browser session is redirected, enabling initial provisioning and service selection for the subscriber.

ce-l2tp-service—(M10, M10i, M7i, and MX Series routers only) (Optional) Restart the Universal Edge Layer 2 Tunneling Protocol (L2TP) process, which establishes L2TP tunnels and Point-to-Point Protocol (PPP) sessions through L2TP tunnels.

chassis-control—(Optional) Restart the chassis management process.

class-of-service—(Optional) Restart the class-of-service (CoS) process, which controls the router's or switch’s CoS configuration.

clksyncd-service—(Optional) Restart the external clock synchronization process, which uses synchronous Ethernet (SyncE).

database-replication—(EX Series switches and MX Series routers only) (Optional) Restart the database replication process.

datapath-trace-service—(Optional) Restart the packet path tracing process.

dhcp—(EX Series switches only) (Optional) Restart the software process for a Dynamic Host Configuration Protocol (DHCP) server. A DHCP server allocates network IP addresses and delivers configuration settings to client hosts without user intervention.

dhcp-service—(Optional) Restart the Dynamic Host Configuration Protocol process.

dialer-services—(EX Series switches only) (Optional) Restart the ISDN dial-out process.

diameter-service—(Optional) Restart the diameter process.

disk-monitoring—(Optional) Restart disk monitoring, which checks the health of the hard disk drive on the Routing Engine.

dlsw—(QFX Series only) (Optional) Restart the data link switching (DLSw) service.

dot1x-protocol—(EX Series switches only) (Optional) Restart the port-based network access control process.

dynamic-flow-capture—(Optional) Restart the dynamic flow capture (DFC) process, which controls DFC configurations on Monitoring Services III PICs.

Copyright © 2016, Juniper Networks, Inc.

ecc-error-logging—(Optional) Restart the error checking and correction (ECC) process, which logs ECC parity errors in memory on the Routing Engine.

ethernet-connectivity-fault-management—(Optional) Restart the process that provides IEEE 802.1ag Operation, Administration, and Management (OAM) connectivity fault management (CFM) database information for CFM maintenance association end points (MEPs) in a CFM session.

ethernet-link-fault-management—(EX Series switches and MX Series routers only) (Optional) Restart the process that provides the OAM link fault management (LFM) information for Ethernet interfaces.

ethernet-switching—(EX Series switches only) (Optional) Restart the Ethernet switching process.

event-processing—(Optional) Restart the event process (eventd).

fibre-channel—(QFX Series only) (Optional) Restart the Fibre Channel process.

firewall—(Optional) Restart the firewall management process, which manages the firewall configuration and enables accepting or rejecting packets that are transiting an interface on a router or switch.

general-authentication-service—(EX Series switches and MX Series routers only) (Optional) Restart the general authentication process.

gracefully—(Optional) Restart the software process.

iccp-service—(Optional) Restart the Inter-Chassis Communication Protocol (ICCP) process.

idp-policy—(Optional) Restart the intrusion detection and prevention (IDP) protocol process.

immediately—(Optional) Immediately restart the software process.

interface-control—(Optional) Restart the interface process, which controls the router's or switch's physical interface devices and logical interfaces.

ipsec-key-management—(Optional) Restart the IPsec key management process.

isdn-signaling—(QFX Series only) (Optional) Restart the ISDN signaling process, which initiates ISDN connections.

kernel-replication—(Optional) Restart the kernel replication process, which replicates the state of the backup Routing Engine when graceful Routing Engine switchover (GRES) is configured.

l2-learning—(Optional) Restart the Layer 2 address flooding and learning process.

l2cpd-service—(Optional) Restart the Layer 2 Control Protocol process, which enables features such as Layer 2 protocol tunneling and nonstop bridging.

 Copyright © 2016, Juniper Networks, Inc.

l2tp-service— (M10, M10i, M7i, and MX Series routers only) (Optional) Restart the Layer 2 Tunneling Protocol (L2TP) process, which sets up client services for establishing Point-to-Point Protocol (PPP) tunnels across a network and negotiating Multilink PPP if it is implemented.

l2tp-universal-edge—(MX Series routers only) (Optional) Restart the L2TP process, which establishes L2TP tunnels and PPP sessions through L2TP tunnels.

lacp—(Optional) Restart the Link Aggregation Control Protocol (LACP) process. LACP provides a standardized means for exchanging information between partner systems on a link to allow their link aggregation control instances to reach agreement on the identity of the LAG to which the link belongs, and then to move the link to that LAG, and to enable the transmission and reception processes for the link to function in an orderly manner.

lcc ***number***—(TX Matrix and TX Matrix Plus routers only) (Optional) For a TX Matrix router, restart the software process for a specific T640 router that is connected to the TX Matrix router. For a TX Matrix Plus router, restart the software process for a specific router that is connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

license-service—(EX Series switches only) (Optional) Restart the feature license management process.

link-management— (TX Matrix and TX Matrix Plus routers and EX Series switches only) (Optional) Restart the Link Management Protocol (LMP) process, which establishes and maintains LMP control channels.

lldpd-service—(EX Series switches only) (Optional) Restart the Link Layer Discovery Protocol (LLDP) process.

local—(MX Series routers only) (Optional) Restart the software process for the local Virtual Chassis member.

local-policy-decision-function— (Optional) Restart the process for the Local Policy Decision Function, which regulates collection of statistics related to applications and application groups and tracking of information about dynamic subscribers and static interfaces.

mac-validation— (Optional) Restart the Media Access Control (MAC) validation process, which configures MAC address validation for subscriber interfaces created on demux interfaces in dynamic profiles on MX Series routers.

member ***member-id***—(MX Series routers only) (Optional) Restart the software process for a specific member of the Virtual Chassis configuration. Replace ***member-id*** with a value of **0** or **1**.

mib-process—(Optional) Restart the Management Information Base (MIB) version II process, which provides the router's MIB II agent.

mobile-ip—(Optional) Restart the Mobile IP process, which configures Junos OS Mobile IP features.

mountd-service—(EX Series switches and MX Series routers only) (Optional) Restart the service for NFS mount requests.

mpls-traceroute—(Optional) Restart the MPLS Periodic Traceroute process.

mspd—(Optional) Restart the Multiservice process.

multicast-snooping—(EX Series switches and MX Series routers only) (Optional) Restart the multicast snooping process, which makes Layer 2 devices, such as VLAN switches, aware of Layer 3 information, such as the media access control (MAC) addresses of members of a multicast group.

named-service—(Optional) Restart the DNS Server process, which is used by a router or a switch to resolve hostnames into addresses.

network-access-service—(QFX Series only) (Optional) Restart the network access process, which provides the router's Challenge Handshake Authentication Protocol (CHAP) authentication service.

nfsd-service—(Optional) Restart the Remote NFS Server process, which provides remote file access for applications that need NFS-based transport.

packet-triggered-subscribers—(Optional) Restart the packet-triggered subscribers and policy control (PTSP) process, which allows the application of policies to dynamic subscribers that are controlled by a subscriber termination device.

peer-selection-service—(Optional) Restart the Peer Selection Service process.

pgcp-service—(Optional) Restart the pgcpd service process running on the Routing Engine. This option does not restart pgcpd processes running on mobile station PICs. To restart pgcpd processes running on mobile station PICs, use the **services pgcp gateway** option.

pgm—(Optional) Restart the process that implements the Pragmatic General Multicast (PGM) protocol for assisting in the reliable delivery of multicast packets.

pic-services-logging—(Optional) Restart the logging process for some PICs. With this process, also known as fsad (the file system access daemon), PICs send special logging information to the Routing Engine for archiving on the hard disk.

 Copyright © 2016, Juniper Networks, Inc.

pki-service—(Optional) Restart the PKI Service process.

ppp—(Optional) Restart the Point-to-Point Protocol (PPP) process, which is the encapsulation protocol process for transporting IP traffic across point-to-point links.

ppp-service—(Optional) Restart the Universal edge PPP process, which is the encapsulation protocol process for transporting IP traffic across universal edge routers.

pppoe—(Optional) Restart the Point-to-Point Protocol over Ethernet (PPPoE) process, which combines PPP that typically runs over broadband connections with the Ethernet link-layer protocol that allows users to connect to a network of hosts over a bridge or access concentrator.

protected-system-domain-service—(Optional) Restart the Protected System Domain (PSD) process.

redundancy-interface-process—(Optional) Restart the ASP redundancy process.

remote-operations—(Optional) Restart the remote operations process, which provides the ping and traceroute MIBs.

root-system-domain-service—(Optional) Restart the Root System Domain (RSD) service.

routing—(ACX Series routers, QFX Series, EX Series switches, and MX Series routers only) (Optional) Restart the routing protocol process.

routing <logical-system *logical-system-name*>—(Optional) Restart the routing protocol process, which controls the routing protocols that run on the router or switch and maintains the routing tables. Optionally, restart the routing protocol process for the specified logical system only.

sampling—(Optional) Restart the sampling process, which performs packet sampling based on particular input interfaces and various fields in the packet header.

sbc-configuration-process—(Optional) Restart the session border controller (SBC) process of the border signaling gateway (BSG).

scc—(TX Matrix routers only) (Optional) Restart the software process on the TX Matrix router (or switch-card chassis).

sdk-service—(Optional) Restart the SDK Service process, which runs on the Routing Engine and is responsible for communications between the SDK application and Junos OS. Although the SDK Service process is present on the router, it is turned off by default.

secure-neighbor-discovery—(QFX Series, EX Series switches, and MX Series routers only) (Optional) Restart the secure Neighbor Discovery Protocol (NDP) process, which provides support for protecting NDP messages.

sfc *number*—(TX Matrix Plus routers only) (Optional) Restart the software process on the TX Matrix Plus router (or switch-fabric chassis). Replace ***number*** with **0**.

service-deployment—(Optional) Restart the service deployment process, which enables Junos OS to work with the Session and Resource Control (SRC) software.

services—(Optional) Restart a service.

services pgcp gateway ***gateway-name***—(Optional) Restart the pgcpd process for a specific border gateway function (BGF) running on an MS-PIC. This option does not restart the pgcpd process running on the Routing Engine. To restart the pgcpd process on the Routing Engine, use the **pgcp-service** option.

sflow-service—(EX Series switches only) (Optional) Restart the flow sampling (sFlow technology) process.

snmp—(Optional) Restart the SNMP process, which enables the monitoring of network devices from a central location and provides the router's or switch's SNMP master agent.

soft—(Optional) Reread and reactivate the configuration without completely restarting the software processes. For example, BGP peers stay up and the routing table stays constant. Omitting this option results in a graceful restart of the software process.

static-subscribers—(Optional) Restart the static subscribers process, which associates subscribers with statically configured interfaces and provides dynamic service activation and activation for these subscribers.

statistics-service—(Optional) Restart the process that manages the Packet Forwarding Engine statistics.

subscriber-management—(Optional) Restart the Subscriber Management process.

subscriber-management-helper—(Optional) Restart the Subscriber Management Helper process.

tunnel-oamd—(Optional) Restart the Tunnel OAM process, which enables the Operations, Administration, and Maintenance of Layer 2 tunneled networks. Layer 2 protocol tunneling (L2PT) allows service providers to send Layer 2 protocol data units (PDUs) across the provider's cloud and deliver them to Juniper Networks EX Series Ethernet Switches that are not part of the local broadcast domain.

usb-control—(MX Series routers) (Optional) Restart the USB control process.

vrrp—(ACX Series routers, EX Series switches, and MX Series routers only) (Optional) Restart the Virtual Router Redundancy Protocol (VRRP) process, which enables hosts on a LAN to make use of redundant routing platforms on that LAN without requiring more than the static configuration of a single default route on the hosts.

web-management—(QFX Series, EX Series switches, and MX Series routers only) (Optional) Restart the Web management process.

Required Privilege Level reset

 Copyright © 2016, Juniper Networks, Inc.

Related Documentation

- Overview of Junos OS CLI Operational Mode Commands on page 42

List of Sample Output

restart interfaces on page 403

Output Fields

When you enter this command, you are provided feedback on the status of your request.

Sample Output

restart interfaces

```
user@host> restart interfaces
interfaces process terminated
interfaces process restarted
```

save

Syntax save *filename*

QFX Series save (dhcp-snooping *filename*)

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Save the configuration to an ASCII file. The contents of the current level of the statement hierarchy (and below) are saved, along with the statement hierarchy containing it. This allows a section of the configuration to be saved, while fully specifying the statement hierarchy.

When saving a file to a remote system, the software uses the **scp**/**ssh** protocol.

Options ***filename***—Name of the saved file. You can specify a filename in one of the following ways:

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

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

  Password for ***username***@ftp.***hostname***.net:

- **http://*hostname/path/filename***—File on a Hypertext Transfer Protocol (HTTP) server. You can also specify ***hostname*** as ***username*@*hostname*** or ***username*:*password*@*hostname***. If a password is required and you omit it, you are prompted for it.
- **re0:*/path/filename*** or **re1:*/path/filename***—File on a local Routing Engine.

 Copyright © 2016, Juniper Networks, Inc.

Required Privilege Level configure—To enter configuration mode.

Related Documentation

- *Deactivating and Reactivating Statements and Identifiers in a Junos OS Configuration*

Copyright © 2016, Juniper Networks, Inc.

CHAPTER 27

CLI Operational Commands

- show cli
- show cli authorization
- show cli directory
- show cli history

show cli

List of Syntax
Syntax on page 408
Syntax (QFX Series and OCX Series) on page 408

Syntax
show cli

Syntax (QFX Series and OCX Series)
show cli
<authorization>
<directory>
<history *count*>

Release Information
Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description
Display configured CLI settings.

Options
This command has no options.

Required Privilege Level
view

List of Sample Output
show cli on page 409

Output Fields
Table 18 on page 408 lists the output fields for the **show cli** command. Output fields are listed in the approximate order in which they appear.

Table 18: show cli Output Fields

Field Name	Field Description
CLI complete-on-space	Capability to complete a partial command entry when you type a space or a tab: **on** or **off**.
CLI idle-timeout	Maximum time that an individual session can be idle before the user is logged out from the router or switch. When this feature is enabled, the number of minutes is displayed. Otherwise, the state is **disabled**.
CLI restart-on-upgrade	CLI is set to prompt you to restart the router or switch after upgrading the software: **on** or **off**.
CLI screen-length	Number of lines of text that the terminal screen displays.
CLI screen-width	Number of characters in a line on the terminal screen.
CLI terminal	Terminal type.
CLI is operating in	Mode: **enhanced**.
CLI timestamp	Date and time format for the timestamp. If the timestamp is not set, the state is **disabled**.
CLI working directory	Pathname of the working directory.

Copyright © 2016, Juniper Networks, Inc.

Sample Output

show cli

```
user@host> show cli
CLI complete-on-space set to on
CLI idle-timeout disabled
CLI restart-on-upgrade set to on
CLI screen-length set to 47
CLI screen-width set to 132
CLI terminal is 'vt100'
CLI is operating in enhanced mode
CLI timestamp disabled
CLI working directory is '/var/tmp'
```

show cli authorization

Syntax show cli authorization

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Display the permissions for the current user.

Options This command has no options.

Required Privilege Level view

List of Sample Output show cli authorization on page 412

Output Fields Table 19 on page 410 lists the output fields for the **show cli authorization** command. In the table, all possible permissions are displayed and output fields are listed in alphabetical order.

Table 19: show cli authorization Output Fields

Field Name	Field Description
access	Can view access configuration information.
access-control	Can modify access configuration.
admin	Can view user account information.
admin-control	Can modify user account information.
clear	Can clear learned network information.
configure	Can enter configuration mode.
control	Can modify any configuration.
edit	Can edit configuration files.
field	Reserved for field (debugging) support.
firewall	Can view firewall configuration information.
firewall-control	Can modify firewall configuration information.
floppy	Can read from and write to removable media.
flow-tap	Can view flow-tap configuration information.

 Copyright © 2016, Juniper Networks, Inc.

Table 19: show cli authorization Output Fields *(continued)*

Field Name	Field Description
flow-tap-control	Can configure flow-tap configuration information.
idp-profiler-operation	Can configure Profiler data.
interface	Can view interface configuration information.
interface-control	Can modify interface configuration information.
maintenance	Can perform system maintenance.
network	Can access the network by entering the **ping**, **ssh**, **telnet**, and **traceroute** commands.
pgcp-session-mirroring	Can view Packet Gateway Control Protocol session mirroring configuration.
pgcp-session-mirroring-control	Can modify Packet Gateway Control Protocol session mirroring configuration all-control.
reset	Can reset or restart interfaces and system processes.
rollback	Can roll back to previous configurations.
routing	Can view routing configuration information.
routing-control	Can modify routing configuration information.
secret	Can view passwords and authentication keys in the configuration.
secret-control	Can modify passwords and authentication keys in the configuration.
security	Can view security configuration information.
security-control	Can modify security configuration information.
shell	Can start a local shell.
snmp	Can view SNMP configuration information.
snmp-control	Can modify SNMP configuration information.
system	Can view system configuration information.
system-control	Can modify system configuration information.
trace	Can view trace file settings information.

Copyright © 2016, Juniper Networks, Inc.

Table 19: show cli authorization Output Fields *(continued)*

Field Name	Field Description
trace-control	Can modify trace file settings information.
view	Can view current values and statistics.
view-configuration	Can view all configuration information (not including secrets).

Sample Output

show cli authorization

```
user@host> show cli authorization
Current user: 'remote' login: 'user' class ''
Permissions:
    admin       -- Can view user accounts
    admin-control-- Can modify user accounts
    clear       -- Can clear learned network information
    configure   -- Can enter configuration mode
    control     -- Can modify any configuration
    edit        -- Can edit full files
    field       -- Special for field (debug) support
    floppy      -- Can read and write from the floppy
    interface   -- Can view interface configuration
    interface-control-- Can modify interface configuration
    network     -- Can access the network
    reset       -- Can reset/restart interfaces and daemons
    routing     -- Can view routing configuration
    routing-control-- Can modify routing configuration
    shell       -- Can start a local shell
    snmp        -- Can view SNMP configuration
    snmp-control-- Can modify SNMP configuration
    system      -- Can view system configuration
    system-control-- Can modify system configuration
    trace       -- Can view trace file settings
    trace-control-- Can modify trace file settings
    view        -- Can view current values and statistics
    maintenance -- Can become the super-user
    firewall    -- Can view firewall configuration
    firewall-control-- Can modify firewall configuration
    secret      -- Can view secret configuration
    secret-control-- Can modify secret configuration
    rollback    -- Can rollback to previous configurations
    security    -- Can view security configuration
    security-control-- Can modify security configuration
    access      -- Can view access configuration
    access-control-- Can modify access configuration
    view-configuration-- Can view all configuration (not including secrets)
    flow-tap    -- Can view flow-tap configuration
    flow-tap-control-- Can configure flow-tap service
Individual command authorization:
    Allow regular expression: none
    Deny regular expression: none
    Allow configuration regular expression: none
    Deny configuration regular expression: none
```


Copyright © 2016, Juniper Networks, Inc.

show cli directory

Syntax show cli directory

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Display the current working directory.

Options This command has no options.

Required Privilege Level view

List of Sample Output show cli directory on page 414

Output Fields Table 20 on page 414 lists the output fields for the **show cli directory** command. Output fields are listed in the approximate order in which they appear.

Table 20: show cli directory Output Fields

Field Name	Field Description
Current directory	Pathname of the current working directory.

Sample Output

show cli directory

```
user@host> show cli directory
Current directory: /var/tmp
```

 Copyright © 2016, Juniper Networks, Inc.

show cli history

Syntax

show cli history
<count>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display a list of previous CLI commands.

Options

none—Display all previous CLI commands.

count—(Optional) Maximum number of commands to display.

Required Privilege Level

view

List of Sample Output

show cli history on page 415

Output Fields

Table 21 on page 415 lists the output fields for the **show cli history** command. Output fields are listed in the approximate order in which they appear.

Table 21: show cli history Output Fields

Field Name	Field Description
timestamp	Time at which the command was entered.
command-syntax	Command that was entered.

Sample Output

show cli history

```
user@host> show cli history
  11:14:14 -- show arp
  11:22:10 -- show cli authorization
  11:27:12 -- show cli history
```

Copyright © 2016, Juniper Networks, Inc.

CHAPTER 28

ISSU Operational Commands

- request system software in-service-upgrade
- show chassis in-service-upgrade

request system software in-service-upgrade

Syntax

request system software in-service-upgrade *package-name*
<no-old-master-upgrade>
<reboot>

Syntax (QFX5100 Switches)

request system software in-service-upgrade *package-name*

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 13.2 for PTX5000 routers.
Command introduced in Junos OS Release 13.2 X51-D15 for the QFX Series.

Description

Perform a unified in-service software upgrade (ISSU). A unified ISSU enables you to upgrade from one Junos OS Release to another with no disruption on the control plane and with minimal disruption of traffic. In addition, graceful Routing Engine switchover (GRES) and nonstop active routing (NSR) must be enabled. On QFX5100 switches, nonstop bridging (NSB) must be enabled if you are using the Layer 2 Control Protocol process (l2cpd) to transmit Layer 2 spanning tree protocols in a Layer 2 bridge environment.

Options

package-name—Location from which the software package or bundle is to be installed. For example:

- **/var/tmp/*package-name***— For a software package or bundle that is being installed from a local directory on the router.
- ***protocol://hostname/pathname/package-name***—For a software package or bundle that is to be downloaded and installed from a remote location. Replace ***protocol*** with one of the following:
  - **ftp**—File Transfer Protocol
  - **http**—Hypertext Transfer Protocol
  - **scp**—Secure copy (available only for Canada and U.S. version)

no-old-master-upgrade—(Optional) When the **no-old-master-upgrade** option is included, after the backup Routing Engine is rebooted with the new software package and a switchover occurs to make it the new master Routing Engine, the former master (new backup) Routing Engine will not be upgraded to the new software. In this case, you must manually upgrade the former master (new backup) Routing Engine. If you do not include the **no-old-master-upgrade** option, the system will automatically upgrade the former master Routing Engine.

reboot—(Optional) When the **reboot** option is included, the former master (new backup) Routing Engine is automatically rebooted after being upgraded to the new software. When the **reboot** option is not included, you must manually reboot the former master (new backup) Routing Engine using the **request system reboot** command.

Copyright © 2016, Juniper Networks, Inc.

NOTE: The reboot option is not available on the QFX5100 switch.

Additional Information

The following conditions apply to unified ISSUs:

- Unified ISSU is not supported on every platform. For a list of supported platforms, see *Unified ISSU System Requirements*.
- Unsupported PICs are restarted during a unified ISSU on certain routing devices. For information about supported PICs, see the *Junos OS High Availability Library for Routing Devices*.
- Unsupported protocols will experience packet loss during a unified ISSU. For information about supported protocols, see the *Junos OS High Availability Library for Routing Devices*.
- During a unified ISSU, you cannot bring any PICs online or offline on certain routing devices.

For more information, see the *Junos OS High Availability Library for Routing Devices*.

Required Privilege Level

view

Related Documentation

- *request system software abort*
- show chassis in-service-upgrade on page 431
- *Getting Started with Unified In-Service Software Upgrade*
- *Example: Performing a Unified ISSU*

List of Sample Output

request system software-in-service upgrade reboot on page 419
request system software-in-service upgrade reboot (TX Matrix Plus Router) on page 421
request system software-in-service upgrade (QFX5100 Switch) on page 429

Output Fields

When you enter this command, you are provided feedback on the status of your request.

Sample Output

request system software-in-service upgrade reboot

```
{master}

user@host> request system software in-service-upgrade
/var/tmp/jinstall-9.0-20080114.2-domestic-signed.tgz reboot
ISSU: Validating Image
PIC 0/3 will be offlined (In-Service-Upgrade not supported)
Do you want to continue with these actions being taken ? [yes,no] (no) yes

ISSU: Preparing Backup RE
Pushing bundle to re1
Checking compatibility with configuration
Initializing...
Using jbase-9.0-20080114.2
```

```
Verified manifest signed by PackageProduction_9_0_0
Using /var/tmp/jinstall-9.0-20080114.2-domestic-signed.tgz
Verified jinstall-9.0-20080114.2-domestic.tgz signed by PackageProduction_9_0_0
Using jinstall-9.0-20080114.2-domestic.tgz
Using jbundle-9.0-20080114.2-domestic.tgz
Checking jbundle requirements on /
Using jbase-9.0-20080114.2.tgz
Verified manifest signed by PackageProduction_9_0_0
Using jkernel-9.0-20080114.2.tgz
Verified manifest signed by PackageProduction_9_0_0
Using jcrypto-9.0-20080114.2.tgz
Verified manifest signed by PackageProduction_9_0_0
Using jpfe-9.0-20080114.2.tgz
Using jdocs-9.0-20080114.2.tgz
Verified manifest signed by PackageProduction_9_0_0
Using jroute-9.0-20080114.2.tgz
Verified manifest signed by PackageProduction_9_0_0
Hardware Database regeneration succeeded
Validating against /config/juniper.conf.gz
mgd: commit complete
Validation succeeded
Installing package '/var/tmp/jinstall-9.0-20080114.2-domestic-signed.tgz' ...
Verified jinstall-9.0-20080114.2-domestic.tgz signed by PackageProduction_9_0_0
Adding jinstall...
Verified manifest signed by PackageProduction_9_0_0

WARNING:     This package will load JUNOS 9.0-20080114.2 software.
WARNING:     It will save JUNOS configuration files, and SSH keys
WARNING:     (if configured), but erase all other files and information
WARNING:     stored on this machine.  It will attempt to preserve dumps
WARNING:     and log files, but this can not be guaranteed.  This is the
WARNING:     pre-installation stage and all the software is loaded when
WARNING:     you reboot the system.

Saving the config files ...
NOTICE: uncommitted changes have been saved in
/var/db/config/juniper.conf.pre-install
Installing the bootstrap installer ...

WARNING:     A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the
WARNING:     'request system reboot' command when software installation is
WARNING:     complete. To abort the installation, do not reboot your system,
WARNING:     instead use the 'request system software delete jinstall'
WARNING:     command as soon as this operation completes.

Saving package file in /var/sw/pkg/jinstall-9.0-20080114.2-domestic-signed.tgz
...
Saving state for rollback ...
Backup upgrade done
Rebooting Backup RE

Rebooting re1
ISSU: Backup RE Prepare Done
Waiting for Backup RE reboot
GRES operational
Initiating Chassis In-Service-Upgrade
Chassis ISSU started
ISSU: Backup RE Prepare Done
ISSU: Preparing Daemons
ISSU: Daemons Ready for ISSU
ISSU: Starting Upgrade for FRUs
```


Copyright © 2016, Juniper Networks, Inc.

```
ISSU: Preparing for Switchover
ISSU: Ready for Switchover
Checking In-Service-Upgrade status
  Item           Status                  Reason
  FPC 0          Online (ISSU)
  FPC 1          Online (ISSU)
  FPC 2          Online (ISSU)
  FPC 6          Online (ISSU)
  FPC 7          Online (ISSU)
Resolving mastership...
Complete. The other routing engine becomes the master.
ISSU: RE switchover Done
ISSU: Upgrading Old Master RE
Installing package '/var/tmp/paKEuy' ...
Verified jinstall-9.0-20080114.2-domestic.tgz signed by PackageProduction_9_0_0
Adding jinstall...
Verified manifest signed by PackageProduction_9_0_0

WARNING:     This package will load JUNOS 9.0-20080114.2 software.
WARNING:     It will save JUNOS configuration files, and SSH keys
WARNING:     (if configured), but erase all other files and information
WARNING:     stored on this machine.  It will attempt to preserve dumps
WARNING:     and log files, but this can not be guaranteed.  This is the
WARNING:     pre-installation stage and all the software is loaded when
WARNING:     you reboot the system.

Saving the config files ...
NOTICE: uncommitted changes have been saved in
/var/db/config/juniper.conf.pre-install
Installing the bootstrap installer ...

WARNING:     A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the
WARNING:     'request system reboot' command when software installation is
WARNING:     complete. To abort the installation, do not reboot your system,
WARNING:     instead use the 'request system software delete jinstall'
WARNING:     command as soon as this operation completes.

Saving package file in /var/sw/pkg/jinstall-9.0-20080114.2-domestic-signed.tgz
...
cp: /var/tmp/paKEuy is a directory (not copied).
Saving state for rollback ...
ISSU: Old Master Upgrade Done
ISSU: IDLE
Shutdown NOW!
Reboot consistency check bypassed - jinstall 9.0-20080114.2 will complete
installation upon reboot
[pid 30227]

*** FINAL System shutdown message from root@host ***

System going down IMMEDIATELY

Connection to host closed.
```

request system software-in-service upgrade reboot (TX Matrix Plus Router)

```
{master}
```

```
user@host> request system software in-service-upgrade
/var/tmp/jinstall-12.3R2-domestic-signed.tgz
Chassis ISSU Check Done
ISSU: Validating Image
```

```
PIC 8/1 will be offlined (In-Service-Upgrade not supported)
PIC 19/2 will be offlined (In-Service-Upgrade not supported)
PIC 15/3 will be offlined (In-Service-Upgrade not supported)
Do you want to continue with these actions being taken ? [yes,no] (no) yes

Checking compatibility with configuration
Initializing...
Using jbase-12.3R2
Verified manifest signed by PackageProduction_12_3_0
Using /var/tmp/jinstall-12.3R2-domestic-signed.tgz
Verified jinstall-12.3R2-domestic.tgz signed by PackageProduction_12_3_0
Using jinstall-12.3R2-domestic.tgz
Using jbundle-12.3R2-domestic.tgz
Checking jbundle requirements on /
Using jbase-12.3R2.tgz
Verified manifest signed by PackageProduction_12_3_0
Verified jbase-12.3R2 signed by PackageProduction_12_3_0
Using /var/validate/chroot/tmp/jbundle/jboot-12.3R2.tgz
Using jcrypto-12.3R2.tgz
Verified manifest signed by PackageProduction_12_3_0
Verified jcrypto-12.3R2 signed by PackageProduction_12_3_0
Using jdocs-12.3R2.tgz
Verified manifest signed by PackageProduction_12_3_0
Verified jdocs-12.3R2 signed by PackageProduction_12_3_0
Using jkernel-12.3R2.tgz
Verified manifest signed by PackageProduction_12_3_0
Verified jkernel-12.3R2 signed by PackageProduction_12_3_0
Using jpfe-12.3R2.tgz
WARNING: jpfe-12.3R2.tgz: not a signed package
WARNING: jpfe-common-12.3R2.tgz: not a signed package
Verified jpfe-common-12.3R2 signed by PackageProduction_12_3_0
WARNING: jpfe-T-12.3R2.tgz: not a signed package
Verified jpfe-T-12.3R2 signed by PackageProduction_12_3_0
Using jplatform-12.3R2.tgz
Verified manifest signed by PackageProduction_12_3_0
Verified jplatform-12.3R2 signed by PackageProduction_12_3_0
Using jroute-12.3R2.tgz
Verified manifest signed by PackageProduction_12_3_0
Verified jroute-12.3R2 signed by PackageProduction_12_3_0
Using jruntime-12.3R2.tgz
Verified manifest signed by PackageProduction_12_3_0
Verified jruntime-12.3R2 signed by PackageProduction_12_3_0
Using jservices-12.3R2.tgz
Using jservices-crypto-12.3R2.tgz
Hardware Database regeneration succeeded
Validating against /config/juniper.conf.gz
mgd: commit complete
Validation succeeded
ISSU: Preparing LCC Backup REs
Pushing bundle to lcc0-re1
Pushing bundle to lcc1-re1
Pushing bundle to lcc2-re1
Pushing bundle to lcc3-re1
Pushing bundle to sfc0-re1
Installing package '/var/tmp/jinstall-12.3R2-domestic-signed.tgz' ...
Verified jinstall-12.3R2-domestic.tgz signed by PackageProduction_12_3_0
Adding jinstall...
Verified manifest signed by PackageProduction_12_3_0

WARNING:     This package will load JUNOS 12.3R2 software.
WARNING:     It will save JUNOS configuration files, and SSH keys
```

 Copyright © 2016, Juniper Networks, Inc.

```
WARNING:     (if configured), but erase all other files and information
WARNING:     stored on this machine.  It will attempt to preserve dumps
WARNING:     and log files, but this can not be guaranteed.  This is the
WARNING:     pre-installation stage and all the software is loaded when
WARNING:     you reboot the system.

Saving the config files ...
NOTICE: uncommitted changes have been saved in
/var/db/config/juniper.conf.pre-install
Installing the bootstrap installer ...

WARNING:     A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the
WARNING:     'request system reboot' command when software installation is
WARNING:     complete. To abort the installation, do not reboot your system,
WARNING:     instead use the 'request system software delete jinstall'
WARNING:     command as soon as this operation completes.

Saving package file in /var/sw/pkg/jinstall-12.3R2-domestic-signed.tgz ...
Saving state for rollback ...
Installing package '/var/tmp/jinstall-12.3R2-domestic-signed.tgz' ...
Verified jinstall-12.3R2-domestic.tgz signed by PackageProduction_12_3_0
Adding jinstall...
Verified manifest signed by PackageProduction_12_3_0

WARNING:     This package will load JUNOS 12.3R2 software.
WARNING:     It will save JUNOS configuration files, and SSH keys
WARNING:     (if configured), but erase all other files and information
WARNING:     stored on this machine.  It will attempt to preserve dumps
WARNING:     and log files, but this can not be guaranteed.  This is the
WARNING:     pre-installation stage and all the software is loaded when
WARNING:     you reboot the system.

Saving the config files ...
NOTICE: uncommitted changes have been saved in
/var/db/config/juniper.conf.pre-install
Installing the bootstrap installer ...

WARNING:     A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the
WARNING:     'request system reboot' command when software installation is
WARNING:     complete. To abort the installation, do not reboot your system,
WARNING:     instead use the 'request system software delete jinstall'
WARNING:     command as soon as this operation completes.

Saving package file in /var/sw/pkg/jinstall-12.3R2-domestic-signed.tgz ...
Saving state for rollback ...
Installing package '/var/tmp/jinstall-12.3R2-domestic-signed.tgz' ...
Verified jinstall-12.3R2-domestic.tgz signed by PackageProduction_12_3_0
Adding jinstall...
Verified manifest signed by PackageProduction_12_3_0

WARNING:     This package will load JUNOS 12.3R2 software.
WARNING:     It will save JUNOS configuration files, and SSH keys
WARNING:     (if configured), but erase all other files and information
WARNING:     stored on this machine.  It will attempt to preserve dumps
WARNING:     and log files, but this can not be guaranteed.  This is the
WARNING:     pre-installation stage and all the software is loaded when
WARNING:     you reboot the system.

Saving the config files ...
NOTICE: uncommitted changes have been saved in
/var/db/config/juniper.conf.pre-install
```

```
Installing the bootstrap installer ...

WARNING:     A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the
WARNING:     'request system reboot' command when software installation is
WARNING:     complete. To abort the installation, do not reboot your system,
WARNING:     instead use the 'request system software delete jinstall'
WARNING:     command as soon as this operation completes.

Saving package file in /var/sw/pkg/jinstall-12.3R2-domestic-signed.tgz ...
Saving state for rollback ...
Installing package '/var/tmp/jinstall-12.3R2-domestic-signed.tgz' ...
Verified jinstall-12.3R2-domestic.tgz signed by PackageProduction_12_3_0
Adding jinstall...
Verified manifest signed by PackageProduction_12_3_0

WARNING:     This package will load JUNOS 12.3R2 software.
WARNING:     It will save JUNOS configuration files, and SSH keys
WARNING:     (if configured), but erase all other files and information
WARNING:     stored on this machine.  It will attempt to preserve dumps
WARNING:     and log files, but this can not be guaranteed.  This is the
WARNING:     pre-installation stage and all the software is loaded when
WARNING:     you reboot the system.

Saving the config files ...
NOTICE: uncommitted changes have been saved in
/var/db/config/juniper.conf.pre-install
Installing the bootstrap installer ...

WARNING:     A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the
WARNING:     'request system reboot' command when software installation is
WARNING:     complete. To abort the installation, do not reboot your system,
WARNING:     instead use the 'request system software delete jinstall'
WARNING:     command as soon as this operation completes.

Saving package file in /var/sw/pkg/jinstall-12.3R2-domestic-signed.tgz ...
Saving state for rollback ...
ISSU: Preparing SFC Backup RE
NOTICE: Validating configuration against jinstall-12.3R2-domestic-signed.tgz.
NOTICE: Use the 'no-validate' option to skip this if desired.
Checking compatibility with configuration
Initializing...
Using jbase-12.3R2
Verified manifest signed by PackageProduction_12_3_0
Using /var/tmp/jinstall-12.3R2-domestic-signed.tgz
Verified jinstall-12.3R2-domestic.tgz signed by PackageProduction_12_3_0
Using jinstall-12.3R2-domestic.tgz
Using jbundle-12.3R2-domestic.tgz
Checking jbundle requirements on /
Using jbase-12.3R2.tgz
Verified manifest signed by PackageProduction_12_3_0
Verified jbase-12.3R2 signed by PackageProduction_12_3_0
Using /var/validate/chroot/tmp/jbundle/jboot-12.3R2.tgz
Using jcrypto-12.3R2.tgz
Verified manifest signed by PackageProduction_12_3_0
Verified jcrypto-12.3R2 signed by PackageProduction_12_3_0
Using jdocs-12.3R2.tgz
Verified manifest signed by PackageProduction_12_3_0
Verified jdocs-12.3R2 signed by PackageProduction_12_3_0
Using jkernel-12.3R2.tgz
Verified manifest signed by PackageProduction_12_3_0
Verified jkernel-12.3R2 signed by PackageProduction_12_3_0
```

 Copyright © 2016, Juniper Networks, Inc.

```
Using jpfe-12.3R2.tgz
WARNING: jpfe-12.3R2.tgz: not a signed package
WARNING: jpfe-common-12.3R2.tgz: not a signed package
Verified jpfe-common-12.3R2 signed by PackageProduction_12_3_0
WARNING: jpfe-T-12.3R2.tgz: not a signed package
Verified jpfe-T-12.3R2 signed by PackageProduction_12_3_0
Using jplatform-12.3R2.tgz
Verified manifest signed by PackageProduction_12_3_0
Verified jplatform-12.3R2 signed by PackageProduction_12_3_0
Using jroute-12.3R2.tgz
Verified manifest signed by PackageProduction_12_3_0
Verified jroute-12.3R2 signed by PackageProduction_12_3_0
Using jruntime-12.3R2.tgz
Verified manifest signed by PackageProduction_12_3_0
Verified jruntime-12.3R2 signed by PackageProduction_12_3_0
Using jservices-12.3R2.tgz
Using jservices-crypto-12.3R2.tgz
Hardware Database regeneration succeeded
Validating against /config/juniper.conf.gz
mgd: commit complete
Validation succeeded
Installing package '/var/tmp/jinstall-12.3R2-domestic-signed.tgz' ...
Verified jinstall-12.3R2-domestic.tgz signed by PackageProduction_12_3_0
Adding jinstall...
Verified manifest signed by PackageProduction_12_3_0

WARNING:     This package will load JUNOS 12.3R2 software.
WARNING:     It will save JUNOS configuration files, and SSH keys
WARNING:     (if configured), but erase all other files and information
WARNING:     stored on this machine.  It will attempt to preserve dumps
WARNING:     and log files, but this can not be guaranteed.  This is the
WARNING:     pre-installation stage and all the software is loaded when
WARNING:     you reboot the system.

Saving the config files ...
NOTICE: uncommitted changes have been saved in
/var/db/config/juniper.conf.pre-install
Installing the bootstrap installer ...

WARNING:     A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the
WARNING:     'request system reboot' command when software installation is
WARNING:     complete. To abort the installation, do not reboot your system,
WARNING:     instead use the 'request system software delete jinstall'
WARNING:     command as soon as this operation completes.

Saving package file in /var/sw/pkg/jinstall-12.3R2-domestic-signed.tgz ...
Saving state for rollback ...
SFC Backup upgrade done
Rebooting SFC Backup RE

Rebooting sfc0-re1
ISSU: SFC Backup RE Prepare Done
Waiting for SFC Backup RE reboot

Rebooting lcc0-re1
Rebooting LCC [lcc0-re1]

Rebooting lcc1-re1
Rebooting LCC [lcc1-re1]

Rebooting lcc2-re1
```

```
Rebooting LCC [lcc2-re1]

Rebooting lcc3-re1
Rebooting LCC [lcc3-re1]
LCC Backup REs have rebooted
Waiting for LCC Backup REs come back online
ISSU: LCC Backup REs Prepare Done
GRES operational
Initiating Chassis In-Service-Upgrade
Chassis ISSU Started
ISSU: Preparing Daemons
ISSU: Daemons Ready for ISSU
ISSU: Starting Upgrade for FRUs
ISSU: Preparing for Switchover
ISSU: Ready for Switchover
Checking In-Service-Upgrade status
lcc0-re0:
--------------------------------------------------------------------------
  Item           Status                  Reason
  FPC 1          Online (ISSU)
    PIC 0        Online (ISSU)
  FPC 2          Online (ISSU)
  FPC 3          Online (ISSU)
    PIC 1        Online (ISSU)
  FPC 4          Online (ISSU)
  FPC 6          Online (ISSU)
  FPC 7          Online (ISSU)

lcc1-re0:
--------------------------------------------------------------------------
  Item           Status                  Reason
  FPC 0          Online (ISSU)
    PIC 3        Online (ISSU)
  FPC 1          Online (ISSU)
  FPC 2          Online (ISSU)
  FPC 4          Online (ISSU)
  FPC 6          Online (ISSU)
  FPC 7          Online (ISSU)

lcc2-re0:
--------------------------------------------------------------------------
  Item           Status                  Reason
  FPC 0          Online (ISSU)
  FPC 2          Online (ISSU)
  FPC 3          Online (ISSU)
    PIC 0        Online (ISSU)
  FPC 4          Online (ISSU)
  FPC 6          Online (ISSU)
  FPC 7          Online (ISSU)
    PIC 1        Online (ISSU)

lcc3-re0:
--------------------------------------------------------------------------
  Item           Status                  Reason
  FPC 0          Online (ISSU)
    PIC 0        Online (ISSU)
  FPC 1          Online (ISSU)
  FPC 2          Online (ISSU)
  FPC 3          Online (ISSU)
    PIC 2        Online (ISSU)
  FPC 4          Online (ISSU)
```


Copyright © 2016, Juniper Networks, Inc.

```
  FPC 5          Online (ISSU)
  FPC 6          Online (ISSU)
  FPC 7          Online (ISSU)
    PIC 1        Online (ISSU)

lcc0-re0:
--------------------------------------------------------------------------
Resolving mastership...
Complete. The other routing engine becomes the master.

lcc1-re0:
--------------------------------------------------------------------------
Resolving mastership...
Complete. The other routing engine becomes the master.

lcc2-re0:
--------------------------------------------------------------------------
Resolving mastership...
Complete. The other routing engine becomes the master.

lcc3-re0:
--------------------------------------------------------------------------
Resolving mastership...
Complete. The other routing engine becomes the master.
Resolving mastership...
Complete. The other routing engine becomes the master.
ISSU: RE switchover Done
ISSU: Upgrading SFC Old Master RE

lcc0-re0:
Installing package '/var/tmp/jinstall-12.3R2-domestic-signed.tgz' ...
Verified jinstall-12.3R2-domestic.tgz signed by PackageProduction_12_3_0
Adding jinstall...
Verified manifest signed by PackageProduction_12_3_0

WARNING:     This package will load JUNOS 12.3R2 software.
WARNING:     It will save JUNOS configuration files, and SSH keys
WARNING:     (if configured), but erase all other files and information
WARNING:     stored on this machine.  It will attempt to preserve dumps
WARNING:     and log files, but this can not be guaranteed.  This is the
WARNING:     pre-installation stage and all the software is loaded when
WARNING:     you reboot the system.

Saving the config files ...
NOTICE: uncommitted changes have been saved in
/var/db/config/juniper.conf.pre-install
Installing the bootstrap installer ...

WARNING:     A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the
WARNING:     'request system reboot' command when software installation is
WARNING:     complete. To abort the installation, do not reboot your system,
WARNING:     instead use the 'request system software delete jinstall'
WARNING:     command as soon as this operation completes.

Saving package file in /var/sw/pkg/jinstall-12.3R2-domestic-signed.tgz ...
Saving state for rollback ...

lcc1-re0:
Installing package '/var/tmp/jinstall-12.3R2-domestic-signed.tgz' ...
Verified jinstall-12.3R2-domestic.tgz signed by PackageProduction_12_3_0
Adding jinstall...
```

```
Verified manifest signed by PackageProduction_12_3_0

WARNING:     This package will load JUNOS 12.3R2 software.
WARNING:     It will save JUNOS configuration files, and SSH keys
WARNING:     (if configured), but erase all other files and information
WARNING:     stored on this machine.  It will attempt to preserve dumps
WARNING:     and log files, but this can not be guaranteed.  This is the
WARNING:     pre-installation stage and all the software is loaded when
WARNING:     you reboot the system.

Saving the config files ...
NOTICE: uncommitted changes have been saved in
/var/db/config/juniper.conf.pre-install
Installing the bootstrap installer ...

WARNING:     A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the
WARNING:     'request system reboot' command when software installation is
WARNING:     complete. To abort the installation, do not reboot your system,
WARNING:     instead use the 'request system software delete jinstall'
WARNING:     command as soon as this operation completes.

Saving package file in /var/sw/pkg/jinstall-12.3R2-domestic-signed.tgz ...
Saving state for rollback ...

lcc2-re0:
Installing package '/var/tmp/jinstall-12.3R2-domestic-signed.tgz' ...
Verified jinstall-12.3R2-domestic.tgz signed by PackageProduction_12_3_0
Adding jinstall...
Verified manifest signed by PackageProduction_12_3_0

WARNING:     This package will load JUNOS 12.3R2 software.
WARNING:     It will save JUNOS configuration files, and SSH keys
WARNING:     (if configured), but erase all other files and information
WARNING:     stored on this machine.  It will attempt to preserve dumps
WARNING:     and log files, but this can not be guaranteed.  This is the
WARNING:     pre-installation stage and all the software is loaded when
WARNING:     you reboot the system.

Saving the config files ...
NOTICE: uncommitted changes have been saved in
/var/db/config/juniper.conf.pre-install
Installing the bootstrap installer ...

WARNING:     A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the
WARNING:     'request system reboot' command when software installation is
WARNING:     complete. To abort the installation, do not reboot your system,
WARNING:     instead use the 'request system software delete jinstall'
WARNING:     command as soon as this operation completes.

Saving package file in /var/sw/pkg/jinstall-12.3R2-domestic-signed.tgz ...
Saving state for rollback ...

lcc3-re0:
Installing package '/var/tmp/jinstall-12.3R2-domestic-signed.tgz' ...
Verified jinstall-12.3R2-domestic.tgz signed by PackageProduction_12_3_0
Adding jinstall...
Verified manifest signed by PackageProduction_12_3_0

WARNING:     This package will load JUNOS 12.3R2 software.
WARNING:     It will save JUNOS configuration files, and SSH keys
WARNING:     (if configured), but erase all other files and information
```

 Copyright © 2016, Juniper Networks, Inc.

```
WARNING:     stored on this machine.  It will attempt to preserve dumps
WARNING:     and log files, but this can not be guaranteed.  This is the
WARNING:     pre-installation stage and all the software is loaded when
WARNING:     you reboot the system.

Saving the config files ...
NOTICE: uncommitted changes have been saved in
/var/db/config/juniper.conf.pre-install
Installing the bootstrap installer ...

WARNING:     A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the
WARNING:     'request system reboot' command when software installation is
WARNING:     complete. To abort the installation, do not reboot your system,
WARNING:     instead use the 'request system software delete jinstall'
WARNING:     command as soon as this operation completes.

Saving package file in /var/sw/pkg/jinstall-12.3R2-domestic-signed.tgz ...
Saving state for rollback ...
Installing package '/var/tmp/paBWTg' ...
Verified jinstall-12.3R2-domestic.tgz signed by PackageProduction_12_3_0
Adding jinstall...
Verified manifest signed by PackageProduction_12_3_0

WARNING:     This package will load JUNOS 12.3R2 software.
WARNING:     It will save JUNOS configuration files, and SSH keys
WARNING:     (if configured), but erase all other files and information
WARNING:     stored on this machine.  It will attempt to preserve dumps
WARNING:     and log files, but this can not be guaranteed.  This is the
WARNING:     pre-installation stage and all the software is loaded when
WARNING:     you reboot the system.

Saving the config files ...
NOTICE: uncommitted changes have been saved in
/var/db/config/juniper.conf.pre-install
Installing the bootstrap installer ...

WARNING:     A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the
WARNING:     'request system reboot' command when software installation is
WARNING:     complete. To abort the installation, do not reboot your system,
WARNING:     instead use the 'request system software delete jinstall'
WARNING:     command as soon as this operation completes.

Saving package file in /var/sw/pkg/jinstall-12.3R2-domestic-signed ...
cp: /var/tmp/paBWTg is a directory (not copied).
Saving state for rollback ...
ISSU: SFC Old Master Upgrade Done
ISSU: IDLE
```

request system software-in-service upgrade (QFX5100 Switch)

```
{master}

user@switch> request system software in-service-upgrade
/var/tmp/jinstall-qfx-132_x51_vjunos.0-domestic.tgz
ISSU: Validating Image
Prepare for ISSU
spawn the backup VM
ISSU: Preparing Backup RE
Backup upgrade done
ISSU: Backup RE Prepare Done
waiting for backup RE switchover ready
GRES operational
```

```
Initiating Chassis In-Service-Upgrade
Chassis ISSU Started
ISSU: Preparing Daemons
ISSU: Daemons Ready for ISSU
ISSU: Starting Upgrade for FRUs
ISSU: FPC Warm Booting
ISSU: FPC Warm Booted
ISSU: Preparing for Switchover
ISSU: Ready for Switchover
Checking In-Service-Upgrade status
  Item           Status                  Reason
  FPC 0          Online (ISSU)
send ISSU done to chassisd on backup VM
Chassis ISSU Completed
ISSU: IDLE
mgd_package_opus_issu: Initiate em0 device handoff
```


Copyright © 2016, Juniper Networks, Inc.

show chassis in-service-upgrade

Syntax **show chassis in-service-upgrade**

Release Information Command introduced in Junos OS Release 9.0.
Command introduced in Junos OS Release 12.3R2, 13.1R2, and 13.2R1 for TX Matrix Plus routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 13.2 for PTX5000 routers.
Command introduced in Junos OS Release 13.2X51-D15 for the QFX Series.

Description Display the status of Flexible PIC Concentrators (FPCs) and their corresponding PICs after the most recent unified in-service software upgrade (ISSU). This command must be issued on the master Routing Engine.

NOTE: Only Intelligent Queuing (IQ) PICs are displayed by this command output. Unified ISSU status for other PIC types is controlled internally by the FPC.

Options This command has no options.

Required Privilege Level view

Related Documentation

- *request system software abort*
- request system software in-service-upgrade on page 418
- *Getting Started with Unified In-Service Software Upgrade*
- *Example: Performing a Unified ISSU*

List of Sample Output

show chassis in-service-upgrade on page 432
show chassis in-service-upgrade (MX2010 Router) on page 432
show chassis in-service-upgrade (MX2020 Router) on page 432
show chassis in-service-upgrade (TX Matrix Plus Router) on page 433
show chassis in-service-upgrade (QFX5100 Switch) on page 434

Output Fields Table 22 on page 431 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 22: show chassis in-service-upgrade Output Fields

Field Name	Field Description
Item	Flexible PIC Concentrator (FPC) slot number.

Table 22: show chassis in-service-upgrade Output Fields *(continued)*

Field Name	Field Description
Status	FPC and corresponding PIC state. State can be either of the follwing: • **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
```


Copyright © 2016, Juniper Networks, Inc.

```
  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

lcc1-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

lcc2-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

lcc3-re0:
--------------------------------------------------------------------------
  Item            Status                  Reason
  FPC 0           Online
    PIC 0         Online
  FPC 1           Online
  FPC 2           Online
  FPC 3           Online
    PIC 2         Online
  FPC 4           Online
  FPC 5           Online
  FPC 6           Online
  FPC 7           Online
    PIC 1         Online
```

show chassis in-service-upgrade (QFX5100 Switch)

```
user@switch> show chassis in-service-upgrade
  Item           Status                   Reason
  FPC 0          Online (ISSU)
```


Copyright © 2016, Juniper Networks, Inc.

CHAPTER 29

Licensing Operational Commands

- request system license add
- request system license delete
- request system license save
- show system license

request system license add

Syntax request system license add (*filename* | terminal)

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 9.5 for SRX Series devices.
Command introduced in Junos OS Release 11.1 for the QFX Series.

Description Add a license key.

Options
filename—License key from a file or URL. Specify the filename or the URL where the key is located.

terminal—License key from the terminal.

Required Privilege Level maintenance

Related Documentation
- Adding New Licenses (CLI Procedure) on page 89

List of Sample Output request system license add on page 436

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request system license add

```
user@host> request system license add terminal
E408408918 aeaqib qcsbja okbuqe rcmxnq vjocwf uxfsta
           z5ufjb kdrmt6 57bimv 2f3ddp qttcdn 627q4a
           jx4s5x hiri
E408408918: successfully added
add license complete (no errors)
```

 Copyright © 2016, Juniper Networks, Inc.

request system license delete

Syntax

request system license delete (*license-identifier* | license-identifier-list [*licenseid001 licenseid002 licenseid003*]| all)

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Option **license-identifier-list** introduced in Junos OS Release 13.1.

Description

Delete a license key. You can choose to delete one license at a time, all licenses at once, or a list of license identifiers enclosed in brackets.

Options

license-identifier—Text string that uniquely identifies a license key.

license-identifier-list [*licenseid001 licenseid002 licenseid003....*]—Delete multiple license identifiers as a list enclosed in brackets.

all—Delete all licenses on the device.

Required Privilege Level

maintenance

Related Documentation

- Deleting a License (CLI Procedure) on page 90

request system license save

Syntax request system license save (*filename* | terminal)

Release Information
Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 9.5 for SRX Series devices.

Description Save installed license keys to a file or URL.

Options ***filename***—License key from a file or URL. Specify the filename or the URL where the key is located.

terminal—License key from the terminal.

Required Privilege Level maintenance

Related Documentation
- Saving License Keys on page 91

List of Sample Output request system license save on page 438

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request system license save

```
user@host> request system license save ftp://user@host/license.conf
```

 Copyright © 2016, Juniper Networks, Inc.

show system license

Syntax

show system license
<installed | keys | usage>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 13.3 for the MX104 3D Universal Edge Routers.

Description

Display licenses and information about how they are used.

Options

none—Display all license information.

installed—(Optional) Display installed licenses only.

keys—(Optional) Display a list of license keys. Use this information to verify that each expected license key is present.

usage—(Optional) Display the state of licensed features.

Required Privilege Level

maintenance

List of Sample Output

show system license on page 440
show system license installed on page 441
show system license keys on page 441
show system license usage on page 441
show system license (MX104 Routers) on page 441
show system license installed (MX104 Routers) on page 442
show system license keys (MX104 Routers) on page 442
show system license usage (MX104 Routers) on page 442
show system license (MX104 Routers) on page 442
show system license installed (MX104 Routers) on page 443
show system license keys (MX104 Routers) on page 443
show system license usage (MX104 Routers) on page 443
show system license (MX104 Routers) on page 444
show system license installed (MX104 Routers) on page 444
show system license keys (MX104 Routers) on page 444
show system license usage (MX104 Routers) on page 445
show system license (QFX Series) on page 445

Output Fields

Table 23 on page 439 lists the output fields for the **show system license** command. Output fields are listed in the approximate order in which they appear.

Table 23: show system license Output Fields

Field Name	Field Description
Feature name	Name assigned to the configured feature. You use this information to verify that all the features for which you installed licenses are present.

Table 23: show system license Output Fields *(continued)*

Field Name	Field Description
Licenses used	Number of licenses used by a router or switch. You use this information to verify that the number of licenses used matches the number configured. If a licensed feature is configured, the feature is considered used. NOTE: In Junos OS Release 10.1 and later, the **Licenses used** column displays the actual usage count based on the number of active sessions or connections as reported by the corresponding feature daemons. This is applicable for scalable license-based features such as Subscriber Access (**scale-subscriber**), L2TP (**scale-l2tp**), Mobile IP (**scale-mobile-ip**), and so on.
Licenses installed	Information about the installed license key: • **License identifier**—Identifier associated with a license key. • **State**—State of the license key:**valid** or **invalid**. An **invalid** state indicates that the key was entered incorrectly or is not valid for the specific device. • **License version**—Version of a license. The version indicates how the license is validated, the type of signature, and the signer of the license key. • **Valid for device**—Device that can use a license key. • **Group defined**—Group membership of a device. • **Features**—Feature associated with a license, such as data link switching (DLSw).
Licenses needed	Number of licenses required for features being used but not yet properly licensed.
Expiry	Amount of time left within the grace period before a license is required for a feature being used.

Sample Output

show system license

```
user@host> show system license

License usage:
                                  Licenses     Licenses    Licenses    Expiry
  Feature name                        used    installed      needed
  subscriber-accounting                  2            2           0    permanent
  subscriber-authentication              1            2           0    permanent
  subscriber-address-assignment          2            2           0    permanent
  subscriber-vlan                        2            2           0    permanent
  subscriber-ip                          0            2           0    permanent
  scale-subscriber                       2            3           0    permanent
  scale-l2tp                             4            5           0    permanent
  scale-mobile-ip                        1            2           0    permanent

Licenses installed:
  License identifier: XXXXXXXXXX
  License version: 2
  Features:
    subscriber-accounting - Per Subscriber Radius Accounting
      permanent
    subscriber-authentication - Per Subscriber Radius Authentication
      permanent
    subscriber-address-assignment - Radius/SRC Address Pool Assignment
      permanent
    subscriber-vlan  - Dynamic Auto-sensed Vlan
```


Copyright © 2016, Juniper Networks, Inc.

```
    permanent
  subscriber-ip    - Dynamic and Static IP
    permanent
```

show system license installed

```
user@host> show system license installed
  License identifier: XXXXXXXXXX
  License version: 2
  Features:
    subscriber-accounting - Per Subscriber Radius Accounting
      permanent
    subscriber-authentication - Per Subscriber Radius Authentication
      permanent
    subscriber-address-assignment - Radius/SRC Address Pool Assignment
      permanent
    subscriber-vlan  - Dynamic Auto-sensed Vlan
      permanent
    subscriber-ip    - Dynamic and Static IP
      permanent
```

show system license keys

```
user@host> show system license keys
XXXXXXXXXX xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx
         xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx
         xxxxxx xxxxxx xxx
```

show system license usage

```
user@host> show system license usage
License usage:
                                 Licenses     Licenses    Licenses    Expiry
  Feature name                       used    installed      needed
  subscriber-accounting                 2            2           0    permanent
  subscriber-authentication             1            2           0    permanent
  subscriber-address-assignment         2            2           0    permanent
  subscriber-vlan                       2            2           0    permanent
  subscriber-ip                         0            2           0    permanent
  scale-subscriber                      2            3           0    permanent
  scale-l2tp                            4            5           0    permanent
  scale-mobile-ip                       1            2           0    permanent
```

show system license (MX104 Routers)

In the following output, ports 0 and 1 are activated by installing the license to activate the first two built-in ports.

```
user@host> show system license
License usage:
                                 Licenses     Licenses    Licenses    Expiry
  Feature name                       used    installed      needed
  scale-subscriber                      0         1000           0    permanent
  scale-l2tp                            0         1000           0    permanent
  scale-mobile-ip                       0         1000           0    permanent
  MX104-2x10Gig-port-0-1                0            1           0    permanent

Licenses installed:
  License identifier: XXXXXXXXXX
  License version: 2
  Features:
```

```
    MX104-2x10Gig-port-0-1 - MX104 2X10Gig Builtin Port(xe-2/0/0 & xe-2/0/1)
upgrade
      permanent
```

show system license installed (MX104 Routers)

In the following output, ports 0 and 1 are activated by installing the license to activate the first two built-in ports.

```
user@host > show system license installed
License identifier: XXXXXXXXXX
  License version: 2
  Features:
    MX104-2x10Gig-port-0-1 - MX104 2X10Gig Builtin Port(xe-2/0/0 & xe-2/0/1)
upgrade
      permanent
```

show system license keys (MX104 Routers)

In the following output, ports 0 and 1 are activated by installing the license to activate the first two built-in ports.

```
user@host > show system license keys

XXXXXXXXXX xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx
           xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx
           xxxxxx xxxx
```

show system license usage (MX104 Routers)

In the following output, ports 0 and 1 are activated by installing the license to activate the first two built-in ports.

```
user@host > show system license usage
           Licenses     Licenses    Licenses    Expiry
  Feature name                       used    installed      needed
  scale-subscriber                      0         1000           0    permanent
  scale-l2tp                            0         1000           0    permanent
  scale-mobile-ip                       0         1000           0    permanent
  MX104-2x10Gig-port-0-1                0            1           0    permanent
```

show system license (MX104 Routers)

In the following output, ports 2 and 3 are activated by installing the license to activate the next two built-in ports after installing the license to activate the first two built-in ports.

```
user@host > show system license
License usage:
                                Licenses     Licenses    Licenses    Expiry
  Feature name                      used    installed      needed
  scale-subscriber                     0         1000           0    permanent
  scale-l2tp                           0         1000           0    permanent
  scale-mobile-ip                      0         1000           0    permanent
  MX104-2x10Gig-port-0-1               0            1           0    permanent
  MX104-2x10Gig-port-2-3               0            1           0    permanent

Licenses installed:
  License identifier: XXXXXXXXXX
  License version: 2
```

 Copyright © 2016, Juniper Networks, Inc.

```
  Features:
    MX104-2x10Gig-port-0-1 - MX104 2X10Gig Builtin Port(xe-2/0/0 & xe-2/0/1)
upgrade
      permanent

  License identifier: XXXXXXXXXX
  License version: 2
  Features:
    MX104-2x10Gig-port-2-3 - MX104 2X10Gig Builtin Port(xe-2/0/2 & xe-2/0/3)
upgrade
      permanent
```

show system license installed (MX104 Routers)

In the following output, ports 2 and 3 are activated by installing the license to activate the next two built-in ports after installing the license to activate the first two built-in ports.

```
user@host > show system license installed
License identifier: XXXXXXXXXX
  License version: 2
  Features:
    MX104-2x10Gig-port-0-1 - MX104 2X10Gig Builtin Port(xe-2/0/0 & xe-2/0/1)
upgrade
      permanent

  License identifier: XXXXXXXXXX
  License version: 2
  Features:
    MX104-2x10Gig-port-2-3 - MX104 2X10Gig Builtin Port(xe-2/0/2 & xe-2/0/3)
upgrade
      permanent
```

show system license keys (MX104 Routers)

In the following output, ports 2 and 3 are activated by installing the license to activate the next two built-in ports after installing the license to activate the first two built-in ports.

```
user@host > show system license keys

XXXXXXXXXX xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx
           xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx
           xxxxxx xxxx

XXXXXXXXXX xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx
           xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx
           xxxxxx xxxx
```

show system license usage (MX104 Routers)

In the following output, ports 2 and 3 are activated by installing the license to activate the next two built-in ports after installing the license to activate the first two built-in ports.

```
user@host > show system license usage
           Licenses     Licenses    Licenses    Expiry
  Feature name                       used    installed      needed
  scale-subscriber                      0         1000           0    permanent
  scale-l2tp                            0         1000           0    permanent
```

```
  scale-mobile-ip                       0         1000           0    permanent
  MX104-2x10Gig-port-0-1                0            1           0    permanent
  MX104-2x10Gig-port-2-3                0            1           0    permanent
```

show system license (MX104 Routers)

In the following output, ports 0,1,2, and 3 are activated by installing a single license key to activate all four built-in ports.

```
user@host > show system license
License usage:
                                 Licenses     Licenses    Licenses    Expiry
  Feature name                       used    installed      needed
  scale-subscriber                      0         1000           0    permanent
  scale-l2tp                            0         1000           0    permanent
  scale-mobile-ip                       0         1000           0    permanent
  MX104-2x10Gig-port-0-1                0            1           0    permanent
  MX104-2x10Gig-port-2-3                0            1           0    permanent

Licenses installed:
  License identifier: XXXXXXXXXX
  License version: 2
  Features:
    MX104-2x10Gig-port-0-1 - MX104 2X10Gig Builtin Port(xe-2/0/0 & xe-2/0/1)
upgrade
      permanent
    MX104-2x10Gig-port-2-3 - MX104 2X10Gig Builtin Port(xe-2/0/2 & xe-2/0/3)
upgrade
      permanent
```

show system license installed (MX104 Routers)

In the following output, ports 0,1,2, and 3 are activated by installing a single license key to activate all four built-in ports.

```
user@host > show system license installed
License identifier: XXXXXXXXXX
  License version: 2
  Features:
    MX104-2x10Gig-port-0-1 - MX104 2X10Gig Builtin Port(xe-2/0/0 & xe-2/0/1)
upgrade
      permanent
    MX104-2x10Gig-port-2-3 - MX104 2X10Gig Builtin Port(xe-2/0/2 & xe-2/0/3)
upgrade
      permanent
```

show system license keys (MX104 Routers)

In the following output, ports 0,1,2, and 3 are activated by installing a single license key to activate all four built-in ports.

```
user@host > show system license keys

XXXXXXXXX  xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx
           xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx
           xxxxxx xxxxxx x
```

 Copyright © 2016, Juniper Networks, Inc.

show system license usage (MX104 Routers)

In the following output, ports 0,1,2, and 3 are activated by installing a single license key to activate all four built-in ports.

```
user@host > show system license usage
           Licenses     Licenses    Licenses    Expiry
  Feature name                       used    installed      needed
  scale-subscriber                      0         1000           0    permanent
  scale-l2tp                            0         1000           0    permanent
  scale-mobile-ip                       0         1000           0    permanent
  MX104-2x10Gig-port-0-1                0            1           0    permanent
  MX104-2x10Gig-port-2-3                0            1           0    permanent
```

show system license (QFX Series)

```
user@switch> show system license
License usage:
                    Licenses     Licenses    Licenses    Expiry
  Feature name         used    installed      needed
  qfx-edge-fab            1            1           1    permanent
Licenses installed:
  License identifier: JUNOS417988
  License version: 1
  Features:
    qfx-edge-fab  -        QFX3000 Series QF/Node feature license
      permanent
```

Copyright © 2016, Juniper Networks, Inc.

CHAPTER 30

NSSU Operational Commands

- request system software nonstop-upgrade
- show chassis nonstop-upgrade

Copyright © 2016, Juniper Networks, Inc.

request system software nonstop-upgrade

Syntax

request system software nonstop-upgrade (*package-name* | set [*package-name package-name*])
<force-host>
<no-copy>
<no-old-master-upgrade>
<reboot >
<unlink>

Release Information

Command introduced in Junos OS Release 10.4 for EX Series switches.
Option **set [*package-name package-name*]** added in Junos OS Release 12.1 for EX Series switches.
Command introduced in Junos OS Release 13.2X50-D20 for the QFX Series.

Description

Perform a nonstop software upgrade (NSSU) on a switch with redundant Routing Engines or on a Virtual Chassis. The behavior of this command depends on which switch or Virtual Chassis it is executed on:

- When you execute this command on an EX3300, EX4200, EX4300, EX4500, or EX4550 Virtual Chassis or QFX3500 and QFX3600 Virtual Chassis, a fixed configuration of switches in a Virtual Chassis Fabric (QFX3500/QFX3600 and QFX5100 switches) or for a mixed Virtual Chassis Fabric composed of any combination of QFX3500/QFX3600, QFX5100, and EX4300 switches, or a mixed Virtual Chassis composed of any combination of EX4200, EX4500, and EX4550 switches, all members are upgraded. The original Virtual Chassis backup becomes the master. The original master is automatically upgraded and rebooted and rejoins the Virtual Chassis as the backup after the upgrade completes.
- When you execute this command on an EX6200 or EX8200 switch, both the backup and master Routing Engines are upgraded, with the original backup Routing Engine becoming the new master at the end of the upgrade.

  The original master Routing Engine is automatically rebooted on an EX6200 switch.

  The original master Routing Engine is not automatically rebooted on an EX8200 switch unless you specify the **reboot** option.
- When you execute this command on an EX8200 Virtual Chassis, all master and backup Routing Engines are upgraded in the Virtual Chassis, including the external Routing Engines. The original backup Routing Engines become the new master Routing Engines. The original master Routing Engines are not automatically rebooted, unless you specify the **reboot** option.

This command has the following requirements:

- All Virtual Chassis members and all Routing Engines must be running the same Junos OS release.
- Graceful Routing Engine switchover (GRES) must be enabled.
- Nonstop active routing (NSR) must be enabled.

Copyright © 2016, Juniper Networks, Inc.

NOTE: Although nonstop bridging (NSB) does not have to be enabled for you to use this command, we recommend that you enable NSB. Enabling NSB ensures that all NSB-supported Layer 2 protocols operate seamlessly during the Routing Engine switchover that is part of the NSSU. See *Configuring Nonstop Bridging on EX Series Switches (CLI Procedure)*.

- The command must be executed from the master Routing Engine on a standalone switch or from the master on a Virtual Chassis.
- For minimal traffic disruption, you must define link aggregation groups (LAGs) such that the member links reside on different Virtual Chassis members (for EX3300, EX4200, EX4300, EX4500, EX4550, QFX3500 and QFX3600 Virtual Chassis, and mixed Virtual Chassis, and Virtual Chassis Fabric) or on different line cards (for EX6200 and EX8200 switches, and for EX8200 Virtual Chassis).
- For EX3300, EX4200, EX4300, EX4500, EX4550, QFX3500 and QFX3600 Virtual Chassis, and mixed Virtual Chassis:
  - The Virtual Chassis members must be connected in a ring topology. A ring topology prevents the Virtual Chassis from splitting during an NSSU.
  - The Virtual Chassis master and backup must be adjacent to each other in the ring topology. Adjacency permits the master and backup to always be in sync, even when the switches in linecard roles are rebooting.
  - The Virtual Chassis must be preprovisioned so that the linecard role has been explicitly assigned to member switches acting in a linecard role. During an NSSU, the Virtual Chassis members must maintain their roles—the master and backup must maintain their Routing Engine roles (although mastership will change), and the remaining switches must maintain their linecard roles.
  - A two-member Virtual Chassis must have **no-split-detection** configured so that the Virtual Chassis does not split when an NSSU upgrades a member.
- For Virtual Chassis Fabric:
  - Only two pre-provisioned members in the routing engine role are supported. If more than two routing engines are configured, a warning will be issued, and NSSU will stop.
  - The Virtual Chassis Fabric members are connected in a spine and leaf topology. A spine and leaf topology prevents the Virtual Chassis Fabric from splitting during an NSSU. Each leaf device must be connected to both spine devices.
  - The Virtual Chassis Fabric must be preprovisioned so that the line card role has been explicitly assigned to member switches acting in a line card role, and that the routing engine role has been explicitly assigned to member switches acting in a routing engine role. During an NSSU, the Virtual Chassis Fabric members must maintain their roles—the master and backup must maintain their master and backup roles (although

mastership will change), the member switches must remain their routing engine roles, and the remaining switches must maintain their linecard roles.

- A two-member Virtual Chassis Fabric must have **no-split-detection** configured so that the Virtual Chassis Fabric does not split when an NSSU upgrades a member.

Options ***package-name***—Location from which the software package or bundle is to be installed. For example:

- **/var/tmp/*package-name***—For a software package or bundle that is being installed from a local directory on the switch.
- ***protocol://hostname/pathname/package-name***—For a software package or bundle that is to be downloaded and installed from a remote location. Replace ***protocol*** with one of the following:
  - **ftp**—File Transfer Protocol.
    Use **ftp*://hostname/pathname/package-name***. To specify authentication credentials, use
    ftp*://<username>:<password>@hostname/pathname/package-name*. To have the system prompt you for the password, specify **prompt** in place of the password. If a password is required, and you do not specify the password or **prompt**, an error message is displayed.
  - **http**—Hypertext Transfer Protocol.
    Use **http*://hostname/pathname/package-name***. To specify authentication credentials, use
    http*://<username>:<password>@hostname/pathname/package-name*. If a password is required and you omit it, you are prompted for it.
  - **scp**—Secure copy (available only for Canada and U.S. version).
    Use **scp*://hostname/pathname/package-name***. To specify authentication credentials, use
    scp*://<username>:<password>@hostname/pathname/package-name*.

NOTE: The ***pathname*** in the protocol is the relative path to the user home directory on the remote system and not the root directory.

set [*package-name package-name*]—(Mixed Virtual Chassis only) Locations of the EX4200 and the EX4500 installation packages. These packages must be for the same Junos OS release. See the description of the ***package-name*** option for information about how to specify the location of the installation packages.

force-host—(Optional) Force the addition of host software package or bundle (ignore warnings) on the QFX5100 device.

no-copy—(Optional) Install a software package or bundle, but do not save copies of package or bundle files.

 Copyright © 2016, Juniper Networks, Inc.

no-old-master-upgrade—(Optional) (EX8200 switches only) Upgrade the backup Routing Engine only. After the upgrade completes, the original master Routing Engine becomes the backup Routing Engine and continues running the previous software version.

reboot—(Optional) (EX8200 switches and EX8200 Virtual Chassis only) When the **reboot** option is included, the original master (new backup) Routing Engines are automatically rebooted after being upgraded to the new software. When the **reboot** option is not included, you must manually reboot the original master (new backup) Routing Engines using the **request system reboot** command.

NOTE: **If you do not use the reboot option on an EX8200 Virtual Chassis, you must establish a connection to the console port on the Switch Fabric and Routing Engine (SRE) module or Routing Engine (RE) module to perform the manual reboot of the backup Routing Engines.**

unlink—(Optional) Remove the software package after a successful upgrade is completed.

Required Privilege Level

maintenance

Related Documentation

- show chassis nonstop-upgrade on page 458
- *Upgrading Software on an EX3300, EX4200, EX4300, EX4500 and EX4550 Virtual Chassis, and Mixed Virtual Chassis Using Nonstop Software Upgrade (CLI Procedure)*
- *Upgrading Software on an EX6200 or EX8200 Standalone Switch Using Nonstop Software Upgrade (CLI Procedure)*
- *Upgrading Software on an EX8200 Virtual Chassis Using Nonstop Software Upgrade (CLI Procedure)*
- *Upgrading Software on a Virtual Chassis and Mixed Virtual Chassis Using Nonstop Software Upgrade*
- Upgrading Software on a Virtual Chassis Fabric Using Nonstop Software Upgrade on page 120

List of Sample Output

request system software nonstop-upgrade (EX4200 Virtual Chassis) on page 452
request system software nonstop-upgrade (EX6200 Switch) on page 453
request system software nonstop-upgrade reboot (EX8200 Switch) on page 454
request system software nonstop-upgrade no-old-master-upgrade (EX8200 Switch) on page 455
request system software nonstop-upgrade reboot (EX8200 Virtual Chassis) on page 455

Output Fields

When you enter this command, you are provided feedback on the status of your request.

Sample Output

request system software nonstop-upgrade (EX4200 Virtual Chassis)

```
user@switch> request system software nonstop-upgrade
/var/tmp/jinstall-ex-4200–12.1R5.5–domestic-signed.tgz
Chassis ISSU Check Done
ISSU: Validating Image
ISSU: Preparing Backup RE
Installing image on other FPC's along with the backup

Checking pending install on fpc1
Pushing bundle to fpc1
WARNING: A reboot is required to install the software
WARNING:     Use the 'request system reboot' command immediately
Completed install on fpc1

Checking pending install on fpc2
Pushing bundle to fpc2
WARNING: A reboot is required to install the software
WARNING:     Use the 'request system reboot' command immediately
Completed install on fpc2

Checking pending install on fpc3
Pushing bundle to fpc3
WARNING: A reboot is required to install the software
WARNING:     Use the 'request system reboot' command immediately
Completed install on fpc3

Checking pending install on fpc4
Pushing bundle to fpc4
WARNING: A reboot is required to install the software
WARNING:     Use the 'request system reboot' command immediately
Completed install on fpc4

Checking pending install on fpc5
Pushing bundle to fpc5
WARNING: A reboot is required to install the software
WARNING:     Use the 'request system reboot' command immediately
Completed install on fpc5

Checking pending install on fpc6
Pushing bundle to fpc6
WARNING: A reboot is required to install the software
WARNING:     Use the 'request system reboot' command immediately
Completed install on fpc6

Checking pending install on fpc7
Pushing bundle to fpc7
WARNING: A reboot is required to install the software
WARNING:     Use the 'request system reboot' command immediately
Completed install on fpc7
Backup upgrade done
Rebooting Backup RE

Rebooting fpc1
ISSU: Backup RE Prepare Done
Waiting for Backup RE reboot
GRES operational
Initiating Chassis In-Service-Upgrade
Chassis ISSU Started
```


Copyright © 2016, Juniper Networks, Inc.

```
ISSU: Preparing Daemons
ISSU: Daemons Ready for ISSU
ISSU: Starting Upgrade for FRUs
ISSU: Preparing for Switchover
ISSU: Ready for Switchover
Checking In-Service-Upgrade status
  Item           Status                  Reason
  FPC 0          Online
  FPC 1          Online
  FPC 2          Online (ISSU)
  FPC 3          Online (ISSU)
  FPC 4          Online (ISSU)
  FPC 5          Online (ISSU)
  FPC 6          Online (ISSU)
  FPC 7          Online (ISSU)
Going to install image on master
WARNING: A reboot is required to install the software
WARNING:     Use the 'request system reboot' command immediately
relinquish mastership
ISSU: IDLE

*** FINAL System shutdown message from root@switch ***

System going down IMMEDIATELY


Shutdown NOW!
[pid 9336]
```

request system software nonstop-upgrade (EX6200 Switch)

```
{master}
user@switch> request system software nonstop-upgrade
/var/tmp/jinstall-ex-6200–12.2R5.5–domestic-signed.tgz
Chassis ISSU Check Done
ISSU: Validating Image
ISSU: Preparing Backup RE
Pushing bundle to re0
NOTICE: Validating configuration against
jinstall-ex-6200-12.2R5.5-domestic-signed.tgz.
NOTICE: Use the 'no-validate' option to skip this if desired.
WARNING: A reboot is required to install the software
WARNING:     Use the 'request system reboot' command immediately
Backup upgrade done
Rebooting Backup RE

Rebooting re0
ISSU: Backup RE Prepare Done
Waiting for Backup RE reboot
GRES operational
Initiating Chassis In-Service-Upgrade
Chassis ISSU Started
ISSU: Preparing Daemons
ISSU: Daemons Ready for ISSU
ISSU: Starting Upgrade for FRUs
ISSU: Preparing for Switchover
ISSU: Ready for Switchover
Checking In-Service-Upgrade status
  Item           Status                  Reason
  FPC 0          Online (ISSU)
```

```
  FPC 1          Online (ISSU)
  FPC 2          Online (ISSU)
  FPC 3          Online (ISSU)
  FPC 4          Online
  FPC 5          Online
  FPC 6          Online (ISSU)
  FPC 7          Online (ISSU)
  FPC 8          Online (ISSU)
  FPC 9          Online (ISSU)
Going to install image on master
NOTICE: Validating configuration against
jinstall-ex-6200-12.2R5.5-domestic-signed.tgz.
NOTICE: Use the 'no-validate' option to skip this if desired.
WARNING: A reboot is required to install the software
WARNING:     Use the 'request system reboot' command immediately
relinquish mastership
ISSU: IDLE
Trying to relinquish mastership before rebooting...
Resolving mastership...
Complete. The other routing engine becomes the master.

*** FINAL System shutdown message from user@switch ***

System going down IMMEDIATELY
```

request system software nonstop-upgrade reboot (EX8200 Switch)

```
{master}
user@switch> request system software nonstop-upgrade reboot
/var/tmp/jinstall-ex-8200-10.4R1.5-domestic-signed.tgz
Chassis ISSU Check Done
ISSU: Validating Image
ISSU: Preparing Backup RE
Pushing bundle to re1
WARNING: A reboot is required to install the software
WARNING:     Use the 'request system reboot' command immediately
Backup upgrade done
Rebooting Backup RE

Rebooting re1
ISSU: Backup RE Prepare Done
Waiting for Backup RE reboot
GRES operational
Initiating Chassis In-Service-Upgrade
Chassis ISSU Started
ISSU: Preparing Daemons
ISSU: Daemons Ready for ISSU
ISSU: Starting Upgrade for FRUs
ISSU: Preparing for Switchover
ISSU: Ready for Switchover
Checking In-Service-Upgrade status
  Item           Status                  Reason
  FPC 0          Online (ISSU)
  FPC 2          Offline                 Offlined by CLI command
  FPC 3          Online (ISSU)
Resolving mastership...
Complete. The other routing engine becomes the master.
ISSU: RE switchover Done
ISSU: Upgrading Old Master RE
WARNING: A reboot is required to install the software
WARNING:     Use the 'request system reboot' command immediately
```

 Copyright © 2016, Juniper Networks, Inc.

```
ISSU: Old Master Upgrade Done
ISSU: IDLE
Shutdown NOW!
[pid 2635]


*** FINAL System shutdown message from user@switch ***
System going down IMMEDIATELY
```

request system software nonstop-upgrade no-old-master-upgrade (EX8200 Switch)

```
{master}
user@switch> request system software nonstop-upgrade no-old-master-upgrade
/var/tmp/jinstall-ex-8200–10.4R1.5–domestic-signed.tgz
Chassis ISSU Check Done
ISSU: Validating Image
ISSU: Preparing Backup RE
Pushing bundle to re1
WARNING: A reboot is required to install the software
WARNING:     Use the 'request system reboot' command immediately
Backup upgrade done
Rebooting Backup RE

Rebooting re1
ISSU: Backup RE Prepare Done
Waiting for Backup RE reboot
GRES operational
Initiating Chassis In-Service-Upgrade
Chassis ISSU Started
ISSU: Preparing Daemons
ISSU: Daemons Ready for ISSU
ISSU: Starting Upgrade for FRUs
ISSU: Preparing for Switchover
ISSU: Ready for Switchover
Checking In-Service-Upgrade status
  Item           Status                 Reason
  FPC 0          Online (ISSU)
  FPC 1          Online (ISSU)
  FPC 2          Online (ISSU)
  FPC 3          Offline                Offlined by CLI command
  FPC 4          Online (ISSU)
  FPC 5          Online (ISSU)
  FPC 6          Online (ISSU)
  FPC 7          Online (ISSU)
Resolving mastership...
Complete. The other routing engine becomes the master.
ISSU: RE switchover Done
Skipping Old Master Upgrade
ISSU: IDLE
```

request system software nonstop-upgrade reboot (EX8200 Virtual Chassis)

```
{master:9}
user@external-routing-engine> request system software nonstop-upgrade reboot
/var/tmp/jinstall-ex-xre200-11.1-20101130.0-domestic-signed.tgz
Chassis ISSU Check Done
ISSU: Validating Image
ISSU: Preparing LCC Backup REs
ISSU: Preparing Backup RE
Pushing bundle /var/tmp/jinstall-ex-xre200-11.1-20101130.0-domestic-signed.tgz
to member8
```

```
---------------------------------------------------------------------------
WARNING: A reboot is required to install the software
WARNING:     Use the 'request system reboot' command immediately
VC Backup upgrade done
Rebooting VC Backup RE

Rebooting member8
ISSU: Backup RE Prepare Done
Waiting for VC Backup RE reboot
Pushing bundle to member0-backup
Pushing bundle to member1-backup
WARNING: A reboot is required to install the software
WARNING:     Use the 'request system reboot' command immediately
WARNING: A reboot is required to install the software
WARNING:     Use the 'request system reboot' command immediately

Rebooting member0-backup
Rebooting LCC [member0-backup]

Rebooting member1-backup
Rebooting LCC [member1-backup]
ISSU: LCC Backup REs Prepare Done
GRES operational
Initiating Chassis Nonstop-Software-Upgrade
Chassis ISSU Started
ISSU: Preparing Daemons
ISSU: Daemons Ready for ISSU
ISSU: Starting Upgrade for FRUs
ISSU: Preparing for Switchover
ISSU: Ready for Switchover
Checking Nonstop-Upgrade status
member0:
---------------------------------------------------------------------------
  Item           Status                  Reason
  FPC 0          Online (ISSU)
  FPC 1          Online (ISSU)
  FPC 2          Online (ISSU)
  FPC 5          Online (ISSU)

member1:
---------------------------------------------------------------------------
  Item           Status                  Reason
  FPC 0          Online (ISSU)
  FPC 1          Offline                 Offlined due to config
  FPC 2          Online (ISSU)
  FPC 3          Online (ISSU)
  FPC 4          Online (ISSU)
  FPC 5          Online (ISSU)
  FPC 7          Online (ISSU)

member0:
---------------------------------------------------------------------------
  Item           Status                  Reason
  FPC 0          Online (ISSU)
  FPC 1          Online (ISSU)
  FPC 2          Online (ISSU)
  FPC 5          Online (ISSU)

member1:
---------------------------------------------------------------------------
  Item           Status                  Reason
```

 Copyright © 2016, Juniper Networks, Inc.

```
  FPC 0          Online (ISSU)
  FPC 1          Offline                Offlined due to config
  FPC 2          Online (ISSU)
  FPC 3          Online (ISSU)
  FPC 4          Online (ISSU)
  FPC 5          Online (ISSU)
  FPC 7          Online (ISSU)
ISSU: Upgrading Old Master RE
Pushing bundle /var/tmp/incoming-package-8200.tgz to member0-master
Pushing bundle /var/tmp/incoming-package-8200.tgz to member1-master

ISSU: RE switchover Done
WARNING: A reboot is required to install the software
WARNING:     Use the 'request system reboot' command immediately
Rebooting ...
shutdown: [pid 2188]
Shutdown NOW!
ISSU: Old Master Upgrade Done
ISSU: IDLE
Shutdown NOW!

*** FINAL System shutdown message from root@ ***
System going down IMMEDIATELY
```

show chassis nonstop-upgrade

Syntax **show chassis nonstop-upgrade**

Release Information Command introduced in Junos OS Release 10.4 for EX Series switches.
Command introduced in Junos OS Release 13.2X50-D15 for the QFX Series.

Description (EX6200 switches, EX8200 switches, EX8200 Virtual Chassis, QFX3500 and QFX3600 Virtual Chassis, and Virtual Chassis Fabric only) Display the status of the line cards or Virtual Chassis members in the linecard role after the most recent nonstop software upgrade (NSSU). This command must be issued on the master Routing Engine.

Required Privilege Level view

Related Documentation

- request system software nonstop-upgrade on page 448
- *Upgrading Software on an EX6200 or EX8200 Standalone Switch Using Nonstop Software Upgrade (CLI Procedure)*
- *Upgrading Software on a Virtual Chassis and Mixed Virtual Chassis Using Nonstop Software Upgrade*
- Upgrading Software on a Virtual Chassis Fabric Using Nonstop Software Upgrade on page 120
- *Upgrading Software on an EX8200 Virtual Chassis Using Nonstop Software Upgrade (CLI Procedure)*

List of Sample Output

show chassis nonstop-upgrade (EX8200 Switch) on page 459
show chassis nonstop-upgrade (EX8200 Virtual Chassis) on page 459
show chassis nonstop-upgrade (Virtual Chassis Fabric) on page 459

Output Fields Table 24 on page 458 lists the output fields for the **show chassis nonstop-upgrade** command. Output fields are listed in the approximate order in which they appear.

Table 24: show chassis nonstop-upgrade Output Fields

Field Name	Field Description
Item	Line card slot number.
Status	State of line card: • **Error**—Line card is in an error state. • **Offline**—Line card is powered down. • **Online**—Line card is online and running.
Reason	Reason for the state (if the line card is offline).

 Copyright © 2016, Juniper Networks, Inc.

Sample Output

show chassis nonstop-upgrade (EX8200 Switch)

```
user@switch> show chassis nonstop-upgrade
  Item           Status                  Reason
  FPC 0          Online
  FPC 1          Online
  FPC 2          Online
  FPC 3          Offline                 Offlined by CLI command
  FPC 4          Online
  FPC 5          Online
  FPC 6          Online
  FPC 7          Online
```

show chassis nonstop-upgrade (EX8200 Virtual Chassis)

```
user@external-routing-engine> show chassis nonstop-upgrade
member0:
--------------------------------------------------------------------------
  Item           Status                  Reason
  FPC 0          Online
  FPC 1          Online
  FPC 2          Online
  FPC 5          Online

member1:
--------------------------------------------------------------------------
  Item           Status                  Reason
  FPC 0          Online
  FPC 1          Offline                 Offlined due to config
  FPC 2          Online
  FPC 3          Online
  FPC 4          Online
  FPC 5          Online
  FPC 7          Online
```

show chassis nonstop-upgrade (Virtual Chassis Fabric)

```
 Item           Status                  Reason
  FPC 0          Online
  FPC 1          Online
  FPC 2          Online
  FPC 3          Online
  FPC 4          Online
  FPC 5          Online
```

Copyright © 2016, Juniper Networks, Inc.

CHAPTER 31

NTP Operational Commands

- show ntp associations
- show ntp status

show ntp associations

Syntax

show ntp associations
<no-resolve>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display Network Time Protocol (NTP) peers and their state.

Options

none—Display NTP peers and their state.

no-resolve—(Optional) Suppress symbolic addressing.

Required Privilege Level

view

Related Documentation

- show ntp status on page 464

List of Sample Output

show ntp associations on page 463

Output Fields

Table 25 on page 462 describes the output fields for the **show ntp associations** command. Output fields are listed in the approximate order in which they appear.

Table 25: show ntp associations Output Fields

Field Name	Field Description
remote	Address or name of the remote NTP peer.
refid	Reference identifier of the remote peer. If the reference identifier is not known, this field shows a value of **0.0.0.0**.
st	Stratum of the remote peer.
t	Type of peer: **b** (broadcast), **l** (local), **m** (multicast), or **u** (unicast).
when	When the last packet from the peer was received.
poll	Polling interval, in seconds.
reach	Reachability register, in octal.
delay	Current estimated delay of the peer, in milliseconds.
offset	Current estimated offset of the peer, in milliseconds.
disp	Current estimated dispersion of the peer, in milliseconds.

Copyright © 2016, Juniper Networks, Inc.

Table 25: show ntp associations Output Fields *(continued)*

Field Name	Field Description
peer-name	Peer name and status of the peer in the clock selection process: • space—Discarded because of a high stratum value or failed sanity checks. • **x**—Designated "falseticker" by the intersection algorithm. • **.**—Culled from the end of the candidate list. • **–** —Discarded by the clustering algorithm. • **+**—Included in the final selection set. • **#**—Selected for synchronization, but the distance exceeds the maximum. • *****—Selected for synchronization. • **o**—Selected for synchronization, but the packets-per-second (pps) signal is in use.

Sample Output

show ntp associations

```
user@host> show ntp associations
 remote     refid        st t when poll reach   delay   offset    disp
=============================================================================
*ex.junipe host1.univ.edu 2 u   43   64  377     1.86    0.319    0.08
```

show ntp status

Syntax

show ntp status
<no-resolve>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display the values of internal variables returned by Network Time Protocol (NTP) peers.

Options

none—Display the values of internal variables returned by NTP peers.

no-resolve—(Optional) Suppress symbolic addressing.

Required Privilege Level

view

Related Documentation

- show ntp associations on page 462

List of Sample Output

show ntp status on page 465

Output Fields

Table 26 on page 464 describes the output fields for the **show ntp status** command. Output fields are listed in the approximate order in which they appear.

Table 26: show ntp status Output Fields

Field Name	Field Description
status	System status word, a code representing the status items listed.
leap_none	Indicates a normal synchronized state with no leap seconds imminent. Other options could be **leap_add_sec**, **leap_del_sec**, or **leap_alarm**, indicating a leap second will be added, deleted, or a leap second requirement is upcoming.
sync_ntp	Indicates the current synchronization source, in this case, an NTP server. Other options include **sync_alarm** and **sync_unspec**, both indicating that the router has not been synched.
x events	Indicates the number of events that have occurred since that last code change. An event is often the receipt of an NTP polling message.
event_peer/strat_chg	Describes the most recent event, in this case, the stratum of the peer server changed.
version	A detailed description of the version of NTP being used.
processor	Indicates the current hardware platform and version of the processor.
system	Detailed description of the name and version of the operating system in use.
leap	The number of leap seconds in use.

Copyright © 2016, Juniper Networks, Inc.

Table 26: show ntp status Output Fields *(continued)*

Field Name	Field Description
stratum	The stratum of the peer server. Anything greater than 1 is a secondary reference source, and the number roughly represents the number of hops away from the stratum 1 server.. Stratum 1 is a primary reference, such as an atomic clock.
precision	The precision of the peer clock, how precisely the frequency and time can be maintained with this particular timekeeping system.
rootdelay	The total roundtrip delay to the primary reference source, in seconds.
rootdispersion	The maximum error relative to the primary reference source, in seconds.
peer	An identification number of the peer in use.
refid	Reference identifier of the remote peer. If the reference identifier is not known, this field shows a value of **0.0.0.0**.
reftime	The local time, in timestamp format, when the local clock was last updated. If the local clock has never been synchronized, the value is zero.
poll	The NTP broadcast message polling interval, in seconds.
clock	The current time on the local router clock.
state	The current mode of NTP operation, where 1 is symmetric active, 2 is symmetric passive, 3 is client, 4 is server, and 5 is broadcast.
offset	Current estimated offset of the peer, in milliseconds. Indicates the time difference between the reference clock and the local clock.
frequency	The frequency of the clock.
jitter	Indicates the magnitude of jitter, in milliseconds, between several time queries.
stability	A measure of how well this clock can maintain a constant frequency.

Sample Output

show ntp status

```
user@host> show ntp status
assID=0 status=0544 leap_none, sync_local_proto, 4 events, event_peer/strat_chg,
version="ntpd 4.2.2p1@1.1570-o Tue May 19 13:57:55 UTC 2009 (1)",
processor="x86_64", system="Linux/2.6.18-164.el5", leap=00, stratum=4,
precision=-10, rootdelay=0.000, rootdispersion=11.974, peer=59475,
refid=LOCAL(0),
reftime=d495c32c.0e71eaf2  Mon, Jan  7 2013 13:57:00.056, poll=10,
clock=d495c32c.cebd43bd  Mon, Jan  7 2013 13:57:00.807, state=4,
offset=0.000, frequency=0.000, jitter=0.977, noise=0.977,
stability=0.000, tai=0
```

Copyright © 2016, Juniper Networks, Inc.

CHAPTER 32

Routine Monitoring Operational Commands

- show chassis alarms
- show chassis beacon
- show chassis environment
- show chassis environment fpc
- show chassis environment pem
- show chassis environment routing-engine
- show chassis fan
- show chassis firmware
- show chassis fpc
- show chassis hardware
- show chassis lcd
- show chassis led
- show chassis location
- show chassis mac-addresses
- show chassis pic
- show chassis routing-engine
- show chassis temperature-thresholds
- show chassis zones
- show host
- show log
- show subscribers
- show system alarms
- show system audit
- show system boot-messages
- show system buffers
- show system certificate

Copyright © 2016, Juniper Networks, Inc.

- show system commit
- show system configuration archival
- show system configuration rescue
- show system connections
- show system core-dumps
- show system directory-usage
- show system processes
- show system reboot
- show system resource-cleanup processes
- show system services service-deployment
- show system software
- show system statistics
- show system storage
- show system uptime
- show system users
- show system virtual-memory
- show version
- start shell
- test configuration
- traceroute
- traceroute monitor

Copyright © 2016, Juniper Networks, Inc.

show chassis alarms

List of Syntax

Syntax on page 469
Syntax (TX Matrix Routers) on page 469
Syntax (TX Matrix Plus Routers) on page 469
Syntax (MX Series Routers) on page 469
Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers) on page 469
Syntax (QFX Series) on page 469
Syntax (OCX Series) on page 469
Syntax (PTX Series Packet Transport Routers) on page 469
Syntax (ACX Series Universal Access Routers) on page 469

Syntax

show chassis alarms

Syntax (TX Matrix Routers)

show chassis alarms
<lcc *number* | scc>

Syntax (TX Matrix Plus Routers)

show chassis alarms
<lcc *number* | sfc *number*>

Syntax (MX Series Routers)

show chassis alarms
<all-members>
<local>
<member *member-id*>

Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers)

show chassis alarms
<satellite [slot-id *slot-id*]>

Syntax (QFX Series)

show chassis alarms
<interconnect-device *name*>
<node-device *name*>

Syntax (OCX Series)

show chassis alarms

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.

Copyright © 2016, Juniper Networks, Inc.

Command introduced in Junos OS Release 12.2 for the ACX Series Universal Access Routers.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.
Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
satellite option introduced in Junos OS Release 14.2R3 for Junos Fusion.

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.

satellite [slot-id ***slot-id*****]**—(Junos Fusion only)(Optional) Display information about alarm conditions for the specified satellite device in a Junos Fusion, or for all satellite devices in the Junos Fusion if no satellite devices are specified.

scc—(TX Matrix router only) (Optional) Show information about the TX Matrix router (switch-card chassis).

 Copyright © 2016, Juniper Networks, Inc.

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 **1000101111**. The LSB in this case is **1**, which means that this is a major alarm. After removing the LSB, you are left with **100010111**,

which is equal to 279 in decimal. This is the actual error code, its meaning can be found from the following list:

Chip Type: L Chip	Code
CMALARM_LCHIP_LOUT_DESRD_PARITY_ERR	1
CMALARM_LCHIP_LOUT_DESRD_UNINIT_ERR	2
CMALARM_LCHIP_LOUT_DESRD_ILLEGALLINK_ERR	3
CMALARM_LCHIP_LOUT_DESRD_ILLEGALSIZE_ERR	4
CMALARM_LCHIP_LOUT_HDRF_TOERR_ERR	5
CMALARM_LCHIP_LOUT_HDRF_PARITY_ERR	6
CMALARM_LCHIP_LOUT_HDRF_UCERR_ERR	7
CMALARM_LCHIP_LOUT_NLIF_CRCDROP_ERR	8
CMALARM_LCHIP_LOUT_NLIF_CRCERR_ERR	9
CMALARM_LCHIP_UCODE_TIMEOUT_ERR	10
CMALARM_LCHIP_LIN_SRCTL_ACCT_DROP_ERR	11
CMALARM_LCHIP_LIN_SRCTL_ACCT_ADDR_SIZE_ERR	12
CMALARM_LCHIP_SRAM_PARITY_ERR	13
CMALARM_LCHIP_UCODE_OVFLW_ERR	14
CMALARM_LCHIP_LOUT_HDRF_MTU_ERR	15

Chip Type: M Chip	Code
CMALARM_MCHIP_ECC_UNCORRECT_ERR	128

Chip Type: N Chip	Code
CMALARM_NCHIP_RDDMA_JBUS_TIMEOUT_ERR	256
CMALARM_NCHIP_RDDMA_FIFO_OVFLW_ERR	257
CMALARM_NCHIP_RDDMA_FIFO_UNFLW_ERR	258
CMALARM_NCHIP_RDDMA_SIZE_ERR	259

Copyright © 2016, Juniper Networks, Inc.

CMALARM_NCHIP_RDDMA_JBUS_CRC_ERR	260
CMALARM_NCHIP_WRDMA_PKTR_ERR	261
CMALARM_NCHIP_WRDMA_PKT_CRC_ERR	262
CMALARM_NCHIP_WRDMA_JBUS_TIMEOUT_ERR	263
CMALARM_NCHIP_WRDMA_FIFO_OVFLW_ERR	264
CMALARM_NCHIP_WRDMA_FIFO_UNFLW_ERR	265
CMALARM_NCHIP_WRDMA_PKT_LEN_ERR	266
CMALARM_NCHIP_WRDMA_JBUS_CRC_ERR	267
CMALARM_NCHIP_PKTR_DMA_AGE_ERR	268
CMALARM_NCHIP_PKTR_ICELLSIG_ERR	269
CMALARM_NCHIP_PKTR_FTTL_ERR	270
CMALARM_NCHIP_RODR_OFFSET_OVFLW_ERR	271
CMALARM_NCHIP_PKTR_TMO_CELL_ERR	272
CMALARM_NCHIP_PKTR_TMO_OUTRANGE_ERR	273
CMALARM_NCHIP_PKTR_MD_REQUEST_Q_OVFLW_ERR	274
CMALARM_NCHIP_PKTR_DMA_BUFFER_OVFLW_ERR	275
CMALARM_NCHIP_PKTR_GRT_OVFLW_ERR	276
CMALARM_NCHIP_FRQ_ERR	277
CMALARM_NCHIP_RODR_IN_Q_OVFLW_ERR	278
CMALARM_NCHIP_DBUF_CRC_ERR	279

Chip Type: R Chip	Code
CMALARM_RCHIP_SRAM_PARITY_ERR	512

Chip Type: R Chip	Code
CMALARM_ICHIP_WO_DESRD_ID_ERR	601
CMALARM_ICHIP_WO_DESRD_DATA_ERR	602

CMALARM_ICHIP_WO_DESRD_OFLOW_ERR	603
CMALARM_ICHIP_WO_HDRF_UCERR_ERR	604
CMALARM_ICHIP_WO_HDRF_MTUERR_ERR	605
CMALARM_ICHIP_WO_HDRF_PARITY_ERR	606
CMALARM_ICHIP_WO_HDRF_TOERR_ERR	607
CMALARM_ICHIP_WO_IP_CRC_ERR	608
CMALARM_ICHIP_WO_IP_INTER_ERR	609
CMALARM_ICHIP_WI_WAN_TIMEOUT_ERR	625
CMALARM_ICHIP_WI_FAB_TIMEOUT_ERR	626
CMALARM_ICHIP_RLDRAM_BIST_ERR	630
CMALARM_ICHIP_SDRAM_BIST_ERR	631
CMALARM_ICHIP_RLDRAM_PARITY_ERR	632
CMALARM_ICHIP_SDRAM_UNCORRECT_ERR	633
CMALARM_ICHIP_SDRAM_CORRECT_ERR	634
CMALARM_ICHIP_FUSE_DONE_ERR	635

According to the table above, the **279** error code corresponds to **CMALARM_NCHIP_DBUF_CRC_ERR**; this means that new CRC errors were seen on the NCHIP of this particular FPC, which is FPC as per the logs.

If you do not want to convert decimal to binary and vice versa, you may use the following shortcut:

For major alarms, the **Actual Error Code = (Error Code - 1)/2**, where **Error Code** is the code that you get in the log message. For example, if you get the following log:

```
Apr 12 08:04:10 send: red alarm set, device FPC 6, reason FPC 6 Major Errors - Error code: 257
```

Actual Error Code = (257-1)/2 = 128. Similarly, for minor alarms, Actual Error Code = (Error Code)/2

Required Privilege Level view

 Copyright © 2016, Juniper Networks, Inc.

Related Documentation

- *Configuring an Alarm Entry and Its Attributes*
- *Chassis Conditions That Trigger Alarms*

List of Sample Output

show chassis alarms (Alarms Active) on page 476
show chassis alarms (No Alarms Active) on page 476
show chassis alarms (Fan Tray) on page 476
show chassis alarms (MX104 Router) on page 476
show chassis alarms (MX2010 Router) on page 476
show chassis alarms (MX2020 Router) on page 476
show chassis alarms (MX960, MX480, and MX240 Routers showing Major CB Failure) on page 477
show chassis alarms (T4000 Router) on page 477
show chassis alarms (Unreachable Destinations Present on a T Series Router) on page 477
show chassis alarms (FPC Offline Due to Unreachable Destinations on a T Series Router) on page 477
show chassis alarms (SCG Absent on a T Series Router) on page 478
show chassis alarms (Alarms Active on a TX Matrix Router) on page 478
show chassis alarms (TX Matrix Plus router with 3D SIBs) on page 478
show chassis alarms (Alarms on a T4000 Router After the enhanced-mode Statement is Enabled) on page 480
show chassis alarms (Backup Routing Engine) on page 480
show chassis alarms (EX Series Switch) on page 481
show chassis alarms (Alarms Active on the QFX Series and OCX Series Switches) on page 481
show chassis alarms node-device (Alarms Active on the QFabric System) on page 481
show chassis alarms (Alarms Active on the QFabric System) on page 481
show chassis alarms (Alarms Active on an EX8200 Switch) on page 481
show chassis alarms (Alarms Active on a PTX5000 Packet Transport Router) on page 482
show chassis alarms (Mix of PDUs Alarm on a PTX5000 Packet Transport Router with FPC2-PTX-P1A) on page 482
show chassis alarms (PDU Converter Failed Alarm on a PTX5000 Packet Transport Router with FPC2-PTX-P1A) on page 482
show chassis alarms (No Power for System Alarm on a PTX5000 Packet Transport Router with FPC2-PTX-P1A) on page 483
show chassis alarms (Alarms Active on an ACX2000 Universal Access Router) on page 483
show chassis alarms (Active Alarm to Indicate Status of the Bad SCB Clock on MX Series) on page 483
show chassis alarms (Active Alarms on PTX5000, MX240, MX480, MX960, MX2010, and MX2020 Routers with Smart Disk Error) on page 483

Output Fields

Table 27 on page 476 lists the output fields for the **show chassis alarms** command. Output fields are listed in the approximate order in which they appear.

Table 27: 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
```


Copyright © 2016, Juniper Networks, Inc.

```
1 alarms currently active
Alarm time Class Description
2012-10-03 12:14:59 PDT Minor Plane 0 not online
```

show chassis alarms (MX960, MX480, and MX240 Routers showing Major CB Failure)

A major CB 0 failure alarm occurs in the event of a bad CB (unknown or mismatched CBs do not trigger this alarm in Junos Release OS 12.3R9 and later). Following GRES or recovery, if the hardware issue persists, the traffic moves to the good CB and continues. If the alarm was triggered by something transient like a power zone budget on GRES, bringing the CB back online can clear the alarm. Otherwise, replace the bad CB. Note that fabric link speed is not impacted by an offline SCB. The alarm migh be raised on CB0, CB1, and CB2.

```
user@host> show chassis alarms
6 alarms currently active
Alarm time               Class  Description
2014-10-31 16:49:41 EDT  Major  PEM 3 Not OK
2014-10-31 16:49:41 EDT  Major  PEM 2 Not OK
2014-10-31 16:49:31 EDT  Major  CB 0 Failure
2014-10-31 16:49:31 EDT  Minor  CB 0 Fabric Chip 0 Not Online
2014-10-31 16:49:31 EDT  Minor  CB 0 Fabric Chip 1 Not Online
2014-10-31 16:49:31 EDT  Minor  Backup RE Active
```

show chassis alarms (T4000 Router)

```
user@host> show chassis alarms
9 alarms currently active
Alarm time               Class  Description
2007-06-02 01:41:10 UTC  Minor  RE 0 Not Supported
2007-06-02 01:41:10 UTC  Minor  CB 0 Not Supported
2007-06-02 01:41:10 UTC  Minor  Mixed Master and Backup RE types
2007-05-30 19:37:33 UTC  Major  SPMB 1 not online
2007-05-30 19:37:29 UTC  Minor  Front Bottom Fan Tray Absent
2007-05-30 19:37:13 UTC  Major  PEM 1 Input Failure
2007-05-30 19:37:13 UTC  Major  PEM 0 Not OK
2007-05-30 19:37:03 UTC  Major  PEM 0 Improper for Platform
2007-05-30 19:37:03 UTC  Minor  Backup RE Active
```

show chassis alarms (Unreachable Destinations Present on a T Series Router)

```
user@host> show chassis alarms
10 alarms currently active
Alarm time               Class  Description
2011-08-30 18:43:53 PDT  Major  FPC 7 has unreachable destinations
2011-08-30 18:43:53 PDT  Major  FPC 5 has unreachable destinations
2011-08-30 18:43:52 PDT  Major  FPC 3 has unreachable destinations
2011-08-30 18:43:52 PDT  Major  FPC 2 has unreachable destinations
2011-08-30 18:43:52 PDT  Minor  SIB 0 Not Online
2011-08-30 18:43:33 PDT  Minor  SIB 4 Not Online
2011-08-30 18:43:28 PDT  Minor  SIB 3 Not Online
2011-08-30 18:43:05 PDT  Minor  SIB 2 Not Online
2011-08-30 18:43:28 PDT  Minor  SIB 1 Not Online
2011-08-30 18:43:05 PDT  Major  PEM 1 Not Ok
```

show chassis alarms (FPC Offline Due to Unreachable Destinations on a T Series Router)

```
user@host> show chassis alarms
10 alarms currently active
Alarm time               Class  Description
```

```
2011-08-30 18:43:53 PDT  Major  FPC 7 offline due to unreachable destinations
2011-08-30 18:43:53 PDT  Major  FPC 5 offline due to unreachable destinations
2011-08-30 18:43:52 PDT  Major  FPC 3 offline due to unreachable destinations
2011-08-30 18:43:52 PDT  Major  FPC 2 offline due to unreachable destinations
2011-08-30 18:43:52 PDT  Minor  SIB 0 Not Online
2011-08-30 18:43:33 PDT  Minor  SIB 4 Not Online
2011-08-30 18:43:28 PDT  Minor  SIB 3 Not Online
2011-08-30 18:43:05 PDT  Minor  SIB 2 Not Online
2011-08-30 18:43:28 PDT  Minor  SIB 1 Not Online
2011-08-30 18:43:05 PDT  Major  PEM 1 Not Ok
```

show chassis alarms (SCG Absent on a T Series Router)

```
user@host> show chassis alarms
4 alarms currently active
Alarm time               Class  Description
2011-01-23 21:42:46 PST  Major  SCG 0 NO EXT CLK MEAS-BKUP SCG ABS
```

show chassis alarms (Alarms Active on a TX Matrix Router)

```
user@host> show chassis alarms
scc-re0:
--------------------------------------------------------------------------
8 alarms currently active
Alarm time               Class  Description
2004-08-05 18:43:53 PDT  Minor  LCC 0 Minor Errors
2004-08-05 18:43:53 PDT  Minor  SIB 3 Not Online
2004-08-05 18:43:52 PDT  Major  SIB 2 Absent
2004-08-05 18:43:52 PDT  Major  SIB 1 Absent
2004-08-05 18:43:52 PDT  Major  SIB 0 Absent
2004-08-05 18:43:33 PDT  Major  LCC 2 Major Errors
2004-08-05 18:43:28 PDT  Major  LCC 0 Major Errors
2004-08-05 18:43:05 PDT  Minor  LCC 2 Minor Errors
lcc0-re0:
--------------------------------------------------------------------------
5 alarms currently active
Alarm time               Class  Description
2004-08-05 18:43:53 PDT  Minor  SIB 3 Not Online
2004-08-05 18:43:49 PDT  Major  SIB 2 Absent
2004-08-05 18:43:49 PDT  Major  SIB 1 Absent
2004-08-05 18:43:49 PDT  Major  SIB 0 Absent
2004-08-05 18:43:28 PDT  Major  PEM 0 Not OK
lcc2-re0:
--------------------------------------------------------------------------
5 alarms currently active
Alarm time               Class  Description
2004-08-05 18:43:35 PDT  Minor  SIB 3 Not Online
2004-08-05 18:43:33 PDT  Major  SIB 2 Absent
2004-08-05 18:43:33 PDT  Major  SIB 1 Absent
2004-08-05 18:43:33 PDT  Major  SIB 0 Absent
2004-08-05 18:43:05 PDT  Minor  PEM 1 Absent
```

show chassis alarms (TX Matrix Plus router with 3D SIBs)

```
user@host> show chassis alarms
sfc0-re0:
--------------------------------------------------------------------------
Alarm time               Class  Description

2014-04-08 14:35:13 IST  Minor  FPM 0 SFC Config Size Changed
2014-04-08 14:32:58 IST  Major  Fan Tray Failure
2014-04-08 14:31:53 IST  Major  SIB F13 6 Fault
```


Copyright © 2016, Juniper Networks, Inc.

```
2014-04-08 14:31:43 IST  Major  SIB F13 11 Fault
2014-04-08 14:31:08 IST  Minor  Check SIB F13 12 CXP 14 Fbr Cbl
2014-04-08 14:31:08 IST  Minor  Check SIB F13 12 CXP 8 Fbr Cbl
2014-04-08 14:31:08 IST  Minor  Check SIB F13 12 CXP 3 Fbr Cbl
2014-04-08 14:31:08 IST  Major  SIB F13 12 CXP 15 fault
2014-04-08 14:31:08 IST  Minor  SIB F13 12 CXP 14 LOL
2014-04-08 14:31:08 IST  Minor  Check SIB F13 12 CXP 14
2014-04-08 14:31:08 IST  Major  SIB F13 12 CXP 10 fault
2014-04-08 14:31:08 IST  Minor  SIB F13 12 CXP 8 LOL
2014-04-08 14:31:08 IST  Minor  Check SIB F13 12 CXP 8
2014-04-08 14:31:08 IST  Major  SIB F13 12 CXP 7 fault
2014-04-08 14:31:08 IST  Major  SIB F13 12 CXP 4 fault
2014-04-08 14:31:08 IST  Minor  SIB F13 12 CXP 3 LOL
2014-04-08 14:31:08 IST  Minor  Check SIB F13 12 CXP 3
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 14 Fbr Cbl
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 12 Fbr Cbl
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 8 Fbr Cbl
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 6 Fbr Cbl
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 4 Fbr Cbl
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 2 Fbr Cbl
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 0 Fbr Cbl
2014-04-08 14:31:08 IST  Minor  SIB F13 6 CXP 14 LOL
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 14
2014-04-08 14:31:08 IST  Minor  SIB F13 6 CXP 12 LOL
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 12
2014-04-08 14:31:08 IST  Major  SIB F13 6 CXP 10 fault
2014-04-08 14:31:08 IST  Minor  SIB F13 6 CXP 8 LOL
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 8
2014-04-08 14:31:08 IST  Minor  SIB F13 6 CXP 6 LOL
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 6
2014-04-08 14:31:08 IST  Minor  SIB F13 6 CXP 4 LOL
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 4
2014-04-08 14:31:08 IST  Minor  SIB F13 6 CXP 2 LOL
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 2
2014-04-08 14:31:08 IST  Minor  SIB F13 6 CXP 0 LOL
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 0
2014-04-08 14:31:08 IST  Minor  SIB F13 12 CXP 14 XC HSL Link Error
2014-04-08 14:29:27 IST  Minor  LCC 0 Minor Errors
2014-04-08 14:28:37 IST  Major  LCC 0 Major Errors
2014-04-08 14:28:37 IST  Major  LCC 2 Major Errors
2014-04-08 14:28:37 IST  Minor  LCC 2 Minor Errors
2014-04-08 14:28:24 IST  Major  SIB F2S 4/6 Absent
2014-04-08 14:28:24 IST  Major  SIB F2S 4/4 Absent
2014-04-08 14:28:24 IST  Major  SIB F2S 4/2 Absent
2014-04-08 14:28:24 IST  Major  SIB F2S 4/0 Absent
2014-04-08 14:28:24 IST  Major  SIB F2S 3/6 Absent
2014-04-08 14:28:24 IST  Major  SIB F2S 3/4 Absent
2014-04-08 14:28:24 IST  Major  SIB F2S 3/2 Absent
2014-04-08 14:28:24 IST  Major  SIB F2S 3/0 Absent
2014-04-08 14:28:24 IST  Major  SIB F13 9 Absent
2014-04-08 14:28:24 IST  Major  SIB F13 8 Absent
2014-04-08 14:28:24 IST  Major  SIB F13 7 Absent
2014-04-08 14:28:24 IST  Major  SIB F13 4 Absent
2014-04-08 14:28:24 IST  Major  SIB F13 1 Absent
2014-04-08 14:28:22 IST  Major  PEM 0 Input Failure
2014-04-08 14:28:22 IST  Major  PEM 0 Not OK

lcc0-re0:
--------------------------------------------------------------------------
12 alarms currently active
Alarm time               Class  Description
```

```
2014-04-08 14:36:08 IST  Minor  CB 1  M/S Switch Changed
2014-04-08 14:36:08 IST  Minor  CB 1  CHASSIS ID Changed
2014-04-08 14:35:43 IST  Minor  CB 0  M/S Switch Changed
2014-04-08 14:35:43 IST  Minor  CB 0  CHASSIS ID Changed
2014-04-08 14:29:30 IST  Minor  SIB 4 Not Online
2014-04-08 14:29:30 IST  Minor  SIB 3 Not Online
2014-04-08 14:29:30 IST  Minor  SIB 2 Not Online
2014-04-08 14:29:24 IST  Major  Rear Fan Tray Failure
2014-04-08 14:29:24 IST  Major  Front Bottom Fan Tray Improper for Platform
2014-04-08 14:29:24 IST  Major  Front Top Fan Tray Improper for Platform
2014-04-08 14:28:37 IST  Major  SIB 4 Absent
2014-04-08 14:28:37 IST  Major  SIB 3 Absent

lcc2-re0:
--------------------------------------------------------------------------
12 alarms currently active
Alarm time               Class  Description
2014-04-08 14:36:02 IST  Minor  CB 1  M/S Switch Changed
2014-04-08 14:36:02 IST  Minor  CB 1  CHASSIS ID Changed
2014-04-08 14:35:42 IST  Minor  CB 0  M/S Switch Changed
2014-04-08 14:34:42 IST  Minor  CB 0  CHASSIS ID Changed
2014-04-08 14:29:29 IST  Minor  SIB 0 CXP 7 Unsupported Optics
2014-04-08 14:29:27 IST  Major  Front Bottom Fan Tray Improper for Platform
2014-04-08 14:29:27 IST  Major  Front Top Fan Tray Improper for Platform
2014-04-08 14:29:25 IST  Minor  SIB 4 Not Online
2014-04-08 14:29:25 IST  Minor  SIB 3 Not Online
2014-04-08 14:28:47 IST  Major  PEM 0 Not OK
2014-04-08 14:28:36 IST  Major  SIB 2 Absent
2014-04-08 14:28:36 IST  Minor  Host 0 Boot from alternate media

lcc6-re0:
--------------------------------------------------------------------------
2 alarms currently active
Alarm time               Class  Description
2013-11-06 04:03:56 PST  Minor  SIB 1 CXP 0 XC HSL Link Error
2013-11-06 03:49:32 PST  Major  PEM 1 Not OK
```

show chassis alarms (Alarms on a T4000 Router After the enhanced-mode Statement is Enabled)

To enable improved virtual private LAN service (VPLS) MAC address learning on T4000 routers, you must include the **enhanced-mode** statement at the **[edit chassis network-services]** hierarchy level and reboot the router. When router reboots, only the T4000 Type 5 FPCs are required to be present on the router. If there are any other FPCs (apart from T4000 Type 5 FPCs) on the T4000 router, such FPCs become offline, and FPC misconfiguration alarms are generated. The **show chassis alarm** command output displays FPC misconfiguration (**FPC *fpc-slot* misconfig**) as the reason for the generation of the alarms.

```
user@host> show chassis alarms
2 alarms currently active
  Alarm time               Class  Description
  2011-10-22 10:10:47 PDT  Major  FPC 1 misconfig
  2011-10-22 10:10:46 PDT  Major  FPC 0 misconfig
```

show chassis alarms (Backup Routing Engine)

```
user@host> show chassis alarms
2 alarms are currently active
Alarm time               Class  Description
```

 Copyright © 2016, Juniper Networks, Inc.

```
2005-04-07 10:12:22 PDT  Minor  Host 1 Boot from alternate media
2005-04-07 10:11:54 PDT  Major  Host 1 compact-flash missing in Boot List
```

show chassis alarms (EX Series Switch)

```
user@switch> show chassis alarms
 4 alarms currently active
Alarm time               Class  Description
2014-03-12 15:36:09 UTC  Minor  Require a Fan Tray upgrade
2014-03-12 15:00:02 UTC  Major  PEM 0 Input Failure
2014-03-12 15:00:02 UTC  Major  PEM 0 Not OK
2014-03-12 14:59:51 UTC  Minor  Host 1 Boot from alternate media
```

show chassis alarms (Alarms Active on the QFX Series and OCX Series Switches)

```
user@switch> show chassis alarms
1 alarms currently active
Alarm time               Class  Description
2012-03-05 2:10:24 UTC  Major  FPC 0 PEM 0 Airflow not matching Chassis Airflow
```

show chassis alarms node-device (Alarms Active on the QFabric System)

```
user@switch> show chassis alarms node-device ED3691
node-device ED3694
3 alarms currently active
Alarm time               Class  Description
2011-08-24 16:04:15 UTC  Major  ED3694:fte-0/1/2: Link down
2011-08-24 16:04:14 UTC  Major  ED3694:fte-0/1/0: Link down
2011-08-24 14:21:14 UTC  Major  ED3694 PEM 0 is not supported/powered
```

show chassis alarms (Alarms Active on the QFabric System)

```
user@switch> show chassis alarms
IC-A0001:
--------------------------------------------------------------------------
1 alarms currently active
Alarm time               Class  Description
2011-08-24 16:04:15 UTC  Minor  Backup RE Active

ED3694:
--------------------------------------------------------------------------
3 alarms currently active
Alarm time               Class  Description
2011-08-24 16:04:15 UTC  Major  ED3694:fte-0/1/2: Link down
2011-08-24 16:04:14 UTC  Major  ED3694:fte-0/1/0: Link down
2011-08-24 14:21:14 UTC  Major  ED3694 PEM 0 is not supported/powered

SNG-0:
--------------------------------------------------------------------------

NW-NG-0:
--------------------------------------------------------------------------
1 alarms currently active
Alarm time               Class  Description
2011-08-24 15:49:27 UTC  Major  ED3691 PEM 0 is not supported/powered
```

show chassis alarms (Alarms Active on an EX8200 Switch)

```
user@switch> show chassis alarms

6 alarms currently active
```

```
Alarm time               Class  Description
2010-12-02 19:15:22 UTC  Major  Fan Tray Failure
2010-12-02 19:15:22 UTC  Major  Fan Tray Failure
2010-12-02 19:15:14 UTC  Minor  Check CB 0 Fabric Chip 1 on Plane/FPC/PFE: 1/5/0,
 1/5/1, 1/5/2, 1/5/3, 1/7/0, 1/7/1, 1/7/2, 1/7/3, 2/5/0, 2/5/1, ...
2010-12-02 19:15:14 UTC  Minor  Check CB 0 Fabric Chip 0 on Plane/FPC/PFE: 1/5/0,
 1/5/1, 1/5/2, 1/5/3, 1/7/0, 1/7/1, 1/7/2, 1/7/3, 2/5/0, 2/5/1, ...
2010-12-02 19:14:18 UTC  Major  PSU 1 Output Failure
2010-12-02 19:14:18 UTC  Minor  Loss of communication with Backup RE
```

show chassis alarms (Alarms Active on a PTX5000 Packet Transport Router)

```
user@host> show chassis alarms

23 alarms currently active
Alarm time               Class  Description
2011-07-12 16:22:05 PDT  Minor  No Redundant Power for Rear Chassis
2011-07-12 16:22:05 PDT  Major  PDU 0 PSM 1 Not OK
2011-07-12 16:21:57 PDT  Minor  No Redundant Power for Fan 0-2
2011-07-12 16:21:57 PDT  Major  PDU 0 PSM 0 Not OK
2011-07-12 15:56:06 PDT  Major  PDU 1 PSM 2 Not OK
2011-07-12 15:56:06 PDT  Minor  No Redundant Power for FPC 0-7
2011-07-12 15:56:06 PDT  Major  PDU 0 PSM 3 Not OK
2011-07-12 15:28:20 PDT  Major  PDU 0 PSM 2 Not OK
2011-07-12 15:19:14 PDT  Minor  Backup RE Active
```

show chassis alarms (Mix of PDUs Alarm on a PTX5000 Packet Transport Router with FPC2-PTX-P1A)

All PDUs installed on a PTX5000 router must be of the same type. The **Mix of PDUs** or **Power Manager Non Operational** alarm is raised when different types of PDUs are installed on a PTX5000 router.

```
user@host> show chassis alarms
15 alarms currently active
Alarm time               Class  Description
2013-03-19 23:03:53 PDT  Minor  No Redundant Power
2013-03-19 23:03:48 PDT  Minor  Mix of PDUs
2013-03-19 23:03:47 PDT  Minor  PDU 1 PSM 3 Absent
2013-03-19 23:03:47 PDT  Minor  PDU 1 PSM 2 Absent
2013-03-19 23:03:47 PDT  Minor  PDU 1 PSM 1 Absent
2013-03-19 23:03:47 PDT  Minor  PDU 1 PSM 0 Absent
2013-03-19 23:03:46 PDT  Major  No CG Online
```

show chassis alarms (PDU Converter Failed Alarm on a PTX5000 Packet Transport Router with FPC2-PTX-P1A)

The **PDU Converter Failed** alarm is raised when one or more 36 V booster converter of a DC PDU fails. If two or more 36 V booster converter fails, fan trays fail and the router might get over heated. Therefore, when this alarm is raised, check the PDU and replace it, if required.

```
user@host> show chassis alarms
11 alarms currently active
Alarm time               Class  Description
2013-12-11 22:14:13 PST  Minor  No Redundant Power for System
2013-12-11 22:14:10 PST  Major  PDU 0 PSM 7 Not OK
2013-12-11 22:14:10 PST  Major  PDU 0 PSM 6 Not OK
2013-12-11 22:14:10 PST  Major  PDU 0 PSM 5 Not OK
2013-12-11 22:14:10 PST  Major  PDU 0 PSM 4 Not OK
2013-12-11 22:14:10 PST  Major  PDU 0 PSM 3 Not OK
2013-12-11 22:14:10 PST  Major  PDU 0 PSM 2 Not OK
```


Copyright © 2016, Juniper Networks, Inc.

```
2013-12-11 22:14:10 PST  Major  PDU 0 PSM 1 Not OK
2013-12-11 22:14:10 PST  Major  PDU 0 PSM 0 Not OK
2013-12-11 22:14:10 PST  Major  PDU 0 Not OK
2013-12-11 22:14:01 PST  Major  PDU 0 Converter Failed
```

show chassis alarms (No Power for System Alarm on a PTX5000 Packet Transport Router with FPC2-PTX-P1A)

```
user@host> show chassis alarms
8 alarms currently active
Alarm time               Class  Description
2013-11-19 01:58:41 PST  Major  No Power for System
2013-11-19 01:58:37 PST  Major  PDU 0 PSM 1 Not OK
2013-11-19 01:56:46 PST  Major  PDU 0 PSM 2 Not OK
2013-11-19 01:54:26 PST  Major  PDU 0 PSM 3 Not OK
2013-11-19 01:53:30 PST  Major  PDU 1 PSM 3 Not OK
2013-11-19 01:53:29 PST  Major  PDU 1 PSM 2 Not OK
2013-11-19 01:53:29 PST  Major  PDU 1 PSM 1 Not OK
2013-11-19 01:53:29 PST  Major  PDU 1 PSM 0 Not OK
```

show chassis alarms (Alarms Active on an ACX2000 Universal Access Router)

```
user@host> show chassis alarms
7 alarms currently active
Alarm time               Class  Description
2012-05-22 11:19:09 UTC  Major  xe-0/3/1: Link down
2012-05-22 11:19:09 UTC  Major  xe-0/3/0: Link down
2012-05-22 11:19:09 UTC  Major  ge-0/1/7: Link down
2012-05-22 11:19:09 UTC  Major  ge-0/1/6: Link down
2012-05-22 11:19:09 UTC  Major  ge-0/1/3: Link down
2012-05-22 11:19:09 UTC  Major  ge-0/1/2: Link down
2012-05-22 11:19:09 UTC  Major  ge-0/1/1: Link down
```

show chassis alarms (Active Alarm to Indicate Status of the Bad SCB Clock on MX Series)

```
user@host> show chassis alarms
1 alarm currently active
Alarm time               Class  Description
2013-08-06 07:48:35 PDT  Major  CB 0 19.44 MHz clock failure
```

show chassis alarms (Active Alarms on PTX5000, MX240, MX480, MX960, MX2010, and MX2020 Routers with Smart Disk Error)

```
user@host> show chassis alarms
4 alarms currently active
Alarm time               Class  Description
2016-01-11 16:02:10 UTC  MINOR  Host 0 disk drive 2 smart error
2016-01-11 16:02:10 UTC  MINOR  Host 0 disk drive 1 smart error
2016-01-11 16:02:05 UTC  MINOR  Host 1 disk drive 2 smart error
2016-01-11 16:02:05 UTC  MINOR  Host 1 disk drive 1 smart error
```

show chassis beacon

show chassis beacon (QFX Series)

show chassis beacon
<cb *slot-number*>
<fpc *slot-number*>
<interconnect-device *name* (cb *slot-number* | fpc *slot-number*)>
<node-device *name*>

Release Information

Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display the beacon LED status on a QFX3500, QFX3600, QFX5100, EX4600, OCX Series standalone switch, Node device, and an Interconnect device. You can also display the beacon LED status of the Control Boards and Flexible PIC Concentrators on the Interconnect device.

Options

cb *slot-number*— (QFabric systems only) (Optional) Display the status of the beacon LEDs for the Control Board on the Interconnect device.

fpc *slot-number* — (QFabric systems only) (Optional) Display the status of the beacon LEDs for the Flexible PIC Concentrator (FPC) on the Interconnect device. (Optional) Display the status of the beacon LEDs for the Flexible PIC Concentrator on the standalone switch.

interconnect-device *name*— (QFabric systems only) (Optional) Display the status of the beacon LEDs for the Interconnect device.

node-device *name*— (QFabric systems only) (Optional) Display the status of the beacon LEDs for the Node device.

Required Privilege Level

view

Related Documentation

- request chassis beacon on page 343

List of Sample Output

show chassis beacon (QFX Series and OCX Series) on page 485
show chassis beacon interconnect-device (QFabric System) on page 485
show chassis beacon interconnect-device fpc (QFabric System) on page 485
show chassis beacon node-device (QFabric System) on page 485
show chassis beacon node-device fpc (QFabric System) on page 485

Output Fields

Table 28 on page 484 lists the output fields for the **show chassis beacon** command. Output fields are listed in the approximate order in which they appear.

Table 28: show chassis led Output Fields

Field Name	Field Description
Slot	FPC slot number of the device whose content is being displayed. On QFX3500 standalone switches, the number is always **0**.

Copyright © 2016, Juniper Networks, Inc.

Table 28: show chassis led Output Fields *(continued)*

Field Name	Field Description
Beacon State	Status of the beacon state: • Off—The beacon is **OFF**. • On—The beacon is **ON**.

Sample Output

show chassis beacon (QFX Series and OCX Series)

```
user@switch> show chassis beacon
Slot            Beacon State
   FPC     0          OFF
```

show chassis beacon interconnect-device (QFabric System)

```
user@switch> show chassis beacon interconnect-device interconnect1
Chassis              OFF
CB 0                 OFF
CB 1                 OFF
FC 0 FPC 0           OFF
FC 1 FPC 1           OFF
RC 0 FPC 8           OFF
RC 1 FPC 9           OFF
```

show chassis beacon interconnect-device fpc (QFabric System)

```
user@switch> show chassis beacon interconnect-device interconnect1 fpc 0
FPC 0                ON
```

show chassis beacon node-device (QFabric System)

```
user@switch> show chassis beacon node-device node1
node1               ON
```

show chassis beacon node-device fpc (QFabric System)

```
user@switch> show chassis beacon node-device node1 fpc 0
FPC 0               ON
```

show chassis environment

List of Syntax

Syntax on page 486
Syntax (T320, T640, T1600, and T4000 Routers) on page 486
Syntax (TX Matrix Routers) on page 486
Syntax (TX Matrix Plus Routers) on page 486
Syntax (MX Series Routers) on page 486
Syntax (MX104 3D Universal Edge Routers) on page 486
Syntax (MX2010 and MX2020 3D Universal Edge Routers) on page 487
Syntax (EX8200 Switches) on page 487
Syntax (EX Series Switches except EX8200) on page 487
Syntax (QFX Series) on page 487
Syntax (OCX Series) on page 487
Syntax (PTX Series Packet Transport Routers) on page 487
Syntax (ACX Series Universal Access Routers) on page 488

Syntax

show chassis environment

Syntax (T320, T640, T1600, and T4000 Routers)

show chassis environment
<cb *cb-slot-number*>
<fpc *fpc-slot-number*>
<fpm>
<pem *pem-slot-number*>
<routing-engine *re-slot-number*>
<scg *scg-slot-number*>
<sib *sib-slot-number*>

Syntax (TX Matrix Routers)

show chassis environment
<lcc *number* | scc>

Syntax (TX Matrix Plus Routers)

show chassis environment
<cb *cb-slot-number*>
<cip *cip-slot-number*>
<fpc *fpc-slot-number*>
<fpm>
<lcc *number*>
<pem *pem-slot-number*>
<routing-engine *re-slot-number*>
<scg *scg-slot-number*>
< sfc *number*>
<sib *sib-slot-number*>

Syntax (MX Series Routers)

show chassis environment
<all-members>
<local>
<member *member-id*>

Syntax (MX104 3D Universal Edge Routers)

show chassis environment
<cb>
<pem *pem-slot-number*>
<routing-engine *re-slot-number*>

Copyright © 2016, Juniper Networks, Inc.

Syntax (MX2010 and MX2020 3D Universal Edge Routers)

```
show chassis environment
<adc adc-slot-number>
<all-members>
<cb cb-slot-number>
<fan fantray-slot-number>
<fpc fpc-slot-number>
<fpm>
<local>
<member member-id>
<monitored>
<psm psm-slot-number>
<routing-engine re-slot-number>
<sfb sfb-slot-number>
<satellite [slot-id slot-id |device-alias alias-name]>
```

Syntax (EX8200 Switches)

```
show chassis environment
<all-members>
<cb cb-slot-number>
<fpc fpc-slot-number>
<local>
<member member-id>
<psu psu-slot-number>
<routing-engine re-slot-number>
```

Syntax (EX Series Switches except EX8200)

```
show chassis environment
<all-members>
<fpc fpc-slot-number>
<local>
<member member-id>
<power-supply-unit>
<routing-engine>
<satellite [slot-id slot-id |device-alias alias-name]>
```

Syntax (QFX Series)

```
show chassis environment
<cb slot-number <interconnect-device name>>
<fpc slot-number <interconnect-device name>>
<interconnect-device name <slot-number>
<node-device name>
<pem slot-number (interconnect-device name slot-number) | (node-device name)>
<routing-engine name <interconnect-device name slot-number>>
```

Syntax (OCX Series)

```
show chassis environment
```

Syntax (PTX Series Packet Transport Routers)

```
show chassis environment
<cb cb-slot-number>
<ccg ccg-slot-number >
<fpc fpc-slot-number>
<fpm>
<monitored>
<pdu pdu-slot-number>
<routing-engine re-slot-number>
<sib sib-slot-number>
```

Syntax (ACX Series Universal Access Routers)

show chassis environment
<cb *cb-slot-number*>
<pem *pem-slot-number*>
<routing-engine *re-slot-number*>

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.
all-members, **local**, and **member** ***member-id*** options introduced in Junos OS Release 15.1 for MX2020 and MX2010 routers.
satellite option introduced in Junos OS Release 14.2R3.

Description

Display environmental information about the router or switch chassis, including the temperature and information about the fans, power supplies, and Routing Engine.

In addition, on ACX4000 routers, display temperature information about the different channels of a Modular Interface Card (MIC). The number of channels displayed depends on the type of MIC installed.

Starting with Junos OS Release 14.1, the **show chassis environment cb** ***cb-slot-number*** **| ccg** ***ccg-slot-number*** **| fpc** ***fpc-slot-number*** **| fpm | monitored | pdu** ***pdu-slot-number*** **| routing-engine** ***re-slot-number*** **| sib** ***sib-slot-number*** operational mode command output displays environmental information for the new DC power supply module (PSM) and power distribution unit (PDU) that are added to provide power to the high-density FPC (FPC2-PTX-P1A) and other components in a PTX5000 Packet Transport Router.

Options

none—Display 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**.

Copyright © 2016, Juniper Networks, Inc.

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**.

fan ***fantray-slot-number***—(MX2020 and MX2010 routers only) (Optional) Display chassis environmental information for the fan trays. Replace ***fantray-slot-number*** with a value from **0** through **3**.

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.

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 only) (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* with a value of **0** or **1**. For EX Series switches, see *member* for member ID values.

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.

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.

 Copyright © 2016, Juniper Networks, Inc.

satellite [slot-id *slot-id* | device-alias *alias-name*]—(Junos Fusion only)(Optional) Display chassis environmental information for the specified satellite device in a Junos Fusion, or for all satellite devices in the Junos Fusion if no satellite devices are specified.

scg—(T Series routers only) (Optional) Display chassis environmental information about the SONET Clock Generator.

scc—(TX Matrix routers only) (Optional) Display chassis environmental information about the TX Matrix router (switch-card chassis).

sfb *sfb-slot-number*—(MX2020 and MX2010 routers only) (Optional) Display chassis environmental information for the power supply module. Replace ***sfb-slot-number*** with a value from **0** through **7**.

sfc *number*—(TX Matrix Plus routers only) (Optional) Display chassis environmental information about the respective TX Matrix Plus router (switch-fabric chassis). Replace ***number*** variable with **0**.

sib *sib-slot-number*—(M320 routers, PTX Series Packet Transport Routers, and T Series routers only) (Optional) Display chassis environmental information about the specified switch interface board. For information about the options, see *show chassis environment sib*.

Required Privilege Level

view

Related Documentation

- *show chassis environment adc*
- *show chassis environment cb*
- *show chassis environment ccg*
- *show chassis environment cip*
- show chassis environment fpc on page 550
- *show chassis environment fpm*
- *show chassis environment lcc*
- *show chassis environment mcs*
- *show chassis environment monitored*
- *show chassis environment pcg*
- *show chassis environment pdu*
- show chassis environment pem on page 577
- *show chassis environment psm*
- *show chassis environment psu*
- show chassis environment routing-engine on page 586
- *show chassis environment scg*

- *show chassis environment sfb*
- *show chassis environment sib*
- *show chassis environment sfc*

List of Sample Output

show chassis environment (M5 Router) on page 494
show chassis environment (M7i Router) on page 494
show chassis environment (M10 Router) on page 495
show chassis environment (M10i Router) on page 495
show chassis environment (M20 Router) on page 495
show chassis environment (M40 Router) on page 496
show chassis environment (M40e Router) on page 496
show chassis environment (M120 Router) on page 497
show chassis environment (M160 Router) on page 498
show chassis environment (M320 Router) on page 498
show chassis environment (MX104 Router) on page 499
show chassis environment (MX240 Router) on page 499
show chassis environment (MX240 Router with SCBE) on page 500
show chassis environment (MX480 Router) on page 501
show chassis environment (MX480 Router with SCBE) on page 502
show chassis environment (MX960 Router) on page 503
show chassis environment (MX960 Router with SCBE) on page 504
show chassis environment (MX960 Router with MPC5EQ) on page 506
show chassis environment (MX2020 Router) on page 511
show chassis environment (MX2020 Router with MPC5EQ and MPC6E) on page 520
show chassis environment (MX2010 Router) on page 524
show chassis environment (T320 Router) on page 529
show chassis environment (T640 Router) on page 530
show chassis environment (T4000 Router) on page 531
show chassis environment (TX Matrix Router) on page 532
show chassis environment (T1600 Router) on page 534
show chassis environment (TX Matrix Plus Router) on page 535
show chassis environment (TX Matrix Plus router with 3D SIBs) on page 537
show chassis environment (EX4200 Standalone Switch) on page 540
show chassis environment (EX8216 Switch) on page 540
show chassis environment (EX9200 Switch) on page 541
show chassis environment (QFX Series and OCX Series) on page 542
show chassis environment interconnect-device (QFabric System) on page 542
show chassis environment node-device (QFabric System) on page 544
show chassis environment pem node-device (QFabric System) on page 544
show chassis environment (PTX5000 Packet Transport Router) on page 544
show chassis environment (PTX5000 Packet Transport Router with FPC2-PTX-P1A) on page 547
show chassis environment (PTX1000 Packet Transport Router) on page 547
show chassis environment (ACX2000 Universal Access Router) on page 548
show chassis environment (ACX4000 Universal Access Router) on page 548

Output Fields

Table 29 on page 493 lists the output fields for the **show chassis environment** command. Output fields are listed in the approximate order in which they appear.

Copyright © 2016, Juniper Networks, Inc.

Table 29: show chassis environment Output Fields

Field Name	Field Description

Class	Information about the category or class of chassis component:
	• **Power**: Power information:
	  ◦ (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.
	  ◦ EX2200 switches have a side-to-rear cooling system. The **Local Intake** temperature is measured by the sensor on the right side of the chassis, and the **Remote Intake** temperature is measured by the sensor on the left side of the chassis.
	• **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.
	  ◦ 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	(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). (MX104 Routers) Information about the chassis components: Routing Engines, Control Board (CB), Power Entry Module (PEM), and Compact Forwarding Engine Board (AFEB). (QFabric Systems) Information about the chassis component: Control Boards, Routing Engines, Flexible PIC Concentrators (FPCs), and Power Entry Modules (PEMs), Node Devices, and Interconnect Devices. (QFX Series) Information about the chassis component: Flexible PIC Concentrators (FPCs), and Power Entry Modules (PEMs).

Table 29: show chassis environment Output Fields *(continued)*

Field Name	Field Description
Status	(MX104, MX2010, and MX2020 Routers) Status of the specified chassis component. For example, if the Class is Fan, the fan status can be: • **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. If the Class is Power, the power supply status can be: • **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	(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.

Sample Output

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
```


Copyright © 2016, Juniper Networks, Inc.

```
      Fan 3                  OK         Spinning at normal speed
      Fan 4                  OK         Spinning at normal speed
```

show chassis environment (M10 Router)

```
user@host> show chassis environment
Class Item                   Status     Measurement
Power Power Supply A         OK
      Power Supply B         Failed
Temp  FPC 0                  OK         36 degrees C / 96 degrees F
      FPC 1                  OK         35 degrees C / 95 degrees F
      FEB                    OK         34 degrees C / 93 degrees F
      PS Intake              OK         31 degrees C / 87 degrees F
      PS Exhaust             OK         34 degrees C / 93 degrees F
      Routing Engine         OK         35 degrees C / 95 degrees F
Fans  Left Fan 1             OK         Spinning at normal speed
      Left Fan 2             OK         Spinning at normal speed
      Left Fan 3             OK         Spinning at normal speed
      Left Fan 4             OK         Spinning at normal speed
Misc  Craft Interface        OK
```

show chassis environment (M10i Router)

```
user@host> show chassis environment
Class Item                   Status     Measurement
Power Power Supply 0         OK
      Power Supply 1         OK
      Power Supply 2         Absent
      Power Supply 3         Absent
Temp  Intake                 OK         26 degrees C / 78 degrees F
      FPC 0                  OK         27 degrees C / 80 degrees F
      FPC 1                  OK         28 degrees C / 82 degrees F
      Lower Power Supplies   OK         29 degrees C / 84 degrees F
      Upper Power Supplies   OK         28 degrees C / 82 degrees F
      CFEB Intake            OK         27 degrees C / 80 degrees F
      CFEB Exhaust           OK         36 degrees C / 96 degrees F
      Routing Engine 0       OK         31 degrees C / 87 degrees F
      Routing Engine 1       OK         27 degrees C / 80 degrees F
Fans  Fan Tray 0 Fan 1       OK         Spinning at normal speed
      Fan Tray 0 Fan 2       OK         Spinning at normal speed
      Fan Tray 0 Fan 3       OK         Spinning at normal speed
      Fan Tray 0 Fan 4       OK         Spinning at normal speed
      Fan Tray 0 Fan 5       OK         Spinning at normal speed
      Fan Tray 0 Fan 6       OK         Spinning at normal speed
      Fan Tray 0 Fan 7       OK         Spinning at normal speed
      Fan Tray 0 Fan 8       OK         Spinning at normal speed
      Fan Tray 1 Fan 1       Absent
      Fan Tray 1 Fan 2       Absent
      Fan Tray 1 Fan 3       Absent
      Fan Tray 1 Fan 4       Absent
      Fan Tray 1 Fan 5       Absent
      Fan Tray 1 Fan 6       Absent
      Fan Tray 1 Fan 7       Absent
      Fan Tray 1 Fan 8       Absent
```

show chassis environment (M20 Router)

```
user@host> show chassis environment
```

```
Class Item                  Status     Measurement
Power Power Supply A        OK
      Power Supply B        Absent
Temp  FPC 0                 OK         28 degrees C / 82 degrees F
      FPC 1                 OK         27 degrees C / 80 degrees F
      Power Supply A        OK         22 degrees C / 71 degrees F
      Power Supply B        Absent
      SSB 0                 OK         30 degrees C / 86 degrees F
      Backplane             OK         22 degrees C / 71 degrees F
      Routing Engine 0      OK         26 degrees C / 78 degrees F
      Routing Engine 1      Testing
Fans  Rear Fan              OK         Spinning at normal speed
      Front Upper Fan       OK         Spinning at normal speed
      Front Middle Fan      OK         Spinning at normal speed
      Front Bottom Fan      OK         Spinning at normal speed
Misc  Craft Interface       OK
```

show chassis environment (M40 Router)

```
user@host> show chassis environment
Class Item                  Status     Measurement
Power Power Supply A        OK
      Power Supply B        Absent
Temp  FPC 3                 OK         24 degrees C / 75 degrees F
      FPC 6                 OK         26 degrees C / 78 degrees F
      SCB                   OK         26 degrees C / 78 degrees F
      Backplane @ A1        OK         28 degrees C / 82 degrees F
      Backplane @ A2        OK         23 degrees C / 73 degrees F
      Routing Engine        OK         26 degrees C / 78 degrees F
Fans  Top Impeller          OK         Spinning at normal speed
      Bottom impeller       OK         Spinning at normal speed
      Rear Left Fan         OK         Spinning at normal speed
      Rear Center Fan       OK         Spinning at normal speed
      Rear Right Fan        OK         Spinning at normal speed
Misc  Craft Interface       OK
```

show chassis environment (M40e Router)

```
user@host> show chassis environment
Class Item                  Status     Measurement
Power PEM 0                 OK
      PEM 1                 Absent
Temp  PCG 0                 OK         44 degrees C / 111 degrees F
      PCG 1                 OK         47 degrees C / 116 degrees F
      Routing Engine 0      OK         40 degrees C / 104 degrees F
      Routing Engine 1      OK         37 degrees C / 98 degrees F
      MCS 0                 OK         45 degrees C / 113 degrees F
      MCS 1                 OK         42 degrees C / 107 degrees F
      SFM 0 SPP             OK         40 degrees C / 104 degrees F
      SFM 0 SPR             OK         44 degrees C / 111 degrees F
      SFM 1 SPP             OK         43 degrees C / 109 degrees F
      SFM 1 SPR             OK         45 degrees C / 113 degrees F
      FPC 0                 OK         38 degrees C / 100 degrees F
      FPC 1                 OK         40 degrees C / 104 degrees F
      FPC 2                 OK         38 degrees C / 100 degrees F
      FPC 4                 OK         34 degrees C / 93 degrees F
      FPC 5                 OK         43 degrees C / 109 degrees F
      FPC 6                 OK         41 degrees C / 105 degrees F
      FPC 7                 OK         43 degrees C / 109 degrees F
```


Copyright © 2016, Juniper Networks, Inc.

```
      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
```


Copyright © 2016, Juniper Networks, Inc.

```
      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 Router with SCBE)

```
user@host> show chassis environment
Class Item                           Status     Measurement
Temp  PEM 0                          OK         40 degrees C / 104 degrees F
      PEM 1                          OK         45 degrees C / 113 degrees F
      PEM 2                          Absent
      PEM 3                          Absent
      Routing Engine 0               OK         39 degrees C / 102 degrees F
      Routing Engine 1               OK         37 degrees C / 98 degrees F
      CB 0 Intake                    OK         36 degrees C / 96 degrees F
      CB 0 Exhaust A                 OK         34 degrees C / 93 degrees F
      CB 0 Exhaust B                 OK         38 degrees C / 100 degrees F
      CB 0 ACBC                      OK         37 degrees C / 98 degrees F
      CB 0 XF A                      OK         49 degrees C / 120 degrees F
```

 Copyright © 2016, Juniper Networks, Inc.

```
      CB 0 XF B                    OK         41 degrees C / 105 degrees F
      CB 1 Intake                  OK         37 degrees C / 98 degrees F
      CB 1 Exhaust A               OK         34 degrees C / 93 degrees F
      CB 1 Exhaust B               OK         39 degrees C / 102 degrees F
      CB 1 ACBC                    OK         38 degrees C / 100 degrees F
      CB 1 XF A                    OK         47 degrees C / 116 degrees F
      CB 1 XF B                    OK         41 degrees C / 105 degrees F
      FPC 1 Intake                 OK         33 degrees C / 91 degrees F
      FPC 1 Exhaust A              OK         38 degrees C / 100 degrees F
      FPC 1 Exhaust B              OK         53 degrees C / 127 degrees F
      FPC 1 I3 0 TSensor           OK         50 degrees C / 122 degrees F
      FPC 1 I3 0 Chip              OK         53 degrees C / 127 degrees F
      FPC 1 I3 1 TSensor           OK         49 degrees C / 120 degrees F
      FPC 1 I3 1 Chip              OK         52 degrees C / 125 degrees F
      FPC 1 I3 2 TSensor           OK         47 degrees C / 116 degrees F
      FPC 1 I3 2 Chip              OK         49 degrees C / 120 degrees F
      FPC 1 I3 3 TSensor           OK         44 degrees C / 111 degrees F
      FPC 1 I3 3 Chip              OK         46 degrees C / 114 degrees F
      FPC 1 IA 0 TSensor           OK         45 degrees C / 113 degrees F
      FPC 1 IA 0 Chip              OK         44 degrees C / 111 degrees F
      FPC 1 IA 1 TSensor           OK         44 degrees C / 111 degrees F
      FPC 1 IA 1 Chip              OK         48 degrees C / 118 degrees F
      FPC 2 Intake                 OK         32 degrees C / 89 degrees F
      FPC 2 Exhaust A              OK         40 degrees C / 104 degrees F
      FPC 2 Exhaust B              OK         52 degrees C / 125 degrees F
      FPC 2 I3 0 TSensor           OK         52 degrees C / 125 degrees F
      FPC 2 I3 0 Chip              OK         56 degrees C / 132 degrees F
      FPC 2 I3 1 TSensor           OK         52 degrees C / 125 degrees F
      FPC 2 I3 1 Chip              OK         55 degrees C / 131 degrees F
      FPC 2 I3 2 TSensor           OK         49 degrees C / 120 degrees F
      FPC 2 I3 2 Chip              OK         52 degrees C / 125 degrees F
      FPC 2 I3 3 TSensor           OK         44 degrees C / 111 degrees F
      FPC 2 I3 3 Chip              OK         48 degrees C / 118 degrees F
      FPC 2 IA 0 TSensor           OK         50 degrees C / 122 degrees F
      FPC 2 IA 0 Chip              OK         48 degrees C / 118 degrees F
      FPC 2 IA 1 TSensor           OK         47 degrees C / 116 degrees F
      FPC 2 IA 1 Chip              OK         53 degrees C / 127 degrees F
Fans  Front Fan                    OK         Spinning at normal speed
      Middle Fan                   OK         Spinning at normal speed
      Rear Fan                     OK         Spinning at normal speed
```

show chassis environment (MX480 Router)

```
user@host> show chassis environment
Class Item                         Status     Measurement
Temp  PEM 0                        OK         35 degrees C / 95 degrees F
      PEM 1                        OK         40 degrees C / 104 degrees F
      PEM 2                        Absent
      PEM 3                        Absent
      Routing Engine 0             OK         44 degrees C / 111 degrees F
      Routing Engine 1             OK         45 degrees C / 113 degrees F
      CB 0 Intake                  OK         36 degrees C / 96 degrees F
      CB 0 Exhaust A               OK         38 degrees C / 100 degrees F
      CB 0 Exhaust B               OK         39 degrees C / 102 degrees F
      CB 0 ACBC                    OK         37 degrees C / 98 degrees F
      CB 0 SF A                    OK         51 degrees C / 123 degrees F
      CB 0 SF B                    OK         44 degrees C / 111 degrees F
      CB 1 Intake                  OK         36 degrees C / 96 degrees F
      CB 1 Exhaust A               OK         39 degrees C / 102 degrees F
      CB 1 Exhaust B               OK         40 degrees C / 104 degrees F
      CB 1 ACBC                    OK         37 degrees C / 98 degrees F
```

```
      CB 1 SF A                    OK         50 degrees C / 122 degrees F
      CB 1 SF B                    OK         43 degrees C / 109 degrees F
      FPC 0 Intake                 OK         36 degrees C / 96 degrees F
      FPC 0 Exhaust A              OK         39 degrees C / 102 degrees F
      FPC 0 Exhaust B              OK         51 degrees C / 123 degrees F
      FPC 0 I3 0 TSensor           OK         49 degrees C / 120 degrees F
      FPC 0 I3 0 Chip              OK         56 degrees C / 132 degrees F
      FPC 0 I3 1 TSensor           OK         47 degrees C / 116 degrees F
      FPC 0 I3 1 Chip              OK         52 degrees C / 125 degrees F
      FPC 0 I3 2 TSensor           OK         46 degrees C / 114 degrees F
      FPC 0 I3 2 Chip              OK         48 degrees C / 118 degrees F
      FPC 0 I3 3 TSensor           OK         42 degrees C / 107 degrees F
      FPC 0 I3 3 Chip              OK         45 degrees C / 113 degrees F
      FPC 0 IA 0 TSensor           OK         45 degrees C / 113 degrees F
      FPC 0 IA 0 Chip              OK         45 degrees C / 113 degrees F
      FPC 0 IA 1 TSensor           OK         44 degrees C / 111 degrees F
      FPC 0 IA 1 Chip              OK         48 degrees C / 118 degrees F
      FPC 1 Intake                 OK         37 degrees C / 98 degrees F
      FPC 1 Exhaust A              OK         41 degrees C / 105 degrees F
      FPC 1 Exhaust B              OK         52 degrees C / 125 degrees F
      FPC 1 I3 0 TSensor           OK         51 degrees C / 123 degrees F
      FPC 1 I3 0 Chip              OK         57 degrees C / 134 degrees F
      FPC 1 I3 1 TSensor           OK         48 degrees C / 118 degrees F
      FPC 1 I3 1 Chip              OK         52 degrees C / 125 degrees F
      FPC 1 I3 2 TSensor           OK         46 degrees C / 114 degrees F
      FPC 1 I3 2 Chip              OK         50 degrees C / 122 degrees F
      FPC 1 I3 3 TSensor           OK         42 degrees C / 107 degrees F
      FPC 1 I3 3 Chip              OK         46 degrees C / 114 degrees F
      FPC 1 IA 0 TSensor           OK         49 degrees C / 120 degrees F
      FPC 1 IA 0 Chip              OK         48 degrees C / 118 degrees F
      FPC 1 IA 1 TSensor           OK         46 degrees C / 114 degrees F
      FPC 1 IA 1 Chip              OK         50 degrees C / 122 degrees F
Fans  Top Rear Fan                 OK         Spinning at normal speed
      Bottom Rear Fan              OK         Spinning at normal speed
      Top Middle Fan               OK         Spinning at normal speed
      Bottom Middle Fan            OK         Spinning at normal speed
      Top Front Fan                OK         Spinning at normal speed
      Bottom Front Fan             OK         Spinning at normal speed
```

show chassis environment (MX480 Router with SCBE)

```
user@host> show chassis environment
Class Item                         Status     Measurement
Temp  PEM 0                        OK         35 degrees C / 95 degrees F
      PEM 1                        OK         40 degrees C / 104 degrees F
      PEM 2                        Absent
      PEM 3                        Absent
      Routing Engine 0             OK         44 degrees C / 111 degrees F
      Routing Engine 1             OK         45 degrees C / 113 degrees F
      CB 0 Intake                  OK         36 degrees C / 96 degrees F
      CB 0 Exhaust A               OK         38 degrees C / 100 degrees F
      CB 0 Exhaust B               OK         39 degrees C / 102 degrees F
      CB 0 ACBC                    OK         37 degrees C / 98 degrees F
      CB 0 XF A                    OK         51 degrees C / 123 degrees F
      CB 0 XF B                    OK         44 degrees C / 111 degrees F
      CB 1 Intake                  OK         36 degrees C / 96 degrees F
      CB 1 Exhaust A               OK         39 degrees C / 102 degrees F
      CB 1 Exhaust B               OK         40 degrees C / 104 degrees F
      CB 1 ACBC                    OK         37 degrees C / 98 degrees F
      CB 1 XF A                    OK         50 degrees C / 122 degrees F
      CB 1 XF B                    OK         43 degrees C / 109 degrees F
```

 Copyright © 2016, Juniper Networks, Inc.

```
      FPC 0 Intake                  OK         36 degrees C / 96 degrees F
      FPC 0 Exhaust A               OK         39 degrees C / 102 degrees F
      FPC 0 Exhaust B               OK         51 degrees C / 123 degrees F
      FPC 0 I3 0 TSensor            OK         49 degrees C / 120 degrees F
      FPC 0 I3 0 Chip               OK         56 degrees C / 132 degrees F
      FPC 0 I3 1 TSensor            OK         47 degrees C / 116 degrees F
      FPC 0 I3 1 Chip               OK         52 degrees C / 125 degrees F
      FPC 0 I3 2 TSensor            OK         46 degrees C / 114 degrees F
      FPC 0 I3 2 Chip               OK         48 degrees C / 118 degrees F
      FPC 0 I3 3 TSensor            OK         42 degrees C / 107 degrees F
      FPC 0 I3 3 Chip               OK         45 degrees C / 113 degrees F
      FPC 0 IA 0 TSensor            OK         45 degrees C / 113 degrees F
      FPC 0 IA 0 Chip               OK         45 degrees C / 113 degrees F
      FPC 0 IA 1 TSensor            OK         44 degrees C / 111 degrees F
      FPC 0 IA 1 Chip               OK         48 degrees C / 118 degrees F
      FPC 1 Intake                  OK         37 degrees C / 98 degrees F
      FPC 1 Exhaust A               OK         41 degrees C / 105 degrees F
      FPC 1 Exhaust B               OK         52 degrees C / 125 degrees F
      FPC 1 I3 0 TSensor            OK         51 degrees C / 123 degrees F
      FPC 1 I3 0 Chip               OK         57 degrees C / 134 degrees F
      FPC 1 I3 1 TSensor            OK         48 degrees C / 118 degrees F
      FPC 1 I3 1 Chip               OK         52 degrees C / 125 degrees F
      FPC 1 I3 2 TSensor            OK         46 degrees C / 114 degrees F
      FPC 1 I3 2 Chip               OK         50 degrees C / 122 degrees F
      FPC 1 I3 3 TSensor            OK         42 degrees C / 107 degrees F
      FPC 1 I3 3 Chip               OK         46 degrees C / 114 degrees F
      FPC 1 IA 0 TSensor            OK         49 degrees C / 120 degrees F
      FPC 1 IA 0 Chip               OK         48 degrees C / 118 degrees F
      FPC 1 IA 1 TSensor            OK         46 degrees C / 114 degrees F
      FPC 1 IA 1 Chip               OK         50 degrees C / 122 degrees F
Fans  Top Rear Fan                  OK         Spinning at normal speed
      Bottom Rear Fan               OK         Spinning at normal speed
      Top Middle Fan                OK         Spinning at normal speed
      Bottom Middle Fan             OK         Spinning at normal speed
      Top Front Fan                 OK         Spinning at normal speed
      Bottom Front Fan              OK         Spinning at normal speed
```

show chassis environment (MX960 Router)

```
user@host> show chassis environment
Class Item                          Status     Measurement
Temp  PEM 0                         Absent
      PEM 1                         Absent
      PEM 2                         Check
      PEM 3                         OK         35 degrees C / 95 degrees F
      Routing Engine 0              OK         37 degrees C / 98 degrees F
      Routing Engine 1              Absent
      CB 0 Intake                   OK         24 degrees C / 75 degrees F
      CB 0 Exhaust A                OK         30 degrees C / 86 degrees F
      CB 0 Exhaust B                OK         27 degrees C / 80 degrees F
      CB 1 Intake                   Absent
      CB 1 Exhaust A                Absent
      CB 1 Exhaust B                Absent
      CB 1 ACBC                     Absent
      CB 1 SF A                     Absent
      CB 1 SF B                     Absent
      CB 2 Intake                   Absent
      CB 2 Exhaust A                Absent
      CB 2 Exhaust B                Absent
      CB 2 ACBC                     Absent
      CB 2 SF A                     Absent
```

```
      CB 2 SF B                     Absent
      FPC 4 Intake                  OK         24 degrees C / 75 degrees F
      FPC 4 Exhaust A               OK         36 degrees C / 96 degrees F
      FPC 4 Exhaust B               OK         38 degrees C / 100 degrees F
      FPC 7 Intake                  OK         24 degrees C / 75 degrees F
      FPC 7 Exhaust A               OK         36 degrees C / 96 degrees F
      FPC 7 Exhaust B               OK         42 degrees C / 107 degrees F
Fans  Top Fan Tray Temp             Failed
      Top Tray Fan 1                OK         Spinning at normal speed
      Top Tray Fan 2                OK         Spinning at normal speed
      Top Tray Fan 3                OK         Spinning at normal speed
      Top Tray Fan 4                OK         Spinning at normal speed
      Top Tray Fan 5                OK         Spinning at normal speed
      Top Tray Fan 6                OK         Spinning at normal speed
      Bottom Fan Tray Temp          Failed
      Bottom Tray Fan 1             OK         Spinning at normal speed
      Bottom Tray Fan 2             OK         Spinning at normal speed
      Bottom Tray Fan 3             OK         Spinning at normal speed
      Bottom Tray Fan 4             OK         Spinning at normal speed
      Bottom Tray Fan 5             OK         Spinning at normal speed
      Bottom Tray Fan 6             OK         Spinning at normal speed
```

show chassis environment (MX960 Router with SCBE)

```
user@host> show chassis environment
Class Item                          Status     Measurement
Temp  PEM 0                         Absent
      PEM 1                         OK         50 degrees C / 122 degrees F
      PEM 2                         OK         50 degrees C / 122 degrees F
      PEM 3                         OK         50 degrees C / 122 degrees F
      Routing Engine 0              OK         42 degrees C / 107 degrees F
      Routing Engine 0 CPU          OK         51 degrees C / 123 degrees F
      Routing Engine 1              OK         39 degrees C / 102 degrees F
      Routing Engine 1 CPU          OK         44 degrees C / 111 degrees F
      CB 0 Intake                   OK         35 degrees C / 95 degrees F
      CB 0 Exhaust A                OK         36 degrees C / 96 degrees F
      CB 0 Exhaust B                OK         43 degrees C / 109 degrees F
      CB 0 ACBC                     OK         38 degrees C / 100 degrees F
      CB 0 XF A                     OK         53 degrees C / 127 degrees F
      CB 0 XF B                     OK         47 degrees C / 116 degrees F
      CB 1 Intake                   OK         35 degrees C / 95 degrees F
      CB 1 Exhaust A                OK         35 degrees C / 95 degrees F
      CB 1 Exhaust B                OK         41 degrees C / 105 degrees F
      CB 1 ACBC                     OK         38 degrees C / 100 degrees F
      CB 1 XF A                     OK         52 degrees C / 125 degrees F
      CB 1 XF B                     OK         47 degrees C / 116 degrees F
      CB 2 Intake                   OK         32 degrees C / 89 degrees F
      CB 2 Exhaust A                OK         30 degrees C / 86 degrees F
      CB 2 Exhaust B                OK         35 degrees C / 95 degrees F
      CB 2 ACBC                     OK         33 degrees C / 91 degrees F
      CB 2 XF A                     OK         51 degrees C / 123 degrees F
      CB 2 XF B                     OK         50 degrees C / 122 degrees F
      FPC 0 Intake                  OK         35 degrees C / 95 degrees F
      FPC 0 Exhaust A               OK         39 degrees C / 102 degrees F
      FPC 0 Exhaust B               OK         50 degrees C / 122 degrees F
      FPC 0 I3 0 TSensor            OK         50 degrees C / 122 degrees F
      FPC 0 I3 0 Chip               OK         56 degrees C / 132 degrees F
      FPC 0 I3 1 TSensor            OK         47 degrees C / 116 degrees F
      FPC 0 I3 1 Chip               OK         50 degrees C / 122 degrees F
      FPC 0 I3 2 TSensor            OK         45 degrees C / 113 degrees F
      FPC 0 I3 2 Chip               OK         48 degrees C / 118 degrees F
```


Copyright © 2016, Juniper Networks, Inc.

```
FPC 0 I3 3 TSensor            OK        41 degrees C / 105 degrees F
FPC 0 I3 3 Chip               OK        44 degrees C / 111 degrees F
FPC 0 IA 0 TSensor            OK        45 degrees C / 113 degrees F
FPC 0 IA 0 Chip               OK        45 degrees C / 113 degrees F
FPC 0 IA 1 TSensor            OK        44 degrees C / 111 degrees F
FPC 0 IA 1 Chip               OK        48 degrees C / 118 degrees F
FPC 1 Intake                  OK        36 degrees C / 96 degrees F
FPC 1 Exhaust A               OK        47 degrees C / 116 degrees F
FPC 1 Exhaust B               OK        43 degrees C / 109 degrees F
FPC 1 LU 0 TCAM TSensor       OK        53 degrees C / 127 degrees F
FPC 1 LU 0 TCAM Chip          OK        57 degrees C / 134 degrees F
FPC 1 LU 0 TSensor            OK        53 degrees C / 127 degrees F
FPC 1 LU 0 Chip               OK        60 degrees C / 140 degrees F
FPC 1 MQ 0 TSensor            OK        53 degrees C / 127 degrees F
FPC 1 MQ 0 Chip               OK        56 degrees C / 132 degrees F
FPC 1 LU 1 TCAM TSensor       OK        51 degrees C / 123 degrees F
FPC 1 LU 1 TCAM Chip          OK        52 degrees C / 125 degrees F
FPC 1 LU 1 TSensor            OK        51 degrees C / 123 degrees F
FPC 1 LU 1 Chip               OK        53 degrees C / 127 degrees F
FPC 1 MQ 1 TSensor            OK        51 degrees C / 123 degrees F
FPC 1 MQ 1 Chip               OK        58 degrees C / 136 degrees F
FPC 2 Intake                  OK        35 degrees C / 95 degrees F
FPC 2 Exhaust A               OK        39 degrees C / 102 degrees F
FPC 2 Exhaust B               OK        54 degrees C / 129 degrees F
FPC 2 I3 0 TSensor            OK        52 degrees C / 125 degrees F
FPC 2 I3 0 Chip               OK        59 degrees C / 138 degrees F
FPC 2 I3 1 TSensor            OK        48 degrees C / 118 degrees F
FPC 2 I3 1 Chip               OK        52 degrees C / 125 degrees F
FPC 2 I3 2 TSensor            OK        47 degrees C / 116 degrees F
FPC 2 I3 2 Chip               OK        49 degrees C / 120 degrees F
FPC 2 I3 3 TSensor            OK        41 degrees C / 105 degrees F
FPC 2 I3 3 Chip               OK        44 degrees C / 111 degrees F
FPC 2 IA 0 TSensor            OK        47 degrees C / 116 degrees F
FPC 2 IA 0 Chip               OK        46 degrees C / 114 degrees F
FPC 2 IA 1 TSensor            OK        45 degrees C / 113 degrees F
FPC 2 IA 1 Chip               OK        49 degrees C / 120 degrees F
FPC 3 Intake                  OK        34 degrees C / 93 degrees F
FPC 3 Exhaust A               OK        34 degrees C / 93 degrees F
FPC 3 Exhaust B               OK        47 degrees C / 116 degrees F
FPC 3 I3 0 TSensor            OK        48 degrees C / 118 degrees F
FPC 3 I3 0 Chip               OK        52 degrees C / 125 degrees F
FPC 3 I3 1 TSensor            OK        46 degrees C / 114 degrees F
FPC 3 I3 1 Chip               OK        48 degrees C / 118 degrees F
FPC 3 IA 0 TSensor            OK        41 degrees C / 105 degrees F
FPC 3 IA 0 Chip               OK        40 degrees C / 104 degrees F
FPC 5 Intake                  OK        42 degrees C / 107 degrees F
FPC 5 Exhaust A               OK        42 degrees C / 107 degrees F
FPC 5 Exhaust B               OK        53 degrees C / 127 degrees F
FPC 5 LU 0 TSensor            OK        53 degrees C / 127 degrees F
FPC 5 LU 0 Chip               OK        54 degrees C / 129 degrees F
FPC 5 LU 1 TSensor            OK        53 degrees C / 127 degrees F
FPC 5 LU 1 Chip               OK        61 degrees C / 141 degrees F
FPC 5 LU 2 TSensor            OK        53 degrees C / 127 degrees F
FPC 5 LU 2 Chip               OK        51 degrees C / 123 degrees F
FPC 5 LU 3 TSensor            OK        53 degrees C / 127 degrees F
FPC 5 LU 3 Chip               OK        53 degrees C / 127 degrees F
FPC 5 MQ 0 TSensor            OK        47 degrees C / 116 degrees F
FPC 5 MQ 0 Chip               OK        52 degrees C / 125 degrees F
FPC 5 MQ 1 TSensor            OK        47 degrees C / 116 degrees F
FPC 5 MQ 1 Chip               OK        52 degrees C / 125 degrees F
FPC 5 MQ 2 TSensor            OK        47 degrees C / 116 degrees F
```

```
      FPC 5 MQ 2 Chip                OK         46 degrees C / 114 degrees F
      FPC 5 MQ 3 TSensor             OK         47 degrees C / 116 degrees F
      FPC 5 MQ 3 Chip                OK         45 degrees C / 113 degrees F
      FPC 7 Intake                   OK         36 degrees C / 96 degrees F
      FPC 7 Exhaust A                OK         35 degrees C / 95 degrees F
      FPC 7 Exhaust B                OK         33 degrees C / 91 degrees F
      FPC 7 QX 0 TSensor             OK         42 degrees C / 107 degrees F
      FPC 7 QX 0 Chip                OK         47 degrees C / 116 degrees F
      FPC 7 LU 0 TCAM TSensor        OK         42 degrees C / 107 degrees F
      FPC 7 LU 0 TCAM Chip           OK         44 degrees C / 111 degrees F
      FPC 7 LU 0 TSensor             OK         42 degrees C / 107 degrees F
      FPC 7 LU 0 Chip                OK         46 degrees C / 114 degrees F
      FPC 7 MQ 0 TSensor             OK         42 degrees C / 107 degrees F
      FPC 7 MQ 0 Chip                OK         45 degrees C / 113 degrees F
      FPC 8 Intake                   OK         33 degrees C / 91 degrees F
      FPC 8 Exhaust A                OK         33 degrees C / 91 degrees F
      FPC 8 Exhaust B                OK         36 degrees C / 96 degrees F
      FPC 8 I3 0 TSensor             OK         38 degrees C / 100 degrees F
      FPC 8 I3 0 Chip                OK         43 degrees C / 109 degrees F
      FPC 8 BDS 0 TSensor            OK         37 degrees C / 98 degrees F
      FPC 8 BDS 0 Chip               OK         36 degrees C / 96 degrees F
      FPC 8 IA 0 TSensor             OK         37 degrees C / 98 degrees F
      FPC 8 IA 0 Chip                OK         37 degrees C / 98 degrees F
      FPC 10 Intake                  OK         38 degrees C / 100 degrees F
      FPC 10 Exhaust A               OK         36 degrees C / 96 degrees F
      FPC 10 Exhaust B               OK         41 degrees C / 105 degrees F
      FPC 10 I3 0 TSensor            OK         40 degrees C / 104 degrees F
      FPC 10 I3 0 Chip               OK         42 degrees C / 107 degrees F
      FPC 10 I3 1 TSensor            OK         40 degrees C / 104 degrees F
      FPC 10 I3 1 Chip               OK         44 degrees C / 111 degrees F
      FPC 10 I3 2 TSensor            OK         42 degrees C / 107 degrees F
      FPC 10 I3 2 Chip               OK         43 degrees C / 109 degrees F
      FPC 10 I3 3 TSensor            OK         39 degrees C / 102 degrees F
      FPC 10 I3 3 Chip               OK         44 degrees C / 111 degrees F
      FPC 10 IA 0 TSensor            OK         36 degrees C / 96 degrees F
      FPC 10 IA 0 Chip               OK         36 degrees C / 96 degrees F
      FPC 10 IA 1 TSensor            OK         43 degrees C / 109 degrees F
      FPC 10 IA 1 Chip               OK         42 degrees C / 107 degrees F
Fans  Top Fan Tray Temp              OK         37 degrees C / 98 degrees F
      Top Tray Fan 1                 OK         Spinning at normal speed
      Top Tray Fan 2                 OK         Spinning at normal speed
      Top Tray Fan 3                 OK         Spinning at normal speed
      Top Tray Fan 4                 OK         Spinning at normal speed
      Top Tray Fan 5                 OK         Spinning at normal speed
      Top Tray Fan 6                 OK         Spinning at normal speed
      Bottom Fan Tray Temp           OK         28 degrees C / 82 degrees F
      Bottom Tray Fan 1              OK         Spinning at normal speed
      Bottom Tray Fan 2              OK         Spinning at normal speed
      Bottom Tray Fan 3              OK         Spinning at normal speed
      Bottom Tray Fan 4              OK         Spinning at normal speed
      Bottom Tray Fan 5              OK         Spinning at normal speed
      Bottom Tray Fan 6              OK         Spinning at normal speed
```

show chassis environment (MX960 Router with MPC5EQ)

```
user@host> show chassis environment
Class Item                           Status     Measurement
Temp  PEM 0                          OK         50 degrees C / 122 degrees F
      PEM 1                          OK         45 degrees C / 113 degrees F
      PEM 2                          OK         45 degrees C / 113 degrees F
      PEM 3                          Absent
```


Copyright © 2016, Juniper Networks, Inc.

```
     Routing Engine 0              OK         31 degrees C / 87 degrees F
     Routing Engine 0 CPU          OK         30 degrees C / 86 degrees F
     Routing Engine 1              Present
     Routing Engine 1 CPU          Present
     CB 0 Intake                   OK         29 degrees C / 84 degrees F
     CB 0 Exhaust A                OK         29 degrees C / 84 degrees F
     CB 0 Exhaust B                OK         34 degrees C / 93 degrees F
     CB 0 ACBC                     OK         32 degrees C / 89 degrees F
     CB 0 XF A                     OK         49 degrees C / 120 degrees F
     CB 0 XF B                     OK         45 degrees C / 113 degrees F
     CB 1 Intake                   OK         26 degrees C / 78 degrees F
     CB 1 Exhaust A                OK         26 degrees C / 78 degrees F
     CB 1 Exhaust B                OK         27 degrees C / 80 degrees F
     CB 1 ACBC                     OK         26 degrees C / 78 degrees F
     CB 1 XF A                     OK         32 degrees C / 89 degrees F
     CB 1 XF B                     OK         32 degrees C / 89 degrees F
     CB 2 Intake                   OK         28 degrees C / 82 degrees F
     CB 2 Exhaust A                OK         27 degrees C / 80 degrees F
     CB 2 Exhaust B                OK         33 degrees C / 91 degrees F
     CB 2 ACBC                     OK         30 degrees C / 86 degrees F
     CB 2 XF A                     OK         48 degrees C / 118 degrees F
     CB 2 XF B                     OK         46 degrees C / 114 degrees F
     FPC 0 Intake                  OK         38 degrees C / 100 degrees F
     FPC 0 Exhaust A               OK         48 degrees C / 118 degrees F
     FPC 0 Exhaust B               OK         49 degrees C / 120 degrees F
     FPC 0 XL TSen                 OK         48 degrees C / 118 degrees F
     FPC 0 XL Chip                 OK         50 degrees C / 122 degrees F
     FPC 0 XL_XR0 TSen             OK         48 degrees C / 118 degrees F
     FPC 0 XL_XR0 Chip             OK         53 degrees C / 127 degrees F
     FPC 0 XL_XR1 TSen             OK         48 degrees C / 118 degrees F
     FPC 0 XL_XR1 Chip             OK         54 degrees C / 129 degrees F
     FPC 0 XQ TSen                 OK         48 degrees C / 118 degrees F
     FPC 0 XQ Chip                 OK         52 degrees C / 125 degrees F
     FPC 0 XQ_XR0 TSen             OK         48 degrees C / 118 degrees F
     FPC 0 XQ_XR0 Chip             OK         62 degrees C / 143 degrees F
     FPC 0 XQ_XR1 TSen             OK         48 degrees C / 118 degrees F
     FPC 0 XQ_XR1 Chip             OK         62 degrees C / 143 degrees F
     FPC 0 XM 0 TSen               OK         53 degrees C / 127 degrees F
     FPC 0 XM 0 Chip               OK         63 degrees C / 145 degrees F
     FPC 0 XM 1 TSen               OK         53 degrees C / 127 degrees F
     FPC 0 XM 1 Chip               OK         46 degrees C / 114 degrees F
     FPC 0 PLX PCIe Switch TSe     OK         53 degrees C / 127 degrees F
     FPC 0 PLX PCIe Switch Chi     OK         66 degrees C / 150 degrees F
     FPC 1 Intake                  OK         31 degrees C / 87 degrees F
     FPC 1 Exhaust A               OK         38 degrees C / 100 degrees F
     FPC 1 Exhaust B               OK         49 degrees C / 120 degrees F
     FPC 1 LU 0 TSen               OK         41 degrees C / 105 degrees F
     FPC 1 LU 0 Chip               OK         47 degrees C / 116 degrees F
     FPC 1 LU 1 TSen               OK         41 degrees C / 105 degrees F
FPC 1 LU 1 Chip               OK         42 degrees C / 107 degrees F
     FPC 1 LU 2 TSen               OK         41 degrees C / 105 degrees F
     FPC 1 LU 2 Chip               OK         46 degrees C / 114 degrees F
     FPC 1 LU 3 TSen               OK         41 degrees C / 105 degrees F
     FPC 1 LU 3 Chip               OK         51 degrees C / 123 degrees F
     FPC 1 XM 0 TSen               OK         41 degrees C / 105 degrees F
     FPC 1 XM 0 Chip               OK         49 degrees C / 120 degrees F
     FPC 1 XF 0 TSen               OK         41 degrees C / 105 degrees F
     FPC 1 XF 0 Chip               OK         63 degrees C / 145 degrees F
     FPC 1 PLX Switch TSen         OK         41 degrees C / 105 degrees F
     FPC 1 PLX Switch Chip         OK         43 degrees C / 109 degrees F
     FPC 3 Intake                  OK         31 degrees C / 87 degrees F
```

```
     FPC 3 Exhaust A                OK         37 degrees C / 98 degrees F
     FPC 3 Exhaust B                OK         43 degrees C / 109 degrees F
     FPC 3 LU 0 TSen                OK         42 degrees C / 107 degrees F
     FPC 3 LU 0 Chip                OK         43 degrees C / 109 degrees F
     FPC 3 LU 1 TSen                OK         42 degrees C / 107 degrees F
     FPC 3 LU 1 Chip                OK         46 degrees C / 114 degrees F
     FPC 3 LU 2 TSen                OK         42 degrees C / 107 degrees F
     FPC 3 LU 2 Chip                OK         40 degrees C / 104 degrees F
     FPC 3 LU 3 TSen                OK         42 degrees C / 107 degrees F
     FPC 3 LU 3 Chip                OK         41 degrees C / 105 degrees F
     FPC 3 MQ 0 TSen                OK         37 degrees C / 98 degrees F
     FPC 3 MQ 0 Chip                OK         37 degrees C / 98 degrees F
     FPC 3 MQ 1 TSen                OK         37 degrees C / 98 degrees F
     FPC 3 MQ 1 Chip                OK         40 degrees C / 104 degrees F
     FPC 3 MQ 2 TSen                OK         37 degrees C / 98 degrees F
     FPC 3 MQ 2 Chip                OK         36 degrees C / 96 degrees F
     FPC 3 MQ 3 TSen                OK         37 degrees C / 98 degrees F
     FPC 3 MQ 3 Chip                OK         38 degrees C / 100 degrees F
     FPC 4 Intake                   OK         34 degrees C / 93 degrees F
     FPC 4 Exhaust A                OK         45 degrees C / 113 degrees F
     FPC 4 Exhaust B                OK         47 degrees C / 116 degrees F
     FPC 4 XL TSen                  OK         44 degrees C / 111 degrees F
     FPC 4 XL Chip                  OK         47 degrees C / 116 degrees F
     FPC 4 XL_XR0 TSen              OK         44 degrees C / 111 degrees F
     FPC 4 XL_XR0 Chip              OK         48 degrees C / 118 degrees F
     FPC 4 XL_XR1 TSen              OK         44 degrees C / 111 degrees F
     FPC 4 XL_XR1 Chip              OK         47 degrees C / 116 degrees F
     FPC 4 XQ TSen                  OK         44 degrees C / 111 degrees F
     FPC 4 XQ Chip                  OK         47 degrees C / 116 degrees F
     FPC 4 XQ_XR0 TSen              OK         44 degrees C / 111 degrees F
     FPC 4 XQ_XR0 Chip              OK         57 degrees C / 134 degrees F
     FPC 4 XQ_XR1 TSen              OK         44 degrees C / 111 degrees F
     FPC 4 XQ_XR1 Chip              OK         58 degrees C / 136 degrees F
     FPC 4 XM 0 TSen                OK         51 degrees C / 123 degrees F
     FPC 4 XM 0 Chip                OK         61 degrees C / 141 degrees F
     FPC 4 XM 1 TSen                OK         51 degrees C / 123 degrees F
     FPC 4 XM 1 Chip                OK         47 degrees C / 116 degrees F
     FPC 4 PLX PCIe Switch TSe      OK         51 degrees C / 123 degrees F
     FPC 4 PLX PCIe Switch Chi      OK         60 degrees C / 140 degrees F
     FPC 5 Intake                   OK         34 degrees C / 93 degrees F
     FPC 5 Exhaust A                OK         45 degrees C / 113 degrees F
     FPC 5 Exhaust B                OK         47 degrees C / 116 degrees F
     FPC 5 XL TSen                  OK         45 degrees C / 113 degrees F
     FPC 5 XL Chip                  OK         47 degrees C / 116 degrees F
     FPC 5 XL_XR0 TSen              OK         45 degrees C / 113 degrees F
FPC 5 XL_XR0 Chip              OK         49 degrees C / 120 degrees F
     FPC 5 XL_XR1 TSen              OK         45 degrees C / 113 degrees F
     FPC 5 XL_XR1 Chip              OK         49 degrees C / 120 degrees F
     FPC 5 XQ TSen                  OK         45 degrees C / 113 degrees F
     FPC 5 XQ Chip                  OK         48 degrees C / 118 degrees F
     FPC 5 XQ_XR0 TSen              OK         45 degrees C / 113 degrees F
     FPC 5 XQ_XR0 Chip              OK         60 degrees C / 140 degrees F
     FPC 5 XQ_XR1 TSen              OK         45 degrees C / 113 degrees F
     FPC 5 XQ_XR1 Chip              OK         58 degrees C / 136 degrees F
     FPC 5 XM 0 TSen                OK         50 degrees C / 122 degrees F
     FPC 5 XM 0 Chip                OK         48 degrees C / 118 degrees F
     FPC 5 XM 1 TSen                OK         50 degrees C / 122 degrees F
     FPC 5 XM 1 Chip                OK         47 degrees C / 116 degrees F
     FPC 5 PLX PCIe Switch TSe      OK         50 degrees C / 122 degrees F
     FPC 5 PLX PCIe Switch Chi      OK         59 degrees C / 138 degrees F
     FPC 7 Intake                   OK         32 degrees C / 89 degrees F
```


Copyright © 2016, Juniper Networks, Inc.

```
     FPC 7 Exhaust A                OK         32 degrees C / 89 degrees F
     FPC 7 Exhaust B                OK         33 degrees C / 91 degrees F
     FPC 7 LU 0 TSen                OK         49 degrees C / 120 degrees F
     FPC 7 LU 0 Chip                OK         44 degrees C / 111 degrees F
     FPC 7 LU 1 TSen                OK         49 degrees C / 120 degrees F
     FPC 7 LU 1 Chip                OK         47 degrees C / 116 degrees F
     FPC 7 LU 2 TSen                OK         49 degrees C / 120 degrees F
     FPC 7 LU 2 Chip                OK         39 degrees C / 102 degrees F
     FPC 7 LU 3 TSen                OK         49 degrees C / 120 degrees F
     FPC 7 LU 3 Chip                OK         43 degrees C / 109 degrees F
     FPC 7 XM 0 TSen                OK         49 degrees C / 120 degrees F
     FPC 7 XM 0 Chip                OK         57 degrees C / 134 degrees F
     FPC 7 XM 1 TSen                OK         49 degrees C / 120 degrees F
     FPC 7 XM 1 Chip                OK         48 degrees C / 118 degrees F
     FPC 7 PLX Switch TSen          OK         49 degrees C / 120 degrees F
     FPC 7 PLX Switch Chip          OK         45 degrees C / 113 degrees F
     FPC 8 Intake                   OK         36 degrees C / 96 degrees F
     FPC 8 Exhaust A                OK         51 degrees C / 123 degrees F
     FPC 8 Exhaust B                OK         46 degrees C / 114 degrees F
     FPC 8 XL TSen                  OK         46 degrees C / 114 degrees F
     FPC 8 XL Chip                  OK         47 degrees C / 116 degrees F
     FPC 8 XL_XR0 TSen              OK         46 degrees C / 114 degrees F
     FPC 8 XL_XR0 Chip              OK         53 degrees C / 127 degrees F
     FPC 8 XL_XR1 TSen              OK         46 degrees C / 114 degrees F
     FPC 8 XL_XR1 Chip              OK         52 degrees C / 125 degrees F
     FPC 8 XQ TSen                  OK         46 degrees C / 114 degrees F
     FPC 8 XQ Chip                  OK         46 degrees C / 114 degrees F
     FPC 8 XQ_XR0 TSen              OK         46 degrees C / 114 degrees F
     FPC 8 XQ_XR0 Chip              OK         59 degrees C / 138 degrees F
     FPC 8 XQ_XR1 TSen              OK         46 degrees C / 114 degrees F
     FPC 8 XQ_XR1 Chip              OK         57 degrees C / 134 degrees F
     FPC 8 XM 0 TSen                OK         52 degrees C / 125 degrees F
     FPC 8 XM 0 Chip                OK         61 degrees C / 141 degrees F
     FPC 8 XM 1 TSen                OK         52 degrees C / 125 degrees F
     FPC 8 XM 1 Chip                OK         47 degrees C / 116 degrees F
     FPC 8 PLX PCIe Switch TSe      OK         52 degrees C / 125 degrees F
     FPC 8 PLX PCIe Switch Chi      OK         63 degrees C / 145 degrees F
     FPC 9 Intake                   OK         31 degrees C / 87 degrees F
     FPC 9 Exhaust A                OK         34 degrees C / 93 degrees F
     FPC 9 Exhaust B                OK         35 degrees C / 95 degrees F
FPC 9 QX 0 TSen                OK         42 degrees C / 107 degrees F
     FPC 9 QX 0 Chip                OK         45 degrees C / 113 degrees F
     FPC 9 LU 0 TCAM TSen           OK         42 degrees C / 107 degrees F
     FPC 9 LU 0 TCAM Chip           OK         41 degrees C / 105 degrees F
     FPC 9 LU 0 TSen                OK         42 degrees C / 107 degrees F
     FPC 9 LU 0 Chip                OK         43 degrees C / 109 degrees F
     FPC 9 MQ 0 TSen                OK         42 degrees C / 107 degrees F
     FPC 9 MQ 0 Chip                OK         43 degrees C / 109 degrees F
     FPC 9 QX 1 TSen                OK         38 degrees C / 100 degrees F
     FPC 9 QX 1 Chip                OK         40 degrees C / 104 degrees F
     FPC 9 LU 1 TCAM TSen           OK         38 degrees C / 100 degrees F
     FPC 9 LU 1 TCAM Chip           OK         38 degrees C / 100 degrees F
     FPC 9 LU 1 TSen                OK         38 degrees C / 100 degrees F
     FPC 9 LU 1 Chip                OK         41 degrees C / 105 degrees F
     FPC 9 MQ 1 TSen                OK         38 degrees C / 100 degrees F
     FPC 9 MQ 1 Chip                OK         41 degrees C / 105 degrees F
     FPC 10 Intake                  OK         35 degrees C / 95 degrees F
     FPC 10 Exhaust A               OK         51 degrees C / 123 degrees F
     FPC 10 Exhaust B               OK         46 degrees C / 114 degrees F
     FPC 10 XL TSen                 OK         42 degrees C / 107 degrees F
     FPC 10 XL Chip                 OK         44 degrees C / 111 degrees F
```

```
      FPC 10 XL_XR0 TSen            OK         42 degrees C / 107 degrees F
      FPC 10 XL_XR0 Chip            OK         47 degrees C / 116 degrees F
      FPC 10 XL_XR1 TSen            OK         42 degrees C / 107 degrees F
      FPC 10 XL_XR1 Chip            OK         48 degrees C / 118 degrees F
      FPC 10 XQ TSen                OK         42 degrees C / 107 degrees F
      FPC 10 XQ Chip                OK         46 degrees C / 114 degrees F
      FPC 10 XQ_XR0 TSen            OK         42 degrees C / 107 degrees F
      FPC 10 XQ_XR0 Chip            OK         57 degrees C / 134 degrees F
      FPC 10 XQ_XR1 TSen            OK         42 degrees C / 107 degrees F
      FPC 10 XQ_XR1 Chip            OK         53 degrees C / 127 degrees F
      FPC 10 XM 0 TSen              OK         51 degrees C / 123 degrees F
      FPC 10 XM 0 Chip              OK         61 degrees C / 141 degrees F
      FPC 10 XM 1 TSen              OK         51 degrees C / 123 degrees F
      FPC 10 XM 1 Chip              OK         49 degrees C / 120 degrees F
      FPC 10 PLX PCIe Switch TSe    OK         51 degrees C / 123 degrees F
      FPC 10 PLX PCIe Switch Chi    OK         61 degrees C / 141 degrees F
      FPC 11 Intake                 OK         33 degrees C / 91 degrees F
      FPC 11 Exhaust A              OK         33 degrees C / 91 degrees F
      FPC 11 Exhaust B              OK         34 degrees C / 93 degrees F
      FPC 11 LU 0 TSen              OK         50 degrees C / 122 degrees F
      FPC 11 LU 0 Chip              OK         48 degrees C / 118 degrees F
      FPC 11 LU 1 TSen              OK         50 degrees C / 122 degrees F
      FPC 11 LU 1 Chip              OK         50 degrees C / 122 degrees F
      FPC 11 LU 2 TSen              OK         50 degrees C / 122 degrees F
      FPC 11 LU 2 Chip              OK         41 degrees C / 105 degrees F
      FPC 11 LU 3 TSen              OK         50 degrees C / 122 degrees F
      FPC 11 LU 3 Chip              OK         48 degrees C / 118 degrees F
      FPC 11 XM 0 TSen              OK         50 degrees C / 122 degrees F
      FPC 11 XM 0 Chip              OK         57 degrees C / 134 degrees F
      FPC 11 XM 1 TSen              OK         50 degrees C / 122 degrees F
      FPC 11 XM 1 Chip              OK         52 degrees C / 125 degrees F
      FPC 11 PLX Switch TSen        OK         50 degrees C / 122 degrees F
      FPC 11 PLX Switch Chip        OK         45 degrees C / 113 degrees F
Fans  Top Fan Tray Temp             OK         42 degrees C / 107 degrees F
      Top Tray Fan 1                OK         Spinning at high speed
 Top Tray Fan 2                OK         Spinning at high speed
      Top Tray Fan 3                OK         Spinning at high speed
      Top Tray Fan 4                OK         Spinning at high speed
      Top Tray Fan 5                OK         Spinning at high speed
      Top Tray Fan 6                OK         Spinning at high speed
      Top Tray Fan 7                OK         Spinning at high speed
      Top Tray Fan 8                OK         Spinning at high speed
      Top Tray Fan 9                OK         Spinning at high speed
      Top Tray Fan 10               OK         Spinning at high speed
      Top Tray Fan 11               OK         Spinning at high speed
      Top Tray Fan 12               OK         Spinning at high speed
      Bottom Fan Tray Temp          OK         33 degrees C / 91 degrees F
      Bottom Tray Fan 1             OK         Spinning at high speed
      Bottom Tray Fan 2             OK         Spinning at high speed
      Bottom Tray Fan 3             OK         Spinning at high speed
      Bottom Tray Fan 4             OK         Spinning at high speed
      Bottom Tray Fan 5             OK         Spinning at high speed
      Bottom Tray Fan 6             OK         Spinning at high speed
      Bottom Tray Fan 7             OK         Spinning at high speed
      Bottom Tray Fan 8             OK         Spinning at high speed
      Bottom Tray Fan 9             OK         Spinning at high speed
      Bottom Tray Fan 10            OK         Spinning at high speed
      Bottom Tray Fan 11            OK         Spinning at high speed
      Bottom Tray Fan 12            OK         Spinning at high speed
```


Copyright © 2016, Juniper Networks, Inc.

show chassis environment (MX2020 Router)

```
user@host> show chassis environment
Class Item                          Status     Measurement
Temp  PSM 0                         Absent
      PSM 1                         Absent
      PSM 2                         OK         41 degrees C / 105 degrees F
      PSM 3                         OK         39 degrees C / 102 degrees F
      PSM 4                         OK         39 degrees C / 102 degrees F
      PSM 5                         OK         38 degrees C / 100 degrees F
      PSM 6                         OK         38 degrees C / 100 degrees F
      PSM 7                         OK         38 degrees C / 100 degrees F
      PSM 8                         OK         37 degrees C / 98 degrees F
      PSM 9                         Absent
      PSM 10                        Absent
      PSM 11                        OK         47 degrees C / 116 degrees F
      PSM 12                        OK         45 degrees C / 113 degrees F
      PSM 13                        OK         44 degrees C / 111 degrees F
      PSM 14                        OK         44 degrees C / 111 degrees F
      PSM 15                        OK         43 degrees C / 109 degrees F
      PSM 16                        OK         42 degrees C / 107 degrees F
      PSM 17                        OK         41 degrees C / 105 degrees F
      PDM 0                         OK
      PDM 1                         Absent
      PDM 2                         Absent
      PDM 3                         OK
      CB 0 IntakeA-Zone0            OK         45 degrees C / 113 degrees F
      CB 0 IntakeB-Zone1            OK         34 degrees C / 93 degrees F
      CB 0 IntakeC-Zone0            OK         48 degrees C / 118 degrees F
      CB 0 ExhaustA-Zone0           OK         45 degrees C / 113 degrees F
      CB 0 ExhaustB-Zone1           OK         37 degrees C / 98 degrees F
      CB 0 TCBC-Zone0               OK         41 degrees C / 105 degrees F
      CB 1 IntakeA-Zone0            OK         46 degrees C / 114 degrees F
      CB 1 IntakeB-Zone1            OK         42 degrees C / 107 degrees F
      CB 1 IntakeC-Zone0            OK         49 degrees C / 120 degrees F
      CB 1 ExhaustA-Zone0           OK         46 degrees C / 114 degrees F
      CB 1 ExhaustB-Zone1           OK         41 degrees C / 105 degrees F
      CB 1 TCBC-Zone0               OK         46 degrees C / 114 degrees F
      SPMB 0 Intake                 OK         33 degrees C / 91 degrees F
      SPMB 1 Intake                 OK         42 degrees C / 107 degrees F
      Routing Engine 0              OK         35 degrees C / 95 degrees F
      Routing Engine 0 CPU          OK         34 degrees C / 93 degrees F
      Routing Engine 1              OK         44 degrees C / 111 degrees F
      Routing Engine 1 CPU          OK         42 degrees C / 107 degrees F
      SFB 0 Intake-Zone0            OK         55 degrees C / 131 degrees F
      SFB 0 Exhaust-Zone1           OK         48 degrees C / 118 degrees F
      SFB 0 IntakeA-Zone0           OK         50 degrees C / 122 degrees F
      SFB 0 IntakeB-Zone1           OK         40 degrees C / 104 degrees F
      SFB 0 Exhaust-Zone0           OK         52 degrees C / 125 degrees F
      SFB 0 SFB-XF2-Zone1           OK         61 degrees C / 141 degrees F
      SFB 0 SFB-XF1-Zone0           OK         69 degrees C / 156 degrees F
      SFB 0 SFB-XF0-Zone0           OK         68 degrees C / 154 degrees F
      SFB 1 Intake-Zone0            OK         56 degrees C / 132 degrees F
      SFB 1 Exhaust-Zone1           OK         47 degrees C / 116 degrees F
      SFB 1 IntakeA-Zone0           OK         51 degrees C / 123 degrees F
      SFB 1 IntakeB-Zone1           OK         40 degrees C / 104 degrees F
      SFB 1 Exhaust-Zone0           OK         51 degrees C / 123 degrees F
      SFB 1 SFB-XF2-Zone1           OK         62 degrees C / 143 degrees F
      SFB 1 SFB-XF1-Zone0           OK         67 degrees C / 152 degrees F
      SFB 1 SFB-XF0-Zone0           OK         69 degrees C / 156 degrees F
      SFB 2 Intake-Zone0            OK         56 degrees C / 132 degrees F
```

```
SFB 2 Exhaust-Zone1            OK         47 degrees C / 116 degrees F
SFB 2 IntakeA-Zone0            OK         51 degrees C / 123 degrees F
SFB 2 IntakeB-Zone1            OK         40 degrees C / 104 degrees F
SFB 2 Exhaust-Zone0            OK         53 degrees C / 127 degrees F
SFB 2 SFB-XF2-Zone1            OK         65 degrees C / 149 degrees F
SFB 2 SFB-XF1-Zone0            OK         69 degrees C / 156 degrees F
SFB 2 SFB-XF0-Zone0            OK         70 degrees C / 158 degrees F
SFB 3 Intake-Zone0             OK         57 degrees C / 134 degrees F
SFB 3 Exhaust-Zone1            OK         48 degrees C / 118 degrees F
SFB 3 IntakeA-Zone0            OK         52 degrees C / 125 degrees F
SFB 3 IntakeB-Zone1            OK         41 degrees C / 105 degrees F
SFB 3 Exhaust-Zone0            OK         53 degrees C / 127 degrees F
SFB 3 SFB-XF2-Zone1            OK         66 degrees C / 150 degrees F
SFB 3 SFB-XF1-Zone0            OK         69 degrees C / 156 degrees F
SFB 3 SFB-XF0-Zone0            OK         71 degrees C / 159 degrees F
SFB 4 Intake-Zone0             OK         58 degrees C / 136 degrees F
SFB 4 Exhaust-Zone1            OK         49 degrees C / 120 degrees F
SFB 4 IntakeA-Zone0            OK         54 degrees C / 129 degrees F
SFB 4 IntakeB-Zone1            OK         42 degrees C / 107 degrees F
SFB 4 Exhaust-Zone0            OK         53 degrees C / 127 degrees F
SFB 4 SFB-XF2-Zone1            OK         64 degrees C / 147 degrees F
SFB 4 SFB-XF1-Zone0            OK         68 degrees C / 154 degrees F
SFB 4 SFB-XF0-Zone0            OK         71 degrees C / 159 degrees F
SFB 5 Intake-Zone0             OK         58 degrees C / 136 degrees F
SFB 5 Exhaust-Zone1            OK         50 degrees C / 122 degrees F
SFB 5 IntakeA-Zone0            OK         53 degrees C / 127 degrees F
SFB 5 IntakeB-Zone1            OK         43 degrees C / 109 degrees F
SFB 5 Exhaust-Zone0            OK         54 degrees C / 129 degrees F
SFB 5 SFB-XF2-Zone1            OK         66 degrees C / 150 degrees F
SFB 5 SFB-XF1-Zone0            OK         69 degrees C / 156 degrees F
SFB 5 SFB-XF0-Zone0            OK         74 degrees C / 165 degrees F
SFB 6 Intake-Zone0             OK         58 degrees C / 136 degrees F
SFB 6 Exhaust-Zone1            OK         49 degrees C / 120 degrees F
SFB 6 IntakeA-Zone0            OK         53 degrees C / 127 degrees F
SFB 6 IntakeB-Zone1            OK         43 degrees C / 109 degrees F
SFB 6 Exhaust-Zone0            OK         53 degrees C / 127 degrees F
SFB 6 SFB-XF2-Zone1            OK         65 degrees C / 149 degrees F
SFB 6 SFB-XF1-Zone0            OK         68 degrees C / 154 degrees F
SFB 6 SFB-XF0-Zone0            OK         72 degrees C / 161 degrees F
SFB 7 Intake-Zone0             OK         57 degrees C / 134 degrees F
SFB 7 Exhaust-Zone1            OK         50 degrees C / 122 degrees F
SFB 7 IntakeA-Zone0            OK         53 degrees C / 127 degrees F
SFB 7 IntakeB-Zone1            OK         43 degrees C / 109 degrees F
SFB 7 Exhaust-Zone0            OK         54 degrees C / 129 degrees F
SFB 7 SFB-XF2-Zone1            OK         68 degrees C / 154 degrees F
SFB 7 SFB-XF1-Zone0            OK         69 degrees C / 156 degrees F
SFB 7 SFB-XF0-Zone0            OK         73 degrees C / 163 degrees F
FPC 0 Intake                   OK         41 degrees C / 105 degrees F
FPC 0 Exhaust A                OK         48 degrees C / 118 degrees F
FPC 0 Exhaust B                OK         62 degrees C / 143 degrees F
FPC 0 LU 0 TSen                OK         59 degrees C / 138 degrees F
FPC 0 LU 0 Chip                OK         62 degrees C / 143 degrees F
FPC 0 LU 1 TSen                OK         59 degrees C / 138 degrees F
FPC 0 LU 1 Chip                OK         64 degrees C / 147 degrees F
FPC 0 LU 2 TSen                OK         59 degrees C / 138 degrees F
FPC 0 LU 2 Chip                OK         53 degrees C / 127 degrees F
FPC 0 LU 3 TSen                OK         59 degrees C / 138 degrees F
FPC 0 LU 3 Chip                OK         53 degrees C / 127 degrees F
FPC 0 MQ 0 TSen                OK         47 degrees C / 116 degrees F
FPC 0 MQ 0 Chip                OK         49 degrees C / 120 degrees F
FPC 0 MQ 1 TSen                OK         47 degrees C / 116 degrees F
```


Copyright © 2016, Juniper Networks, Inc.

```
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
```


Copyright © 2016, Juniper Networks, Inc.

```
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
```


Copyright © 2016, Juniper Networks, Inc.

```
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
```


Copyright © 2016, Juniper Networks, Inc.

```
ADC 0 ADC-XF1                    OK          59 degrees C / 138 degrees F
ADC 0 ADC-XF0                    OK          66 degrees C / 150 degrees F
ADC 1 Intake                     OK          38 degrees C / 100 degrees F
ADC 1 Exhaust                    OK          50 degrees C / 122 degrees F
ADC 1 ADC-XF1                    OK          59 degrees C / 138 degrees F
ADC 1 ADC-XF0                    OK          63 degrees C / 145 degrees F
ADC 2 Intake                     OK          37 degrees C / 98 degrees F
ADC 2 Exhaust                    OK          52 degrees C / 125 degrees F
ADC 2 ADC-XF1                    OK          53 degrees C / 127 degrees F
ADC 2 ADC-XF0                    OK          61 degrees C / 141 degrees F
ADC 3 Intake                     OK          40 degrees C / 104 degrees F
ADC 3 Exhaust                    OK          51 degrees C / 123 degrees F
ADC 3 ADC-XF1                    OK          61 degrees C / 141 degrees F
ADC 3 ADC-XF0                    OK          64 degrees C / 147 degrees F
ADC 4 Intake                     OK          39 degrees C / 102 degrees F
ADC 4 Exhaust                    OK          51 degrees C / 123 degrees F
ADC 4 ADC-XF1                    OK          60 degrees C / 140 degrees F
ADC 4 ADC-XF0                    OK          63 degrees C / 145 degrees F
ADC 5 Intake                     OK          38 degrees C / 100 degrees F
ADC 5 Exhaust                    OK          54 degrees C / 129 degrees F
ADC 5 ADC-XF1                    OK          56 degrees C / 132 degrees F
ADC 5 ADC-XF0                    OK          67 degrees C / 152 degrees F
ADC 6 Intake                     OK          39 degrees C / 102 degrees F
ADC 6 Exhaust                    OK          52 degrees C / 125 degrees F
ADC 6 ADC-XF1                    OK          59 degrees C / 138 degrees F
ADC 6 ADC-XF0                    OK          66 degrees C / 150 degrees F
ADC 7 Intake                     OK          39 degrees C / 102 degrees F
ADC 7 Exhaust                    OK          54 degrees C / 129 degrees F
ADC 7 ADC-XF1                    OK          62 degrees C / 143 degrees F
ADC 7 ADC-XF0                    OK          70 degrees C / 158 degrees F
ADC 8 Intake                     OK          39 degrees C / 102 degrees F
ADC 8 Exhaust                    OK          52 degrees C / 125 degrees F
ADC 8 ADC-XF1                    OK          61 degrees C / 141 degrees F
ADC 8 ADC-XF0                    OK          65 degrees C / 149 degrees F
ADC 9 Intake                     OK          41 degrees C / 105 degrees F
ADC 9 Exhaust                    OK          51 degrees C / 123 degrees F
ADC 9 ADC-XF1                    OK          63 degrees C / 145 degrees F
ADC 9 ADC-XF0                    OK          63 degrees C / 145 degrees F
ADC 10 Intake                    OK          48 degrees C / 118 degrees F
ADC 10 Exhaust                   OK          53 degrees C / 127 degrees F
ADC 10 ADC-XF1                   OK          67 degrees C / 152 degrees F
ADC 10 ADC-XF0                   OK          66 degrees C / 150 degrees F
ADC 12 Intake                    OK          49 degrees C / 120 degrees F
ADC 12 Exhaust                   OK          54 degrees C / 129 degrees F
ADC 12 ADC-XF1                   OK          67 degrees C / 152 degrees F
ADC 12 ADC-XF0                   OK          67 degrees C / 152 degrees F
ADC 13 Intake                    OK          49 degrees C / 120 degrees F
ADC 13 Exhaust                   OK          57 degrees C / 134 degrees F
ADC 13 ADC-XF1                   OK          66 degrees C / 150 degrees F
ADC 13 ADC-XF0                   OK          69 degrees C / 156 degrees F
ADC 14 Intake                    OK          51 degrees C / 123 degrees F
ADC 14 Exhaust                   OK          59 degrees C / 138 degrees F
ADC 14 ADC-XF1                   OK          69 degrees C / 156 degrees F
ADC 14 ADC-XF0                   OK          74 degrees C / 165 degrees F
ADC 15 Intake                    OK          50 degrees C / 122 degrees F
ADC 15 Exhaust                   OK          59 degrees C / 138 degrees F
ADC 15 ADC-XF1                   OK          68 degrees C / 154 degrees F
ADC 15 ADC-XF0                   OK          69 degrees C / 156 degrees F
ADC 16 Intake                    OK          52 degrees C / 125 degrees F
ADC 16 Exhaust                   OK          58 degrees C / 136 degrees F
ADC 16 ADC-XF1                   OK          68 degrees C / 154 degrees F
```

```
        ADC 16 ADC-XF0                  OK         70 degrees C / 158 degrees F
        ADC 17 Intake                   OK         52 degrees C / 125 degrees F
        ADC 17 Exhaust                  OK         59 degrees C / 138 degrees F
        ADC 17 ADC-XF1                  OK         69 degrees C / 156 degrees F
        ADC 17 ADC-XF0                  OK         71 degrees C / 159 degrees F
        ADC 18 Intake                   OK         53 degrees C / 127 degrees F
        ADC 18 Exhaust                  OK         59 degrees C / 138 degrees F
        ADC 18 ADC-XF1                  OK         68 degrees C / 154 degrees F
        ADC 18 ADC-XF0                  OK         73 degrees C / 163 degrees F
        ADC 19 Intake                   OK         50 degrees C / 122 degrees F
        ADC 19 Exhaust                  OK         59 degrees C / 138 degrees F
        ADC 19 ADC-XF1                  OK         68 degrees C / 154 degrees F
        ADC 19 ADC-XF0                  OK         72 degrees C / 161 degrees F
Fans    Fan Tray 0 Fan 1                OK         7440 RPM
        Fan Tray 0 Fan 2                OK         7200 RPM
        Fan Tray 0 Fan 3                OK         6960 RPM
        Fan Tray 0 Fan 4                OK         7200 RPM
        Fan Tray 0 Fan 5                OK         7080 RPM
        Fan Tray 0 Fan 6                OK         6840 RPM
        Fan Tray 1 Fan 1                OK         6840 RPM
        Fan Tray 1 Fan 2                OK         6960 RPM
        Fan Tray 1 Fan 3                OK         6960 RPM
        Fan Tray 1 Fan 4                OK         7080 RPM
        Fan Tray 1 Fan 5                OK         6960 RPM
        Fan Tray 1 Fan 6                OK         6960 RPM
        Fan Tray 2 Fan 1                OK         8640 RPM
        Fan Tray 2 Fan 2                OK         8640 RPM
        Fan Tray 2 Fan 3                OK         8760 RPM
        Fan Tray 2 Fan 4                OK         8760 RPM
        Fan Tray 2 Fan 5                OK         8640 RPM
        Fan Tray 2 Fan 6                OK         8640 RPM
        Fan Tray 3 Fan 1                OK         8520 RPM
        Fan Tray 3 Fan 2                OK         8520 RPM
        Fan Tray 3 Fan 3                OK         8640 RPM
        Fan Tray 3 Fan 4                OK         8640 RPM
        Fan Tray 3 Fan 5                OK         8520 RPM
        Fan Tray 3 Fan 6                OK         8520 RPM
```

show chassis environment (MX2020 Router with MPC5EQ and MPC6E)

```
Class Item                              Status     Measurement
Temp  PSM 0                             OK         32 degrees C / 89 degrees F
      PSM 1                             OK         32 degrees C / 89 degrees F
      PSM 2                             OK         32 degrees C / 89 degrees F
      PSM 3                             OK         32 degrees C / 89 degrees F
      PSM 4                             OK         32 degrees C / 89 degrees F
      PSM 5                             OK         33 degrees C / 91 degrees F
      PSM 6                             OK         32 degrees C / 89 degrees F
      PSM 7                             OK         32 degrees C / 89 degrees F
      PSM 8                             OK         32 degrees C / 89 degrees F
      PSM 9                             Absent
      PSM 10                            Absent
      PSM 11                            Absent
      PSM 12                            OK         33 degrees C / 91 degrees F
      PSM 13                            OK         33 degrees C / 91 degrees F
      PSM 14                            OK         34 degrees C / 93 degrees F
      PSM 15                            OK         34 degrees C / 93 degrees F
      PSM 16                            OK         33 degrees C / 91 degrees F
      PSM 17                            OK         33 degrees C / 91 degrees F
      PDM 0                             OK
      PDM 1                             OK
```


Copyright © 2016, Juniper Networks, Inc.

```
     PDM 2                          OK
     PDM 3                          OK
     CB 0 IntakeA-Zone0             OK         34 degrees C / 93 degrees F
     CB 0 IntakeB-Zone1             OK         26 degrees C / 78 degrees F
     CB 0 IntakeC-Zone0             OK         38 degrees C / 100 degrees F
     CB 0 ExhaustA-Zone0            OK         34 degrees C / 93 degrees F
     CB 0 ExhaustB-Zone1            OK         27 degrees C / 80 degrees F
     CB 0 TCBC-Zone0                OK         32 degrees C / 89 degrees F
     CB 1 IntakeA-Zone0             OK         24 degrees C / 75 degrees F
     CB 1 IntakeB-Zone1             OK         22 degrees C / 71 degrees F
     CB 1 IntakeC-Zone0             OK         34 degrees C / 93 degrees F
     CB 1 ExhaustA-Zone0            OK         31 degrees C / 87 degrees F
     CB 1 ExhaustB-Zone1            OK         24 degrees C / 75 degrees F
     CB 1 TCBC-Zone0                OK         27 degrees C / 80 degrees F
     SPMB 0 Intake                  OK         25 degrees C / 77 degrees F
     SPMB 1 Intake                  OK         23 degrees C / 73 degrees F
     Routing Engine 0               OK         28 degrees C / 82 degrees F
     Routing Engine 0 CPU           OK         25 degrees C / 77 degrees F
     Routing Engine 1               OK         25 degrees C / 77 degrees F
     Routing Engine 1 CPU           OK         24 degrees C / 75 degrees F
     SFB 0 Intake-Zone0             OK         45 degrees C / 113 degrees F
     SFB 0 Exhaust-Zone1            OK         34 degrees C / 93 degrees F
     SFB 0 IntakeA-Zone0            OK         32 degrees C / 89 degrees F
     SFB 0 IntakeB-Zone1            OK         28 degrees C / 82 degrees F
     SFB 0 Exhaust-Zone0            OK         36 degrees C / 96 degrees F
     SFB 0 SFB-XF2-Zone1            OK         46 degrees C / 114 degrees F
     SFB 0 SFB-XF1-Zone0            OK         48 degrees C / 118 degrees F
     SFB 0 SFB-XF0-Zone0            OK         60 degrees C / 140 degrees F
     SFB 1 Intake-Zone0             OK         44 degrees C / 111 degrees F
     SFB 1 Exhaust-Zone1            OK         34 degrees C / 93 degrees F
     SFB 1 IntakeA-Zone0            OK         35 degrees C / 95 degrees F
     SFB 1 IntakeB-Zone1            OK         27 degrees C / 80 degrees F
     SFB 1 Exhaust-Zone0            OK         37 degrees C / 98 degrees F
     SFB 1 SFB-XF2-Zone1            OK         47 degrees C / 116 degrees F
     SFB 1 SFB-XF1-Zone0            OK         49 degrees C / 120 degrees F
SFB 1 SFB-XF0-Zone0            OK         56 degrees C / 132 degrees F
     SFB 2 Intake-Zone0             OK         41 degrees C / 105 degrees F
     SFB 2 Exhaust-Zone1            OK         34 degrees C / 93 degrees F
     SFB 2 IntakeA-Zone0            OK         35 degrees C / 95 degrees F
     SFB 2 IntakeB-Zone1            OK         28 degrees C / 82 degrees F
     SFB 2 Exhaust-Zone0            OK         37 degrees C / 98 degrees F
     SFB 2 SFB-XF2-Zone1            OK         47 degrees C / 116 degrees F
     SFB 2 SFB-XF1-Zone0            OK         55 degrees C / 131 degrees F
     SFB 2 SFB-XF0-Zone0            OK         55 degrees C / 131 degrees F
     SFB 3 Intake-Zone0             OK         43 degrees C / 109 degrees F
     SFB 3 Exhaust-Zone1            OK         33 degrees C / 91 degrees F
     SFB 3 IntakeA-Zone0            OK         35 degrees C / 95 degrees F
     SFB 3 IntakeB-Zone1            OK         27 degrees C / 80 degrees F
     SFB 3 Exhaust-Zone0            OK         36 degrees C / 96 degrees F
     SFB 3 SFB-XF2-Zone1            OK         46 degrees C / 114 degrees F
     SFB 3 SFB-XF1-Zone0            OK         46 degrees C / 114 degrees F
     SFB 3 SFB-XF0-Zone0            OK         57 degrees C / 134 degrees F
     SFB 4 Intake-Zone0             OK         36 degrees C / 96 degrees F
     SFB 4 Exhaust-Zone1            OK         32 degrees C / 89 degrees F
     SFB 4 IntakeA-Zone0            OK         31 degrees C / 87 degrees F
     SFB 4 IntakeB-Zone1            OK         26 degrees C / 78 degrees F
     SFB 4 Exhaust-Zone0            OK         32 degrees C / 89 degrees F
     SFB 4 SFB-XF2-Zone1            OK         44 degrees C / 111 degrees F
     SFB 4 SFB-XF1-Zone0            OK         45 degrees C / 113 degrees F
     SFB 4 SFB-XF0-Zone0            OK         52 degrees C / 125 degrees F
     SFB 5 Intake-Zone0             OK         31 degrees C / 87 degrees F
```

```
     SFB 5 Exhaust-Zone1            OK         30 degrees C / 86 degrees F
     SFB 5 IntakeA-Zone0            OK         26 degrees C / 78 degrees F
     SFB 5 IntakeB-Zone1            OK         24 degrees C / 75 degrees F
     SFB 5 Exhaust-Zone0            OK         29 degrees C / 84 degrees F
     SFB 5 SFB-XF2-Zone1            OK         43 degrees C / 109 degrees F
     SFB 5 SFB-XF1-Zone0            OK         47 degrees C / 116 degrees F
     SFB 5 SFB-XF0-Zone0            OK         49 degrees C / 120 degrees F
     SFB 6 Intake-Zone0             OK         30 degrees C / 86 degrees F
     SFB 6 Exhaust-Zone1            OK         29 degrees C / 84 degrees F
     SFB 6 IntakeA-Zone0            OK         25 degrees C / 77 degrees F
     SFB 6 IntakeB-Zone1            OK         24 degrees C / 75 degrees F
     SFB 6 Exhaust-Zone0            OK         29 degrees C / 84 degrees F
     SFB 6 SFB-XF2-Zone1            OK         43 degrees C / 109 degrees F
     SFB 6 SFB-XF1-Zone0            OK         44 degrees C / 111 degrees F
     SFB 6 SFB-XF0-Zone0            OK         45 degrees C / 113 degrees F
     SFB 7 Intake-Zone0             OK         31 degrees C / 87 degrees F
     SFB 7 Exhaust-Zone1            OK         30 degrees C / 86 degrees F
     SFB 7 IntakeA-Zone0            OK         26 degrees C / 78 degrees F
     SFB 7 IntakeB-Zone1            OK         24 degrees C / 75 degrees F
     SFB 7 Exhaust-Zone0            OK         28 degrees C / 82 degrees F
     SFB 7 SFB-XF2-Zone1            OK         50 degrees C / 122 degrees F
     SFB 7 SFB-XF1-Zone0            OK         43 degrees C / 109 degrees F
     SFB 7 SFB-XF0-Zone0            OK         47 degrees C / 116 degrees F
     FPC 0 Intake                   OK         31 degrees C / 87 degrees F
     FPC 0 Exhaust A                OK         49 degrees C / 120 degrees F
     FPC 0 Exhaust B                OK         43 degrees C / 109 degrees F
     FPC 0 XL TSen                  OK         42 degrees C / 107 degrees F
     FPC 0 XL Chip                  OK         46 degrees C / 114 degrees F
     FPC 0 XL_XR0 TSen              OK         42 degrees C / 107 degrees F
     FPC 0 XL_XR0 Chip              OK         48 degrees C / 118 degrees F
FPC 0 XL_XR1 TSen              OK         42 degrees C / 107 degrees F
     FPC 0 XL_XR1 Chip              OK         48 degrees C / 118 degrees F
     FPC 0 XQ TSen                  OK         42 degrees C / 107 degrees F
     FPC 0 XQ Chip                  OK         44 degrees C / 111 degrees F
     FPC 0 XQ_XR0 TSen              OK         42 degrees C / 107 degrees F
     FPC 0 XQ_XR0 Chip              OK         57 degrees C / 134 degrees F
     FPC 0 XQ_XR1 TSen              OK         42 degrees C / 107 degrees F
     FPC 0 XQ_XR1 Chip              OK         55 degrees C / 131 degrees F
     FPC 0 XM 0 TSen                OK         48 degrees C / 118 degrees F
     FPC 0 XM 0 Chip                OK         62 degrees C / 143 degrees F
     FPC 0 XM 1 TSen                OK         48 degrees C / 118 degrees F
     FPC 0 XM 1 Chip                OK         44 degrees C / 111 degrees F
     FPC 0 PLX PCIe Switch TSe      OK         48 degrees C / 118 degrees F
     FPC 0 PLX PCIe Switch Chi      OK         57 degrees C / 134 degrees F
     FPC 1 Intake                   OK         29 degrees C / 84 degrees F
     FPC 1 Exhaust A                OK         36 degrees C / 96 degrees F
     FPC 1 Exhaust B                OK         44 degrees C / 111 degrees F
     FPC 1 LU 0 TSen                OK         38 degrees C / 100 degrees F
     FPC 1 LU 0 Chip                OK         45 degrees C / 113 degrees F
     FPC 1 LU 1 TSen                OK         38 degrees C / 100 degrees F
     FPC 1 LU 1 Chip                OK         38 degrees C / 100 degrees F
     FPC 1 LU 2 TSen                OK         38 degrees C / 100 degrees F
     FPC 1 LU 2 Chip                OK         42 degrees C / 107 degrees F
     FPC 1 LU 3 TSen                OK         38 degrees C / 100 degrees F
     FPC 1 LU 3 Chip                OK         47 degrees C / 116 degrees F
     FPC 1 XM 0 TSen                OK         38 degrees C / 100 degrees F
     FPC 1 XM 0 Chip                OK         44 degrees C / 111 degrees F
     FPC 1 XF 0 TSen                OK         38 degrees C / 100 degrees F
     FPC 1 XF 0 Chip                OK         54 degrees C / 129 degrees F
     FPC 1 PLX Switch TSen          OK         38 degrees C / 100 degrees F
     FPC 1 PLX Switch Chip          OK         41 degrees C / 105 degrees F
```


Copyright © 2016, Juniper Networks, Inc.

```
     FPC 2 Intake                  OK         28 degrees C / 82 degrees F
     FPC 2 Exhaust A               OK         28 degrees C / 82 degrees F
     FPC 2 Exhaust B               OK         28 degrees C / 82 degrees F
     FPC 2 LU 0 TSen               OK         40 degrees C / 104 degrees F
     FPC 2 LU 0 Chip               OK         40 degrees C / 104 degrees F
     FPC 2 LU 1 TSen               OK         40 degrees C / 104 degrees F
     FPC 2 LU 1 Chip               OK         41 degrees C / 105 degrees F
     FPC 2 LU 2 TSen               OK         40 degrees C / 104 degrees F
     FPC 2 LU 2 Chip               OK         34 degrees C / 93 degrees F
     FPC 2 LU 3 TSen               OK         40 degrees C / 104 degrees F
     FPC 2 LU 3 Chip               OK         38 degrees C / 100 degrees F
     FPC 2 XM 0 TSen               OK         40 degrees C / 104 degrees F
     FPC 2 XM 0 Chip               OK         47 degrees C / 116 degrees F
     FPC 2 XM 1 TSen               OK         40 degrees C / 104 degrees F
     FPC 2 XM 1 Chip               OK         42 degrees C / 107 degrees F
     FPC 2 PLX Switch TSen         OK         40 degrees C / 104 degrees F
     FPC 2 PLX Switch Chip         OK         39 degrees C / 102 degrees F
     FPC 3 Intake                  OK         27 degrees C / 80 degrees F
     FPC 3 Exhaust A               OK         38 degrees C / 100 degrees F
     FPC 3 Exhaust B               OK         31 degrees C / 87 degrees F
     FPC 3 QX 0 TSen               OK         38 degrees C / 100 degrees F
     FPC 3 QX 0 Chip               OK         42 degrees C / 107 degrees F
     FPC 3 LU 0 TCAM TSen          OK         38 degrees C / 100 degrees F
     FPC 3 LU 0 TCAM Chip          OK         43 degrees C / 109 degrees F
     FPC 3 LU 0 TSen               OK         38 degrees C / 100 degrees F
FPC 3 LU 0 Chip               OK         42 degrees C / 107 degrees F
     FPC 3 MQ 0 TSen               OK         38 degrees C / 100 degrees F
     FPC 3 MQ 0 Chip               OK         39 degrees C / 102 degrees F
     FPC 3 QX 1 TSen               OK         32 degrees C / 89 degrees F
     FPC 3 QX 1 Chip               OK         36 degrees C / 96 degrees F
     FPC 3 LU 1 TCAM TSen          OK         32 degrees C / 89 degrees F
     FPC 3 LU 1 TCAM Chip          OK         35 degrees C / 95 degrees F
     FPC 3 LU 1 TSen               OK         32 degrees C / 89 degrees F
     FPC 3 LU 1 Chip               OK         37 degrees C / 98 degrees F
     FPC 3 MQ 1 TSen               OK         32 degrees C / 89 degrees F
     FPC 3 MQ 1 Chip               OK         36 degrees C / 96 degrees F
     FPC 4 Intake                  OK         29 degrees C / 84 degrees F
     FPC 4 Exhaust A               OK         36 degrees C / 96 degrees F
     FPC 4 Exhaust B               OK         40 degrees C / 104 degrees F
     FPC 4 XL TSen                 OK         39 degrees C / 102 degrees F
     FPC 4 XL Chip                 OK         42 degrees C / 107 degrees F
     FPC 4 XL_XR0 TSen             OK         39 degrees C / 102 degrees F
     FPC 4 XL_XR0 Chip             OK         45 degrees C / 113 degrees F
     FPC 4 XL_XR1 TSen             OK         39 degrees C / 102 degrees F
     FPC 4 XL_XR1 Chip             OK         46 degrees C / 114 degrees F
     FPC 4 XQ TSen                 OK         39 degrees C / 102 degrees F
     FPC 4 XQ Chip                 OK         42 degrees C / 107 degrees F
     FPC 4 XQ_XR0 TSen             OK         39 degrees C / 102 degrees F
     FPC 4 XQ_XR0 Chip             OK         54 degrees C / 129 degrees F
     FPC 4 XQ_XR1 TSen             OK         39 degrees C / 102 degrees F
     FPC 4 XQ_XR1 Chip             OK         53 degrees C / 127 degrees F
     FPC 4 XM 0 TSen               OK         45 degrees C / 113 degrees F
     FPC 4 XM 0 Chip               OK         59 degrees C / 138 degrees F
     FPC 4 XM 1 TSen               OK         45 degrees C / 113 degrees F
     FPC 4 XM 1 Chip               OK         41 degrees C / 105 degrees F
     FPC 4 PLX PCIe Switch TSe     OK         45 degrees C / 113 degrees F
     FPC 4 PLX PCIe Switch Chi     OK         58 degrees C / 136 degrees F
     FPC 5 Intake                  OK         29 degrees C / 84 degrees F
     FPC 5 Exhaust A               OK         33 degrees C / 91 degrees F
     FPC 5 Exhaust B               OK         39 degrees C / 102 degrees F
     FPC 5 LU 0 TSen               OK         40 degrees C / 104 degrees F
```

```
      FPC 5 LU 0 Chip                OK         40 degrees C / 104 degrees F
      FPC 5 LU 1 TSen                OK         40 degrees C / 104 degrees F
      FPC 5 LU 1 Chip                OK         45 degrees C / 113 degrees F
      FPC 5 LU 2 TSen                OK         40 degrees C / 104 degrees F
      FPC 5 LU 2 Chip                OK         40 degrees C / 104 degrees F
      FPC 5 LU 3 TSen                OK         40 degrees C / 104 degrees F
      FPC 5 LU 3 Chip                OK         46 degrees C / 114 degrees F
      FPC 5 MQ 0 TSen                OK         32 degrees C / 89 degrees F
      FPC 5 MQ 0 Chip                OK         33 degrees C / 91 degrees F
      FPC 5 MQ 1 TSen                OK         32 degrees C / 89 degrees F
      FPC 5 MQ 1 Chip                OK         35 degrees C / 95 degrees F
      FPC 5 MQ 2 TSen                OK         32 degrees C / 89 degrees F
      FPC 5 MQ 2 Chip                OK         32 degrees C / 89 degrees F
      FPC 5 MQ 3 TSen                OK         32 degrees C / 89 degrees F
      FPC 5 MQ 3 Chip                OK         32 degrees C / 89 degrees F
      FPC 9 Intake                   OK         25 degrees C / 77 degrees F
      FPC 9 Exhaust A                OK         37 degrees C / 98 degrees F
      FPC 9 Exhaust B                OK         40 degrees C / 104 degrees F
      FPC 9 XL 0 TSen                OK         40 degrees C / 104 degrees F
...
```

show chassis environment (MX2010 Router)

```
user@host> show chassis environment
Class Item                           Status     Measurement
Temp  PSM 0                          OK         7 degrees C / 44 degrees F
      PSM 1                          OK         7 degrees C / 44 degrees F
      PSM 2                          OK         7 degrees C / 44 degrees F
      PSM 3                          OK         6 degrees C / 42 degrees F
      PSM 4                          OK         6 degrees C / 42 degrees F
      PSM 5                          OK         6 degrees C / 42 degrees F
      PSM 6                          OK         6 degrees C / 42 degrees F
      PSM 7                          OK         7 degrees C / 44 degrees F
      PSM 8                          OK         7 degrees C / 44 degrees F
      PDM 0                          OK
      PDM 1                          Absent
      CB 0 IntakeA-Zone0             OK         14 degrees C / 57 degrees F
      CB 0 IntakeB-Zone1             OK         7 degrees C / 44 degrees F
      CB 0 IntakeC-Zone0             OK         22 degrees C / 71 degrees F
      CB 0 ExhaustA-Zone0            OK         14 degrees C / 57 degrees F
      CB 0 ExhaustB-Zone1            OK         9 degrees C / 48 degrees F
      CB 0 TCBC-Zone0                OK         11 degrees C / 51 degrees F
      CB 1 IntakeA-Zone0             OK         9 degrees C / 48 degrees F
      CB 1 IntakeB-Zone1             OK         5 degrees C / 41 degrees F
      CB 1 IntakeC-Zone0             OK         20 degrees C / 68 degrees F
      CB 1 ExhaustA-Zone0            OK         12 degrees C / 53 degrees F
      CB 1 ExhaustB-Zone1            OK         7 degrees C / 44 degrees F
      CB 1 TCBC-Zone0                OK         10 degrees C / 50 degrees F
      SPMB 0 Intake                  OK         5 degrees C / 41 degrees F
      SPMB 1 Intake                  OK         4 degrees C / 39 degrees F
      Routing Engine 0               OK         9 degrees C / 48 degrees F
      Routing Engine 0 CPU           OK         9 degrees C / 48 degrees F
      Routing Engine 1               OK         6 degrees C / 42 degrees F
      Routing Engine 1 CPU           OK         6 degrees C / 42 degrees F
      SFB 0 Intake-Zone0             OK         26 degrees C / 78 degrees F
      SFB 0 Exhaust-Zone1            OK         17 degrees C / 62 degrees F
      SFB 0 IntakeA-Zone0            OK         16 degrees C / 60 degrees F
      SFB 0 IntakeB-Zone1            OK         11 degrees C / 51 degrees F
      SFB 0 Exhaust-Zone0            OK         18 degrees C / 64 degrees F
      SFB 0 SFB-XF2-Zone1            OK         25 degrees C / 77 degrees F
      SFB 0 SFB-XF1-Zone0            OK         23 degrees C / 73 degrees F
```


Copyright © 2016, Juniper Networks, Inc.

```
      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
```


Copyright © 2016, Juniper Networks, Inc.

```
     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
```


Copyright © 2016, Juniper Networks, Inc.

```
      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
```

 Copyright © 2016, Juniper Networks, Inc.

```
      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
```


Copyright © 2016, Juniper Networks, Inc.

```
      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
```


Copyright © 2016, Juniper Networks, Inc.

```
      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
```


Copyright © 2016, Juniper Networks, Inc.

```
      SIB 0                          OK         41 degrees C / 105 degrees F
      SIB 0 (B)                      OK         34 degrees C / 93 degrees F
      SIB 1                          OK         0 degrees C / 32 degrees F
      SIB 1 (B)                      OK         0 degrees C / 32 degrees F
      SIB 2                          OK         0 degrees C / 32 degrees F
      SIB 2 (B)                      OK         0 degrees C / 32 degrees F
      SIB 3                          OK         0 degrees C / 32 degrees F
      SIB 3 (B)                      OK         0 degrees C / 32 degrees F
      SIB 4                          OK         0 degrees C / 32 degrees F
      SIB 4 (B)                      OK         0 degrees C / 32 degrees F
      FPC 0 Top                      OK         49 degrees C / 120 degrees F
      FPC 0 Bottom                   OK         50 degrees C / 122 degrees F
      FPC 1 Top                      OK         48 degrees C / 118 degrees F
      FPC 1 Bottom                   OK         49 degrees C / 120 degrees F
      FPM GBUS                       OK         27 degrees C / 80 degrees F
      FPM Display                    OK         30 degrees C / 86 degrees F
Fans  Top Left Front fan             OK         Spinning at normal speed
      Top Left Middle fan            OK         Spinning at normal speed
      Top Left Rear fan              OK         Spinning at normal speed
      Top Right Front fan            OK         Spinning at normal speed
      Top Right Middle fan           OK         Spinning at normal speed
      Top Right Rear fan             OK         Spinning at normal speed
      Bottom Left Front fan          OK         Spinning at normal speed
      Bottom Left Middle fan         OK         Spinning at normal speed
      Bottom Left Rear fan           OK         Spinning at normal speed
      Bottom Right Front fan         OK         Spinning at normal speed
      Bottom Right Middle fan        OK         Spinning at normal speed
      Bottom Right Rear fan          OK         Spinning at normal speed
      Rear Tray Top fan              OK         Spinning at normal speed
      Rear Tray Second fan           OK         Spinning at normal speed
      Rear Tray Third fan            OK         Spinning at normal speed
      Rear Tray Fourth fan           OK         Spinning at normal speed
      Rear Tray Fifth fan            OK         Spinning at normal speed
      Rear Tray Sixth fan            OK         Spinning at normal speed
      Rear Tray Seventh fan          OK         Spinning at normal speed
      Rear Tray Bottom fan           OK         Spinning at normal speed
Misc  CIP                            OK
      SPMB 0                         OK
      SPMB 1                         OK
```

show chassis environment (TX Matrix Plus router with 3D SIBs)

```
user@host> show chassis environment
sfc0-re0:
--------------------------------------------------------------------------
Class Item                           Status     Measurement
Temp  PEM 0                          Check      30 degrees C / 86 degrees F
      PEM 1                          OK         33 degrees C / 91 degrees F
      Routing Engine 0               OK         28 degrees C / 82 degrees F
      Routing Engine 0 CPU           OK         42 degrees C / 107 degrees F
      Routing Engine 1               OK         29 degrees C / 84 degrees F
      Routing Engine 1 CPU           OK         44 degrees C / 111 degrees F
      CB 0 Intake                    OK         30 degrees C / 86 degrees F
      CB 0 Exhaust A                 OK         28 degrees C / 82 degrees F
      CB 0 Exhaust B                 OK         30 degrees C / 86 degrees F
      CB 1 Intake                    OK         31 degrees C / 87 degrees F
      CB 1 Exhaust A                 OK         27 degrees C / 80 degrees F
      CB 1 Exhaust B                 OK         31 degrees C / 87 degrees F
      SIB F13 0 Board                OK         44 degrees C / 111 degrees F
      SIB F13 0 XF Junction          OK         62 degrees C / 143 degrees F
      SIB F13 3 Board                OK         45 degrees C / 113 degrees F
```

```
        SIB F13 3 XF Junction          OK         60 degrees C / 140 degrees F
        SIB F13 6 Board                OK         47 degrees C / 116 degrees F
        SIB F13 6 XF Junction          OK         62 degrees C / 143 degrees F
        SIB F2S 0/0 Board              OK         32 degrees C / 89 degrees F
        SIB F2S 0/0 XF Junction        OK         42 degrees C / 107 degrees F
        SIB F2S 0/2 Board              OK         31 degrees C / 87 degrees F
        SIB F2S 0/2 XF Junction        OK         41 degrees C / 105 degrees F
        SIB F2S 0/4 Board              OK         31 degrees C / 87 degrees F
        SIB F2S 0/4 XF Junction        OK         42 degrees C / 107 degrees F
        SIB F2S 0/6 Board              OK         31 degrees C / 87 degrees F
        SIB F2S 0/6 XF Junction        OK         41 degrees C / 105 degrees F
        SIB F2S 1/0 Board              OK         31 degrees C / 87 degrees F
        SIB F2S 1/0 XF Junction        OK         41 degrees C / 105 degrees F
        SIB F2S 1/2 Board              OK         29 degrees C / 84 degrees F
        SIB F2S 1/2 XF Junction        OK         39 degrees C / 102 degrees F
        SIB F2S 1/4 Board              OK         29 degrees C / 84 degrees F
        SIB F2S 1/4 XF Junction        OK         35 degrees C / 95 degrees F
        SIB F2S 1/6 Board              OK         30 degrees C / 86 degrees F
        SIB F2S 1/6 XF Junction        OK         41 degrees C / 105 degrees F
        SIB F2S 2/0 Board              OK         30 degrees C / 86 degrees F
        SIB F2S 2/0 XF Junction        OK         42 degrees C / 107 degrees F
        SIB F2S 2/2 Board              OK         28 degrees C / 82 degrees F
        SIB F2S 2/2 XF Junction        OK         39 degrees C / 102 degrees F
        SIB F2S 2/4 Board              OK         29 degrees C / 84 degrees F
        SIB F2S 2/4 XF Junction        OK         42 degrees C / 107 degrees F
        SIB F2S 2/6 Board              OK         29 degrees C / 84 degrees F
        SIB F2S 2/6 XF Junction        OK         41 degrees C / 105 degrees F
        CIP 0 Intake                   OK         25 degrees C / 77 degrees F
        CIP 0 Exhaust A                OK         26 degrees C / 78 degrees F
        CIP 0 Exhaust B                OK         26 degrees C / 78 degrees F
        CIP 1 Intake                   OK         26 degrees C / 78 degrees F
        CIP 1 Exhaust A                OK         27 degrees C / 80 degrees F
        CIP 1 Exhaust B                OK         27 degrees C / 80 degrees F
Fans    Fan Tray 0 Fan 1               OK         Spinning at normal speed
        Fan Tray 0 Fan 2               OK         Spinning at normal speed
        Fan Tray 0 Fan 3               OK         Spinning at normal speed
        Fan Tray 0 Fan 4               OK         Spinning at normal speed
        Fan Tray 0 Fan 5               OK         Spinning at normal speed
        Fan Tray 0 Fan 6               OK         Spinning at normal speed
        Fan Tray 1 Fan 1               OK         Spinning at normal speed
        Fan Tray 1 Fan 2               OK         Spinning at normal speed
        Fan Tray 1 Fan 3               OK         Spinning at normal speed
        Fan Tray 1 Fan 4               OK         Spinning at normal speed
        Fan Tray 1 Fan 5               OK         Spinning at normal speed
        Fan Tray 1 Fan 6               OK         Spinning at normal speed
        Fan Tray 2 Fan 1               OK         Spinning at normal speed
        Fan Tray 2 Fan 2               OK         Spinning at normal speed
        Fan Tray 2 Fan 3               OK         Spinning at normal speed
        Fan Tray 2 Fan 4               OK         Spinning at normal speed
        Fan Tray 2 Fan 5               OK         Spinning at normal speed
        Fan Tray 2 Fan 6               OK         Spinning at normal speed
        Fan Tray 2 Fan 7               OK         Spinning at normal speed
        Fan Tray 2 Fan 8               OK         Spinning at normal speed
        Fan Tray 2 Fan 9               OK         Spinning at normal speed
        Fan Tray 3 Fan 1               OK         Spinning at normal speed
        Fan Tray 3 Fan 2               OK         Spinning at normal speed
        Fan Tray 3 Fan 3               OK         Spinning at normal speed
        Fan Tray 3 Fan 4               OK         Spinning at normal speed
        Fan Tray 3 Fan 5               OK         Spinning at normal speed
        Fan Tray 3 Fan 6               OK         Spinning at normal speed
        Fan Tray 3 Fan 7               OK         Spinning at normal speed
```


Copyright © 2016, Juniper Networks, Inc.

```
      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
```


Copyright © 2016, Juniper Networks, Inc.

```
      CB 1 Intake                    OK         22 degrees C / 71 degrees F
      CB 1 Exhaust                   OK         25 degrees C / 77 degrees F
      FPC 4 Intake                   OK         49 degrees C / 120 degrees F
      FPC 4 Exhaust                  OK         59 degrees C / 138 degrees F
      SIB 5 Intake                   OK         25 degrees C / 77 degrees F
      SIB 5 Exhaust                  OK         35 degrees C / 95 degrees F
      SIB 6 Intake                   OK         25 degrees C / 77 degrees F
      SIB 6 Exhaust                  OK         38 degrees C / 100 degrees F
Fans  Top Fan 1                      OK         Spinning at normal speed
      Top Fan 2                      OK         Spinning at normal speed
      Top Fan 3                      OK         Spinning at normal speed
      Top Fan 4                      OK         Spinning at normal speed
      Top Fan 5                      OK         Spinning at normal speed
      Top Fan 6                      OK         Spinning at normal speed
      Top Fan 7                      OK         Spinning at normal speed
      Top Fan 8                      OK         Spinning at normal speed
      Top Fan 9                      OK         Spinning at normal speed
      Bottom Fan 1                   OK         Spinning at normal speed
      Bottom Fan 2                   OK         Spinning at normal speed
      Bottom Fan 3                   OK         Spinning at normal speed
      Bottom Fan 4                   OK         Spinning at normal speed
      Bottom Fan 5                   OK         Spinning at normal speed
      Bottom Fan 6                   OK         Spinning at normal speed
      Bottom Fan 7                   OK         Spinning at normal speed
      Bottom Fan 8                   OK         Spinning at normal speed
      Bottom Fan 9                   OK         Spinning at normal speed
```

show chassis environment (EX9200 Switch)

```
user@switch> show chassis environment
Class Item                           Status     Measurement
Temp  PEM 0                          Check
      PEM 1                          OK         40 degrees C / 104 degrees F
      PEM 2                          OK         40 degrees C / 104 degrees F
      PEM 3                          Absent
      Routing Engine 0               OK         35 degrees C / 95 degrees F
      Routing Engine 0 CPU           OK         33 degrees C / 91 degrees F
      Routing Engine 1               OK         38 degrees C / 100 degrees F
      Routing Engine 1 CPU           OK         33 degrees C / 91 degrees F
      CB 0 Intake                    OK         35 degrees C / 95 degrees F
      CB 0 Exhaust A                 OK         33 degrees C / 91 degrees F
      CB 0 Exhaust B                 OK         40 degrees C / 104 degrees F
      CB 0 ACBC                      OK         39 degrees C / 102 degrees F
      CB 0 XF A                      OK         49 degrees C / 120 degrees F
      CB 0 XF B                      OK         46 degrees C / 114 degrees F
      CB 1 Intake                    OK         37 degrees C / 98 degrees F
      CB 1 Exhaust A                 OK         32 degrees C / 89 degrees F
      CB 1 Exhaust B                 OK         39 degrees C / 102 degrees F
      CB 1 ACBC                      OK         41 degrees C / 105 degrees F
      CB 1 XF A                      OK         49 degrees C / 120 degrees F
      CB 1 XF B                      OK         49 degrees C / 120 degrees F
      FPC 2 Intake                   OK         37 degrees C / 98 degrees F
      FPC 2 Exhaust A                OK         40 degrees C / 104 degrees F
      FPC 2 Exhaust B                OK         34 degrees C / 93 degrees F
      FPC 2 LU 0 TCAM TSen           OK         44 degrees C / 111 degrees F
      FPC 2 LU 0 TCAM Chip           OK         48 degrees C / 118 degrees F
      FPC 2 LU 0 TSen                OK         44 degrees C / 111 degrees F
      FPC 2 LU 0 Chip                OK         60 degrees C / 140 degrees F
      FPC 2 MQ 0 TSen                OK         44 degrees C / 111 degrees F
      FPC 2 MQ 0 Chip                OK         51 degrees C / 123 degrees F
      FPC 3 Intake                   OK         39 degrees C / 102 degrees F
```

```
      FPC 3 Exhaust A                OK         51 degrees C / 123 degrees F

[...Output truncated...]

     Fans  Top Rear Fan              OK         Spinning at intermediate-speed
     Bottom Rear Fan                 OK         Spinning at intermediate-speed
     Top Middle Fan                  OK         Spinning at intermediate-speed
     Bottom Middle Fan               OK         Spinning at intermediate-speed
     Top Front Fan                   OK         Spinning at intermediate-speed
     Bottom Front Fan                OK         Spinning at intermediate-speed
```

show chassis environment (QFX Series and OCX Series)

```
user@switch> show chassis environment
Class Item                           Status     Measurement
Power FPC 0 Power Supply 0           OK
      FPC 0 Power Supply 1           OK
Temp  FPC 0 Sensor TopLeft I         OK         26 degrees C / 78 degrees F
      FPC 0 Sensor TopRight I        OK         24 degrees C / 75 degrees F
      FPC 0 Sensor TopLeft E         OK         30 degrees C / 86 degrees F
      FPC 0 Sensor TopRight E        OK         30 degrees C / 86 degrees F
      FPC 0 Sensor TopMiddle I       OK         30 degrees C / 86 degrees F
      FPC 0 Sensor TopMiddle E       OK         38 degrees C / 100 degrees F
      FPC 0 Sensor Bottom I          OK         34 degrees C / 93 degrees F
      FPC 0 Sensor Bottom E          OK         38 degrees C / 100 degrees F
      FPC 0 Sensor Die Temp          OK         38 degrees C / 100 degrees F
      FPC 0 Sensor Mgmnt Brd I       OK         24 degrees C / 75 degrees F
      FPC 0 Sensor Switch I          OK         28 degrees C / 82 degrees F
Fans  FPC 0 Fan 1 (left)             Failed
      FPC 0 Fan 2 (right)            OK         Spinning at normal speed
      FPC 0 Fan 3 (middle)           OK         Spinning at normal speed
```

show chassis environment interconnect-device (QFabric System)

```
user@switch> show chassis environment interconnect-device IC-A0004
Class Item                           Status     Measurement
      CB 0
      CB 0 L Intake                  OK         30 degrees C / 86 degrees F
      CB 0 R Intake                  OK         31 degrees C / 87 degrees F
      CB 0 L Exhaust                 OK         32 degrees C / 89 degrees F
      CB 0 R Exhaust                 OK         33 degrees C / 91 degrees F
      Routing Engine 0 CPU temp      OK         51 degrees C / 123 degrees F
      CB 1
      CB 1 L Intake                  OK         27 degrees C / 80 degrees F
      CB 1 R Intake                  OK         29 degrees C / 84 degrees F
      CB 1 L Exhaust                 OK         31 degrees C / 87 degrees F
      CB 1 R Exhaust                 OK         32 degrees C / 89 degrees F
      Routing Engine 1 CPU temp      OK         40 degrees C / 104 degrees F
      FC 0 FPC 0
      FPC 0 L Intake                 OK         25 degrees C / 77 degrees F
      FPC 0 R Intake                 OK         28 degrees C / 82 degrees F
      FPC 0 L Exhaust                OK         28 degrees C / 82 degrees F
      FPC 0 R Exhaust                OK         29 degrees C / 84 degrees F
      FC 7 FPC 7
      FPC 7 L Intake                 OK         25 degrees C / 77 degrees F
      FPC 7 R Intake                 OK         26 degrees C / 78 degrees F
      FPC 7 L Exhaust                OK         28 degrees C / 82 degrees F
      FPC 7 R Exhaust                OK         29 degrees C / 84 degrees F
      RC 0 FPC 8
      FPC 8 L Intake                 OK         25 degrees C / 77 degrees F
      FPC 8 R Intake                 OK         26 degrees C / 78 degrees F
```


Copyright © 2016, Juniper Networks, Inc.

```
      FPC 8 L Exhaust                OK         32 degrees C / 89 degrees F
      FPC 8 R Exhaust                OK         30 degrees C / 86 degrees F
      RC 7 FPC 15
      FPC 15 L Intake                OK         24 degrees C / 75 degrees F
      FPC 15 R Intake                OK         25 degrees C / 77 degrees F
      FPC 15 L Exhaust               OK         33 degrees C / 91 degrees F
      FPC 15 R Exhaust               OK         31 degrees C / 87 degrees F
Fans  TFT 0 Fan 0                    OK         Spinning at normal speed
Fans  TFT 0 Fan 1                    OK         Spinning at normal speed
Fans  TFT 0 Fan 2                    OK         Spinning at normal speed
Fans  TFT 0 Fan 3                    OK         Spinning at normal speed
Fans  TFT 0 Fan 4                    OK         Spinning at normal speed
Fans  TFT 0 Fan 5                    OK         Spinning at normal speed
Fans  BFT 1 Fan 0                    OK         Spinning at normal speed
Fans  BFT 1 Fan 1                    OK         Spinning at normal speed
Fans  BFT 1 Fan 2                    OK         Spinning at normal speed
Fans  BFT 1 Fan 3                    Check
Fans  BFT 1 Fan 4                    OK         Spinning at normal speed
Fans  BFT 1 Fan 5                    OK         Spinning at normal speed
Fans  SFT 0 Fan 0 Rotor 0            OK         Spinning at normal speed
Fans  SFT 0 Fan 0 Rotor 1            OK         Spinning at normal speed
Fans  SFT 0 Fan 1 Rotor 0            OK         Spinning at normal speed
Fans  SFT 0 Fan 1 Rotor 1            OK         Spinning at normal speed
Fans  SFT 0 Fan 2 Rotor 0            OK         Spinning at normal speed
Fans  SFT 0 Fan 2 Rotor 1            OK         Spinning at normal speed
Fans  SFT 0 Fan 3 Rotor 0            OK         Spinning at normal speed
Fans  SFT 0 Fan 3 Rotor 1            OK         Spinning at normal speed
Fans  SFT 1 Fan 0 Rotor 0            OK         Spinning at normal speed
Fans  SFT 1 Fan 0 Rotor 1            OK         Spinning at normal speed
Fans  SFT 1 Fan 1 Rotor 0            OK         Spinning at normal speed
Fans  SFT 1 Fan 1 Rotor 1            OK         Spinning at normal speed
Fans  SFT 1 Fan 2 Rotor 0            OK         Spinning at normal speed
Fans  SFT 1 Fan 2 Rotor 1            OK         Spinning at normal speed
Fans  SFT 1 Fan 3 Rotor 0            OK         Spinning at normal speed
Fans  SFT 1 Fan 3 Rotor 1            OK         Spinning at normal speed
Fans  SFT 2 Fan 0 Rotor 0            OK         Spinning at normal speed
Fans  SFT 2 Fan 0 Rotor 1            OK         Spinning at normal speed
Fans  SFT 2 Fan 1 Rotor 0            OK         Spinning at normal speed
Fans  SFT 2 Fan 1 Rotor 1            OK         Spinning at normal speed
Fans  SFT 2 Fan 2 Rotor 0            OK         Spinning at normal speed
Fans  SFT 2 Fan 2 Rotor 1            OK         Spinning at normal speed
Fans  SFT 2 Fan 3 Rotor 0            OK         Spinning at normal speed
Fans  SFT 2 Fan 3 Rotor 1            OK         Spinning at normal speed
Fans  SFT 3 Fan 0 Rotor 0            OK         Spinning at normal speed
Fans  SFT 3 Fan 0 Rotor 1            OK         Spinning at normal speed
Fans  SFT 3 Fan 1 Rotor 0            OK         Spinning at normal speed
Fans  SFT 3 Fan 1 Rotor 1            OK         Spinning at normal speed
Fans  SFT 3 Fan 2 Rotor 0            OK         Spinning at normal speed
Fans  SFT 3 Fan 2 Rotor 1            OK         Spinning at normal speed
Fans  SFT 3 Fan 3 Rotor 0            OK         Spinning at normal speed
Fans  SFT 3 Fan 3 Rotor 1            OK         Spinning at normal speed
Fans  SFT 4 Fan 0 Rotor 0            OK         Spinning at normal speed
Fans  SFT 4 Fan 0 Rotor 1            OK         Spinning at normal speed
Fans  SFT 4 Fan 1 Rotor 0            OK         Spinning at normal speed
Fans  SFT 4 Fan 1 Rotor 1            OK         Spinning at normal speed
Fans  SFT 4 Fan 2 Rotor 0            OK         Spinning at normal speed
Fans  SFT 4 Fan 2 Rotor 1            OK         Spinning at normal speed
Fans  SFT 4 Fan 3 Rotor 0            OK         Spinning at normal speed
Fans  SFT 4 Fan 3 Rotor 1            OK         Spinning at normal speed
Fans  SFT 5 Fan 0 Rotor 0            OK         Spinning at normal speed
Fans  SFT 5 Fan 0 Rotor 1            OK         Spinning at normal speed
```

```
Fans  SFT 5 Fan 1 Rotor 0            OK         Spinning at normal speed
Fans  SFT 5 Fan 1 Rotor 1            OK         Spinning at normal speed
Fans  SFT 5 Fan 2 Rotor 0            OK         Spinning at normal speed
Fans  SFT 5 Fan 2 Rotor 1            OK         Spinning at normal speed
Fans  SFT 5 Fan 3 Rotor 0            OK         Spinning at normal speed
Fans  SFT 5 Fan 3 Rotor 1            OK         Spinning at normal speed
Fans  SFT 6 Fan 0 Rotor 0            OK         Spinning at normal speed
Fans  SFT 6 Fan 0 Rotor 1            OK         Spinning at normal speed
Fans  SFT 6 Fan 1 Rotor 0            OK         Spinning at normal speed
Fans  SFT 6 Fan 1 Rotor 1            OK         Spinning at normal speed
Fans  SFT 6 Fan 2 Rotor 0            OK         Spinning at normal speed
Fans  SFT 6 Fan 2 Rotor 1            OK         Spinning at normal speed
Fans  SFT 6 Fan 3 Rotor 0            OK         Spinning at normal speed
Fans  SFT 6 Fan 3 Rotor 1            OK         Spinning at normal speed
Fans  SFT 7 Fan 0 Rotor 0            OK         Spinning at normal speed
Fans  SFT 7 Fan 0 Rotor 1            OK         Spinning at normal speed
Fans  SFT 7 Fan 1 Rotor 0            OK         Spinning at normal speed
Fans  SFT 7 Fan 1 Rotor 1            OK         Spinning at normal speed
Fans  SFT 7 Fan 2 Rotor 0            OK         Spinning at normal speed
Fans  SFT 7 Fan 2 Rotor 1            OK         Spinning at normal speed
Fans  SFT 7 Fan 3 Rotor 0            OK         Spinning at normal speed
Fans  SFT 7 Fan 3 Rotor 1            OK         Spinning at normal speed
Power PEM 0                          OK         30 degrees C / 86 degrees F
Power PEM 1                          OK         30 degrees C / 86 degrees F
Power PEM 2                          OK         30 degrees C / 86 degrees F
Power PEM 3                          Absent
Power PEM 4                          Absent
Power PEM 5                          Absent
```

show chassis environment node-device (QFabric System)

```
user@switch> show chassis environment node-device node1
Class Item                           Status     Measurement
Power node1 Power Supply 0            Absent
      node1 Power Supply 1            Absent
Fans  node1 Fan Tray 0                Testing
      node1 Fan Tray 1                Testing
      node1 Fan Tray 2                Testing
```

show chassis environment pem node-device (QFabric System)

```
user@switch> show chassis environment pem node-device node1
FPC 0 PEM 0 status:
  State                      Check
  Airflow                    Front to Back
  Temperature                OK
  AC Input:                  OK
  DC Output           Voltage(V) Current(A)  Power(W)  Load(%)
                          12        10            120      18
FPC 0 PEM 1 status:
  State                      Online
  Airflow                    Back to Front
  Temperature                OK
  AC Input:                  OK
  DC Output           Voltage(V) Current(A)  Power(W)  Load(%)
                          11        10           110      17
```

show chassis environment (PTX5000 Packet Transport Router)

```
user@host> show chassis environment
Class Item                           Status     Measurement
Temp  PDU 0                          OK
```


Copyright © 2016, Juniper Networks, Inc.

```
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
```


Copyright © 2016, Juniper Networks, Inc.

```
      Fan Tray 0 Fan 9                OK          3042 RPM
      Fan Tray 0 Fan 10               OK          3085 RPM
      Fan Tray 0 Fan 11               OK          3085 RPM
      Fan Tray 0 Fan 12               OK          3128 RPM
      Fan Tray 0 Fan 13               OK          3128 RPM
      Fan Tray 0 Fan 14               OK          3042 RPM
      Fan Tray 1 Fan 1                OK          2299 RPM
      Fan Tray 1 Fan 2                OK          2399 RPM
      Fan Tray 1 Fan 3                OK          2299 RPM
      Fan Tray 1 Fan 4                OK          2266 RPM
      Fan Tray 1 Fan 5                OK          2266 RPM
      Fan Tray 1 Fan 6                OK          2366 RPM
      Fan Tray 2 Fan 1                OK          2199 RPM
      Fan Tray 2 Fan 2                OK          2133 RPM
      Fan Tray 2 Fan 3                OK          2366 RPM
      Fan Tray 2 Fan 4                OK          2233 RPM
      Fan Tray 2 Fan 5                OK          2399 RPM
      Fan Tray 2 Fan 6                OK          2233 RPM
Misc  SPMB 0 Intake                   OK          50 degrees C / 122 degrees F
      SPMB 1 Intake                   OK          40 degrees C / 104 degrees F
```

show chassis environment (PTX5000 Packet Transport Router with FPC2-PTX-P1A)

```
user@host> show chassis environment
Class Item                            Status     Measurement
Temp  PDU 0                           OK
      PDU 0 PSM 0                     OK         41 degrees C / 105 degrees F
      PDU 0 PSM 1                     Absent
      PDU 0 PSM 2                     OK         43 degrees C / 109 degrees F
      PDU 0 PSM 3                     Absent
      PDU 0 PSM 4                     OK         44 degrees C / 111 degrees F
      PDU 0 PSM 5                     Absent
      PDU 0 PSM 6                     OK         45 degrees C / 113 degrees F
      PDU 0 PSM 7                     Absent
      PDU 1                           OK
      PDU 1 PSM 0                     Absent
      PDU 1 PSM 1                     OK         45 degrees C / 113 degrees F
      PDU 1 PSM 2                     Absent
      PDU 1 PSM 3                     OK         43 degrees C / 109 degrees F
      PDU 1 PSM 4                     Absent
      PDU 1 PSM 5                     OK         46 degrees C / 114 degrees F
      PDU 1 PSM 6                     Absent
      PDU 1 PSM 7                     OK         46 degrees C / 114 degrees F
      CCG 0                           OK         27 degrees C / 80 degrees F
      CCG 1                           OK         29 degrees C / 84 degrees F
...
```

show chassis environment (PTX1000 Packet Transport Router)

```
user@host> show chassis environment
Class Item                            Status     Measurement
Power FPC 0 Power Supply 0            Absent
      FPC 0 Power Supply 1            Absent
      FPC 0 Power Supply 2            OK
      FPC 0 Power Supply 3            OK
Temp  FPC 0 Intake Temp Sensor        OK         25 degrees C / 77 degrees F
      FPC 0 Exhaust Temp Sensor       OK         35 degrees C / 95 degrees F
      FPC 0 Mezz Temp Sensor 0        OK         25 degrees C / 77 degrees F
      FPC 0 Mezz Temp Sensor 1        OK         34 degrees C / 93 degrees F
      FPC 0 PE2 Temp Sensor           OK         34 degrees C / 93 degrees F
      FPC 0 PE1 Temp Sensor           OK         32 degrees C / 89 degrees F
```

```
      FPC 0 PF0 Temp Sensor          OK         40 degrees C / 104 degrees F
      FPC 0 PE0 Temp Sensor          OK         33 degrees C / 91 degrees F
      FPC 0 PE5 Temp Sensor          OK         34 degrees C / 93 degrees F
      FPC 0 PE4 Temp Sensor          OK         34 degrees C / 93 degrees F
      FPC 0 PF1 Temp Sensor          OK         41 degrees C / 105 degrees F
      FPC 0 PE3 Temp Sensor          OK         36 degrees C / 96 degrees F
      FPC 0 CPU Die Temp Sensor      OK         40 degrees C / 104 degrees F
      FPC 0 OCXO Temp Sensor         OK         37 degrees C / 98 degrees F
Fans  FPC 0 Fan Tray 0               OK         Spinning at normal speed
      FPC 0 Fan Tray 1               OK         Spinning at normal speed
      FPC 0 Fan Tray 2               OK         Spinning at normal speed
```

show chassis environment (ACX2000 Universal Access Router)

```
user@host> show chassis environment
Class Item                           Status     Measurement
      PCB Left                       OK         44 degrees C / 111 degrees F
      SFP+ Xcvr                      OK         50 degrees C / 122 degrees F
      FEB                            OK         70 degrees C / 158 degrees F
      PCB Up                         OK         63 degrees C / 145 degrees F
      PCB Mid                        OK         66 degrees C / 150 degrees F
      Telecom Mod                    OK         65 degrees C / 149 degrees F
      Routing Engine                 OK         54 degrees C / 129 degrees F
      Heater off
```

show chassis environment (ACX4000 Universal Access Router)

On the ACX4000 router, the MIC output of the **show chassis environment** command varies depending on the number of temperature channels present in the installed MIC.

```
user@host> show chassis environment

Class Item                           Status     Measurement
Temp  PEM 0                          OK         33 degrees C / 91 degrees F
      PEM 1                          Absent
      PCB Bottom                     OK         30 degrees C / 86 degrees F
      PCB Middle                     OK         34 degrees C / 93 degrees F
      BCM56445                       OK         33 degrees C / 91 degrees F
      SFP+ Xcvr                      OK         32 degrees C / 89 degrees F
      Fan tray inlet                 OK         39 degrees C / 102 degrees F
      Exhaust                        OK         30 degrees C / 86 degrees F
      Routing Engine                 OK         32 degrees C / 89 degrees F
      Heater off
Pic   PIC 0/0 Channel 0              OK         28 degrees C / 82 degrees F
      PIC 0/0 Channel 1              OK         29 degrees C / 84 degrees F
      PIC 0/0 Channel 2              OK         0 degrees C / 32 degrees F
      PIC 0/0 Channel 3              OK         0 degrees C / 32 degrees F
      PIC 0/0 Channel 4              OK         0 degrees C / 32 degrees F
      PIC 0/0 Channel 5              OK         0 degrees C / 32 degrees F
      PIC 0/0 Channel 6              OK         0 degrees C / 32 degrees F
      PIC 0/0 Channel 7              OK         0 degrees C / 32 degrees F
      PIC 0/0 Channel 8              OK         0 degrees C / 32 degrees F
      PIC 0/0 Channel 9              OK         0 degrees C / 32 degrees F
      PIC 1/0 Channel 0              OK         33 degrees C / 91 degrees F
      PIC 1/0 Channel 1              OK         31 degrees C / 87 degrees F
      PIC 1/0 Channel 2              OK         30 degrees C / 86 degrees F
      PIC 1/0 Channel 3              OK         0 degrees C / 32 degrees F
      PIC 1/0 Channel 4              OK         0 degrees C / 32 degrees F
      PIC 1/0 Channel 5              OK         0 degrees C / 32 degrees F
      PIC 1/0 Channel 6              OK         0 degrees C / 32 degrees F
      PIC 1/0 Channel 7              OK         0 degrees C / 32 degrees F
```


Copyright © 2016, Juniper Networks, Inc.

```
      PIC 1/0 Channel 8              OK         0 degrees C / 32 degrees F
      PIC 1/1 Channel 0              OK         31 degrees C / 87 degrees F
      PIC 1/1 Channel 1              OK         29 degrees C / 84 degrees F
      PIC 1/1 Channel 2              OK         28 degrees C / 82 degrees F
      PIC 1/1 Channel 3              OK         0 degrees C / 32 degrees F
      PIC 1/1 Channel 4              OK         0 degrees C / 32 degrees F
      PIC 1/1 Channel 5              OK         0 degrees C / 32 degrees F
      PIC 1/1 Channel 6              OK         0 degrees C / 32 degrees F
      PIC 1/1 Channel 7              OK         0 degrees C / 32 degrees F
      PIC 1/1 Channel 8              OK         0 degrees C / 32 degrees F
Fans  Fan 1                          OK         Spinning at normal speed
      Fan 2                          OK         Spinning at normal speed
```

show chassis environment fpc

List of Syntax

Syntax on page 550
Syntax (TX Matrix and TX Matrix Plus Routers) on page 550
Syntax (MX Series Routers) on page 550
Syntax (MX2010 3D Universal Edge Routers) on page 550
Syntax (MX2020 3D Universal Edge Routers) on page 550
Syntax (QFX Series) on page 550
Syntax (OCX Series) on page 550
Syntax (PTX3000 Series) on page 550

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 *member-id*>

Syntax (MX2010 3D Universal Edge Routers)

show chassis environment fpc
<*slot*>

Syntax (MX2020 3D Universal Edge Routers)

show chassis environment fpc
<*slot*>
<satellite [slot-id *slot-id* |device-alias *alias-name*]

Syntax (QFX Series)

show chassis environment fpc
<fpc-slot>
interconnect-device *name*

Syntax (OCX Series)

show chassis environment fpc
<fpc-slot>

Syntax (PTX3000 Series)

show chassis environment fpc
<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 12.1 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.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Copyright © 2016, Juniper Networks, Inc.

satellite option introduced in Junos OS Release 14.2R3.

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 ***name***—(QFabric systems only) (Optional) Display chassis environmental information for the Interconnect device.

lcc ***number***—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(MX Series routers only) (Optional) Display environmental information for the FPCs in the local Virtual Chassis member.

member ***member-id***—(MX Series routers only) (Optional) Display environmental information for the FPCs in the specified member of the Virtual Chassis configuration. Replace ***member-id*** with a value of 0 or 1.

satellite [slot-id ***slot-id*** **| device-alias** ***alias-name*****]**—(Junos Fusion only)(Optional) Display environmental information for the FPCs in the specified satellite device in a Junos Fusion, or for all satellite devices in the Junos Fusion if no satellite devices are specified.

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 Rotuing 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.
- PTX3000 Packet Transport Router—Replace ***fpc-slot*** with 0 through 15.

Required Privilege Level view

Related Documentation

- request chassis fpc on page 345
- show chassis fpc on page 616
- *show chassis fpc-feb-connectivity*
- *Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online*
- *MX960 Flexible PIC Concentrator Description*

List of Sample Output

show chassis environment fpc (M120 Router) on page 554
show chassis environment fpc (M160 Router) on page 555
show chassis environment fpc (M320 Router) on page 556
show chassis environment fpc (MX2020 Router) on page 556

 Copyright © 2016, Juniper Networks, Inc.

show chassis environment fpc (MX2010 Router) on page 559
show chassis environment fpc (MX240 Router) on page 562
show chassis environment fpc (MX480 Router) on page 563
show chassis environment fpc (MX960 Router) on page 563
show chassis environment fpc (MX480 Router with 100-Gigabit Ethernet CFP) on page 564
show chassis environment fpc (MX240, MX480, MX960 with Application Services Modular Line Card on page 566
show chassis environment fpc (T320, T640, and T1600 Routers) on page 566
show chassis environment fpc (T4000 Router) on page 567
show chassis environment fpc lcc (TX Matrix Router) on page 572
show chassis environment fpc lcc (TX Matrix Plus Router) on page 572
show chassis environment fpc (QFX Series and OCX Series) on page 573
show chassis environment fpc interconnect-device (QFabric Systems) on page 573
show chassis environment fpc 5(PTX3000 Packet Transport Router) on page 574
show chassis environment fpc 0 (PTX5000 Packet Transport Router) on page 574
show chassis environment fpc 07 (PTX5000 Packet Transport Router with FPC2-PTX-P1A) on page 575
show chassis environment FPC 1 (MX Routers with Media Services Blade [MSB]) on page 576

Output Fields Table 30 on page 553 lists the output fields for the **show chassis environment fpc** command. Output fields are listed in the approximate order in which they appear.

Table 30: show chassis environment fpc Output Fields

Field Name	Field Description
State	Status of the FPC: • **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). The PTX5000 Packet Transport Router with FPC2-PTX-P1A include multiple temperatures for PMB (**TEMP0** and **TEMP1**).
PMB CPU Temperature	(PTX5000 Packet Transport Router with FPC2-PTX-P1A only) Temperature of the air flowing past the PMB CPU.

Table 30: show chassis environment fpc Output Fields *(continued)*

Field Name	Field Description
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	(M120 and M320 routers, MX2010 routers, MX2020 routers, and PTX Series only) Temperature of the air flowing out of the chassis. The PTX Series Packet Transport Routers, and the MX2010 and MX2020 routers include exhaust temperatures for multiple zones (**Exhaust A** and **Exhaust B**).
Temperature Bottom	(T Series routers only) Temperature of the air flowing past the bottom of the FPC.
TL *n* Temperature	(PTX Series only) Temperature of the air flowing past the specified TL area of the packet forwarding engine (PFE) on the FPC.
TQ *n* 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
```


Copyright © 2016, Juniper Networks, Inc.

```
  Temperature Exhaust A      31 degrees C / 87 degrees F
  Temperature Exhaust B      33 degrees C / 91 degrees F
  Power A-Board
    1.2 V                     1211 mV
    1.5 V                     1501 mV
    1.8 V                     1798 mV
    2.5 V                     2471 mV
    3.3 V                     3293 mV
    5.0 V                     4930 mV
    3.3 V bias                3296 mV
    1.2 V Rocket IO           1205 mV
    1.5 V Rocket IO           1501 mV
  Power B-Board
    1.2 V                     1214 mV
    1.5 V                     1501 mV
    2.5 V                     2471 mV
    3.3 V                     3300 mV
    5.0 V                     4943 mV
    3.3 V bias                3296 mV
    1.2 V Rocket IO           1205 mV
    1.5 V Rocket IO           1501 mV
  I2C Slave Revision         12
FPC 4 status:
  State                      Online
  Temperature Exhaust A      32 degrees C / 89 degrees F
  Temperature Exhaust B      30 degrees C / 86 degrees F
  Power A-Board
    1.2 V                     1195 mV
    1.5 V                     1504 mV
    1.8 V                     1801 mV
    2.5 V                     2504 mV
    3.3 V                     3293 mV
    5.0 V                     4917 mV
    3.3 V bias                3296 mV
    1.2 V Rocket IO           1202 mV
    1.5 V Rocket IO           1492 mV
  I2C Slave Revision         12
```

show chassis environment fpc (M160 Router)

```
user@host> show chassis environment fpc
FPC 0 status:
  State                        Online
  Temperature               42 degrees C / 107 degrees F
  Power:
    1.5 V                 1500 mV
    2.5 V                 2509 mV
    3.3 V                 3308 mV
    5.0 V                 4991 mV
    5.0 V bias            4952 mV
    8.0 V bias            8307 mV
  CMB Revision              12
FPC 1 status:
  State                        Online
  Temperature               45 degrees C / 113 degrees F
  Power:
    1.5 V                 1498 mV
    2.5 V                 2501 mV
    3.3 V                 3319 mV
    5.0 V                 5020 mV
    5.0 V bias            5025 mV
```

```
    8.0 V bias           8307 mV
  CMB Revision             12
```

show chassis environment fpc (M320 Router)

```
user@host> show chassis environment fpc
FPC 0 status:
  State                          Online
  Temperature Intake           27 degrees C / 80 degrees F
  Temperature Exhaust          38 degrees C / 100 degrees F
  Temperature MMB1             31 degrees C / 87 degrees F
  Power:
    1.5 V                    1487 mV
    1.5 V *                  1494 mV
    1.8 V                    1821 mV
    2.5 V                    2533 mV
    3.3 V                    3323 mV
    5.0 V                    5028 mV
    3.3 V bias               3296 mV
    5.0 V bias               4984 mV
  CMB Revision                 16
FPC 1 status:
  State                          Online
  Temperature Intake           27 degrees C / 80 degrees F
  Temperature Exhaust          37 degrees C / 98 degrees F
  Temperature MMB1             32 degrees C / 89 degrees F
  Power:
    1.5 V                    1504 mV
    1.5 V *                  1499 mV
    1.8 V                    1820 mV
    2.5 V                    2529 mV
    3.3 V                    3328 mV
    5.0 V                    5013 mV
    3.3 V bias               3294 mV
    5.0 V bias               4984 mV
  CMB Revision                 16
FPC 2 status:
  State                          Online
  Temperature Intake           28 degrees C / 82 degrees F
  Temperature Exhaust          38 degrees C / 100 degrees F
  Temperature MMB1             32 degrees C / 89 degrees F
  Power:
    1.5 V                    1498 mV
    1.5 V *                  1487 mV
    1.8 V                    1816 mV
    2.5 V                    2531 mV
    3.3 V                    3324 mV
    5.0 V                    5025 mV
    3.3 V bias               3277 mV
    5.0 V bias               5013 mV
  CMB Revision                 17
FPC 3 status:
...
```

show chassis environment fpc (MX2020 Router)

```
user@host> show chassis environment fpc
FPC 0 status:
  State                      Online
  Temperature Intake         41 degrees C / 105 degrees F
  Temperature Exhaust A      48 degrees C / 118 degrees F
```

 Copyright © 2016, Juniper Networks, Inc.

```
  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-zl2105         3299 mV
    AS-VDD1V8-zl2006          1807 mV
    AS-VDD2V5-zl2006          2512 mV
    AS-AVDD1V0-zl2004          997 mV
    AS-PCIE_1V0-zl2004         996 mV
    AS-VDD3V3-zl2004          3294 mV
    AS-VDD_1V5A-zl2004        1501 mV
    AS-VDD_1V5B-zl2004        1498 mV
    AS-LU0_1V0-zl2004          998 mV
    AS-LU1_1V0-zl2004         1002 mV
    AS-MQ0_1V0-zl2004          999 mV
    AS-MQ1_1V0-zl2004          994 mV
    AS-LU2_1V0-zl2004         1000 mV
    AS-LU3_1V0-zl2004          998 mV
    AS-MQ2_1V0-zl2004         1002 mV
    AS-MQ3_1V0-zl2004          999 mV
    AS-PMB_1V1-zl2006         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-zl2105         3291 mV
    AS-VDD1V8-zl2006          1786 mV
    AS-VDD2V5-zl2006          2496 mV
```

```
    AS-AVDD1V0-zl2004         1000 mV
    AS-PCIE_1V0-zl2004        1000 mV
    AS-VDD3V3-zl2004          3294 mV
    AS-VDD_1V5A-zl2004        1500 mV
    AS-VDD_1V5B-zl2004        1498 mV
    AS-LU0_1V0-zl2004         1003 mV
    AS-LU1_1V0-zl2004         1000 mV
    AS-MQ0_1V0-zl2004         1000 mV
    AS-MQ1_1V0-zl2004          995 mV
    AS-LU2_1V0-zl2004         1002 mV
    AS-LU3_1V0-zl2004          997 mV
    AS-MQ2_1V0-zl2004         1000 mV
    AS-MQ3_1V0-zl2004          998 mV
    AS-PMB_1V1-zl2006         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-zl2105         3299 mV
    AS-VDD1V8-zl2006          1805 mV
    AS-VDD2V5-zl2006          2510 mV
    AS-AVDD1V0-zl2004          999 mV
    AS-PCIE_1V0-zl2004         998 mV
    AS-VDD3V3-zl2004          3296 mV
    AS-VDD_1V5A-zl2004        1492 mV
    AS-VDD_1V5B-zl2004        1497 mV
    AS-LU0_1V0-zl2004          997 mV
    AS-LU1_1V0-zl2004         1000 mV
    AS-MQ0_1V0-zl2004          998 mV
    AS-MQ1_1V0-zl2004         1001 mV
    AS-LU2_1V0-zl2004          996 mV
    AS-LU3_1V0-zl2004          995 mV
    AS-MQ2_1V0-zl2004          998 mV
    AS-MQ3_1V0-zl2004          997 mV
    AS-PMB_1V1-zl2006         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
```

 Copyright © 2016, Juniper Networks, Inc.

```
  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-zl2105         3305 mV
    AS-VDD1V8-zl2006          1810 mV
    AS-VDD2V5-zl2006          2508 mV
    AS-AVDD1V0-zl2004          999 mV
    AS-PCIE_1V0-zl2004        1001 mV
    AS-VDD3V3-zl2004          3294 mV
    AS-VDD_1V5A-zl2004        1500 mV
    AS-VDD_1V5B-zl2004        1498 mV
    AS-LU0_1V0-zl2004          998 mV
    AS-LU1_1V0-zl2004          998 mV
    AS-MQ0_1V0-zl2004          999 mV
    AS-MQ1_1V0-zl2004          998 mV
    AS-LU2_1V0-zl2004         1000 mV
    AS-LU3_1V0-zl2004         1001 mV
    AS-MQ2_1V0-zl2004          996 mV
    AS-MQ3_1V0-zl2004          998 mV
    AS-PMB_1V1-zl2006         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-zl2105         3300 mV
    AS-VDD1V8-zl2006          1805 mV
    AS-VDD2V5-zl2006          2505 mV
    AS-AVDD1V0-zl2004          998 mV
    AS-PCIE_1V0-zl2004         999 mV
    AS-VDD3V3-zl2004          3303 mV
    AS-VDD_1V5A-zl2004        1497 mV
    AS-VDD_1V5B-zl2004        1497 mV
    AS-LU0_1V0-zl2004          998 mV
    AS-LU1_1V0-zl2004         1003 mV
    AS-MQ0_1V0-zl2004          998 mV
    AS-MQ1_1V0-zl2004          998 mV
    AS-LU2_1V0-zl2004          997 mV
    AS-LU3_1V0-zl2004         1001 mV
    AS-MQ2_1V0-zl2004          996 mV
    AS-MQ3_1V0-zl2004          994 mV
    AS-PMB_1V1-zl2006         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 TSen45 degrees C / 113 degrees F
  Temperature PLX Switch Chip47 degrees C / 116 degrees F
  Power
    MPC-BIAS3V3-zl2105         3300 mV
    MPC-VDD3V3-zl6100          3294 mV
    MPC-VDD2V5-zl6100          2505 mV
    MPC-VDD1V8-zl2004          1796 mV
    MPC-AVDD1V0-zl2004          991 mV
    MPC-VDD1V2-zl6100          1196 mV
    MPC-VDD1V5A-zl2004         1491 mV
    MPC-VDD1V5B-zl2004         1492 mV
    MPC-XF_0V9-zl2004           996 mV
    MPC-PCIE_1V0-zl6100        1003 mV
    MPC-LU0_1V0-zl2004          996 mV
    MPC-LU1_1V0-zl2004          996 mV
    MPC-LU2_1V0-zl2004          998 mV
    MPC-LU3_1V0-zl2004          994 mV
    MPC-12VA-BMR453           12031 mV
    MPC-12VB-BMR453           12003 mV
    MPC-PMB_1V1-zl2006         1104 mV
    MPC-PMB_1V2-zl2106         1194 mV
    MPC-XM_0V9-vt273m           911 mV
  I2C Slave Revision         110
FPC 8 status:
  State                      Online
```


Copyright © 2016, Juniper Networks, Inc.

```
  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-zl2105        3296 mV
    MPC-VDD3V3-zl2006         3298 mV
    MPC-VDD2V5-zl2006         2505 mV
    MPC-TCAM_1V0-zl2004        997 mV
    MPC-AVDD1V0-zl2006        1007 mV
    MPC-VDD1V8-zl2006         1803 mV
    MPC-PCIE_1V0-zl2006       1004 mV
    MPC-LU0_1V0-zl2004        1000 mV
    MPC-MQ0_1V0-zl2004         999 mV
    MPC-VDD_1V5-zl2004        1498 mV
    MPC-PMB_1V1-zl2006        1102 mV
    MPC-9VA-BMR453            9009 mV
    MPC-9VB-BMR453            8960 mV
    MPC-PMB_1V2-zl2105        1202 mV
    MPC-LU1_1V0-zl2004        1005 mV
    MPC-MQ1_1V0-zl2004        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-zl2105         3302 mV
    AS-VDD1V8-zl2006          1808 mV
    AS-VDD2V5-zl2006          2513 mV
    AS-AVDD1V0-zl2004          997 mV
    AS-PCIE_1V0-zl2004         999 mV
    AS-VDD3V3-zl2004          3294 mV
```

```
    AS-VDD_1V5A-zl2004        1503 mV
    AS-VDD_1V5B-zl2004        1502 mV
    AS-LU0_1V0-zl2004          996 mV
    AS-LU1_1V0-zl2004          999 mV
    AS-MQ0_1V0-zl2004          997 mV
    AS-MQ1_1V0-zl2004          999 mV
    AS-LU2_1V0-zl2004          997 mV
    AS-LU3_1V0-zl2004          998 mV
    AS-MQ2_1V0-zl2004         1000 mV
    AS-MQ3_1V0-zl2004         1000 mV
    AS-PMB_1V1-zl2006         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
```

 Copyright © 2016, Juniper Networks, Inc.

```
  Temperature IA 1 TSensor   48 degrees C / 118 degrees F
  Temperature IA 1 Chip      53 degrees C / 127 degrees F
  Power
    1.5 V                     1492 mV
    2.5 V                     2445 mV
    3.3 V                     3293 mV
    1.8 V PFE 0               1827 mV
    1.8 V PFE 1               1775 mV
    1.8 V PFE 2               1788 mV
    1.8 V PFE 3               1798 mV
    1.2 V PFE 0               1250 mV
    1.2 V PFE 1               1234 mV
    1.2 V PFE 2               1231 mV
    1.2 V PFE 3               1192 mV
  I2C Slave Revision         42
```

show chassis environment fpc (MX480 Router)

```
user@host> show chassis environment fpc
FPC 1 status:
  State                      Online
  Temperature Intake         36 degrees C / 96 degrees F
  Temperature Exhaust A      41 degrees C / 105 degrees F
  Temperature Exhaust B      55 degrees C / 131 degrees F
  Temperature I3 0 TSensor   55 degrees C / 131 degrees F
  Temperature I3 0 Chip      57 degrees C / 134 degrees F
  Temperature I3 1 TSensor   53 degrees C / 127 degrees F
  Temperature I3 1 Chip      53 degrees C / 127 degrees F
  Temperature I3 2 TSensor   52 degrees C / 125 degrees F
  Temperature I3 2 Chip      49 degrees C / 120 degrees F
  Temperature I3 3 TSensor   47 degrees C / 116 degrees F
  Temperature I3 3 Chip      47 degrees C / 116 degrees F
  Temperature IA 0 TSensor   54 degrees C / 129 degrees F
  Temperature IA 0 Chip      58 degrees C / 136 degrees F
  Temperature IA 1 TSensor   48 degrees C / 118 degrees F
  Temperature IA 1 Chip      53 degrees C / 127 degrees F
  Power
    1.5 V                     1479 mV
    2.5 V                     2542 mV
    3.3 V                     3319 mV
    1.8 V PFE 0               1811 mV
    1.8 V PFE 1               1804 mV
    1.8 V PFE 2               1804 mV
    1.8 V PFE 3               1814 mV
    1.2 V PFE 0               1192 mV
    1.2 V PFE 1               1202 mV
    1.2 V PFE 2               1205 mV
    1.2 V PFE 3               1189 mV
  I2C Slave Revision         40
```

show chassis environment fpc (MX960 Router)

```
user@host> show chassis environment fpc
FPC 5 status:
  State                      Online
  Temperature Intake         27 degrees C / 80 degrees F
  Temperature Exhaust A      34 degrees C / 93 degrees F
  Temperature Exhaust B      40 degrees C / 104 degrees F
  Temperature I3 0 TSensor   39 degrees C / 102 degrees F
  Temperature I3 0 Chip      41 degrees C / 105 degrees F
  Temperature I3 1 TSensor   38 degrees C / 100 degrees F
```

```
  Temperature I3 1 Chip      37 degrees C / 98 degrees F
  Temperature I3 2 TSensor   37 degrees C / 98 degrees F
  Temperature I3 2 Chip      34 degrees C / 93 degrees F
  Temperature I3 3 TSensor   32 degrees C / 89 degrees F
  Temperature I3 3 Chip      33 degrees C / 91 degrees F
  Temperature IA 0 TSensor   39 degrees C / 102 degrees F
  Temperature IA 0 Chip      44 degrees C / 111 degrees F
  Temperature IA 1 TSensor   36 degrees C / 96 degrees F
  Temperature IA 1 Chip      44 degrees C / 111 degrees F
  Power
    1.5 V                     1479 mV
    2.5 V                     2523 mV
    3.3 V                     3254 mV
    1.8 V PFE 0               1798 mV
    1.8 V PFE 1               1798 mV
    1.8 V PFE 2               1807 mV
    1.8 V PFE 3               1791 mV
    1.2 V PFE 0               1173 mV
    1.2 V PFE 1               1179 mV
    1.2 V PFE 2               1179 mV
    1.2 V PFE 3               1185 mV
  I2C Slave Revision         6
FPC 6 status:
  State                      Online
  Temperature Intake         25 degrees C / 77 degrees F
  Temperature Exhaust A      38 degrees C / 100 degrees F
  Temperature Exhaust B      38 degrees C / 100 degrees F
  Temperature I3 0 TSensor   40 degrees C / 104 degrees F
  Temperature I3 0 Chip      40 degrees C / 104 degrees F
  Temperature I3 1 TSensor   40 degrees C / 104 degrees F
  Temperature I3 1 Chip      38 degrees C / 100 degrees F
  Temperature I3 2 TSensor   37 degrees C / 98 degrees F
  Temperature I3 2 Chip      32 degrees C / 89 degrees F
  Temperature I3 3 TSensor   34 degrees C / 93 degrees F
  Temperature I3 3 Chip      33 degrees C / 91 degrees F
  Temperature IA 0 TSensor   45 degrees C / 113 degrees F
  Temperature IA 0 Chip      47 degrees C / 116 degrees F
  Temperature IA 1 TSensor   37 degrees C / 98 degrees F
  Temperature IA 1 Chip      42 degrees C / 107 degrees F
  Power
    1.5 V                     1485 mV
    2.5 V                     2510 mV
    3.3 V                     3332 mV
    1.8 V PFE 0               1801 mV
    1.8 V PFE 1               1814 mV
    1.8 V PFE 2               1804 mV
    1.8 V PFE 3               1820 mV
    1.2 V PFE 0               1192 mV
    1.2 V PFE 1               1189 mV
    1.2 V PFE 2               1202 mV
    1.2 V PFE 3               1156 mV
  I2C Slave Revision         40
```

show chassis environment fpc (MX480 Router with 100-Gigabit Ethernet CFP)

```
user@host> show chassis environment fpc
FPC 0 status:
  State                      Online
  Temperature Intake         32 degrees C / 89 degrees F
  Temperature Exhaust A      39 degrees C / 102 degrees F
  Temperature Exhaust B      37 degrees C / 98 degrees F
```

 Copyright © 2016, Juniper Networks, Inc.

```
  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-zl2105        3297 mV
    MPC-VDD3V3-zl2105         3306 mV
    MPC-VDD2V5-zl2105         2498 mV
    MPC-TCAM_1V0-zl2004        999 mV
    MPC-AVDD1V0-zl2006         999 mV
    MPC-VDD1V8-zl2006         1796 mV
    MPC-PCIE_1V0-zl2006       1002 mV
    MPC-LU0_1V0-zl2004         997 mV
    MPC-MQ0_1V0-zl2004         995 mV
    MPC-VDD_1V5-zl2004        1496 mV
    MPC-PMB_1V1-zl2006        1094 mV
    MPC-9VA-BMR453            9054 mV
    MPC-9VB-BMR453            9037 mV
    MPC-PMB_1V2-zl2106        1191 mV
    MPC-QXM0_1V0-zl2006       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-zl2105        3292 mV
    MPC-VDD3V3-zl6100         3303 mV
    MPC-VDD2V5-zl6100         2501 mV
    MPC-VDD1V8-zl2004         1801 mV
    MPC-AVDD1V0-zl2006         996 mV
    MPC-VDD1V2-zl6100         1199 mV
    MPC-VDD1V5A-zl2004        1493 mV
    MPC-VDD1V5B-zl2004        1498 mV
    MPC-XF_0V9-zl2006          996 mV
    MPC-PCIE_1V0-zl6100       1000 mV
    MPC-LU0_1V0-zl2004         994 mV
    MPC-LU1_1V0-zl2004         994 mV
    MPC-LU2_1V0-zl2004         992 mV
    MPC-LU3_1V0-zl2004         993 mV
    MPC-12VA-BMR453          12003 mV
    MPC-12VB-BMR453          12043 mV
    MPC-PMB_1V1-zl2006        1091 mV
    MPC-PMB_1V2-zl2106        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-zl2106        3302 mV
    MPC-VDD3V3-zl6100         3325 mV
    MPC-AVDD1V0-zl6100        1007 mV
    MPC-PCIE_1V0-zl6100        904 mV
    MPC-LU0_1V0-zl2004         996 mV
    MPC-VDD_1V5-zl2004        1498 mV
    MPC-12VA-BMR453          11733 mV
    MPC-12VB-BMR453          11728 mV
    MPC-XM_0V9-vt273m          900 mV
  I2C Slave Revision         81
```

show chassis environment fpc (T320, T640, and T1600 Routers)

```
user@host>  show chassis environment fpc
FPC 0 status:
  State                          Online
  Temperature Top              42 degrees C / 107 degrees F
  Temperature Bottom           36 degrees C / 96 degrees F
  Temperature MMB1             39 degrees C / 102 degrees F
  Power:
    1.8 V                    1959 mV
    2.5 V                    2495 mV
    3.3 V                    3344 mV
    5.0 V                    5047 mV
    1.8 V bias               1787 mV
    3.3 V bias               3291 mV
    5.0 V bias               4998 mV
    8.0 V bias               7343 mV
  BUS Revision                 40
FPC 1 status:
  State                          Online
  Temperature Top              42 degrees C / 107 degrees F
  Temperature Bottom           39 degrees C / 102 degrees F
  Temperature MMB1             40 degrees C / 104 degrees F
  Power:
    1.8 V                    1956 mV
    2.5 V                    2498 mV
    3.3 V                    3340 mV
    5.0 V                    5023 mV
    1.8 V bias               1782 mV
    3.3 V bias               3277 mV
    5.0 V bias               4989 mV
    8.0 V bias               7289 mV
  BUS Revision                 40
```


Copyright © 2016, Juniper Networks, Inc.

```
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
```


Copyright © 2016, Juniper Networks, Inc.

```
    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
```


Copyright © 2016, Juniper Networks, Inc.

```
Power 1
  1.0 V                       998 mV
  1.2 V bias                 1191 mV
  1.8 V                      1781 mV
  2.5 V                      2487 mV
  3.3 V                      3302 mV
  3.3 V bias                 3300 mV
  12.0 V A                  10388 mV
  12.0 V B                  10388 mV
Power 2
  0.9 V                       902 mV
  0.9 V PFE0                  921 mV
  0.9 V PFE1                  907 mV
  1.0 V PFE0                  996 mV
  1.0 V PFE1                  974 mV
  1.1 V                      1095 mV
  1.5 V_0                    1495 mV
  1.5 V_1                    1478 mV
Power 3
  1.0 V PFE0                  997 mV
  1.0 V PFE1                  998 mV
  1.0 V PFE0 *                993 mV
  1.0 V PFE1 *                991 mV
  1.8 V PFE 0                1796 mV
  1.8 V PFE 1                1789 mV
  2.5 V                      2465 mV
  12.0 V                    11609 mV
Power 4
  1.0 V PFE0 LU0             1003 mV
  1.0 V PFE1 LU0             1006 mV
  1.0 V PFE1 LU2             1002 mV
  1.0 V PFE0 LU0 *           1000 mV
  1.0 V PFE1 LU0 *            998 mV
  1.0 V PFE1 LU2 *            998 mV
  12.0 V                    11638 mV
  12.0 V C                  11702 mV
Power (Base/PMB/MMB)
  LMB0 VDD2V5                2484 mV
  LMB0 VDD1V8                1780 mV
  LMB0 VDD1V5                1496 mV
  LMB0 PFE0 LU0 AVDD1V0       998 mV
  LMB0 PFE0 LU0 VDD1V0       1004 mV
  LMB0 VDD12V0              10528 mV
  LMB1 VDD2V5                2472 mV
  LMB1 VDD1V8                1776 mV
  LMB1 VDD1V5                1474 mV
  LMB1 PFE0 LU2 AVDD1V0       994 mV
  LMB1 PFE0 LU2 VDD1V0       1004 mV
  LMB1 VDD12V0              10544 mV
  LMB2 VDD2V5                2476 mV
  LMB2 VDD1V8                1790 mV
  LMB2 VDD1V5                1492 mV
  LMB2 PFE1 LU1 AVDD1V0       996 mV
  LMB2 PFE1 LU1 VDD1V0       1010 mV
  LMB2 VDD12V0              10528 mV
  PMB 1.05v                  1050 mV
  PMB 1.5v                   1499 mV
  PMB 2.5v                   2500 mV
  PMB 3.3v                   3300 mV
Bus Revision                80
```

show chassis environment fpc lcc (TX Matrix Router)

```
user@host> show chassis environment fpc lcc 0
lcc0-re0:
--------------------------------------------------------------------------
FPC 1 status:
  State                            Online
  Temperature Top                30 degrees C / 86 degrees F
  Temperature Bottom             25 degrees C / 77 degrees F
  Temperature MMB0                 Absent
  Temperature MMB1               27 degrees C / 80 degrees F
  Power:
    1.8 V                      1813 mV
    2.5 V                      2504 mV
    3.3 V                      3338 mV
    5.0 V                      5037 mV
    1.8 V bias                 1797 mV
    3.3 V bias                 3301 mV
    5.0 V bias                 5013 mV
    8.0 V bias                 7345 mV
  BUS Revision                   40
FPC 2 status:
  State                            Online
  Temperature Top                37 degrees C / 98 degrees F
  Temperature Bottom             26 degrees C / 78 degrees F
  Temperature MMB0               32 degrees C / 89 degrees F
  Temperature MMB1               27 degrees C / 80 degrees F
  Power:
    1.8 V                      1791 mV
    2.5 V                      2517 mV
    3.3 V                      3308 mV
    5.0 V                      5052 mV
    1.8 V bias                 1797 mV
    3.3 V bias                 3289 mV
    5.0 V bias                 4991 mV
    8.0 V bias                 7477 mV
  BUS Revision                   40
```

show chassis environment fpc lcc (TX Matrix Plus Router)

```
user@host> show chassis environment fpc lcc 0
lcc0-re0:
--------------------------------------------------------------------------
FPC 1 status:
  State                        Online
  Temperature Top              46 degrees C / 114 degrees F
  Temperature Bottom           47 degrees C / 116 degrees F
  Power
    1.8 V                       1788 mV
    1.8 V bias                  1787 mV
    3.3 V                       3321 mV
    3.3 V bias                  3306 mV
    5.0 V bias                  5018 mV
    5.0 V TOP                   5037 mV
    8.0 V bias                  7223 mV
  Power (Base/PMB/MMB)
    1.2 V                       1205 mV
    1.5 V                       1503 mV
    5.0 V BOT                   5084 mV
    12.0 V TOP Base            11775 mV
    12.0 V BOT Base            11794 mV
```


Copyright © 2016, Juniper Networks, Inc.

```
    1.1 V PMB                 1108 mV
    1.2 V PMB                 1196 mV
    1.5 V PMB                 1499 mV
    1.8 V PMB                 1811 mV
    2.5 V PMB                 2515 mV
    3.3 V PMB                 3318 mV
    5.0 V PMB                 5030 mV
    12.0  V PMB              11832 mV
    0.75 MMB TOP               752 mV
    1.5 V MMB TOP             1489 mV
    1.8 V MMB TOP             1782 mV
    2.5 V MMB TOP             2498 mV
    1.2 V MMB TOP             1155 mV
    5.0 V MMB TOP             4902 mV
    12.0 V MMB TOP           11721 mV
    3.3 V MMB TOP             3316 mV
    0.75 MMB BOT               754 mV
    1.5 V MMB BOT             1482 mV
    1.8 V MMB BOT             1758 mV
    2.5 V MMB BOT             2488 mV
    1.2 V MMB BOT             1157 mV
    5.0 V MMB BOT             4962 mV
    12.0 V MMB BOT           11691 mV
    3.3 V MMB BOT             3308 mV
    APS 00                    1484 mV
    APS 01                    2503 mV
    APS 02                    3313 mV
    5.0 V PIC 0               5025 mV
    APS 10                    1501 mV
    APS 11                    2466 mV
    APS 12                    3311 mV
    5.0 V PIC 1               5081 mV
  Bus Revision               49
```

show chassis environment fpc (QFX Series and OCX Series)

```
user@switch> show chassis environment fpc 0
FPC 0 status:
  State                      Online
  Temperature                42 degrees C / 107 degrees F
```

show chassis environment fpc interconnect-device (QFabric Systems)

```
user@switch> show chassis environment fpc interconnect-device interconnect1 0
FC 0 FPC 0 status:
  State                      Online
  Left Intake Temperature    24 degrees C / 75 degrees F
  Right Intake Temperature   24 degrees C / 75 degrees F
  Left Exhaust Temperature   27 degrees C / 80 degrees F
  Right Exhaust Temperature  27 degrees C / 80 degrees F
  Power
    BIAS 3V3                  3330 mV
    VDD 3V3                   3300 mV
    VDD 2V5                   2502 mV
    VDD 1V5                   1496 mV
    VDD 1V2                   1194 mV
    VDD 1V0                   1000 mV
    SW0 VDD  1V0              1020 mV
    SW0 CVDD 1V025            1032 mV
    SW1 VDD  1V0              1022 mV
```

```
    SW1 CVDD 1V025            1030 mV
    VDD 12V0 DIV3_33          3414 mV
```

show chassis environment fpc 5(PTX3000 Packet Transport Router)

```
user@host> show chassis environment fpc 5
FPC 5 status:
  State                       Online
  Intake Temperature          31 degrees C / 87 degrees F
  Exhaust Temperature         41 degrees C / 105 degrees F
  Power
    FPC 12.0v                  12221 mV
    FPC VCC 0.5-1.3v            1640 mV
    FPC VNN 0.5-1.3v            1640 mV
    FPC 1.0v                    1640 mV
    FPC 1.1v                    1640 mV
    FPC 1.35v                   1640 mV
    FPC VDDQ 1.5v               1640 mV
    FPC 1.8v                    1640 mV
    FPC 3.3v                    3280 mV
    FPC 5.0v bias               5143 mV
    FPC 5.0v usb                5143 mV
    FPC VCC 12.0v              12289 mV
    FPC Vref 3.3v               3280 mV
    MAIN 12.0v-i                2265 mA
```

show chassis environment fpc 0 (PTX5000 Packet Transport Router)

```
user@host> show chassis environment fpc 0
FPC 0 status:
  State                       Online
  PMB Temperature             35 degrees C / 95 degrees F
  Intake Temperature          33 degrees C / 91 degrees F
  Exhaust A Temperature       51 degrees C / 123 degrees F
  Exhaust B Temperature       43 degrees C / 109 degrees F
  TL0 Temperature             48 degrees C / 118 degrees F
  TQ0 Temperature             53 degrees C / 127 degrees F
  TL1 Temperature             56 degrees C / 132 degrees F
  TQ1 Temperature             58 degrees C / 136 degrees F
  TL2 Temperature             55 degrees C / 131 degrees F
  TQ2 Temperature             57 degrees C / 134 degrees F
  TL3 Temperature             59 degrees C / 138 degrees F
  TQ3 Temperature             59 degrees C / 138 degrees F
  Power
    PMB   1.05v                1049 mV
    PMB   1.5v                 1500 mV
    PMB   2.5v                 2500 mV
    PMB   3.3v                 3299 mV
    PFE0  1.5v                 1500 mV
    PFE0  1.0v                  999 mV
    TQ0   0.9v                  900 mV
    TL0   0.9v                  900 mV
    PFE1  1.5v                 1499 mV
    PFE1  1.0v                  999 mV
    TQ1   0.9v                  899 mV
    TL1   0.9v                  900 mV
    PFE2  1.5v                 1500 mV
    PFE2  1.0v                 1000 mV
    TQ2   0.9v                  900 mV
    TL2   0.9v                  900 mV
    PFE3  1.5v                 1499 mV
```


Copyright © 2016, Juniper Networks, Inc.

```
    PFE3  1.0v                1000 mV
    TQ3   0.9v                 900 mV
    TL3   0.9v                 900 mV
    Bias  3.3v                3327 mV
    FPC   3.3v                3300 mV
    FPC   2.5v                2500 mV
    SAM   0.9v                 900 mV
    A    12.0v                2014 mV
    B    12.0v                2030 mV
```

show chassis environment fpc 07 (PTX5000 Packet Transport Router with FPC2-PTX-P1A)

```
user@host> show chassis environment fpc 07
FPC 7 status:
  State                      Online
  PMB TEMP0 Temperature      32 degrees C / 89 degrees F
  PMB TEMP1 Temperature      28 degrees C / 82 degrees F
  PMB CPU Temperature        46 degrees C / 114 degrees F
  Intake Temperature         35 degrees C / 95 degrees F
  Exhaust A Temperature      55 degrees C / 131 degrees F
  Exhaust B Temperature      54 degrees C / 129 degrees F
  TL5 Temperature            59 degrees C / 138 degrees F
  TQ5 Temperature            57 degrees C / 134 degrees F
  TL6 Temperature            57 degrees C / 134 degrees F
  TQ6 Temperature            51 degrees C / 123 degrees F
  TL1 Temperature            76 degrees C / 168 degrees F
  TQ1 Temperature            58 degrees C / 136 degrees F
  TL2 Temperature            75 degrees C / 167 degrees F
  TQ2 Temperature            57 degrees C / 134 degrees F
  TL4 Temperature            52 degrees C / 125 degrees F
  TQ4 Temperature            66 degrees C / 150 degrees F
  TL7 Temperature            52 degrees C / 125 degrees F
  TQ7 Temperature            60 degrees C / 140 degrees F
  TL0 Temperature            72 degrees C / 161 degrees F
  TQ0 Temperature            73 degrees C / 163 degrees F
  TL3 Temperature            64 degrees C / 147 degrees F
  TQ3 Temperature            70 degrees C / 158 degrees F
  Power
    PMB   1.05v               1049 mV
    PMB   3.3v                3299 mV
    PMB   1.1v-a              1100 mV
    PMB   1.5v                1499 mV
    PMB   1.1v-b              1100 mV
    Base  3.3v                3300 mV
    FPC Base  2.5v            2499 mV
    TL1   0.9v                 897 mV
    TQ1   0.9v                 897 mV
    PFE1  1.0v                 999 mV
    PFE1  1.5v                1499 mV
    TL2   0.9v                 897 mV
    TQ2   0.9v                 897 mV
    PFE2  1.0v                 999 mV
    PFE2  1.5v                1499 mV
    FPC Base  1.0v            1000 mV
    FPC Base  1.2v            1199 mV
    TL5   0.9v                 898 mV
    TQ5   0.9v                 898 mV
    PFE5  1.0v                1000 mV
    PFE5  1.5v                1500 mV
    TL6   0.9v                 897 mV
    TQ6   0.9v                 897 mV
```

```
    PFE6  1.0v                1000 mV
    PFE6  1.5v                1499 mV
    Mezz Base  2.5v           2500 mV
    TL0   0.9v                 896 mV
    TQ0   0.9v                 896 mV
    PFE0  1.0v                 999 mV
    PFE0  1.5v                1499 mV
```

show chassis environment FPC 1 (MX Routers with Media Services Blade [MSB])

```
user@switch> show chassis environment fpc 1
FPC 1 status:
  State                      Online
  Temperature Intake         36 degrees C / 96 degrees F
  Temperature Exhaust A      39 degrees C / 102 degrees F
  Temperature LU TSen        52 degrees C / 125 degrees F
  Temperature LU Chip        54 degrees C / 129 degrees F
  Temperature XM TSen        52 degrees C / 125 degrees F
  Temperature XM Chip        60 degrees C / 140 degrees F
  Temperature PCIe TSen      52 degrees C / 125 degrees F
  Temperature PCIe Chip      69 degrees C / 156 degrees F
  Power
    MPC-BIAS3V3-zl2106        3302 mV
    MPC-VDD3V3-zl6100         3325 mV
    MPC-AVDD1V0-zl6100        1007 mV
    MPC-PCIE_1V0-zl6100        904 mV
    MPC-LU0_1V0-zl2004         996 mV
    MPC-VDD_1V5-zl2004        1498 mV
    MPC-12VA-BMR453          11733 mV
    MPC-12VB-BMR453          11728 mV
    MPC-XM_0V9-vt273m          900 mV
  I2C Slave Revision         81
```


Copyright © 2016, Juniper Networks, Inc.

show chassis environment pem

List of Syntax

Syntax on page 577
Syntax (ACX4000 Router) on page 577
Syntax (TX Matrix Routers) on page 577
Syntax (TX Matrix Plus Routers) on page 577
Syntax (MX Series Router) on page 577
Syntax (MX104 3D Universal Edge Routers) on page 577
Syntax (QFX Series) on page 577
Syntax (OCX Series) on page 577

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 3D Universal Edge Routers)

show chassis environment pem
<*slot*>

Syntax (QFX Series)

show chassis environment pem
<*slot* (interconnect-device *name slot*) | (node-device *name*)>

Syntax (OCX Series)

show chassis environment pem
<*slot*>

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.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

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 T1600 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 and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display environmental information about the PEM in a specified T640 router (or line-card chassis) that is connected to a TX Matrix router. On a TX Matrix Plus router, display environmental information about the PEM in a specified T1600 router (or line-card chassis) that is connected to a TX Matrix Plus router. Replace ***number*** with a value from **0** through **3**.

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 (or 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

Copyright © 2016, Juniper Networks, Inc.

Related Documentation

- show chassis hardware on page 656

List of Sample Output

show chassis environment pem (M40e Router) on page 580
show chassis environment pem (M120 Router) on page 580
show chassis environment pem (M160 Router) on page 580
show chassis environment pem (M320 Router) on page 581
show chassis environment pem (MX104 Router) on page 581
show chassis environment pem (MX240 Router) on page 581
show chassis environment pem (MX480 Router) on page 581
show chassis environment pem (MX960 Router) on page 582
show chassis environment pem (T320 Router) on page 582
show chassis environment pem (T640 Router) on page 582
show chassis environment pem (T4000 Router) on page 582
show chassis environment pem (T640/T1600/T4000 Routers With Six-Input DC Power Supply) on page 583
show chassis environment pem lcc (TX Matrix Routing Matrix) on page 583
show chassis environment pem scc (TX Matrix Routing Matrix) on page 583
show chassis environment pem sfc (TX Matrix Plus Routing Matrix) on page 584
show chassis environment pem lcc (TX Matrix Plus Routing Matrix) on page 584
show chassis environment pem node-device (QFabric System) on page 585
show chassis environment pem (QFX Series and OCX Series) on page 585
show chassis environment pem interconnect-device (QFabric System) on page 585

Output Fields

Table 31 on page 579 lists the output fields for the **show chassis environment pem** command. Output fields are listed in the approximate order in which they appear.

Table 31: show chassis environment pem Output Fields

Field Name	Field Description
PEM *slot* status	Number of the PEM slot.
State	Status of the PEM.
Temperature	Temperature of the air flowing past the PEM.
AC Input	Status of the AC input for the specified component
AC Output	Status of the AC output for the specified component.
DC input	Status of the DC input for the specified component.
DC output	Status of the DC output for the specified component.
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.

Table 31: show chassis environment pem Output Fields *(continued)*

Field Name	Field Description
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
```


Copyright © 2016, Juniper Networks, Inc.

```
  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
```


Copyright © 2016, Juniper Networks, Inc.

```
    FPC 4            52.125       0.000        0        0
    FPC 5            55.000       9.375      515       34
    FPC 6            55.187       9.687      534       35
    FPC 7            51.437       0.000        0        0
    SCG/CB/SIB       55.375      15.750      872       35
    FAN              54.562      14.750      804       42
```

show chassis environment pem (T640/T1600/T4000 Routers With Six-Input DC Power Supply)

```
user@host> show chassis environment pem
PEM 1 status:
  State                      Online
  Temperature                36 degrees C / 96 degrees F
  DC Input:                  OK
                     Voltage(V)  Current(A)  Power(W)  Load(%)
    INPUT 0            0.000       0.000        0        0
    INPUT 1           54.875       3.812      209       27
    INPUT 2           55.375       3.937      218       29
    INPUT 3           54.625       3.750      204       27
    INPUT 4           55.125       3.375      186       24
    INPUT 5           55.125       3.375      186       24
  DC Output          Voltage(V)  Current(A)  Power(W)  Load(%)
    FPC 0             52.312       0.000        0        0
    FPC 1             52.687       0.000        0        0
    FPC 2             52.812       0.000        0        0
    FPC 3             55.812       7.062      394       52
    FPC 4             52.625       0.000        0        0
    FPC 5             52.625       0.000        0        0
    FPC 6             52.750       0.000        0        0
    FPC 7             52.750       0.000        0        0
    SCG/CB/SIB        55.937      11.937      667       55
    FAN               55.812       4.937      275       36
```

show chassis environment pem lcc (TX Matrix Routing Matrix)

```
user@host> show chassis environment pem 0 lcc 0
lcc0-re0:
--------------------------------------------------------------------------
PEM 0 status:
  State                          Present
  Temperature                 27 degrees C / 80 degrees F
  DC input:                      Check
  DC output:            Voltage  Current       Power    Load
      FPC 0                   0        0           0       0
      FPC 1                   0        0           0       0
      FPC 2                   0        0           0       0
      FPC 3                   0        0           0       0
      FPC 4                   0        0           0       0
      FPC 5                   0        0           0       0
      FPC 6                   0        0           0       0
      FPC 7                   0        0           0       0
  SCG/CB/SIB                  0        0           0       0
```

show chassis environment pem scc (TX Matrix Routing Matrix)

```
user@host> show chassis environment pem scc
scc-re0:
--------------------------------------------------------------------------
PEM 1 status:
  State                          Online
  Temperature                 24 degrees C / 75 degrees F
  DC input:                      OK
```

```
  DC output:            Voltage   Current       Power    Load
       SIB 0                  0         0           0       0
       SIB 1                  0         0           0       0
       SIB 2                  0         0           0       0
       SIB 3              56550         0           0       0
       SIB 4              55958      6912         386      51
```

show chassis environment pem sfc (TX Matrix Plus Routing Matrix)

```
user@host> show chassis environment pem sfc 0
sfc0-re0:
--------------------------------------------------------------------------
PEM 0 status:
  State                      Online
  Temperature                35 degrees C / 95 degrees F
  DC Input:                   OK
  DC Output             Voltage   Current       Power    Load
      Channel 0           53820     14140         761      59
      Channel 1           53550     12720         681      53
      Channel 2           53840     12930         696      54
      Channel 3           53690     14990         804      63
      Channel 4           53620     15070         808      63
      Channel 5           53900     14820         798      62
      Channel 6           54120     5020          271      21
```

show chassis environment pem lcc (TX Matrix Plus Routing Matrix)

```
user@host> show chassis environment lcc 0

lcc0-re1:
--------------------------------------------------------------------------
PEM 0 status:
  State                      Online
  Temperature                38 degrees C / 100 degrees F
  DC Input:                  OK
  DC Output             Voltage   Current       Power    Load
      FPC 0               0         0             0        0
      FPC 1               0         0             0        0
      FPC 2               0         0             0        0
      FPC 3               0         0             0        0
      FPC 4               56408     7575          427      56
      FPC 5               0         0             0        0
      FPC 6               56266     7956          447      59
      FPC 7               56283     6100          343      45
      SCG/CB/SIB          55916     8950          500      41
PEM 1 status:
  State                      Present
  Temperature                35 degrees C / 95 degrees F
  DC Input:                  Check
  DC Output             Voltage   Current       Power    Load
      FPC 0               0         0             0        0
      FPC 1               0         0             0        0
      FPC 2               0         0             0        0
      FPC 3               0         0             0        0
      FPC 4               0         0             0        0
      FPC 5               0         0             0        0
      FPC 6               0         0             0        0
      FPC 7               0         0             0        0
      SCG/CB/SIB          0         0             0        0
```


Copyright © 2016, Juniper Networks, Inc.

show chassis environment pem node-device (QFabric System)

```
user@switch> show chassis environment pem node-device node1
FPC 0 PEM 0 status:
  State                     Check
  Airflow                   Front to Back
  Temperature               OK
  AC Input:                 OK
  DC Output          Voltage(V) Current(A)  Power(W)  Load(%)
                         12        10           120      18
FPC 0 PEM 1 status:
  State                     Online
  Airflow                   Back to Front
  Temperature               OK
  AC Input:                 OK
  DC Output          Voltage(V) Current(A)  Power(W)  Load(%)
                         11        10           110      17
```

show chassis environment pem (QFX Series and OCX Series)

```
user@switch> show chassis environment pem
FPC 0 PEM 1 status:
  State                     Online
  Airflow                   Front to Back
  Temperature               OK
  AC Input:                 OK
  DC Output          Voltage(V) Current(A)  Power(W)  Load(%)
                         12        17           204      31
```

show chassis environment pem interconnect-device (QFabric System)

```
user@switch> show chassis environment pem interconnect-device IC1 1
IC1 PEM 1 status:
  State                     Online
  Airflow                   Front to Back
  Temperature               OK
  AC Input:                 OK
  DC Output          Voltage(V) Current(A)  Power(W)  Load(%)
                         12        18           216      33
```

show chassis environment routing-engine

List of Syntax

Syntax on page 586
Syntax (TX Matrix Routers) on page 586
Syntax (TX Matrix Plus Routers) on page 586
Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers) on page 586
Syntax (MX Series Routers) on page 586
Syntax (QFX Series) on page 586
Syntax (OCX Series) on page 586

Syntax

show chassis environment routing-engine
<*slot*>

Syntax (TX Matrix Routers)

show chassis environment routing-engine
<lcc *number* | scc>
<*slot*>

Syntax (TX Matrix Plus Routers)

show chassis environment routing-engine
<lcc *number* | sfc *number*>
<*slot*>

Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers)

show chassis environment routing-engine
<*slot*>
<satellite [slot-id *slot-id* |device-alias *alias-name*]

Syntax (MX Series Routers)

show chassis environment routing-engine
<*slot*>
<all-members>
<local>
<member *member-id*>

Syntax (QFX Series)

show chassis environment routing-engine
interconnect-device *name*

Syntax (OCX Series)

show chassis environment routing-engine

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.
Command introduced in Junos OS Release 12.1 for the PTX Series Packet Transport Routers.
Command introduced in Junos OS Release 12.1 for the 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.
Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
satellite option introduced in Junos OS Release 14.2R3.

Description

Display Routing Engine environmental status information.

Copyright © 2016, Juniper Networks, Inc.

Options

none—Display environmental information about all Routing Engines. For a TX Matrix router, display environmental information about all Routing Engines on the TX Matrix router and its attached T640 routers. For a TX Matrix Plus router, display environmental information about all Routing Engines on the TX Matrix Plus router and its attached routers.

all-members—(MX Series routers only) (Optional) Display environmental information about the Routing Engines in all member routers in the Virtual Chassis configuration.

interconnect-device *name*—(QFabric systems only) (Optional) Display environmental information about the Routing Engines for the Interconnect device.

lcc *number*——(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(MX Series routers only) (Optional) Display environmental information about the Routing Engines in the local Virtual Chassis member.

member *member-id*—(MX Series routers only) (Optional) Display environmental information about the Routing Engines in the specified member in the Virtual Chassis configuration. Replace ***member-id*** with the value of 0 or 1.

satellite [slot-id *slot-id* | device-alias *alias-name*]—(Junos Fusion only)(Optional) Display e environmental information for the specified satellite device in a Junos Fusion, or for all satellite devices in the Junos Fusion if no satellite devices are specified.

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, 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 355
- show chassis routing-engine on page 888

List of Sample Output

show chassis environment routing-engine (Nonredundant) on page 588
show chassis environment routing-engine (Redundant) on page 589
show chassis environment routing-engine (MX104 Router) on page 589
show chassis environment routing-engine (MX2010 Router) on page 589
show chassis environment routing-engine (MX2020 Router) on page 589
show chassis environment routing-engine (TX Matrix Plus Router) on page 589
show chassis environment routing-engine (T4000 Core Router) on page 590
show chassis environment routing-engine (QFX Series and OCX Series) on page 590
show chassis environment routing-engine interconnect-device (QFabric System) on page 590
show chassis environment routing-engine (PTX5000 Packet Transport Router) on page 590

Output Fields Table 32 on page 588 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 32: show chassis environment routing-engine Output Fields

Field Name	Field Description
Routing engine *slot* status	Number of the Routing Engine slot: **0** or **1**.
State	Status of the Routing Engine: • **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
```

 Copyright © 2016, Juniper Networks, Inc.

show chassis environment routing-engine (Redundant)

```
user@host> show chassis environment routing-engine
Route Engine 0 status:
  State:                      Online Master
  Temperature:              26 degrees C / 78 degrees F
Route Engine 1 status:
  State:                      Online Standby
  Temperature:              26 degrees C / 78 degrees F
```

show chassis environment routing-engine (MX104 Router)

```
user@ host >show chassis environment routing-engine
Routing Engine 0 status:
  State                       Online Master
  Temperature                 34 degrees C / 93 degrees F
  CPU Temperature             43 degrees C / 109 degrees F
Routing Engine 1 status:
  State                       Online Standby
  Temperature                 33 degrees C / 91 degrees F
  CPU Temperature             39 degrees C / 102 degrees F
```

show chassis environment routing-engine (MX2010 Router)

```
user@host> show chassis environment routing-engine
Routing Engine 0 status:
  State                       Online Master
  Temperature                 37 degrees C / 98 degrees F
  CPU Temperature             37 degrees C / 98 degrees F
Routing Engine 1 status:
  State                       Online Standby
  Temperature                 35 degrees C / 95 degrees F
  CPU Temperature             34 degrees C / 93 degrees F
```

show chassis environment routing-engine (MX2020 Router)

```
user@host> show chassis environment routing-engine
Routing Engine 0 status:
  State                       Online Master
  Temperature                 35 degrees C / 95 degrees F
  CPU Temperature             34 degrees C / 93 degrees F
Routing Engine 1 status:
  State                       Online Standby
  Temperature                 44 degrees C / 111 degrees F
  CPU Temperature             43 degrees C / 109 degrees F
```

show chassis environment routing-engine (TX Matrix Plus Router)

```
user@host> show chassis environment routing-engine
sfc0-re0:
--------------------------------------------------------------------------
Routing Engine 0 status:
  State                       Online Master
  Temperature                 26 degrees C / 78 degrees F
Routing Engine 1 status:
  State                       Online Standby
  Temperature                 28 degrees C / 82 degrees F

lcc0-re0:
--------------------------------------------------------------------------
Routing Engine 0 status:
```

```
  State                       Online Master
  Temperature                 30 degrees C / 86 degrees F
Routing Engine 1 status:
  State                       Online Standby
  Temperature                 29 degrees C / 84 degrees F
```

show chassis environment routing-engine (T4000 Core Router)

```
user@host> show chassis environment routing-engine
Routing Engine 0 status:
  State                       Online Master
  Temperature                 33 degrees C / 91 degrees F
  CPU Temperature             50 degrees C / 122 degrees F
Routing Engine 1 status:
  State                       Online Standby
  Temperature                 33 degrees C / 91 degrees F
  CPU Temperature             46 degrees C / 114 degrees F
```

show chassis environment routing-engine (QFX Series and OCX Series)

```
user@switch> show chassis environment routing-engine
Routing Engine 0 status:
  State                       Online Master
  Temperature                 42 degrees C / 107 degrees F
```

show chassis environment routing-engine interconnect-device (QFabric System)

```
user@switch> show chassis environment routing-engine interconnect-device interconnect1
routing-engine interconnect-device interconnect1
Routing Engine 0 status:
  State                       Online Standby
  Temperature                 52 degrees C / 125 degrees F
Routing Engine 1 status:
  State                       Online Master
  Temperature                 57 degrees C / 134 degrees F
```

show chassis environment routing-engine (PTX5000 Packet Transport Router)

```
user@switch> show chassis environment routing-engine
Routing Engine 0 status:
  State                       Online Master
  Temperature                 55 degrees C / 131 degrees F
  CPU Temperature             66 degrees C / 150 degrees F
Routing Engine 1 status:
  State                       Online Standby
  Temperature                 52 degrees C / 125 degrees F
  CPU Temperature             64 degrees C / 147 degrees F
```


Copyright © 2016, Juniper Networks, Inc.

show chassis fan

List of Syntax

Syntax on page 591
Syntax (ACX4000 Series Router) on page 591
Syntax (MX Series Router) on page 591
Syntax (T Series Routers) on page 591
Syntax (MX104, MX2010, and MX2020 3D Universal Edge Router) on page 591
Syntax (QFX Series) on page 591
Syntax (OCX Series) on page 591
Syntax (TX Matrix Router) on page 591
Syntax (TX Matrix Plus Router) on page 591

Syntax

show chassis fan

Syntax (ACX4000 Series Router)

show chassis fan

Syntax (MX Series Router)

show chassis fan
<all-members>
<local>
<member *member-id*>

Syntax (T Series Routers)

show chassis fan

Syntax (MX104, MX2010, and MX2020 3D Universal Edge Router)

show chassis fan
<satellite [slot-id *slot-id* |device-alias *alias-name*]>

Syntax (QFX Series)

show chassis fan
<interconnect-device *name*>

Syntax (OCX Series)

show chassis fan

Syntax (TX Matrix Router)

show chassis fan
<lcc *number* | scc>

Syntax (TX Matrix Plus Router)

show chassis fan
<lcc *number* | sfc *number*>

Release Information

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.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 11.4 for EX Series switches.
Command introduced in Junos OS Release 12.3 for PTX5000 Packet Transport Routers.
Command introduced in Junos OS Release 12.1 for T4000 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 12.3 for ACX Series Routers.

Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
satellite option introduced in Junos OS Release 14.2R3.

Description (T Series routers, TX Matrix routers, TX Matrix Plus routers, M120 routers, M320 routers, MX104 routers, MX2010 routers, MX2020 routers, MX Series 3D Universal Edge Routers, QFX3008-I Interconnect devices, QFX Series, OCX Series, EX Series switches, and PTX Series Packet Transport Routers only) Show information about the fan tray and fans.

Options

all-members—(MX Series routers only) (Optional) Display information about the fan tray and fans for all members of the Virtual Chassis configuration.

local—(MX Series routers only) (Optional) Display information about the fan tray and fans for the local Virtual Chassis member.

member ***member-id***—(MX Series routers only) (Optional) Display information about the fan tray and fans for the specified member of the Virtual Chassis configuration. For an MX Series Virtual Chassis, replace *member-id* variable with a value 0 or 1.

interconnect-device ***name***—(QFX3000-G QFabric systems only) (Optional) Display information about the fan tray and fans for the specified QFX3008-I Interconnect device.

lcc ***number***—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display information about the fan tray and fans for the specified T640 router (line-card chassis) that is connected to a TX Matrix router. On a TX Matrix Plus router, display information about the fan tray and fans for the specified router (line-card chassis) that is connected to a TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

satellite [slot-id ***slot-id*** **| device-alias** ***alias-name*****]**—(Junos Fusion only) (Optional) Display information about the fan tray and fans for the specified satellite device or devices in a Junos Fusion, or for all satellite devices if no satellite devices are specified.

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**.

 Copyright © 2016, Juniper Networks, Inc.

Required Privilege Level view

List of Sample Output

show chassis fan on page 594
show chassis fan (QFabric Systems) on page 594
show chassis fan (EX Series Switches) on page 596
show chassis fan (T320 Router) on page 596
show chassis fan (T640 Router) on page 596
show chassis fan (T1600 Router) on page 597
show chassis fan (T4000 Core Router) on page 597
show chassis fan (TX Matrix Router) on page 598
show chassis fan (TX Matrix Plus Router) on page 598
show chassis fan (TX Matrix Plus Router with 3D SIBs) on page 600
show chassis fan (PTX5000 Packet Transport Router) on page 602
show chassis fan (MX104 Router) on page 602
show chassis fan (MX2010 Router) on page 602
show chassis fan (MX2020 Router) on page 603
show chassis fan (ACX4000 Router) on page 603
show chassis fan (QFX5100 Switch and OCX Series) on page 603

Output Fields Table 33 on page 593 lists the output fields for the **show chassis fan** command. Output fields are listed in the approximate order in which they appear.

Table 33: show chassis fan Output Fields

Field Name	Field Description
Item	Fan item identifier.
Status	Status of the fan: • **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.

Table 33: show chassis fan Output Fields *(continued)*

Field Name	Field Description
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: • 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
```


Copyright © 2016, Juniper Networks, Inc.

```
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
```


Copyright © 2016, Juniper Networks, Inc.

```
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
```


Copyright © 2016, Juniper Networks, Inc.

```
      Fan Tray 0 Fan 2          OK       4380    Spinning at normal speed
      Fan Tray 0 Fan 3          OK       4410    Spinning at normal speed
      Fan Tray 0 Fan 4          OK       4380    Spinning at normal speed
      Fan Tray 0 Fan 5          OK       4350    Spinning at normal speed
      Fan Tray 0 Fan 6          OK       4380    Spinning at normal speed
      Fan Tray 1 Fan 1          OK       4410    Spinning at normal speed
      Fan Tray 1 Fan 2          OK       4380    Spinning at normal speed
      Fan Tray 1 Fan 3          OK       4410    Spinning at normal speed
      Fan Tray 1 Fan 4          OK       4380    Spinning at normal speed
      Fan Tray 1 Fan 5          OK       4410    Spinning at normal speed
      Fan Tray 1 Fan 6          OK       4410    Spinning at normal speed
      Fan Tray 2 Fan 1          OK       4380    Spinning at normal speed
      Fan Tray 2 Fan 2          OK       4380    Spinning at normal speed
      Fan Tray 2 Fan 3          OK       4380    Spinning at normal speed
      Fan Tray 2 Fan 4          OK       4410    Spinning at normal speed
      Fan Tray 2 Fan 5          OK       4380    Spinning at normal speed
      Fan Tray 2 Fan 6          OK       4410    Spinning at normal speed
      Fan Tray 2 Fan 7          OK       4410    Spinning at normal speed
      Fan Tray 2 Fan 8          OK       4380    Spinning at normal speed
      Fan Tray 2 Fan 9          OK       4380    Spinning at normal speed
      Fan Tray 3 Fan 1          OK       4350    Spinning at normal speed
      Fan Tray 3 Fan 2          OK       4380    Spinning at normal speed
      Fan Tray 3 Fan 3          OK       4410    Spinning at normal speed
      Fan Tray 3 Fan 4          OK       4440    Spinning at normal speed
      Fan Tray 3 Fan 5          OK       4380    Spinning at normal speed
      Fan Tray 3 Fan 6          OK       4410    Spinning at normal speed
      Fan Tray 3 Fan 7          OK       4410    Spinning at normal speed
      Fan Tray 3 Fan 8          OK       4380    Spinning at normal speed
      Fan Tray 3 Fan 9          OK       4410    Spinning at normal speed
      Fan Tray 4 Fan 1          OK       4410    Spinning at normal speed
      Fan Tray 4 Fan 2          OK       4410    Spinning at normal speed
      Fan Tray 4 Fan 3          OK       4380    Spinning at normal speed
      Fan Tray 4 Fan 4          OK       4380    Spinning at normal speed
      Fan Tray 4 Fan 5          OK       4410    Spinning at normal speed
      Fan Tray 4 Fan 6          OK       4410    Spinning at normal speed
      Fan Tray 4 Fan 7          OK       4410    Spinning at normal speed
      Fan Tray 4 Fan 8          OK       4410    Spinning at normal speed
      Fan Tray 4 Fan 9          OK       4410    Spinning at normal speed
      Fan Tray 5 Fan 1          OK       4350    Spinning at normal speed
      Fan Tray 5 Fan 2          OK       4380    Spinning at normal speed
      Fan Tray 5 Fan 3          OK       4380    Spinning at normal speed
      Fan Tray 5 Fan 4          OK       4350    Spinning at normal speed
      Fan Tray 5 Fan 5          OK       4380    Spinning at normal speed
      Fan Tray 5 Fan 6          OK       4410    Spinning at normal speed
      Fan Tray 5 Fan 7          OK       4410    Spinning at normal speed
      Fan Tray 5 Fan 8          OK       4380    Spinning at normal speed
      Fan Tray 5 Fan 9          OK       4410    Spinning at normal speed

lcc0-re0:
--------------------------------------------------------------------------
      Item                      Status   RPM     Measurement
      Top Left Front fan        OK       3420    Spinning at normal speed
      Top Left Middle fan       OK       3420    Spinning at normal speed
      Top Left Rear fan         OK       3420    Spinning at normal speed
      Top Right Front fan       OK       3450    Spinning at normal speed
      Top Right Middle fan      OK       3420    Spinning at normal speed
      Top Right Rear fan        OK       3420    Spinning at normal speed
      Bottom Left Front fan     OK       3420    Spinning at normal speed
      Bottom Left Middle fan    OK       3420    Spinning at normal speed
      Bottom Left Rear fan      OK       3390    Spinning at normal speed
      Bottom Right Front fan    OK       3420    Spinning at normal speed
```

```
      Bottom Right Middle fan   OK       3390    Spinning at normal speed
      Bottom Right Rear fan     OK       3390    Spinning at normal speed
      Rear Tray Top fan         OK       7050    Spinning at normal speed
      Rear Tray Second fan      OK       7050    Spinning at normal speed
      Rear Tray Third fan       OK       7050    Spinning at normal speed
      Rear Tray Fourth fan      OK       7050    Spinning at normal speed
      Rear Tray Fifth fan       OK       7050    Spinning at normal speed
      Rear Tray Sixth fan       OK       7050    Spinning at normal speed
      Rear Tray Seventh fan     OK       7050    Spinning at normal speed
      Rear Tray Bottom fan      OK       7050    Spinning at normal speed
```

show chassis fan (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis fan
sfc0-re0:
--------------------------------------------------------------------------
      Item                      Status   RPM     Measurement
      Fan Tray 0 Fan 1          OK       4830    Spinning at normal speed
      Fan Tray 0 Fan 2          OK       4860    Spinning at normal speed
      Fan Tray 0 Fan 3          OK       4830    Spinning at normal speed
      Fan Tray 0 Fan 4          OK       4800    Spinning at normal speed
      Fan Tray 0 Fan 5          OK       4830    Spinning at normal speed
      Fan Tray 0 Fan 6          OK       4770    Spinning at normal speed
      Fan Tray 1 Fan 1          OK       4800    Spinning at normal speed
      Fan Tray 1 Fan 2          OK       4770    Spinning at normal speed
      Fan Tray 1 Fan 3          OK       4800    Spinning at normal speed
      Fan Tray 1 Fan 4          OK       4770    Spinning at normal speed
      Fan Tray 1 Fan 5          OK       4770    Spinning at normal speed
      Fan Tray 1 Fan 6          OK       4800    Spinning at normal speed
      Fan Tray 2 Fan 1          OK       4800    Spinning at normal speed
      Fan Tray 2 Fan 2          OK       4800    Spinning at normal speed
      Fan Tray 2 Fan 3          OK       4830    Spinning at normal speed
      Fan Tray 2 Fan 4          OK       4830    Spinning at normal speed
      Fan Tray 2 Fan 5          OK       4830    Spinning at normal speed
      Fan Tray 2 Fan 6          OK       4830    Spinning at normal speed
      Fan Tray 2 Fan 7          OK       4800    Spinning at normal speed
      Fan Tray 2 Fan 8          OK       4830    Spinning at normal speed
      Fan Tray 2 Fan 9          OK       4800    Spinning at normal speed
      Fan Tray 3 Fan 1          OK       4860    Spinning at normal speed
      Fan Tray 3 Fan 2          OK       4860    Spinning at normal speed
      Fan Tray 3 Fan 3          OK       4800    Spinning at normal speed
      Fan Tray 3 Fan 4          OK       4830    Spinning at normal speed
      Fan Tray 3 Fan 5          OK       4830    Spinning at normal speed
      Fan Tray 3 Fan 6          OK       4830    Spinning at normal speed
      Fan Tray 3 Fan 7          OK       4830    Spinning at normal speed
      Fan Tray 3 Fan 8          OK       4800    Spinning at normal speed
      Fan Tray 3 Fan 9          OK       4800    Spinning at normal speed
      Fan Tray 4 Fan 1          OK       4830    Spinning at normal speed
      Fan Tray 4 Fan 2          OK       4830    Spinning at normal speed
      Fan Tray 4 Fan 3          OK       4830    Spinning at normal speed
      Fan Tray 4 Fan 4          OK       4830    Spinning at normal speed
      Fan Tray 4 Fan 5          OK       4830    Spinning at normal speed
      Fan Tray 4 Fan 6          OK       4860    Spinning at normal speed
      Fan Tray 4 Fan 7          OK       4800    Spinning at normal speed
      Fan Tray 4 Fan 8          OK       4860    Spinning at normal speed
      Fan Tray 4 Fan 9          OK       4770    Spinning at normal speed
      Fan Tray 5 Fan 1          OK       4830    Spinning at normal speed
      Fan Tray 5 Fan 2          OK       4830    Spinning at normal speed
      Fan Tray 5 Fan 3          OK       4830    Spinning at normal speed
      Fan Tray 5 Fan 4          OK       4800    Spinning at normal speed
      Fan Tray 5 Fan 5          OK       4800    Spinning at normal speed
```

 Copyright © 2016, Juniper Networks, Inc.

```
      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
```


Copyright © 2016, Juniper Networks, Inc.

```
      Fan Tray 1 Fan 3          OK       38%       3480 RPM
      Fan Tray 1 Fan 4          OK       38%       3480 RPM
      Fan Tray 1 Fan 5          OK       38%       3480 RPM
      Fan Tray 1 Fan 6          OK       38%       3480 RPM
      Fan Tray 2 Fan 1          OK       38%       3480 RPM
      Fan Tray 2 Fan 2          OK       41%       3720 RPM
      Fan Tray 2 Fan 3          OK       38%       3480 RPM
      Fan Tray 2 Fan 4          OK       38%       3480 RPM
      Fan Tray 2 Fan 5          OK       38%       3480 RPM
      Fan Tray 2 Fan 6          OK       38%       3480 RPM
      Fan Tray 3 Fan 1          OK       38%       3480 RPM
      Fan Tray 3 Fan 2          OK       40%       3600 RPM
      Fan Tray 3 Fan 3          OK       40%       3600 RPM
      Fan Tray 3 Fan 4          OK       40%       3600 RPM
      Fan Tray 3 Fan 5          OK       40%       3600 RPM
      Fan Tray 3 Fan 6          OK       38%       3480 RPM
```

show chassis fan (MX2020 Router)

```
user@host > show chassis fan
      Item                      Status   % RPM     Measurement
      Fan Tray 0 Fan 1          OK       37%       3360 RPM
      Fan Tray 0 Fan 2          OK       37%       3360 RPM
      Fan Tray 0 Fan 3          OK       36%       3240 RPM
      Fan Tray 0 Fan 4          OK       37%       3360 RPM
      Fan Tray 0 Fan 5          OK       37%       3360 RPM
      Fan Tray 0 Fan 6          OK       37%       3360 RPM
      Fan Tray 1 Fan 1          OK       37%       3360 RPM
      Fan Tray 1 Fan 2          OK       37%       3360 RPM
      Fan Tray 1 Fan 3          OK       37%       3360 RPM
      Fan Tray 1 Fan 4          OK       37%       3360 RPM
      Fan Tray 1 Fan 5          OK       37%       3360 RPM
      Fan Tray 1 Fan 6          OK       36%       3240 RPM
      Fan Tray 2 Fan 1          OK       37%       3360 RPM
      Fan Tray 2 Fan 2          OK       37%       3360 RPM
      Fan Tray 2 Fan 3          OK       37%       3360 RPM
      Fan Tray 2 Fan 4          OK       37%       3360 RPM
      Fan Tray 2 Fan 5          OK       37%       3360 RPM
      Fan Tray 2 Fan 6          OK       38%       3480 RPM
      Fan Tray 3 Fan 1          OK       38%       3480 RPM
      Fan Tray 3 Fan 2          OK       38%       3480 RPM
      Fan Tray 3 Fan 3          OK       38%       3480 RPM
      Fan Tray 3 Fan 4          OK       37%       3360 RPM
      Fan Tray 3 Fan 5          OK       37%       3360 RPM
      Fan Tray 3 Fan 6          OK       37%       3360 RPM
```

show chassis fan (ACX4000 Router)

```
user@host > show chassis fan
      Item                      Status   RPM     Measurement
      Fan 1                     OK       4140    Spinning at normal speed
      Fan 2                     OK       4200    Spinning at normal speed
```

show chassis fan (QFX5100 Switch and OCX Series)

```
user@switch > show chassis fan
Item                      Status   RPM     Measurement
FPC 0 Tray 0 Fan 0        OK       6428    Spinning at normal speed
FPC 0 Tray 0 Fan 1        OK       5515    Spinning at normal speed
FPC 0 Tray 1 Fan 0        OK       6360    Spinning at normal speed
FPC 0 Tray 1 Fan 1        OK       5532    Spinning at normal speed
```

Copyright © 2016, Juniper Networks, Inc.

show chassis firmware

List of Syntax

Syntax on page 605
Syntax (TX Matrix Routers) on page 605
Syntax (TX Matrix Plus Routers) on page 605
Syntax (MX Series Routers) on page 605
Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers) on page 605
Syntax (QFX Series) on page 605
Syntax (OCX Series) on page 605
Syntax (ACX Series Universal Access Routers) on page 605
Syntax (EX Series Switches) on page 605

Syntax

show chassis firmware

Syntax (TX Matrix Routers)

show chassis firmware
<lcc *number* | scc>

Syntax (TX Matrix Plus Routers)

show chassis firmware
<lcc *number* | sfc *number*>

Syntax (MX Series Routers)

show chassis firmware
<all-members>
<local>
<member *member-id*>

Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers)

show chassis firmware
<satellite [slot-id *slot-id* |device-alias *alias-name*]>

Syntax (QFX Series)

show chassis firmware
interconnect-device *name*
node-device *name*

Syntax (OCX Series)

show chassis firmware

Syntax (ACX Series Universal Access Routers)

show chassis firmware

Syntax (EX Series Switches)

show chassis firmware
<detail>
<satellite [slot-id *slot-id* |device-alias *alias-name*]>

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 for the TX Matrix Plus router in Junos OS Release 9.6.
Command introduced for EX8200 switches in Junos OS Release 10.2 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.

Copyright © 2016, Juniper Networks, Inc.

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 12.3 for ACX4000 Universal Access Routers.
Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
satellite option introduced in Junos OS Release 14.2R3.

Description On routers and switches, display the version levels of the firmware running on the System Control Board (SCB), Switching and Forwarding Module (SFM), System and Switch Board (SSB), Forwarding Engine Board (FEB), Flexible PIC Concentrators (FPCs), and Routing Engines. On a TX Matrix Plus router, display the version levels of the firmware running on the FPCs and the Switch Processor Mezzanine Board (SPMBs).

On EX2200, EX3200, EX4200, QFX Series, and OCX Series switches, display the version levels of the firmware running on the switch. On an EX8208 switch, display the version levels of the firmware running on the Switch Fabric and Routing Engine (SRE) modules and on the line cards (shown as FPCs). On an EX8216 switch, display the version levels of the firmware running on the Routing Engine (RE) modules and on the line cards (shown as FPCs).

Options

none—Display the version levels of the firmware running. For an EX4200 switch that is a member of a Virtual Chassis, display version levels for all members. For a TX Matrix router, display version levels for the firmware on the TX Matrix router and on all the T640 routers connected to the TX Matrix router. For a TX Matrix Plus router, display version levels for the firmware on the TX Matrix Plus router and on all the routers connected to the TX Matrix Plus router.

all-members—(MX Series routers only) (Optional) Display the version levels of the firmware running for all members of the Virtual Chassis configuration.

interconnect-device ***name***—(QFabric systems) (Optional) Display the version levels of the firmware running on the Interconnect device.

lcc ***number***—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display version levels for the firmware on a specified T640 router (line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, display the version levels for the firmware on a specified router (line-card chassis) that is connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

 Copyright © 2016, Juniper Networks, Inc.

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.

satellite [slot-id ***slot-id*** **| device-alias** ***alias-name*****]**—(Junos Fusion only) (Optional) Display version levels of the firmware running for the specified satellite device or devices in a Junos Fusion, or for all satellite devices if no satellite devices are specified.

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

List of Sample Output

show chassis firmware (M10 Router) on page 608
show chassis firmware (M20 Router) on page 608
show chassis firmware (M40 Router) on page 609
show chassis firmware (M120 Router) on page 609
show chassis firmware (M160 Router) on page 609
show chassis firmware (MX104 Router) on page 609
show chassis firmware (MX240 Router) on page 609
show chassis firmware (MX480 Router) on page 610
show chassis firmware (MX960 Router) on page 610
show chassis firmware (MX2010 Router) on page 610
show chassis firmware (MX2020 Router) on page 610
show chassis firmware (MX240, MX480, MX960 Router with Application Services Modular Line Card) on page 611
show chassis firmware (EX4200 Switch) on page 611
show chassis firmware (EX8200 Switch) on page 611
show chassis firmware (EX9200 Switch) on page 612
show chassis firmware lcc (TX Matrix Router) on page 612
show chassis firmware scc (TX Matrix Router) on page 612
show chassis firmware (TX Matrix Plus Router) on page 612
show chassis firmware lcc (TX Matrix Plus Router) on page 614
show chassis firmware sfc (TX Matrix Plus Router) on page 614
show chassis firmware (QFX Series and OCX Series) on page 615
show chassis firmware (PTX1000 Packet Transport Routers) on page 615
show chassis firmware interconnect-device (QFabric System) on page 615

show chassis firmware (ACX2000 Universal Access Router) on page 615
show chassis firmware detail (EX3300 Switch) on page 615
show chassis firmware (MX Routers with Media Services Blade [MSB]) on page 615

Output Fields Table 34 on page 608 lists the output fields for the **show chassis firmware** command. Output fields are listed in the approximate order in which they appear.

Table 34: 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.
FPC	(*detail* 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	(*detail* option only) Version of the SYSPLD.
PoE	(*detail* option only) Version of the PoE firmware.
PFE-<*number*>	(*detail* option only) Version of the PFE used in the switch.
PHY-	(*detail* option only) Version of the physical layer device (PHY) used in the switch.
microcode	(*detail* option only) Microcode of the physical layer devices (PHY) used in the switch.
uboot	(*detail* option only) Version of the u-boot used in the switch.
loader	(*detail* 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 usera on 2000-04-24 11:27
```

show chassis firmware (M20 Router)

```
user@host> show chassis firmware
```

 Copyright © 2016, Juniper Networks, Inc.

```
Part                    Type       Version
System switch board     ROM        Juniper ROM Monitor Version 3.4b26
                        O/S        Version 3.4I16 by userc on 2000-02-29 2
FPC 1                   ROM        Juniper ROM Monitor Version 3.0b1
                        O/S        Version 3.4I4 by userc on 2000-02-25 21
FPC 2                   ROM        Juniper ROM Monitor Version 3.0b1
                        O/S        Version 3.4I4 by userc 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 userb on 2006-10-18 16:2
FPC 3                   ROM        Juniper ROM Monitor Version 8.0b29
                        O/S        Version 8.2B1 by userb on 2006-10-18 16:2
FPC 4                   ROM        Juniper ROM Monitor Version 8.0b29
                        O/S        Version 8.2B1 by userb on 2006-10-18 16:2
FEB 3                   ROM        Juniper ROM Monitor Version 8.0b29
                        O/S        Version 8.2B1 by userb on 2006-10-18 16:1
FEB 4                   ROM        Juniper ROM Monitor Version 8.0b29
                        O/S        Version 8.2B1 by userb 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 usera on 2000-02-29 11:50
SFM 1                   ROM        Juniper ROM Monitor Version 4.0b2
                        O/S        Version 4.0I1 by usera on 2000-02-29 11:50
FPC 0                   ROM        Juniper ROM Monitor Version 4.0b2
                        O/S        Version 4.0I1 by usera on 2000-02-29 11:56
FPC 1                   ROM        Juniper ROM Monitor Version 4.0b2
                        O/S        Version 4.0I1 by usera on 2000-02-29 11:56
FPC 2                   ROM        Juniper ROM Monitor Version 4.0b3
                        O/S        Version 4.0I1 by usera 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 userb on 2013-
FPC 1                   ROM        Juniper ROM Monitor Version 13.1b24
                        O/S        Version 13.2-20130514.1 by userb on 2013-
FPC 2                   ROM        Juniper ROM Monitor Version 13.1b24
                        O/S        Version 13.2-20130514.1 by userb on 2013-
AFEB                    ROM        Juniper ROM Monitor Version 13.1b24
                        O/S        Version 13.2-20130514.1 by userb on 2013-
```

show chassis firmware (MX240 Router)

```
user@host> show chassis firmware
```

```
Part                    Type       Version
FPC 1                   ROM        Juniper ROM Monitor Version 8.3b1
                        O/S        Version 9.0-20080103.0 by userb on 2008-0
FPC 2                   ROM        Juniper ROM Monitor Version 8.3b1
                        O/S        Version 9.0-20080103.0 by userb on 2008-0
```

show chassis firmware (MX480 Router)

```
user@host> show chassis firmware
Part                    Type       Version
FPC 1                   ROM        Juniper ROM Monitor Version 8.3b1
                        O/S        Version 9.0-20070916.3 by userb on 2007-0
```

show chassis firmware (MX960 Router)

```
user@host> show chassis firmware
Part                    Type       Version
FPC 4                   ROM        Juniper ROM Monitor Version 8.0b8
                        O/S        Version 8.2I59 by user3 on 2006-10-31 19:22
FPC 7                   ROM        Juniper ROM Monitor Version 8.2b1
                        O/S        Version 8.2-20061026.1 by userb on 2006-1
```

show chassis firmware (MX2010 Router)

```
user@host> show chassis firmware
Part                    Type       Version
FPC 0                   ROM        Juniper ROM Monitor Version 12.3b1
                        O/S        Version 12.3-20121220.0 by userb on 2012-
FPC 1                   ROM        Juniper ROM Monitor Version 10.1b3
                        O/S        Version 12.3-20121220.0 by userb on 2012-
FPC 2                   ROM        Juniper ROM Monitor Version 10.1b3
                        O/S        Version 12.3-20121220.0 by userb on 2012-
FPC 3                   ROM        Juniper ROM Monitor Version 10.1b3
                        O/S        Version 12.3-20121220.0 by userb on 2012-
FPC 4                   ROM        Juniper ROM Monitor Version 10.0b39
                        O/S        Version 12.3-20121220.0 by userb on 2012-
FPC 5                   ROM        Juniper ROM Monitor Version 10.0b39
                        O/S        Version 12.3-20121220.0 by userb on 2012-
FPC 6                   ROM        Juniper ROM Monitor Version 10.4b1
                        O/S        Version 12.3-20121220.0 by userb on 2012-
FPC 7                   ROM        Juniper ROM Monitor Version 10.1b3
                        O/S        Version 12.3-20121220.0 by userb on 2012-
FPC 8                   ROM        Juniper ROM Monitor Version 10.4b1
                        O/S        Version 12.3-20121220.0 by userb on 2012-
FPC 9                   ROM        Juniper ROM Monitor Version 10.4b1
                        O/S        Version 12.3-20121220.0 by userb on 2012-
SPMB 0                  ROM        Juniper ROM Monitor Version 12.1b1
                        O/S        Version 12.3-20121220.0 by userb on 2012-
SPMB 1                  ROM        Juniper ROM Monitor Version 12.1b1
                        O/S        Version 12.3-20121220.0 by userb on 2012-
```

show chassis firmware (MX2020 Router)

```
user@host> show chassis firmware
Part                    Type       Version
FPC 0                   ROM        Juniper ROM Monitor Version 10.0b39
                        O/S        Version 12.3-20130415.0 by userb on 2013-
FPC 1                   ROM        Juniper ROM Monitor Version 10.0b39
                        O/S        Version 12.3-20130415.0 by userb on 2013-
FPC 2                   ROM        Juniper ROM Monitor Version 10.0b39
                        O/S        Version 12.3-20130415.0 by userb on 2013-
FPC 3                   ROM        Juniper ROM Monitor Version 10.0b39
```


Copyright © 2016, Juniper Networks, Inc.

```
                                O/S        Version 12.3-20130415.0 by userb on 2013-
FPC 4                           ROM        Juniper ROM Monitor Version 10.0b39
                                O/S        Version 12.3-20130415.0 by userb on 2013-
FPC 5                           ROM        Juniper ROM Monitor Version 10.0b39
                                O/S        Version 12.3-20130415.0 by userb on 2013-
FPC 6                           ROM        Juniper ROM Monitor Version 10.0b39
                                O/S        Version 12.3-20130415.0 by userb on 2013-
FPC 7                           ROM        Juniper ROM Monitor Version 10.0b39
                                O/S        Version 12.3-20130415.0 by userb on 2013-
FPC 8                           ROM        Juniper ROM Monitor Version 10.0b39
                                O/S        Version 12.3-20130415.0 by userb on 2013-
FPC 9                           ROM        Juniper ROM Monitor Version 10.0b39
                                O/S        Version 12.3-20130415.0 by userb on 2013-
FPC 10                          ROM        Juniper ROM Monitor Version 10.0b39
                                O/S        Version 12.3-20130415.0 by userb on 2013-
FPC 11                          ROM        Juniper ROM Monitor Version 10.0b39
                                O/S        Version 12.3-20130415.0 by userb on 2013-
FPC 12                          ROM        Juniper ROM Monitor Version 10.0b39
                                O/S        Version 12.3-20130415.0 by userb on 2013-
FPC 13                          ROM        Juniper ROM Monitor Version 10.0b39
                                O/S        Version 12.3-20130415.0 by userb on 2013-
FPC 14                          ROM        Juniper ROM Monitor Version 10.0b39
                                O/S        Version 12.3-20130415.0 by userb on 2013-
FPC 15                          ROM        Juniper ROM Monitor Version 10.0b39
                                O/S        Version 12.3-20130415.0 by userb on 2013-
FPC 16                          ROM        Juniper ROM Monitor Version 10.0b39
                                O/S        Version 12.3-20130415.0 by userb on 2013-
FPC 17                          ROM        Juniper ROM Monitor Version 10.0b39
                                O/S        Version 12.3-20130415.0 by userb on 2013-
FPC 18                          ROM        Juniper ROM Monitor Version 10.0b39
                                O/S        Version 12.3-20130415.0 by userb on 2013-
FPC 19                          ROM        Juniper ROM Monitor Version 10.0b39
                                O/S        Version 12.3-20130415.0 by userb on 2013-
SPMB 0                          ROM        Juniper ROM Monitor Version 12.1b1
                                O/S        Version 12.3-20130415.0 by userb on 2013-
SPMB 1                          ROM        Juniper ROM Monitor Version 12.1b1
                                O/S        Version 12.3-20130415.0 by userb on 2013-
```

show chassis firmware (MX240, MX480, MX960 Router with Application Services Modular Line Card)

```
user@host> show chassis firmware

Part                            Type       Version
FPC 1                           ROM        Juniper ROM Monitor Version 12.1b1
                                O/S        Version 12.2I21 by user1 on 2012-06-19 17:
```

show chassis firmware (EX4200 Switch)

```
user@switch> show chassis firmware

Part                          Type       Version
FPC 0                         uboot      U-Boot 1.1.6 (Feb  6 2008 - 11:27:42)
                              loader     FreeBSD/PowerPC U-Boot bootstrap loader 2.1
FPC 1                         uboot      U-Boot 1.1.6 (Feb  6 2008 - 11:27:42)
                              loader     FreeBSD/PowerPC U-Boot bootstrap loader 2.1
FPC 2                         uboot      U-Boot 1.1.6 (Feb  6 2008 - 11:27:42)
                              loader     FreeBSD/PowerPC U-Boot bootstrap loader 2.1
```

show chassis firmware (EX8200 Switch)

```
user@switch> show chassis firmware
```

```
Part                    Type       Version
FPC 0                   U-Boot     U-Boot 1.1.6 (Mar 25 2009 - 06:13:12) 2.4.0
                        loader     FreeBSD/PowerPC U-Boot bootstrap loader 2.2
FPC 3                   U-Boot     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
                                   FreeBSD/PowerPC U-Boot bootstrap loader 2.2
                        loader
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 (EX9200 Switch)

```
user@switch> show chassis firmware
 Part                    Type       Version
 FPC 2                   ROM        Juniper ROM Monitor Version 11.4b2
                         O/S        Version 14.1I20140312_0741 by userd o
FPC 3                    ROM        Juniper ROM Monitor Version 10.4b1
                         O/S        Version 14.1I20140312_0741 by userd o
```

show chassis firmware lcc (TX Matrix Router)

```
user@host> show chassis firmware lcc 0
lcc0-re0:
--------------------------------------------------------------------------
Part                    Type       Version
FPC 1                   ROM        Juniper ROM Monitor Version 6.4b18
                        O/S        Version 7.0-20040804.0 by userb on 2004-0
FPC 2                   ROM        Juniper ROM Monitor Version 6.4b20
                        O/S        Version 7.0-20040804.0 by userb on 2004-0
SPMB 0                  ROM        Juniper ROM Monitor Version 6.4b18
                        O/S        Version 7.0-20040804.0 by userb 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 userb 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
```


Copyright © 2016, Juniper Networks, Inc.

```
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 userb on 2009-0
SPMB 1                  ROM        Juniper ROM Monitor Version 9.5b1
                        O/S        Version 9.6-20090507.0 by userb 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 userb on 2009-0
FPC 6                   ROM        Juniper ROM Monitor Version 9.0b2
                        O/S        Version 9.6-20090507.0 by userb on 2009-0
FPC 7                   ROM        Juniper ROM Monitor Version 9.0b2
                        O/S        Version 9.6-20090507.0 by userb on 2009-0
SPMB 0                  ROM        Juniper ROM Monitor Version 9.5b1
                        O/S        Version 9.6-20090507.0 by userb on 2009-0
SPMB 1                  ROM        Juniper ROM Monitor Version 9.5b1
                        O/S        Version 9.6-20090507.0 by userb 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 userb on 2009-0
FPC 6                   ROM        Juniper ROM Monitor Version 9.0b2
                        O/S        Version 9.6-20090507.0 by userb on 2009-0
FPC 7                   ROM        Juniper ROM Monitor Version 9.0b2
                        O/S        Version 9.6-20090507.0 by userb on 2009-0
SPMB 0                  ROM        Juniper ROM Monitor Version 9.5b1
                        O/S        Version 9.6-20090507.0 by userb on 2009-0
SPMB 1                  ROM        Juniper ROM Monitor Version 9.5b1
                        O/S        Version 9.6-20090507.0 by userb 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 userb on 2009-0
FPC 5                   ROM        Juniper ROM Monitor Version 9.0b2
                        O/S        Version 9.6-20090507.0 by userb on 2009-0
FPC 6                   ROM        Juniper ROM Monitor Version 9.0b2
                        O/S        Version 9.6-20090507.0 by userb on 2009-0
FPC 7                   ROM        Juniper ROM Monitor Version 7.5b4
                        O/S        Version 9.6-20090507.0 by userb on 2009-0
SPMB 0                  ROM        Juniper ROM Monitor Version 9.5b1
                        O/S        Version 9.6-20090507.0 by userb on 2009-0
SPMB 1                  ROM        Juniper ROM Monitor Version 9.5b1
                        O/S        Version 9.6-20090507.0 by userb 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 userb on 2009-0
FPC 1                       ROM        Juniper ROM Monitor Version 9.0b2
                            O/S        Version 9.6-20090507.0 by userb on 2009-0
FPC 2                       ROM        Juniper ROM Monitor Version 9.0b2
                            O/S        Version 9.6-20090507.0 by userb on 2009-0
FPC 4                       ROM        Juniper ROM Monitor Version 7.5b4
                            O/S        Version 9.6-20090507.0 by userb on 2009-0
FPC 5                       ROM        Juniper ROM Monitor Version 9.0b2
                            O/S        Version 9.6-20090507.0 by userb on 2009-0
FPC 7                       ROM        Juniper ROM Monitor Version 9.0b2
                            O/S        Version 9.6-20090507.0 by userb on 2009-0
SPMB 0                      ROM        Juniper ROM Monitor Version 9.5b1
                            O/S        Version 9.6-20090507.0 by userb on 2009-0
SPMB 1                      ROM        Juniper ROM Monitor Version 9.5b1
                            O/S        Version 9.6-20090507.0 by userb 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 userb on 2009-0
FPC 6                       ROM        Juniper ROM Monitor Version 9.0b2
                            O/S        Version 9.6-20090507.0 by userb on 2009-0
FPC 7                       ROM        Juniper ROM Monitor Version 9.0b2
                            O/S        Version 9.6-20090507.0 by userb on 2009-0
SPMB 0                      ROM        Juniper ROM Monitor Version 9.5b1
                            O/S        Version 9.6-20090507.0 by userb on 2009-0
SPMB 1                      ROM        Juniper ROM Monitor Version 9.5b1
                            O/S        Version 9.6-20090507.0 by userb 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 userb on 2009-0
SPMB 1                      ROM        Juniper ROM Monitor Version 9.5b1
                            O/S        Version 9.6-20090507.0 by userb on 2009-0
```


Copyright © 2016, Juniper Networks, Inc.

show chassis firmware (QFX Series and OCX 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 (PTX1000 Packet Transport Routers)

```
user@host> show chassis firmware
Part                    Type       Version
FPC 0                   U-Boot      ***
                        loader           FreeBSD/i386 bootstrap loader 1.2
                        BIOS       V0018.2U
                        EC FPGA    2.0
                        MAIN_CPLD  1.f
                        MEZZ_CPLD  1.f
                        RE FPGA    2.3
```

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                     O/S        Version 12.2I13 by user2 on 2012-05-29 06:
FEB                     O/S        Version 12.2I13 by user2 on 2012-05-29 06:
```

show chassis firmware detail (EX3300 Switch)

```
user@switch> show chassis firmware detail
FPC 0
   Boot SYSPLD             3
   PoE firmware            4.1.6
   PFE-0                   3
   PFE-1                   3
   PHY
      microcode            0x514
   Boot Firmware
      uboot                U-Boot 1.1.6 (Aug 21 2011 - 01:45:26)   1.0.0
      loader               FreeBSD/arm U-Boot loader 1.0
```

show chassis firmware (MX Routers with Media Services Blade [MSB])

```
user@switch> show chassis firmware
Part                    Type       Version
FPC 1                   ROM        Juniper ROM Monitor Version 12.1b1
                        O/S        Version 12.2I21 by user1 on 2012-06-19 17:
```

show chassis fpc

List of Syntax

Syntax on page 616
Syntax (EX Series Switches) on page 616
Syntax (T4000 Routers) on page 616
Syntax (TX Matrix and TX Matrix Plus Routers) on page 616
Syntax (MX Series Router) on page 616
Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers) on page 616
Syntax (QFX Series) on page 616
Syntax (OCX Series) on page 616
Syntax (PTX Series Packet Transport Routers) on page 616
Syntax (PTX Series Packet Transport Switches) on page 617

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 Router)

show chassis fpc
<detail <*slot*>> | <pic-status <*slot*>>
<all-members>
<local>
<member *member-id*>

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 *name* <fpc-slot *fpc-slot*>>
<node-device *name*>

Syntax (OCX Series)

show chassis fpc
<detail>

Syntax (PTX Series Packet Transport Routers)

show chassis fpc
<detail <*fpc-slot*>> | <pic-status <*fpc-slot*>>
<*fpc-slot*>

Copyright © 2016, Juniper Networks, Inc.

Syntax (PTX Series Packet Transport Switches)

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 MX104 3D Universal Edge Routers.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
Command introduced in Junos OS Release 15.1 for MX104-40G 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 T1600 routers in the routing matrix.

NOTE: In EX8200 switches, line cards initialize Packet Forwarding Engine during start up. If an error occurs during hardware initialization, the FPCs with bad hardware parts power down after transferring the debug information to the Routing Engine. The Routing Engine marks the FPC offline, logs the error in system log messages (/var/log/messages), and generates an alarm to inform the user.

See the following sample output:

```
user@host> show chassis fpc

                     Temp  CPU Utilization (%)   Memory
Utilization (%)
Slot State            (C)  Total  Interrupt      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
```


Copyright © 2016, Juniper Networks, Inc.

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      DRAM (MB) Heap
    Buffer
  0  offline         ---FPC misconfiguration---
  1  offline         ---FPC misconfiguration---
  2  offline         ---FPC misconfiguration---
  3  Empty
  4  Empty
  5  Online            66      50          0       2816       29
    27
```

The following sample output shows FPC misconfiguration alarms.

```
user@host > show chassis alarms

3 alarms currently active
Alarm time               Class  Description
2011-03-24 00:52:51 PST  Major  FPC 1 misconfig
2011-03-24 00:52:31 PST  Major  FPC 2 misconfig
2011-03-24 00:52:31 PST  Major  FPC 3 misconfig
```

detail—(Optional) Display detailed status information for all FPCs or for the FPC in the specified slot (see ***fpc-slot*** or ***slot***).

all-members—(MX Series routers and EX Series switches only) (Optional) Display status information for all FPCs on all members of the Virtual Chassis configuration.

interconnect-device *name*—(QFabric switches 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 and MX104-40G routers—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:
  - QFX Series and OCX Series switches—Replace ***fpc-slot*** with 0.
  - QFabric systems—Replace ***fpc-slot*** with 0 through 31 on the Interconnect device.
- PTX Series Packet Transport Switches:
  - 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 and EX Series switches only) (Optional) Display status information for all FPCs on the specified member of the Virtual Chassis configuration. Replace ***member-id*** with a value of 0 or 1.

 Copyright © 2016, Juniper Networks, Inc.

node-device ***name***—(QFabric switches 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      1xCOC12/4xCOC3 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 345
- *show chassis fpc-feb-connectivity*
- *show chassis fabric fpcs*
- *Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online*
- *MX960 Flexible PIC Concentrator Description*
- *ACX2000 and ACX2100 Routers Hardware and CLI Terminology Mapping*
- *enhanced-mode*

List of Sample Output

show chassis fpc (EX6210 Switch) on page 626
show chassis fpc (M10 Router) on page 627
show chassis fpc (M20 Router) on page 627
show chassis fpc detail (M Series Routers) on page 627
show chassis fpc detail (MX80 Router) on page 627
show chassis fpc (MX104 Router) on page 627
show chassis fpc detail (MX104 Router) on page 628
show chassis fpc pic-status (MX104 Router) on page 628

 Copyright © 2016, Juniper Networks, Inc.

show chassis fpc (MX104-40G Router) on page 628
show chassis fpc detail (MX104-40G Router) on page 628
show chassis fpc pic-status (MX104-40G Router) on page 629
show chassis fpc pic-status (MX104-40G Router with Upgrade License) on page 629
show chassis fpc (MX240 Router) on page 629
show chassis fpc (MX480 Router) on page 630
show chassis fpc detail (EX9200 Switch) on page 630
show chassis fpc (MX480 Router) on page 630
show chassis fpc (MX480 Router with 100-Gigabit Ethernet CFP) on page 630
show chassis fpc pic-status (MX480 Router with 100-Gigabit Ethernet CFP) on page 631
show chassis fpc pic-status (EX Series Switch) on page 631
show chassis fpc (MX480 Router with MPC4E) on page 631
show chassis fpc detail (MX480 Router with MPC4E) on page 631
show chassis fpc (MX480 Router with MPC4E) on page 632
show chassis fpc detail (MX480 Router with MPC4E) on page 632
show chassis fpc (MX960 Router) on page 632
show chassis fpc (MX960 Router with MPC5EQ) on page 633
show chassis fpc detail (MX960 Router with MPC5EQ) on page 633
show chassis fpc pic-status(MX960 Router with MPC5EQ) on page 635
show chassis fpc (MX240, MX480, MX960 Routers with Application Services Modular Line Card) on page 635
show chassis fpc (MX240, MX480, MX960 with Application Services Modular Line Card) on page 636
show chassis fpc (MX240, MX480, MX960, MX2010, and MX2020 3D Universal Edge Routers Configured for Dynamic Power Management on page 636
show chassis fpc (MX2010 Routers) on page 636
show chassis fpc (MX2020 Routers) on page 636
show chassis fpc (MX2020 Router with MPC4E) on page 637
show chassis fpc detail (MX2020 Router with MPC4E) on page 637
show chassis fpc (MX2020 Router with MPC5EQ and MPC6E) on page 638
show chassis fpc detail (MX2020 Router with MPCEQ and MPC6E) on page 638
show chassis fpc pic-status (MX2020 Router with MPC5EQ and MPC6E) on page 640
show chassis fpc detail (MX Series Routers) on page 641
show chassis fpc detail (EX Series Switches) on page 641
show chassis fpc (Hardware Not Supported) on page 641
show chassis fpc detail (Hardware Not Supported) on page 642
show chassis fpc pic-status on page 642
show chassis fpc pic-status (M Series Routers) on page 642
show chassis fpc pic-status (M120 Router) on page 643
show chassis fpc pic-status (MX240, MX480, and MX960 Routers with Application Services Modular Line Card) on page 643
show chassis fpc lcc (TX Matrix Router) on page 643
show chassis fpc pic-status (TX Matrix Router) on page 643
show chassis fpc pic-status lcc (TX Matrix Router) on page 644
show chassis fpc (TX Matrix Plus Router) on page 644
show chassis fpc lcc (TX Matrix Plus Router) on page 645
show chassis fpc detail (TX Matrix Plus Router) on page 645
show chassis fpc pic-status (TX Matrix Plus Router) on page 647
show chassis fpc (T1600 Router) on page 648

show chassis fpc detail (T1600 Router) on page 649
show chassis fpc <fpc-slot> (EX Series Switch) on page 649
show chassis fpc slot (T1600 Router) on page 649
show chassis fpc pic-status (T1600 Router) on page 649
show chassis fpc (T4000 Router) on page 650
show chassis fpc detail (T4000 Router) on page 650
show chassis fpc pic-status (T4000 Router) on page 651
show chassis fpc (QFX Series) on page 651
show chassis fpc detail (QFX3500 Switches) on page 651
show chassis fpc pic-status (QFX3500 Switches) on page 651
show chassis fpc interconnect-device (QFabric Switch) on page 651
show chassis fpc interconnect-device (QFabric Switch) on page 652
show chassis fpc interconnect-device detail (QFabric Switch) on page 652
show chassis fpc pic-status interconnect-device (QFabric Switch) on page 652
show chassis fpc pic-status node-device (QFabric Switch) on page 653
show chassis fpc (PTX5000 Packet Transport Switch) on page 653
show chassis fpc detail (PTX5000 Packet Transport Switch) on page 653
show chassis fpc pic-status (PTX5000 Packet Transport Switch) on page 654
show chassis fpc (ACX2000 Universal Access Router) on page 654
show chassis fpc 0 (ACX2000 Universal Access Router) on page 654
show chassis fpc detail (ACX2000 Universal Access Router) on page 654
show chassis fpc pic-status (ACX2000 Universal Access Router) on page 655
show chassis FPC 1 (MX Routers with Media Services Blade [MSB]) on page 655
show chassis FPC 1 detail (MX Routers with Media Services Blade [MSB]) on page 655

Output Fields Table 35 on page 624 lists the output fields for the **show chassis fpc** command. Output fields are listed in the approximate order in which they appear.

Table 35: 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:
	• **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:
	  ◦ **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

 Copyright © 2016, Juniper Networks, Inc.

Table 35: show chassis fpc Output Fields *(continued)*

Field Name	Field Description	Level of Output
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: • 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 (TL*n*)-–Temperature of the specified Lookup ASIC (TL) of the packet forwarding engine on the FPC. • Temperature (TQ*n*)-–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
Interrupt CPU Utilization (%)	Of the total CPU being used by the FPC's processor, the percentage being used for interrupts.	none specified
1 min CPU utilization (%) NOTE: Supported only on MX240, MX480, MX960, MX2010, and MX2020.	Information about the Routing Engine's CPU utilization in the past 1 minute.	none specified
5 min CPU utilization (%) NOTE: Supported only on MX240, MX480, MX960, MX2010, and MX2020.	Information about the Routing Engine's CPU utilization in the past 5 minutes.	none specified
15 min CPU utilization (%) NOTE: Supported only on MX240, MX480, MX960, MX2010, and MX2020.	Information about the Routing Engine's CPU utilization in the past 5 minutes.	none specified
Memory DRAM (MB)	Total DRAM, in megabytes, available to the FPC's processor.	none specified

Copyright © 2016, Juniper Networks, Inc.

Table 35: show chassis fpc Output Fields *(continued)*

Field Name	Field Description	Level of Output
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 and EX Series switches in a broadband edge environment, heap utilization levels higher than 70 percent can affect unified ISSU, router stability, or scaling capability.	none specified
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
                     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) 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
```


Copyright © 2016, Juniper Networks, Inc.

show chassis fpc (M10 Router)

```
user@host> show chassis fpc
FPC status:
                Temp
Slot State       (C)
  0  Online       27
  1  Online       28
```

show chassis fpc (M20 Router)

```
user@host> show chassis fpc
FPC status:
                Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State       (C)  Total  Interrupt      DRAM (MB) 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 (MX104-40G Router)

```
user@host> show chassis fpc
      Temp  CPU Utilization (%)   CPU Utilization (%)  Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      1min   5min   15min  DRAM (MB)
Heap     Buffer
  0  Online            48     18          6                           2048
  9         13
  1  Online            48     18          6                           2048
  9         13
  2  Online            48     18          6                           2048
  9         13
```

show chassis fpc detail (MX104-40G Router)

```
user@host> show chassis fpc detail
Slot 0 information:
  State                                 Online
  Temperature                        48 (C)
  Total CPU DRAM                   2048 MB
  Total SRAM                        403 MB
```

 Copyright © 2016, Juniper Networks, Inc.

```
  Total SDRAM                    1316 MB
  Start time                          2015-02-27 03:05:54 PST
  Uptime                              2 hours, 38 minutes, 27 seconds
Slot 1 information:
  State                               Online
  Temperature                      48 (C)
  Total CPU DRAM                 2048 MB
  Total SRAM                      403 MB
  Total SDRAM                    1316 MB
  Start time                          2015-02-27 03:05:55 PST
  Uptime                              2 hours, 38 minutes, 26 seconds
Slot 2 information:
  State                               Online
  Temperature                      48 (C)
  Total CPU DRAM                 2048 MB
  Total SRAM                      403 MB
  Total SDRAM                    1316 MB
  Start time                          2015-02-27 03:05:55 PST
  Uptime                              2 hours, 38 minutes, 26 seconds
```

show chassis fpc pic-status (MX104-40G Router)

MIC slots 1/0 and 1/1 have been disabled by default on the MX104-40G routers. If you install MICs on those slots, the MIC details are displayed when you run the **show chassis fpc pic-status** command. However, the status of the MIC is displayed as offline.

```
user@host> show chassis fpc pic-status
Slot 0   Online
  PIC 0  Online       MS-MIC-16G
  PIC 2  Online       10x 1GE(LAN) SFP
  PIC 3  Online       10x 1GE(LAN) SFP
Slot 1   Online
  PIC 0  Offline      10x 1GE(LAN) SFP
  PIC 1  Offline      10x 1GE(LAN) SFP
Slot 2   Online
  PIC 0  Online       4x 10GE(LAN) SFP+
```

show chassis fpc pic-status (MX104-40G Router with Upgrade License)

When you install the upgrade license on MX104-40G, MIC slots 1/0 and 1/1 are enabled. If you install MICs on those slots, the MIC details are displayed and the status of the MIC is displayed as online when you run the **show chassis fpc pic-status** command.

```
user@host> show chassis fpc pic-status
Slot 0   Online
  PIC 0  Online       MS-MIC-16G
  PIC 2  Online       10x 1GE(LAN) SFP
  PIC 3  Online       10x 1GE(LAN) SFP
Slot 1   Online
  PIC 0  Online       10x 1GE(LAN) SFP
  PIC 1  Online       10x 1GE(LAN) 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 detail (EX9200 Switch)

```
user@switch> show chassis fpc detail
Slot 2 information:
  State                                 Online
  Temperature                        37
  Total CPU DRAM                   2048 MB
  Total RLDRAM                      331 MB
  Total DDR DRAM                   1536 MB
  Start time:                           2014-03-12 15:35:28 UTC
  Uptime:                               1 hour, 4 minutes, 29 seconds
  Max Power Consumption             239 Watts
Slot 3 information:
  State                                 Online
  Temperature                        39
  Total CPU DRAM                   2048 MB
  Total RLDRAM                     1036 MB
  Total DDR DRAM                   6656 MB
  Start time:                           2014-03-12 15:00:18 UTC
  Uptime:                               1 hour, 39 minutes, 39 seconds
  Max Power Consumption             520 Watts
```

show chassis fpc (MX480 Router)

```
user@host> show chassis fpc
               Temp  CPU Utilization (%)   CPU Utilization (%)  Memory
Utilization (%)
Slot State            (C)  Total  Interrupt      1min   5min   15min  DRAM (MB)
Heap     Buffer
  0  Online                    1          0        1      2      3    1024
  4         56
  1  Online                    1          0        2      2      3    1024
  4         56
```

show chassis fpc (MX480 Router with 100-Gigabit Ethernet CFP)

```
user@host> show chassis fpc
        Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State     (C)  Total  Interrupt      DRAM (MB) Heap     Buffer
 0  Online      33   4      0              2048      10       13
 1  Online      36   7      0              2048      16       13
 2  Online      29   6      0              1024      27       29
 3  Online      33   0      0                 0       0        0
 4  Online      36   7      0              2048      19       13
 5  Online      34  31     11              2048      14       13
```


Copyright © 2016, Juniper Networks, Inc.

show chassis fpc pic-status (MX480 Router with 100-Gigabit Ethernet CFP)

```
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
  PIC 0  Online       10x 1GE(LAN) EQ
  PIC 1  Online       10x 1GE(LAN) EQ
  PIC 2  Online       10x 1GE(LAN) EQ
  PIC 3  Online       10x 1GE(LAN) EQ
 Slot 3  Online       MPC Type 3
  PIC 0  Online       1X100GE CFP
  PIC 2  Online       1X100GE CFP
 Slot 4  Online       MPC Type 3
  PIC 0  Online       1X100GE CFP
  PIC 2  Online       1X100GE CFP
 Slot 5  Online       MPC Type 2 3D EQ
  PIC 0  Online       2x 10GE  XFP
  PIC 1  Online       2x 10GE  XFP
  PIC 2  Online       10x 1GE(LAN) SFP
  PIC 3  Online       10x 1GE(LAN) SFP
```

show chassis fpc pic-status (EX Series Switch)

```
user@host> show chassis fpc pic-status
Slot 1   Online       EX9200 32x10G SFP
  PIC 0  Online       8X10GE SFPP
  PIC 1  Online       8X10GE SFPP
  PIC 2  Online       8X10GE SFPP
  PIC 3  Online       8X10GE SFPP
Slot 2   Online       EX9200 32x10G SFP
  PIC 0  Online       8X10GE SFPP
  PIC 1  Online       8X10GE SFPP
  PIC 2  Online       8X10GE SFPP
  PIC 3  Online       8X10GE SFPP
```

show chassis fpc (MX480 Router with MPC4E)

```
user@host> show chassis fpc
       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 RLDRAM                     1036 MB
  Total DDR DRAM                   11264 MB
  Start time:                           2013-02-18 05:06:57 PST
  Uptime:                               17 hours, 41 minutes, 9 seconds
  Max Power Consumption             610 Watts
Slot 3 information:
```

```
  State                                 Online
  Temperature                        38
  Total CPU DRAM                   2048 MB
  Total RLDRAM                     1036 MB
  Total DDR DRAM                   11264 MB
  Start time:                           2013-02-18 05:07:00 PST
  Uptime:                               17 hours, 41 minutes, 6 seconds
  Max Power Consumption             610 Watts
Slot 4 information:
  State                                 Diagnostics
  Temperature                        37
  Total CPU DRAM                      0 MB
  Total RLDRAM                        0 MB
  Total DDR DRAM                      0 MB
  Max Power Consumption             520 Watts
```

show chassis fpc (MX480 Router with MPC4E)

```
user@host> show chassis fpc
                   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 RLDRAM                     1036 MB
  Total DDR DRAM                   11264 MB
  Start time:                           2013-02-18 05:06:57 PST
  Uptime:                               17 hours, 41 minutes, 9 seconds
  Max Power Consumption             610 Watts
Slot 3 information:
  State                                 Online
  Temperature                        38
  Total CPU DRAM                   2048 MB
  Total RLDRAM                     1036 MB
  Total DDR DRAM                   11264 MB
  Start time:                           2013-02-18 05:07:00 PST
  Uptime:                               17 hours, 41 minutes, 6 seconds
  Max Power Consumption             610 Watts
Slot 4 information:
  State                                 Diagnostics
  Temperature                        37
  Total CPU DRAM                      0 MB
  Total RLDRAM                        0 MB
  Total DDR DRAM                      0 MB
  Max Power Consumption             520 Watts
```

show chassis fpc (MX960 Router)

```
user@host> show chassis fpc
                     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State      (C)  Total  Interrupt      DRAM (MB) Heap     Buffer
```

 Copyright © 2016, Juniper Networks, Inc.

```
 0  Empty
 1  Empty
 2  Empty
 3  Online       25     19          0       1024       15         57
 4  Empty
 5  Online       26     27          0       1024       15         57
 6  Empty
 7  Empty
 8  Empty
 9  Empty
 10  Empty
 11  Empty
```

show chassis fpc (MX960 Router with MPC5EQ)

```
user@host> show chassis fpc
                     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) Heap     Buffer
  0  Online            38     16          0       3584        7         13
  1  Online            31     15          0       2048       17         13
  2  Empty
  3  Online            31     14          0       2048       20         13
  4  Online            34     16          0       3584        7         13
  5  Online            34     16          0       3584        7         13
  6  Empty
  7  Online            32      9          0       2048       18         14
  8  Online            36     19          0       3584        7         13
  9  Online            31      9          0       2048       13         13
 10  Online            35     14          0       3584        7         13
 11  Online            33     11          0       2048       18         14
```

show chassis fpc detail (MX960 Router with MPC5EQ)

```
user@host> show chassis fpc detail
Slot 0 information:
  State                                 Online
  Temperature                        38
  Total CPU DRAM                   3584 MB
  Total XR2                         291 MB
  Total DDR DRAM                  24960 MB
  Start time:                           2014-04-22 10:01:46 PDT
  Uptime:                               1 hour, 23 minutes, 40 seconds
  Max Power Consumption             607 Watts
Slot 1 information:
  State                                 Online
  Temperature                        31
  Total CPU DRAM                   2048 MB
  Total RLDRAM                     1036 MB
  Total DDR DRAM                   6656 MB
  Start time:                           2014-04-22 10:01:50 PDT
  Uptime:                               1 hour, 23 minutes, 36 seconds
  Max Power Consumption             520 Watts
Slot 3 information:
  State                                 Online
  Temperature                        31
  Total CPU DRAM                   2048 MB
  Total RLDRAM                     1324 MB
  Total DDR DRAM                   5120 MB
  Start time:                           2014-04-22 10:01:50 PDT
  Uptime:                               1 hour, 23 minutes, 36 seconds
  Max Power Consumption             440 Watts
```

```
Slot 4 information:
  State                                 Online
  Temperature                        34
  Total CPU DRAM                   3584 MB
  Total XR2                         291 MB
  Total DDR DRAM                  24960 MB
  Start time:                           2014-04-22 10:01:54 PDT
  Uptime:                               1 hour, 23 minutes, 32 seconds
  Max Power Consumption             607 Watts
Slot 5 information:
  State                                 Online
  Temperature                        34
  Total CPU DRAM                   3584 MB
  Total XR2                         291 MB
  Total DDR DRAM                  24960 MB
  Start time:                           2014-04-22 10:01:56 PDT
  Uptime:                               1 hour, 23 minutes, 30 seconds
  Max Power Consumption             607 Watts
Slot 7 information:
  State                                 Online
  Temperature                        32
  Total CPU DRAM                   2048 MB
  Total RLDRAM                     1036 MB
  Total DDR DRAM                  11264 MB
  Start time:                           2014-04-22 10:02:02 PDT
  Uptime:                               1 hour, 23 minutes, 24 seconds
  Max Power Consumption             608 Watts
Slot 8 information:
  State                                 Online
  Temperature                        36
  Total CPU DRAM                   3584 MB
  Total XR2                         291 MB
  Total DDR DRAM                  24960 MB
  Start time:                           2014-04-22 10:02:07 PDT
  Uptime:                               1 hour, 23 minutes, 19 seconds
  Max Power Consumption             607 Watts
Slot 9 information:
  State                                 Online
  Temperature                        31
  Total CPU DRAM                   2048 MB
  Total RLDRAM                      734 MB
  Total DDR DRAM                   3108 MB
  Start time:                           2014-04-22 10:02:05 PDT
  Uptime:                               1 hour, 23 minutes, 21 seconds
  Max Power Consumption             368 Watts
Slot 10 information:
  State                                 Online
  Temperature                        35
  Total CPU DRAM                   3584 MB
  Total XR2                         291 MB
  Total DDR DRAM                  24960 MB
  Start time:                           2014-04-22 10:02:11 PDT
  Uptime:                               1 hour, 23 minutes, 15 seconds
  Max Power Consumption             607 Watts
Slot 11 information:
  State                                 Online
  Temperature                        33
  Total CPU DRAM                   2048 MB
  Total RLDRAM                     1036 MB
  Total DDR DRAM                  11264 MB
  Start time:                           2014-04-22 10:02:16 PDT
```


Copyright © 2016, Juniper Networks, Inc.

```
  Uptime:                                1 hour, 23 minutes, 10 seconds
  Max Power Consumption             608 Watts
```

show chassis fpc pic-status(MX960 Router with MPC5EQ)

```
user@host> show chassis fpc pic-status
Slot 0   Online       MPC5E 3D Q 2CGE+4XGE
  PIC 0  Online       2X10GE SFPP OTN
  PIC 1  Online       1X100GE CFP2 OTN
  PIC 2  Online       2X10GE SFPP OTN
  PIC 3  Online       1X100GE CFP2 OTN
Slot 1   Online       MPCE Type 3 3D
  PIC 0  Online       10X10GE SFPP
  PIC 2  Online       1X100GE CXP
Slot 3   Online       MPC 3D 16x 10GE
  PIC 0  Online       4x 10GE(LAN) SFP+
  PIC 1  Online       4x 10GE(LAN) SFP+
  PIC 2  Online       4x 10GE(LAN) SFP+
  PIC 3  Online       4x 10GE(LAN) SFP+
Slot 4   Online       MPC5E 3D Q 2CGE+4XGE
  PIC 0  Online       2X10GE SFPP OTN
  PIC 1  Online       1X100GE CFP2 OTN
  PIC 2  Online       2X10GE SFPP OTN
  PIC 3  Online       1X100GE CFP2 OTN
Slot 5   Online       MPC5E 3D Q 2CGE+4XGE
  PIC 0  Online       2X10GE SFPP OTN
  PIC 1  Online       1X100GE CFP2 OTN
  PIC 2  Online       2X10GE SFPP OTN
  PIC 3  Online       1X100GE CFP2 OTN
Slot 7   Online       MPC4E 3D 2CGE+8XGE
  PIC 0  Online       4x10GE SFPP
  PIC 1  Online       1X100GE CFP
  PIC 2  Online       4x10GE SFPP
  PIC 3  Online       1X100GE CFP
Slot 8   Online       MPC5E 3D Q 24XGE+6XLGE
  PIC 0  Offline      12X10GE SFPP OTN
  PIC 1  Offline      12X10GE SFPP OTN
  PIC 2  Online       3X40GE QSFPP
  PIC 3  Online       3X40GE QSFPP
Slot 9   Online       MPCE Type 2 3D P
  PIC 0  Online       2x 10GE  XFP
  PIC 1  Online       2x 10GE  XFP
Slot 10  Online       MPC5E 3D Q 24XGE+6XLGE
  PIC 0  Online       12X10GE SFPP
  PIC 1  Online       12X10GE SFPP
  PIC 2  Offline      3X40GE QSFPP
  PIC 3  Offline      3X40GE QSFPP
Slot 11  Online       MPC4E 3D 2CGE+8XGE
  PIC 0  Online       4x10GE SFPP
  PIC 1  Online       1X100GE CFP
  PIC 2  Online       4x10GE SFPP
  PIC 3  Online       1X100GE CFP
```

show chassis fpc (MX240, MX480, MX960 Routers with Application Services Modular Line Card)

```
user@host> show chassis fpc 1
    Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) Heap     Buffer
  1  Online            34      5          0       3072        5         13
```

show chassis fpc (MX240, MX480, MX960 with Application Services Modular Line Card)

```
user@host> show chassis fpc 1 detail
Slot 1 information:
  State                                 Online
  Temperature                        34
  Total CPU DRAM                   3072 MB
  Total RLDRAM                      259 MB
  Total DDR DRAM                   4864 MB
  Start time:                           2012-06-19 10:51:43 PDT
  Uptime:                               16 minutes, 48 seconds
  Max Power Consumption             550 Watts
```

show chassis fpc (MX240, MX480, MX960, MX2010, and MX2020 3D Universal Edge Routers Configured for Dynamic Power Management

```
user@host> show chassis fpc 2 detail

Slot 2 information:
  State                                 Online
  Temperature                        37
  Total CPU DRAM                   3584 MB
  Total XR2                         275 MB
  Total DDR DRAM                  20352 MB
  Start time:                           2014-07-18 02:51:23 PDT
  Uptime:                               5 minutes, 19 seconds
  Max MPC Base Power Consumption   485 Watts
  Max MIC0 Power Consumption        50 Watts
  Max MIC1 Power Consumption        50 Watts
  Max MPC Total Power Consumption  585 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
```


Copyright © 2016, Juniper Networks, Inc.

```
  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 (MX2020 Router with MPC5EQ and MPC6E)

```
user@host> show chassis fpc
                     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) Heap     Buffer
  0  Online            31     20          0       3584        7         13
  1  Online            28     19          0       2048       17         13
  2  Online            27     10          0       2048       18         14
  3  Online            26     10          0       2048       13         13
  4  Online            29     19          0       3584        7         13
  5  Online            28     68          0       2048       20         13
  6  Empty
  7  Empty
  8  Empty
  9  Online            36     19          0       3584       10         13
 10  Online            37     26          0       3584       10         13
 11  Empty
 12  Empty
 13  Empty
 14  Empty
 15  Empty
 16  Empty
 17  Online            28     43          0       3584       10         13
 18  Online            29     19          0       3584        7         13
 19  Online            31     19          0       3584        7         13
```

show chassis fpc detail (MX2020 Router with MPCEQ and MPC6E)

```
user@host> show chassis fpc detail
Slot 0 information:
  State                                 Online
  Temperature                        31
  Total CPU DRAM                   3584 MB
  Total XR2                         291 MB
```


Copyright © 2016, Juniper Networks, Inc.

```
  Total DDR DRAM                    24960 MB
  Start time:                            2014-04-22 23:33:19 PDT
  Uptime:                                6 minutes, 24 seconds
  Max Power Consumption              607 Watts
Slot 1 information:
  State                                  Online
  Temperature                         28
  Total CPU DRAM                    2048 MB
  Total RLDRAM                      1036 MB
  Total DDR DRAM                    6656 MB
  Start time:                            2014-04-22 23:33:24 PDT
  Uptime:                                6 minutes, 19 seconds
  Max Power Consumption              520 Watts
Slot 2 information:
  State                                  Online
  Temperature                         27
  Total CPU DRAM                    2048 MB
  Total RLDRAM                      1036 MB
  Total DDR DRAM                    11264 MB
  Start time:                            2014-04-22 23:33:34 PDT
  Uptime:                                6 minutes, 9 seconds
  Max Power Consumption              608 Watts
Slot 3 information:
  State                                  Online
  Temperature                         26
  Total CPU DRAM                    2048 MB
  Total RLDRAM                       734 MB
  Total DDR DRAM                    3108 MB
  Start time:                            2014-04-22 23:33:39 PDT
  Uptime:                                6 minutes, 4 seconds
  Max Power Consumption              368 Watts
Slot 4 information:
  State                                  Online
  Temperature                         29
  Total CPU DRAM                    3584 MB
  Total XR2                          291 MB
  Total DDR DRAM                    24960 MB
  Start time:                            2014-04-22 23:33:51 PDT
  Uptime:                                5 minutes, 52 seconds
  Max Power Consumption              607 Watts
Slot 5 information:
  State                                  Online
  Temperature                         28
  Total CPU DRAM                    2048 MB
  Total RLDRAM                      1324 MB
  Total DDR DRAM                    5120 MB
  Start time:                            2014-04-22 23:33:57 PDT
  Uptime:                                5 minutes, 46 seconds
  Max Power Consumption              440 Watts
Slot 9 information:
  State                                  Online
 Temperature                          25
  Total CPU DRAM                    3584 MB
  Total XR2                          518 MB
  Total DDR DRAM                    49920 MB
  Start time:                            2014-04-22 23:31:20 PDT
  Uptime:                                8 minutes, 23 seconds
  Max Power Consumption             1130 Watts
Slot 10 information:
  State                                  Online
  Temperature                         32
```

```
  Total CPU DRAM                    3584 MB
  Total XR2                          518 MB
  Total DDR DRAM                   49920 MB
  Start time:                           2014-04-22 23:31:25 PDT
  Uptime:                               8 minutes, 18 seconds
  Max Power Consumption            1130 Watts
Slot 17 information:
  State                                 Online
  Temperature                        25
  Total CPU DRAM                    3584 MB
  Total XR2                          518 MB
  Total DDR DRAM                   49920 MB
  Start time:                           2014-04-22 23:31:29 PDT
  Uptime:                               8 minutes, 14 seconds
  Max Power Consumption            1130 Watts
Slot 18 information:
  State                                 Online
  Temperature                        29
  Total CPU DRAM                    3584 MB
  Total XR2                          291 MB
  Total DDR DRAM                   24960 MB
  Start time:                           2014-04-22 23:34:11 PDT
  Uptime:                               5 minutes, 32 seconds
  Max Power Consumption             607 Watts
Slot 19 information:
  State                                 Online
  Temperature                        32
  Total CPU DRAM                    3584 MB
  Total XR2                          291 MB
  Total DDR DRAM                   24960 MB
  Start time:                           2014-04-22 23:34:20 PDT
  Uptime:                               5 minutes, 23 seconds
  Max Power Consumption             607 Watts
```

show chassis fpc pic-status (MX2020 Router with MPC5EQ and MPC6E)

```
user@host> show chassis fpc pic-status
Slot 0   Online       MPC5E 3D Q 24XGE+6XLGE
  PIC 0  Online       12X10GE SFPP OTN
  PIC 1  Online       12X10GE SFPP OTN
  PIC 2  Offline      3X40GE QSFPP
  PIC 3  Offline      3X40GE QSFPP
Slot 1   Online       MPCE Type 3 3D
  PIC 0  Online       10X10GE SFPP
  PIC 2  Online       1X100GE CXP
Slot 2   Online       MPC4E 3D 2CGE+8XGE
  PIC 0  Online       4x10GE SFPP
  PIC 1  Online       1X100GE CFP
  PIC 2  Online       4x10GE SFPP
  PIC 3  Online       1X100GE CFP
Slot 3   Online       MPCE Type 2 3D P
  PIC 0  Online       2x 10GE  XFP
  PIC 1  Online       2x 10GE  XFP
Slot 4   Online       MPC5E 3D Q 2CGE+4XGE
  PIC 0  Online       2X10GE SFPP OTN
  PIC 1  Online       1X100GE CFP2 OTN
  PIC 2  Online       2X10GE SFPP OTN
  PIC 3  Online       1X100GE CFP2 OTN
Slot 5   Online       MPC 3D 16x 10GE
  PIC 0  Online       4x 10GE(LAN) SFP+
  PIC 1  Online       4x 10GE(LAN) SFP+
```

 Copyright © 2016, Juniper Networks, Inc.

```
  PIC 2  Online       4x 10GE(LAN) SFP+
  PIC 3  Online       4x 10GE(LAN) SFP+
Slot 9   Online       MPC6E 3D
  PIC 0  Online       2X100GE CFP2 OTN
  PIC 1  Online       2X100GE CFP2 OTN
Slot 10  Online       MPC6E 3D
  PIC 0  Online       24X10GE SFPP OTN
  PIC 1  Online       4X100GE CXP
Slot 17  Online       MPC6E 3D
  PIC 0  Online       24X10GE SFPP
  PIC 1  Online       4X100GE CXP
Slot 18  Online       MPC5E 3D Q 24XGE+6XLGE
  PIC 0  Offline      12X10GE SFPP OTN
  PIC 1  Offline      12X10GE SFPP OTN
  PIC 2  Online       3X40GE QSFPP
  PIC 3  Online       3X40GE QSFPP
Slot 19  Online       MPC5E 3D Q 24XGE+6XLGE
  PIC 0  Online       12X10GE SFPP OTN
  PIC 1  Offline      12X10GE SFPP OTN
  PIC 2  Offline      3X40GE QSFPP
  PIC 3  Online       3X40GE QSFPP
```

show chassis fpc detail (MX Series Routers)

```
user@host> show chassis fpc detail 2
Slot 0 information:
  State                                 Online
  Temperature                        36 degrees C / 96 degrees F
  Total CPU DRAM                   1024 MB
  Total RLDRAM                      256 MB
  Total DDR DRAM                   4096 MB
  Start time:                           2009-08-11 21:20:30 PDT
  Uptime:                               2 hours, 8 minutes, 50 seconds
  Max Power Consumption             335 Watts
```

show chassis fpc detail (EX Series Switches)

```
user@host> show chassis fpc detail 2
Slot 1 information:
  State                                 Online
  Temperature                        41
  Total CPU DRAM                   2048 MB
  Total RLDRAM                     1036 MB
  Total DDR DRAM                   11264 MB
  Start time:                           2013-04-02 00:04:52 PDT
  Uptime:                               7 days, 9 hours, 47 minutes, 46 seconds
  Max Power Consumption             610 Watts
Slot 2 information:
  State                                 Online
  Temperature                        41
  Total CPU DRAM                   2048 MB
  Total RLDRAM                     1036 MB
  Total DDR DRAM                   11264 MB
  Start time:                           2013-04-02 00:04:56 PDT
  Uptime:                               7 days, 9 hours, 47 minutes, 42 seconds
  Max Power Consumption             610 Watts
```

show chassis fpc (Hardware Not Supported)

```
user@host> show chassis fpc
show chassis fpc
                     Temp  CPU Utilization (%)   Memory    Utilization (%)
```

```
 Slot State            (C)  Total  Interrupt      DRAM (MB) Heap     Buffer
  0  Online          -------------------- CPU less FPC --------------------
  1  Present         ------ Hardware Not In Right Slot ------
  2  Online                   0          0         0         0          0
  3  Present         ------ Hardware Not Supported ------
  4  Empty
  5  Empty
  6  Online                   0          0         0         0          0
```

show chassis fpc detail (Hardware Not Supported)

```
user@host> show chassis fpc detail
Slot 0 information:
  State                                 Online
  Total CPU DRAM                        ---- CPU less FPC ----
  Start time                            2006-07-07 03:21:00 UTC
  Uptime                                27 minutes, 51 seconds
 Slot 1 information:
  State                                 Present
  Reason                                --- Hardware Not In Right Slot ---
 Slot 2 information:
  State                                 Online
  Total CPU DRAM                    32 MB
  Start time                            2006-07-07 03:20:59 UTC
  Uptime                                27 minutes, 52 seconds
 Slot 3 information:
  State                                 Present
  Reason                                --- Hardware Not Supported ---
  Total CPU DRAM                     0 MB
 Slot 6 information:
  State                                 Online
  Total CPU DRAM                    32 MB
  Start time                            2006-07-07 03:21:01 UTC
  Uptime                                27 minutes, 50 seconds
```

show chassis fpc pic-status

```
user@host> show chassis fpc pic-status
Slot 0 Online
  PIC 1    1x OC-12 ATM, MM
  PIC 2    1x OC-12 ATM, MM
  PIC 3    1x OC-12 ATM, MM
Slot 1 Online
  PIC 0    1x OC-48 SONET, SMIR
Slot 2 Online
  PIC 0    1x OC-192 SONET, SMSR
```

show chassis fpc pic-status (M Series Routers)

```
user@host> show chassis fpc pic-status
Slot 1   Online       FPC Type 1
  PIC 0  Present      2x OC-3 ATM, MM- Hardware Error
  PIC 1  Online       4x OC-3 SONET, SMIR
Slot 2   Online       E-FPC Type 2
  PIC 0  Online       4x G/E, 1000 BASE-SX
  PIC 1  Online       2x G/E SFP, 1000 BASE
  PIC 3  Online       1x Tunnel
Slot 3   Online       E-FPC Type 1
  PIC 0  Online       1x G/E IQ, 1000 BASE
  PIC 2  Online       1x G/E SFP, 1000 BASE
Slot 4   Online       E-FPC Type 2
```

 Copyright © 2016, Juniper Networks, Inc.

```
  PIC 0  Online       4x G/E SFP, 1000 BASE
  PIC 1  Online       4x G/E SFP, 1000 BASE
  PIC 2  Online       4x G/E SFP, 1000 BASE
  PIC 3  Online       4x G/E SFP, 1000 BASE
Slot 5   Online       FPC Type 2
...
```

show chassis fpc pic-status (M120 Router)

```
user@host> show chassis fpc pic-status
Slot 1   Online       M120 CFPC 10GE
  PIC 0  Online       1x 10GE(LAN/WAN) XFP
Slot 3   Online       M120 FPC Type 2 (proto)
  PIC 0  Online       2x G/E IQ, 1000 BASE
  PIC 1  Online       4x OC-3 SONET, SMIR
  PIC 2  Online       2x G/E IQ, 1000 BASE
  PIC 3  Online       8x 1GE(LAN), IQ2
Slot 4   Online       M120 FPC Type 3 (proto)
  PIC 0  Online       10x 1GE(LAN), 1000 BASE
Slot 5   Online       M120 FPC Type 1 (proto)
  PIC 0  Present      1x G/E, 1000 BASE-LX- Not Supported
  PIC 1  Online       1x CHOC3 IQ SONET, SMLR
  PIC 2  Online       4x CHDS3 IQ
  PIC 3  Online       1x G/E SFP, 1000 BASE
```

show chassis fpc pic-status (MX240, MX480, and MX960 Routers with Application Services Modular Line Card)

In the following output **Slot 1 and Slot 5** are the Application Services Modular Carrier Cards (AS MCC), **PIC 0** is the Application Services Modular Storage Card (AS MSC), and **PIC 2** is the Application Services Modular Processing Card (AS MXC).

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

show chassis fpc lcc (TX Matrix Router)

```
user@host> show chassis fpc lcc 0
lcc0-re0:
--------------------------------------------------------------------------
                      Temp  CPU       Utilization (%)  Memory    Utilization (%)
Slot State       (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:
--------------------------------------------------------------------------
                     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) 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:
--------------------------------------------------------------------------
                     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) 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
```


Copyright © 2016, Juniper Networks, Inc.

```
  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:
--------------------------------------------------------------------------
                     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) 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:
--------------------------------------------------------------------------
                     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) 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
```


Copyright © 2016, Juniper Networks, Inc.

```
  Uptime                              1 hour, 32 minutes, 29 seconds
Slot 7 information:
  State                               Online
  Temperature                      46 degrees C / 114 degrees F
  Total CPU DRAM                 2048 MB
  Total SRAM                       64 MB
  Total SDRAM                    1280 MB
  Start time                          2010-10-04 20:06:46 PDT
  Uptime                              1 hour, 32 minutes, 27 seconds

lcc3-re0:
--------------------------------------------------------------------------
Slot 2 information:
  State                               Online
  Temperature                      38 degrees C / 100 degrees F
  Total CPU DRAM                 2048 MB
  Total SRAM                      128 MB
  Total SDRAM                    2560 MB
  Start time                          2010-10-04 20:17:31 PDT
  Uptime                              1 hour, 21 minutes, 42 seconds
Slot 4 information:
  State                               Online
  Temperature                      41 degrees C / 105 degrees F
  Total CPU DRAM                 2048 MB
  Total SRAM                      128 MB
  Total SDRAM                    2560 MB
  Start time                          2010-10-04 20:17:34 PDT
  Uptime                              1 hour, 21 minutes, 39 seconds
Slot 5 information:
  State                               Online
  Temperature                      41 degrees C / 105 degrees F
  Total CPU DRAM                 2048 MB
  Total SRAM                      128 MB
  Total SDRAM                    2560 MB
  Start time                          2010-10-04 20:17:36 PDT
  Uptime                              1 hour, 21 minutes, 37 seconds
Slot 6 information:
  State                               Online
  Temperature                      40 degrees C / 104 degrees F
  Total CPU DRAM                 2048 MB
  Total SRAM                      128 MB
  Total SDRAM                    2560 MB
  Start time                          2010-10-04 20:17:39 PDT
  Uptime                              1 hour, 21 minutes, 34 seconds
Slot 7 information:
  State                               Online
  Temperature                      42 degrees C / 107 degrees F
  Total CPU DRAM                 2048 MB
  Total SRAM                       64 MB
  Total SDRAM                    1280 MB
  Start time                          2010-10-04 20:17:41 PDT
  Uptime                              1 hour, 21 minutes, 32 seconds
```

show chassis fpc pic-status (TX Matrix Plus Router)

```
user@host> show chassis fpc pic-status

lcc0-re0:
--------------------------------------------------------------------------
Slot 1   Online       FPC Type 2-ES
  PIC 0  Online       8x 1GE(LAN), IQ2
```

```
Slot 2   Online       FPC Type 4-ES
  PIC 0  Online       4x 10GE (LAN/WAN) XFP
Slot 4   Online       FPC Type 4-ES
  PIC 0  Online       4x 10GE (LAN/WAN) XFP
Slot 6   Online       FPC Type 4-ES
  PIC 0  Online       4x 10GE (LAN/WAN) XFP
  PIC 1  Online       4x 10GE (LAN/WAN) XFP
Slot 7   Online       FPC Type 3-ES
  PIC 0  Online       10x 1GE(LAN), 1000 BASE
  PIC 2  Online       1x OC-192 SM SR2
  PIC 3  Online       10x 1GE(LAN), 1000 BASE

lcc2-re0:
--------------------------------------------------------------------------
Slot 0   Online       FPC Type 4-ES
  PIC 0  Online       4x 10GE (LAN/WAN) XFP
Slot 2   Online       FPC Type 4-ES
  PIC 0  Online       4x 10GE (LAN/WAN) XFP
  PIC 1  Online       4x 10GE (LAN/WAN) XFP
Slot 3   Online       FPC Type 2-ES
  PIC 0  Online       8x 1GE(LAN), IQ2
Slot 4   Online       FPC Type 4
  PIC 0  Online       10x10GE(LAN/WAN) SFPP
Slot 6   Online       FPC Type 4-ES
  PIC 0  Online       4x OC-192 SONET XFP
Slot 7   Online       FPC Type 3-ES
  PIC 0  Online       10x 1GE(LAN), 1000 BASE
  PIC 1  Offline      1x 10GE(LAN/WAN) IQ2E
  PIC 2  Online       1x OC-192 SM SR2
  PIC 3  Online       1x Tunnel

lcc3-re0:
--------------------------------------------------------------------------
Slot 2   Online       FPC Type 4-ES
  PIC 0  Online       10x10GE(LAN/WAN) SFPP
Slot 4   Online       FPC Type 4-ES
  PIC 0  Online       4x OC-192 SONET XFP
Slot 5   Online       FPC Type 4-ES
  PIC 0  Online       4x OC-192 SONET XFP
  PIC 1  Online       4x 10GE (LAN/WAN) XFP
Slot 6   Online       FPC Type 4-ES
  PIC 1  Online       4x 10GE (LAN/WAN) XFP
Slot 7   Online       FPC Type 3-ES
  PIC 0  Online       10x 1GE(LAN), 1000 BASE
  PIC 1  Online       8x 1GE(TYPE3), IQ2E
  PIC 2  Online       4x OC-48 SONET
```

show chassis fpc (T1600 Router)

```
user@host> show chassis fpc
                     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) 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
```


Copyright © 2016, Juniper Networks, Inc.

show chassis fpc detail (T1600 Router)

```
user@host> show chassis fpc detail

show chassis fpc detail
Slot 2 information:
  State                                 Online
  Temperature                        49 degrees C / 120 degrees F
  Total CPU DRAM                   2048 MB
  Total SRAM                         64 MB
  Total SDRAM                      1280 MB
  Start time                            2010-10-04 21:12:52 PDT
  Uptime                                32 minutes, 9 seconds
Slot 3 information:
  State                                 Online
  Temperature                        47 degrees C / 116 degrees F
  Total CPU DRAM                   2048 MB
  Total SRAM                        128 MB
  Total SDRAM                      2560 MB
  Start time                            2010-10-04 21:13:06 PDT
  Uptime                                31 minutes, 55 seconds
Slot 5 information:
  State                                 Online
  Temperature                        46 degrees C / 114 degrees F
  Total CPU DRAM                   2048 MB
  Total SRAM                         64 MB
  Total SDRAM                      1280 MB
  Start time                            2010-10-04 21:12:56 PDT
  Uptime                                32 minutes, 5 seconds
Slot 7 information:
  State                                 Online
  Temperature                        44 degrees C / 111 degrees F
  Total CPU DRAM                   1024 MB
  Total SRAM                         64 MB
  Total SDRAM                      1280 MB
  Start time                            2010-10-04 21:14:34 PDT
  Uptime                                30 minutes, 27 seconds
```

show chassis fpc <fpc-slot> (EX Series Switch)

```
user@host> show chassis fpc 2

                     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) Heap     Buffer
  2  Online            40     12          0       2048       19         14
```

show chassis fpc slot (T1600 Router)

```
user@host> show chassis fpc slot 2

                     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) 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

                    Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State           (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
```


Copyright © 2016, Juniper Networks, Inc.

```
  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 Switch)

```
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 Switch)

```
user@switch> show chassis fpc interconnect-device interconnect1 3
FPC status:
                     Temp
Slot State            (C)
  3  Online            0
```

show chassis fpc interconnect-device detail (QFabric Switch)

```
user@switch> show chassis fpc interconnect-device interconnect1 3 detail
Slot 3 information:
  State                                Online
  Temperature                     0 degrees C / 32 degrees F
  Start time                           2011-08-18 10:45:04 PDT
  Uptime                               1 minute, 49 seconds
```

show chassis fpc pic-status interconnect-device (QFabric Switch)

```
user@switch> show chassis fpc pic-status interconnect-device interconnect1
Slot 0   Online       QFX 16-port QSFP+ Front Card
  PIC 0  Online       16x 40G-QSFP+
  PIC 1  Online       16x 40G-GE
Slot 1   Online       QFX 16-port QSFP+ Front Card
  PIC 0  Online       16x 40G-QSFP+
 PIC 1  Online       16x 40G-GE
Slot 2   Online       QFX 16-port QSFP+ Front Card
  PIC 0  Online       16x 40G-QSFP+
  PIC 1  Online       16x 40G-GE
Slot 3   Online       QFX 16-port QSFP+ Front Card
  PIC 0  Online       16x 40G-QSFP+
  PIC 1  Online       16x 40G-GE
Slot 4   Online       QFX 16-port QSFP+ Front Card
  PIC 0  Online       16x 40G-QSFP+
  PIC 1  Online       16x 40G-GE
Slot 5   Online       QFX 16-port QSFP+ Front Card
  PIC 0  Online       16x 40G-QSFP+
  PIC 1  Online       16x 40G-GE
Slot 6   Online       QFX 16-port QSFP+ Front Card
  PIC 0  Online       16x 40G-QSFP+
  PIC 1  Online       16x 40G-GE
Slot 7   Online       QFX 16-port QSFP+ Front Card
  PIC 0  Online       16x 40G-QSFP+
  PIC 1  Online       16x 40G-GE
Slot 8   Online       QFX Fabric Rear Card
  PIC 0  Online       16x 40G-GE
Slot 9   Online       QFX Fabric Rear Card
  PIC 0  Online       16x 40G-GE
Slot 10  Online       QFX Fabric Rear Card
  PIC 0  Online       16x 40G-GE
Slot 11  Online       QFX Fabric Rear Card
  PIC 0  Online       16x 40G-GE
Slot 12  Online       QFX Fabric Rear Card
  PIC 0  Online       16x 40G-GE
Slot 13  Online       QFX Fabric Rear Card
  PIC 0  Online       16x 40G-GE
```


Copyright © 2016, Juniper Networks, Inc.

```
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 Switch)

```
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 Switch)

```
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            50      6          0       2816        5         27
  3  Empty
  4  Empty
  5  Online            48      9          0       2816        5         27
  6  Empty
  7  Online            49      8          0       2816        5         27
```

show chassis fpc detail (PTX5000 Packet Transport Switch)

```
user@host> show chassis fpc detail
Slot 2 information:
  State                                Online
  Temperature                       35 degrees C / 95 degrees F (PMB)
  Temperature                       35 degrees C / 95 degrees F (Intake)
  Temperature                       50 degrees C / 122 degrees F (Exhaust A)
  Temperature                       54 degrees C / 129 degrees F (Exhaust B)
  Temperature                       54 degrees C / 129 degrees F (TL0)
  Temperature                       52 degrees C / 125 degrees F (TQ0)
  Temperature                       61 degrees C / 141 degrees F (TL1)
  Temperature                       58 degrees C / 136 degrees F (TQ1)
  Temperature                       57 degrees C / 134 degrees F (TL2)
  Temperature                       58 degrees C / 136 degrees F (TQ2)
  Temperature                       62 degrees C / 143 degrees F (TL3)
  Temperature                       61 degrees C / 141 degrees F (TQ3)
  Total CPU DRAM                  2816 MB
  Total SRAM                         0 MB
  Total SDRAM                        0 MB
  Start time                           2012-01-12 12:05:42 PST
  Uptime                               3 hours, 14 minutes, 7 seconds
Slot 5 information:
  State                                Online
  Temperature                       35 degrees C / 95 degrees F (PMB)
  Temperature                       34 degrees C / 93 degrees F (Intake)
  Temperature                       48 degrees C / 118 degrees F (Exhaust A)
  Temperature                       53 degrees C / 127 degrees F (Exhaust B)
  Temperature                       54 degrees C / 129 degrees F (TL0)
  Temperature                       52 degrees C / 125 degrees F (TQ0)
  Temperature                       69 degrees C / 156 degrees F (TL1)
  Temperature                       56 degrees C / 132 degrees F (TQ1)
  Temperature                       54 degrees C / 129 degrees F (TL2)
  Temperature                       56 degrees C / 132 degrees F (TQ2)
  Temperature                       59 degrees C / 138 degrees F (TL3)
```

```
  Temperature                      60 degrees C / 140 degrees F (TQ3)
  Total CPU DRAM                 2816 MB
  Total SRAM                        0 MB
  Total SDRAM                       0 MB
  Start time                          2012-01-12 12:05:43 PST
  Uptime                              3 hours, 14 minutes, 6 seconds
Slot 7 information:
  State                               Online
  Temperature                      35 degrees C / 95 degrees F (PMB)
  Temperature                      33 degrees C / 91 degrees F (Intake)
  Temperature                      50 degrees C / 122 degrees F (Exhaust A)
  Temperature                      55 degrees C / 131 degrees F (Exhaust B)
  Temperature                      56 degrees C / 132 degrees F (TL0)
  Temperature                      56 degrees C / 132 degrees F (TQ0)
  Temperature                      61 degrees C / 141 degrees F (TL1)
  Temperature                      57 degrees C / 134 degrees F (TQ1)
  Temperature                      55 degrees C / 131 degrees F (TL2)
  Temperature                      59 degrees C / 138 degrees F (TQ2)
  Temperature                      62 degrees C / 143 degrees F (TL3)
  Temperature                      62 degrees C / 143 degrees F (TQ3)
  Total CPU DRAM                 2816 MB
  Total SRAM                        0 MB
  Total SDRAM                       0 MB
  Start time                          2012-01-12 12:05:44 PST
  Uptime                              3 hours, 14 minutes, 5 seconds
```

show chassis fpc pic-status (PTX5000 Packet Transport Switch)

```
user@host> show chassis fpc pic-status
Slot 2   Online       FPC
  PIC 0  Online       24x 10GE(LAN) SFP+
  PIC 1  Online       24x 10GE(LAN) SFP+
Slot 5   Online       FPC
  PIC 0  Online       24x 10GE(LAN) SFP+
  PIC 1  Online       2x 40GE CFP
Slot 7   Online       FPC
  PIC 0  Online       24x 10GE(LAN) SFP+
  PIC 1  Online       2x 40GE CFP
```

show chassis fpc (ACX2000 Universal Access Router)

```
user@host> show chassis fpc
                     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  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
                     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  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
```


Copyright © 2016, Juniper Networks, Inc.

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
                   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 1 detail (MX Routers with Media Services Blade [MSB])

```
user@switch> show chassis fpc 1 detail
Slot 1 information:
  State                                 Online
  Temperature                        34
  Total CPU DRAM                   3072 MB
  Total RLDRAM                      259 MB
  Total DDR DRAM                   4864 MB
  Start time:                           2012-06-19 10:51:43 PDT
  Uptime:                               16 minutes, 48 seconds
  Max Power Consumption             550 Watts
```

show chassis hardware

List of Syntax

Syntax on page 656
Syntax (EX Series) on page 656
Syntax (T4000 Router) on page 656
Syntax (TX Matrix Router) on page 656
Syntax (TX Matrix Plus Router) on page 656
Syntax (MX Series Routers) on page 656
Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers) on page 656
Syntax (QFX Series) on page 657
Syntax (OCX Series) on page 657
Syntax (PTX Series Packet Transport Routers) on page 657
Syntax (ACX Series Universal Access Routers) on page 657

Syntax

```
show chassis hardware
<detail | extensive>
<clei-models>
<models>
```

Syntax (EX Series)

```
show chassis hardware
<clei-models>
<detail | extensive>
<models>
<satellite [slot-id slot-id |device-alias alias-name]>
```

Syntax (T4000 Router)

```
show chassis hardware
<clei-models>
<detail | extensive>
<models>
```

Syntax (TX Matrix Router)

```
show chassis hardware
<clei-models>
<detail | extensive>
<models>
<lcc number | scc>
```

Syntax (TX Matrix Plus Router)

```
show chassis hardware
<clei-models>
<detail | extensive>
<models>
<lcc number | sfc number>
```

Syntax (MX Series Routers)

```
show chassis hardware
<detail | extensive>
<clei-models>
<models>
<all-members>
<local>
<member member-id>
```

Syntax (MX104, MX2010, and MX2020

```
show chassis hardware
<clei-models>
```


Copyright © 2016, Juniper Networks, Inc.

3D Universal Edge Routers)

<detail | extensive>
<models>
<satellite [slot-id *slot-id* |device-alias *alias-name*]>

Syntax (QFX Series)

show chassis hardware
<detail | extensive>
<clei-models>
<interconnect-device *name*>
<node-device *name*>
<models>

Syntax (OCX Series)

show chassis hardware
<detail | extensive>
<clei-models>
<models>

Syntax (PTX Series Packet Transport Routers)

show chassis hardware
<detail | extensive>
<clei-models>
<models>

Syntax (ACX Series Universal Access Routers)

show chassis hardware
<detail | extensive>
<clei-models>
<models>

Release Information

Command introduced before Junos OS Release 7.4.
models option introduced in Junos OS Release 8.2.
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.
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 MX104 3D Universal Edge Routers.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
satellite option introduced in Junos OS Release 14.2R3.

Description

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.

In the EX Series switch command output, FPC refers to the following:

- On EX2200 switches, EX3200 switches, EX4200 standalone switches, and EX4500 switches—Refers to the switch; FPC *number* is always 0.
- On EX4200 switches in a Virtual Chassis configuration—Refers to the member of a Virtual Chassis; FPC *number* equals the member ID, from 0 through 9.
- On EX8208 and EX8216 switches—Refers to a line card; FPC *number* equals the slot number for the line card.

On QFX3500, QFX5100, OCX Series standalone switches, and PTX1000 routers, both the FPC and FPC *number* are always **0**.

On T4000 Type 5 FPCs, there are no **top temperature sensor** or **bottom temperature sensor** parameters. Instead, **fan intake temperature sensor** and **fan exhaust temperature sensors** parameters are displayed.

Starting from Junos OS Release 11.4, the output of the **show chassis hardware models** operational mode command displays the enhanced midplanes FRU model numbers (CHAS-BP3-MX240-S, CHAS-BP3-MX480-S or CHAS-BP3-MX960-S) based on the router. Prior to release 11.4, the FRU model numbers are left blank when the router has enhanced midplanes. Note that the enhanced midplanes are introduced through the Junos OS Release 13.3, but can be supported on all Junos OS releases.

Starting with Junos OS Release 14.1, the output of the **show chassis hardware detail | extensive | clei-models | models** operational mode command displays the new DC power supply module (PSM) and power distribution unit (PDU) that are added to provide power to the high-density FPC (FPC2-PTX-P1A) and other components in a PTX5000 Packet Transport Router.

Options

none—Display information about hardware. For a TX Matrix router, display information about the TX Matrix router and its attached T640 routers. For a TX Matrix Plus router, display information about the TX Matrix Plus router and its attached routers.

clei-models—(Optional) Display Common Language Equipment Identifier (CLEI) barcode and model number for orderable field-replaceable units (FRUs).

detail—(Optional) Include RAM and disk information in output.

extensive—(Optional) Display ID EEPROM information.

all-members—(MX Series routers only) (Optional) Display hardware-specific information for all the members of the Virtual Chassis configuration.

interconnect-device ***name***—(QFabric systems only) (Optional) Display hardware-specific information for the Interconnect device.

lcc ***number***—(TX Matrix routers and TX Matrix Plus router only) (Optional) On a TX Matrix router, display hardware information for a specified T640 router (line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, display hardware information for a specified router (line-card chassis) that is connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.

 Copyright © 2016, Juniper Networks, Inc.

- 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.

satellite [slot-id ***slot-id*** **| device-alias** ***alias-name*****]**—(Junos Fusion only) (Optional) Display hardware information for the specified satellite device in a Junos Fusion, or for all satellite devices in the Junos Fusion if no satellite devices are specified.

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 36: Routing Engines Displaying DIMM Information

Routing Engines	Routers
RE-S-1800x2 and RE-S-1800x4	MX240, MX480, and MX960 routers
RE-A-1800x2	M120 and M320 routers

In Junos OS Release 11.4 and later, the output for the **show chassis hardware models** operational mode command for MX Series routers display the enhanced midplanes FRU model numbers—CHAS-BP3-MX240-S, CHAS-BP3-MX480-S, or CHAS-BP3-MX960-S—based on the router. In releases before Junos OS Release 11.4, the FRU model numbers are left blank when the router has enhanced midplanes. Note that the enhanced midplanes are introduced through Junos OS Release 13.3, but can be supported on all Junos OS releases.

Required Privilege Level

view

Related Documentation

- *show chassis power*

List of Sample Output

show chassis hardware (EX8216 Switch) on page 666
show chassis hardware clei-models (EX8216 Switch) on page 667
show chassis hardware clei-models (T1600 Router) on page 668
show chassis hardware (EX2300-C Switch) on page 669
show chassis hardware (EX2300 Switch) on page 669
show chassis hardware detail (EX4200 Switch) on page 669
show chassis hardware (EX4300 Switch) on page 669
show chassis hardware models (EX4500 Switch) on page 670
show chassis hardware detail (EX9200 Switch) on page 670
show chassis hardware (M7i Router) on page 671
show chassis hardware (M10 Router) on page 671
show chassis hardware models (M10 Router) on page 672
show chassis hardware (M20 Router) on page 672
show chassis hardware models (M20 Router) on page 673
show chassis hardware (M40 Router) on page 673
show chassis hardware (M40e Router) on page 674
show chassis hardware (M120 Router) on page 674
show chassis hardware detail (M120 Router) on page 675
show chassis hardware models (M120 Router) on page 676
show chassis hardware (M160 Router) on page 677
show chassis hardware models (M160 Router) on page 677
show chassis hardware detail (M160 Router) on page 678
show chassis hardware (M320 Router) on page 679
show chassis hardware models (M320 Router) on page 680
show chassis hardware (MX5 Router) on page 681
show chassis hardware (MX10 Router) on page 681
show chassis hardware (MX40 Router) on page 682
show chassis hardware (Fixed MX80 Router) on page 682
show chassis hardware (Modular MX80 Router) on page 683
show chassis hardware (MX104 Router) on page 683
show chassis hardware detail (MX104 Router) on page 684
show chassis hardware extensive (MX104 Router) on page 684
show chassis hardware models (MX104 Router) on page 688
show chassis hardware clei-models (MX104 Router) on page 688
show chassis hardware (MX240 Router) on page 688
show chassis hardware detail (MX 240 Router with Routing Engine Displaying DIMM Information) on page 689
show chassis hardware (MX240 Router with Enhanced MX SCB) on page 689
show chassis hardware (MX480 Router) on page 690
show chassis hardware (MX480 Router with Enhanced MX SCB) on page 690
show chassis hardware (MX480 Routers with MPC5E and Built-in OTN PIC) on page 691
show chassis hardware detail (MX480 Routers with MPC5E and Built-in OTN PIC) on page 692
show chassis hardware extensive (MX480 Routers with MPC5E and Built-in OTN PIC) on page 694
show chassis hardware (MX960 Router) on page 697

Copyright © 2016, Juniper Networks, Inc.

show chassis hardware (MX960 Router with Bidirectional Optics) on page 697
show chassis hardware (MX960 Router with Enhanced MX SCB) on page 698
show chassis hardware models (MX960 Router with Enhanced MX SCB) on page 700
show chassis hardware (MX960 Router with MPC5EQ) on page 700
show chassis hardware detail (MX960 Router) on page 703
show chassis hardware detail (MX960 Router with MPC5EQ) on page 704
show chassis hardware extensive (MX960 Router with MPC5EQ) on page 707
show chassis hardware models (MX960 Router with MPC5EQ) on page 715
show chassis hardware clei-models (MX960 Router with MPC5EQ) on page 716
show chassis hardware (MX960 Router with MPC3E and 100-Gigabit DWDM OTN MIC) on page 716
show chassis hardware clei-models(MX960 Router with MPC3E and 100-Gigabit DWDM OTN MIC) on page 717
show chassis hardware (PTX3000 Router with 5-port 100-Gigabit DWDM OTN PIC) on page 718
show chassis hardware clei-models (PTX3000 Router with 5-port 100-Gigabit DWDM OTN PIC) on page 718
show chassis hardware (MX2010 Router) on page 719
show chassis hardware detail (MX2010 Router) on page 721
show chassis hardware extensive (MX2010 Router) on page 726
show chassis hardware models (MX2010 Router) on page 731
show chassis hardware clei-models (MX2010 Routers) on page 732
show chassis hardware (MX2010 Routers with MPC6E and OTN MIC) on page 733
show chassis hardware detail (MX2010 Routers with MPC6E and OTN MIC) on page 735
show chassis hardware extensive (MX2010 Routers with MPC6E and OTN MIC) on page 736
show chassis hardware (MX2020 Router) on page 741
show chassis hardware detail (MX2020 Router) on page 750
show chassis hardware models (MX2020 Router) on page 759
show chassis hardware clei-models (MX2020 Router) on page 760
show chassis hardware (MX2020 Router with MPC5EQ and MPC6E) on page 761
show chassis hardware detail (MX2020 Router with MPC5EQ and MPC6E) on page 766
show chassis hardware extensive (MX2020 Router with MPC5EQ and MPC6E) on page 767
show chassis hardware models (MX2020 Routers with MPC5EQ and MPC6E) on page 773
show chassis hardware clei-models (MX2020 Router with MPC5EQ and MPC6E) on page 774
show chassis hardware (MX Series routers with ATM MIC) on page 775
show chassis hardware (MX240, MX480, MX960 routers with Application Services Modular Line Card) on page 776
show chassis hardware extensive (MX240, MX480, MX960 Routers with Application Services Modular Line Card) on page 776
show chassis hardware (MX480 Router with MPC4E) on page 777
show chassis hardware (MX2020 Router with MPC4E) on page 778
show chassis hardware (MX5, MX10, MX40, MX80, MX240, MX480, and MX960 Routers with Enhanced 20-Port Gigabit Ethernet MIC) on page 780
show chassis hardware models (MX5, MX10, MX40, MX80, MX240, MX480, and MX960 Routers with Enhanced 20-Port Gigabit Ethernet MIC) on page 781

show chassis hardware (T320 Router) on page 781
show chassis hardware (T640 Router) on page 782
show chassis hardware models (T640 Router) on page 783
show chassis hardware extensive (T640 Router) on page 783
show chassis hardware (T4000 Router) on page 784
show chassis hardware (T4000 Router with 16-GB Line Card Chassis (LCC) Routing Engine) on page 786
show chassis hardware (T4000 Router with LSR FPC) on page 786
show chassis hardware clei-models (T4000 Router) on page 787
show chassis hardware detail (T4000 Router) on page 787
show chassis hardware models (T4000 Router) on page 789
show chassis hardware lcc (TX Matrix Router) on page 790
show chassis hardware scc (TX Matrix Router) on page 790
show chassis hardware (T1600 Router) on page 791
show chassis hardware (TX Matrix Plus Router) on page 793
show chassis hardware sfc (TX Matrix Plus Router) on page 798
show chassis hardware extensive (TX Matrix Plus Router) on page 799
show chassis hardware clei-models (TX Matrix Plus Router) on page 800
show chassis hardware detail (TX Matrix Plus Router) on page 803
show chassis hardware models (TX Matrix Plus Router) on page 804
show chassis hardware (TX Matrix Plus Router with 3D SIBs) on page 807
show chassis hardware clei-models (TX Matrix Plus Router with 3D SIBs) on page 811
show chassis hardware detail (TX Matrix Plus Router with 3D SIBs) on page 815
show chassis hardware lcc (TX Matrix Plus Router with 3D SIBs) on page 818
show chassis hardware sfc (TX Matrix Plus Router with 3D SIBs) on page 819
show chassis hardware (16-Port 10-Gigabit Ethernet MPC with SFP+ Optics [MX Series Routers]) on page 820
show chassis hardware (MPC3E [MX Series Routers]) on page 821
show chassis hardware (QFX3500 Switches) on page 822
show chassis hardware detail (QFX3500 Switches) on page 822
show chassis hardware models (QFX3500 Switches) on page 824
show chassis hardware clei-models (QFX3500 Switches) on page 824
show chassis hardware clei-models (QFX5100 Switches) on page 824
show chassis hardware interconnect-device (QFabric Systems) on page 824
show chassis hardware node-device (QFabric Systems) on page 824
show chassis hardware (PTX3000 Packet Transport Router with the IPLC module) on page 824
show chassis hardware (PTX5000 Packet Transport Router) on page 826
show chassis hardware (PTX5000 Packet Transport Router with AC PSM and PDU) on page 827
show chassis hardware (PTX5000 Packet Transport Router with FPC2-PTX-P1A) on page 828
show chassis hardware clei-models (PTX5000 Packet Transport Router) on page 828
show chassis hardware clei-models (PTX5000 Packet Transport Router with AC PSM and PDU) on page 829
show chassis hardware clei-models (PTX5000 Packet Transport Router with FPC2-PTX-P1A) on page 829
show chassis hardware detail (PTX5000 Packet Transport Router) on page 830

 Copyright © 2016, Juniper Networks, Inc.

show chassis hardware detail (PTX5000 Packet Transport Router with AC PSM and PDU) on page 831
show chassis hardware detail (PTX5000 Packet Transport Router with FPC2-PTX-P1A) on page 831
show chassis hardware models (PTX5000 Packet Transport Router) on page 832
show chassis hardware models (PTX5000 Packet Transport Router with AC PSM and PDU) on page 832
show chassis hardware models (PTX5000 Packet Transport Router with FPC2-PTX-P1A) on page 833
show chassis hardware extensive (PTX5000 Packet Transport Router) on page 833
show chassis hardware extensive (PTX1000 Packet Transport Router) on page 834
show chassis hardware (MX Routers with Media Services Blade [MSB]) on page 834
show chassis hardware extensive (MX Routers with Media Services Blade [MSB]) on page 835
show chassis hardware (QFX3500 Switch running Enhanced Layer 2 Software) on page 836
show chassis hardware (QFX5100 Switch running Enhanced Layer 2 Software) on page 837

Output Fields

Table 37 on page 664 lists the output fields for the **show chassis hardware** command. Output fields are listed in the approximate order in which they appear.

Table 37: show chassis hardware Output Fields

Field Name	Field Description	Level of Output
Item	Chassis component: • (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 *EX Series Switches Hardware and CLI Terminology Mapping*. • (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, Pseudo CB, Routing Engine, power supplies, fan trays, Interconnect devices, and Node devices. Also displays information about Flexible PIC Concentrators (FPCs) and associated Physical Interface Cards (PICs). • (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
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

Copyright © 2016, Juniper Networks, Inc.

Table 37: show chassis hardware Output Fields *(continued)*

Field Name	Field Description	Level of Output
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	Brief description of the hardware item:
	• 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**.
	On EX Series switches, a brief description of the FPC.
	The following list shows the PIM abbreviation in the output and the corresponding PIM name.
	  • **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)
	  • **2x Serial**—Dual-port serial PIM
	  • **2x T1**—Dual-port T1 PIM
	  • **2x E1**—Dual-port E1 PIM
	  • **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)
		All levels

Table 37: show chassis hardware Output Fields *(continued)*

Field Name	Field Description	Level of Output
	• **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, 4xFXO, 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 M 16x 10GE**—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-SFPP and MPC4E-3D-2CGE-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
```


Copyright © 2016, Juniper Networks, Inc.

```
  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-1OC48-SON-SMSR
  PIC 2          REV 14   750-001901                     PB-4OC12-SON-SMIR
  PIC 3          REV 07   750-001900                     PB-1OC48-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-4OC48-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-4OC48-SON-SFP
  PIC 3          REV 32   750-003700                     PC-1OC192-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-4OC192-SON-XFP
  PIC 1          REV 01   750-010850                     PD-1OC768-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-1OC192-SON-SR2
SIB 0            REV 07   710-013074                     SIB-I-T1600-S
SIB 1            REV 07   710-013074                     SIB-I-T1600-S
SIB 2            REV 07   710-013074                     SIB-I-T1600-S
SIB 3            REV 07   710-013074                     SIB-I-T1600-S
SIB 4            REV 07   710-013074                     SIB-I-T1600-S
```


Copyright © 2016, Juniper Networks, Inc.

```
Fan Tray 0                                                  FANTRAY-T-S
Fan Tray 1                                                  FANTRAY-T-S
Fan Tray 2                                                  FAN-REAR-TX-T640-S
```

show chassis hardware (EX2300-C Switch)

```
user@switch> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                HV0215410003      EX2300-C-12P
Pseudo CB 0
Routing Engine 0          BUILTIN      BUILTIN           RE-EX2300C-12P
FPC 0            REV 04   650-059984   HV0215410003      EX2300-C-12P
  CPU                     BUILTIN      BUILTIN           FPC CPU
  PIC 0          REV 04   BUILTIN      BUILTIN           12x10/100/1000 Base-T
  PIC 1          REV 04   650-059984   HV0215410003      2x10G SFP/SFP+
    Xcvr 0       REV 01   740-021309   T09K00695         SFP+-10G-LR
    Xcvr 1       REV 01   740-030658   AD1146A05JT       SFP+-10G-USR
Power Supply 0                                           JPSU-170W-AC
```

show chassis hardware (EX2300 Switch)

```
user@switch> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JY0215410033      EX2300-24P
Pseudo CB 0
Routing Engine 0          BUILTIN      BUILTIN           RE-EX2300-24P
FPC 0            REV 05   650-059968   JY0215410033      EX2300-24P
  CPU                     BUILTIN      BUILTIN           FPC CPU
  PIC 0          REV 05   BUILTIN      BUILTIN           24x10/100/1000 Base-T
  PIC 1          REV 05   650-059968   JY0215410033      4x10G SFP/SFP+
    Xcvr 0       REV 01   740-030658   AD1125A03ES       SFP+-10G-USR
    Xcvr 1       REV 01   740-021308   AJP0TDZ           SFP+-10G-SR
    Xcvr 3       REV 01   740-021309   A9401FL           SFP+-10G-LR
Power Supply 0                                           JPSU-450W-AC-AFO
Fan Tray 0                                               Fan Module, Airflow Out
 (AFO)
Fan Tray 1                                               Fan Module, Airflow Out
 (AFO)
```

show chassis hardware detail (EX4200 Switch)

```
user@host> show chassis hardware detail
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                BM0208327733      EX4200-24T
Routing Engine 0 REV 11   750-021256   BM0208327733      EX4200-24T, 8 POE
Routing Engine 0                       BM0208327733      EX4200-24T, 8 POE
FPC 0            REV 11   750-021256   BM0208327733      EX4200-24T, 8 POE
  CPU                     BUILTIN      BUILTIN           FPC CPU
  PIC 0                   BUILTIN      BUILTIN           24x 10/100/1000 Base-T
  PIC 1          REV 03B  711-021270   AR0208162285      4x GE SFP
  BRD            REV 08   711-021264   AK0208328289      EX4200-24T, 8 POE
Power Supply 0   REV 03   740-020957   AT0508346354      PS 320W AC
Fan Tray                                                 Fan Tray
```

show chassis hardware (EX4300 Switch)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
```

```
Chassis                                 PD3713160055      EX4300-48P
Routing Engine 0 REV 04   650-044930   PD3713160055      EX4300-48P
FPC 0            REV 04   650-044930   PD3713160055      EX4300-48P
  CPU                     BUILTIN      BUILTIN           FPC CPU
  PIC 0          REV 04   BUILTIN      BUILTIN           48x 10/100/1000 Base-T
  PIC 1          REV 04   BUILTIN      BUILTIN           4x 40GE
Power Supply 0   REV 01   740-046871   1EDA3090026       JPSU-1100-AC-AFO-A
Fan Tray 0                                               Fan Module, Airflow Out
 (AFO)
Fan Tray 1                                               Fan Module, Airflow Out
 (AFO)
```

show chassis hardware models (EX4500 Switch)

```
user@host> show chassis hardware models
Hardware inventory:
Item             Version  Part number  Serial number     FRU model number
Routing Engine 0 REV 01   750-035700   GG0210271867      EX4500-40F-FB-C
FPC 0            REV 01   750-035700   GG0210271867      EX4500-40F-FB-C
  PIC 0                   BUILTIN      BUILTIN           EX4500-40F-FB-C
Power Supply 1   REV 01   740-029654   H884FS00JC09      EX4500-PWR1-AC-FB
```

show chassis hardware detail (EX9200 Switch)

```
user@switch> show chassis hardware

Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN111DA44RFB      EX9208
Midplane         REV 05   710-017414   TS2912            EX9208-BP
FPM Board        REV 02   710-017254   XN1804            Front Panel Display
PEM 0            Rev 01   740-022697   QCS0906C033       PS 1.2-1.7kW; 100-240V
AC in
PEM 1            Rev 01   740-022697   QCS0906C095       PS 1.2-1.7kW; 100-240V
AC in
Routing Engine 0 REV 08   740-031116   9009122883        RE-S-EX9200-1800X4
CB 0             REV 16   750-031391   CAAW4391          EX9200-SCBEF
PC 0             REV 07   750-049612   CABJ9312          EX9200 40x1G Copper
  CPU          REV 04   711-038484   CABH8268          MPCE PMB 2G
  MIC 0          REV 02   750-049607   CABT9623          40x 1GE RJ45
    PIC 0                 BUILTIN      BUILTIN           10x 1GE RJ45
    PIC 1                 BUILTIN      BUILTIN           10x 1GE RJ45
    PIC 2                 BUILTIN      BUILTIN           10x 1GE RJ45
    PIC 3                 BUILTIN      BUILTIN           10x 1GE RJ45
FPC 1            REV 10   710-013699   CAAN3529          EX9200-40x1G-SFP
  CPU            REV 04   711-038484   CAAL7608          MPCE PMB 2G
   MIC 0          REV 26   750-028392   CAAS5151          20x 1GE SFP
    PIC 0                 BUILTIN      BUILTIN           10x 1GE SFP
    PIC 1                 BUILTIN      BUILTIN           10x 1GE SFP
  MIC 1          REV 26   750-028392   CAAC8006          20x 1GE SFP
    PIC 2                 BUILTIN      BUILTIN           10x 1GE SFP
      Xcvr 8     REV 01   740-011613   E08L03674         SFP-SX
      Xcvr 9     REV 01   740-011613   E08M00243         SFP-SX
    PIC 3                 BUILTIN      BUILTIN           10x 1GE SFP
    FPC 3        REV 10   710-013699   CAAR5261          EX9200-40x1G-SFP
  CPU            REV 04   711-038484   CAAS2118          MPCE PMB 2G
   MIC 0          REV 26   750-028392   CAAS5067          20x 1GE SFP
    PIC 0                 BUILTIN      BUILTIN           10x 1GE SFP
      Xcvr 2     REV 01   740-031851   PNA7L8U           SFP-SX
      Xcvr 3     REV 02   740-011613   AM0943SEKGZ       SFP-SX
      Xcvr 4     REV 02   740-011613   AM0943SEJZ9       SFP-SX
```

 Copyright © 2016, Juniper Networks, Inc.

```
    PIC 1                 BUILTIN      BUILTIN           10x 1GE SFP
  MIC 1          REV 26   750-028392   CAAS5132          20x 1GE SFP
    PIC 2                 BUILTIN      BUILTIN           10x 1GE SFP
      Xcvr 4     REV 01   740-011613   E08D02625         SFP-SX
      Xcvr 9     REV 02   740-011613   PJH4RD9           SFP-SX
    PIC 3                 BUILTIN      BUILTIN           10x 1GE SFP
      Xcvr 0     REV 01   740-011613   AM0813S8YME       SFP-SX
      Fan Tray                                           Left Fan Tray
```

show chassis hardware (M7i Router)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                31959             M7i
Midplane         REV 02   710-008761   CA0209            M7i Midplane
Power Supply 0   Rev 04   740-008537   PD10272           AC Power Supply
Routing Engine   REV 01   740-008846   1000396803        RE-5.0
CFEB             REV 02   750-009492   CA0166            Internet Processor IIv1
FPC 0                                                    E-FPC
  PIC 0          REV 04   750-003163   HJ6416            1x G/E, 1000 BASE-SX
  PIC 1          REV 04   750-003163   HJ6423            1x G/E, 1000 BASE-SX
  PIC 2          REV 04   750-003163   HJ6421            1x G/E, 1000 BASE-SX
  PIC 3          REV 02   750-003163   HJ0425            1x G/E, 1000 BASE-SX
FPC 1                                                    E-FPC
  PIC 2          REV 01   750-009487   HM2275            ASP - Integrated
  PIC 3          REV 01   750-009098   CA0142            2x F/E, 100 BASE-TX

Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                B1157             M7i
Midplane         REV 05   710-008761   DM0840            M7i Midplane
Power Supply 0   Rev 08   740-008537   TE53755           AC Power Supply
Routing Engine   REV 07   740-011202   1000736567        RE-850
CFEB             REV 09   750-010463   DK6952            Internet Processor II
FPC 0                                                    E-FPC
  PIC 0          REV 12   750-012838   DL7993            4x 1GE(LAN), IQ2
    Xcvr 0       REV 01   740-011614   PD94TDJ           SFP-LX10
    Xcvr 1       REV 01   740-011615   PAD5EER           UNSUPPORTED
    Xcvr 2       REV 01   740-011614   PD94THU           SFP-LX10
    Xcvr 3                NON-JNPR     PDC2E7A           SFP-LX10
  PIC 1          REV 03   750-023116   JT0203            4x CHSTM1 SDH CE SFP
    Xcvr 0       REV 01   740-012434   AGT063832PS       SFP-SR
    Xcvr 1       REV 01   740-012434   AGT063832LY       SFP-SR
    Xcvr 3       REV 01   740-016064   C06J19018         SFP-LR
  PIC 2          REV 15   750-014895   DM5757            MultiServices 100
  PIC 3          REV 01   750-025390   JW9448            12x T1/E1 CE
FPC 1                                                    E-FPC
  PIC 2                   BUILTIN      BUILTIN           1x Tunnel
  PIC 3          REV 09   750-009099   DM0899            1x G/E, 1000 BASE
    Xcvr 0       REV 01   740-012434   AGT07150HGJ       UNSUPPORTED
Fan Tray                                                 Rear Fan Tray
```

show chassis hardware (M10 Router)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                1122              M10
Midplane         REV 1.1  710-001950   S/N AC6626
Power supply A   Rev 01   740-002497   S/N LC36095       AC
Power supply B   Rev 01   740-002497   S/N LC36100       AC
```

```
Display          REV 1.2  710-001995   S/N AC6656
Host                                   18000005dfb3fb01  teknor
FEB              REV 01   710-001948   S/N AC6632        Internet Processor II
FPC 0
  PIC 0          REV 08   750-001072   S/N AB2485        1x G/E, 1000 BASE-SX
  PIC 1          REV 01   750-000613   S/N AA1048        1x OC-12 SONET, SMIR
FPC 1
Fan Tray 0                                               FANTRAY-M10I-S
Fan Tray 1                                               FANTRAY-M10I-S
```

show chassis hardware models (M10 Router)

```
user@host> 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-4OC3-SON-MM
  PIC 1          REV 11   750-002992                     PE-4FE-TX
  PIC 2          REV 03   750-002977                     PE-2OC3-ATM-MM
  PIC 3          REV 08   750-005724                     PE-2OC3-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
```


Copyright © 2016, Juniper Networks, Inc.

```
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-2OC3-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
```


Copyright © 2016, Juniper Networks, Inc.

```
PEM 1            Rev 05   740-011936   RM28321          AC Power Entry Module
Routing Engine 0 REV 03   740-014080   1000642883       RE-A-1000
CB 0             REV 03   710-011403   CM8346           M120 Control Board
CB 1             REV 06   710-011403   CP6728           M120 Control Board
FPC 1            REV 02   710-015908   CP6925           M120 CFPC 10GE
  PIC 0                   BUILTIN      BUILTIN          1x 10GE(LAN/WAN) XFP
    Xcvr 0       REV 01   740-014279   62E204N00007     XFP-10G-LR
FPC 3            REV 03   710-011393   CJ9234           M120 FPC Type 2
  PIC 0          REV 16   750-008155   NB5229           2x G/E IQ, 1000 BASE
    Xcvr 0       REV 01   740-011613   P9F15JB          SFP-SX
    Xcvr 1       REV 01   740-007326   P4Q0R9G          SFP-SX
  PIC 1          REV 09   750-007745   CG4360           4x OC-3 SONET, SMIR
  PIC 2          REV 16   750-008155   ND7787           2x G/E IQ, 1000 BASE
    Xcvr 0       REV 01   740-011613   P9F12AS          SFP-SX
    Xcvr 1       REV 01   740-011613   P9F1ALU          SFP-SX
  PIC 3          REV 07   750-011800   JW1284           8x 1GE(LAN), IQ2
    Xcvr 0       REV 01   740-011613   P9F1AM6          SFP-SX
    Xcvr 6       REV 01   740-011613   P9F16NN          SFP-SX
    Xcvr 7       REV 01   740-011782   P8C29Y7          SFP-SX
  Board B        REV 02   710-011395   CN3754           M120 FPC Mezz
FPC 4            REV 02   710-011398   CP6741           M120 FPC Type 3
  PIC 0          REV 16   750-007141   NB2855           10x 1GE(LAN), 1000 BASE

    Xcvr 0       REV 01   740-011782   P922A1F          SFP-SX
    Xcvr 1       REV 01   740-011782   P922A16          SFP-SX
    Xcvr 2       REV 01   740-011782   P922A0U          SFP-SX
    Xcvr 3       REV 01   740-011782   P9229UZ          SFP-SX
    Xcvr 4       REV 01   740-009029   P11JXWP          SFP-LX
    Xcvr 6       REV 01   740-011613   P9F1ALW          SFP-SX
FPC 5            REV 01   710-011388   CJ9088           M120 FPC Type 1
  PIC 0          *** Hardware Not Supported ***
  PIC 1          REV 05   750-012052   NB0410           1x CHOC3 IQ SONET, SMLR

  PIC 2          REV 01   750-013167   CM3824           4x CHDS3 IQ
  PIC 3          REV 01   750-010240   CB5366           1x G/E SFP, 1000 BASE
  Board B        REV 01   710-011390   CJ9103           M120 FPC Mezz Board
FEB 3            REV 04   710-011663   CP6673           M120 FEB
FEB 4            REV 04   710-011663   CJ9368           M120 FEB
FEB 5            REV 04   710-011663   CJ9386           M120 FEB
Fan Tray 0                                              Front Top Fan Tray
Fan Tray 1                                              Front Bottom Fan Tray
Fan Tray 2                                              Rear Top Fan Tray
Fan Tray 3                                              Rear Bottom Fan Tray
```

show chassis hardware detail (M120 Router)

```
user@host> show chassis hardware detail
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN000054AC        M120
Midplane         REV 01   710-013667   RB4170           M120 Midplane
FPM Board        REV 02   710-011407   CJ9186           M120 FPM Board
FPM Display      REV 02   710-011405   CJ9173           M120 FPM Display
FPM CIP          REV 02   710-011410   CJ9221           M120 FPM CIP
PEM 0            Rev 05   740-011936   RM28320          AC Power Entry Module
PEM 1            Rev 05   740-011936   RM28321          AC Power Entry Module
Routing Engine 0 REV 03   740-014080   1000642883       RE-A-1000
  ad0     248 MB  SILICONSYSTEMS INC 256M 126CT505S0763SC00110 Compact Flash
  ad2   38154 MB  HTE541040G9SA00      MPBBT0X2HS2E3M    Hard Disk
CB 0             REV 03   710-011403   CM8346           M120 Control Board
CB 1             REV 06   710-011403   CP6728           M120 Control Board
```

```
FPC 1            REV 02   710-015908   CP6925            M120 CFPC 10GE
  PIC 0                   BUILTIN      BUILTIN           1x 10GE(LAN/WAN) XFP
    Xcvr 0       REV 01   740-014279   62E204N00007      XFP-10G-LR
FPC 3            REV 03   710-011393   CJ9234            M120 FPC Type 2
  PIC 0          REV 16   750-008155   NB5229            2x G/E IQ, 1000 BASE
    Xcvr 0       REV 01   740-011613   P9F15JB           SFP-SX
    Xcvr 1       REV 01   740-007326   P4Q0R9G           SFP-SX
  PIC 1          REV 09   750-007745   CG4360            4x OC-3 SONET, SMIR
  PIC 2          REV 16   750-008155   ND7787            2x G/E IQ, 1000 BASE
    Xcvr 0       REV 01   740-011613   P9F12AS           SFP-SX
    Xcvr 1       REV 01   740-011613   P9F1ALU           SFP-SX
  PIC 3          REV 07   750-011800   JW1284            8x 1GE(LAN), IQ2
    Xcvr 0       REV 01   740-011613   P9F1AM6           SFP-SX
    Xcvr 6       REV 01   740-011613   P9F16NN           SFP-SX
    Xcvr 7       REV 01   740-011782   P8C29Y7           SFP-SX
  Board B        REV 02   710-011395   CN3754            M120 FPC Mezz
FPC 4            REV 02   710-011398   CP6741            M120 FPC Type 3
  PIC 0          REV 16   750-007141   NB2855            10x 1GE(LAN), 1000 BASE

    Xcvr 0       REV 01   740-011782   P922A1F           SFP-SX
    Xcvr 1       REV 01   740-011782   P922A16           SFP-SX
    Xcvr 2       REV 01   740-011782   P922A0U           SFP-SX
    Xcvr 3       REV 01   740-011782   P9229UZ           SFP-SX
    Xcvr 4       REV 01   740-009029   P11JXWP           SFP-LX
    Xcvr 6       REV 01   740-011613   P9F1ALW           SFP-SX
FPC 5            REV 01   710-011388   CJ9088            M120 FPC Type 1
  PIC 0          *** Hardware Not Supported ***
  PIC 1          REV 05   750-012052   NB0410            1x CHOC3 IQ SONET, SMLR

  PIC 2          REV 01   750-013167   CM3824            4x CHDS3 IQ
  PIC 3          REV 01   750-010240   CB5366            1x G/E SFP, 1000 BASE
  Board B        REV 01   710-011390   CJ9103            M120 FPC Mezz Board
FEB 3            REV 04   710-011663   CP6673            M120 FEB
FEB 4            REV 04   710-011663   CJ9368            M120 FEB
FEB 5            REV 04   710-011663   CJ9386            M120 FEB
Fan Tray 0                                                Front Top Fan Tray
Fan Tray 1                                                Front Bottom Fan Tray
Fan Tray 2                                                Rear Top Fan Tray
Fan Tray 3                                                Rear Bottom Fan Tray
```

show chassis hardware models (M120 Router)

```
user@host> show chassis hardware models
Hardware inventory:
Item             Version  Part number  CLEI code         FRU model number
Midplane         REV 01   710-013667
FPM CIP          REV 02   710-011410                     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
```


Copyright © 2016, Juniper Networks, Inc.

```
  PIC 1          REV 05   750-012052                     PB-1CHOC3-SMIR-QPP
  PIC 2          REV 01   750-013167                     PE-4CHDS3-QPP
  PIC 3          REV 01   750-010240                     PB-1GE-SFP
Fan Tray 0                                               FFANTRAY-M120-S
Fan Tray 1                                               FFANTRAY-M120-S
Fan Tray 2                                               RFANTRAY-M120-S
Fan Tray 3                                               RFANTRAY-M120-S
```

show chassis hardware (M160 Router)

```
user@host> show chassis hardware
Item             Version  Part number  Serial number     Description
Chassis                                101               M160
Midplane         REV 02   710-001245   S/N AB4107
FPM CMB          REV 01   710-001642   S/N AA2911
FPM Display      REV 01   710-001647   S/N AA2999
CIP              REV 02   710-001593   S/N AA9563
PEM 0            Rev 01   740-001243   S/N KJ35769       DC
PEM 1            Rev 01   740-001243   S/N KJ35765       DC
PCG 0            REV 01   710-001568   S/N AA9794
PCG 1            REV 01   710-001568   S/N AA9804
Host 1                                 da000004f8d57001  teknor
MCS 1            REV 03   710-001226   S/N AA9777
SFM 0 SPP        REV 04   710-001228   S/N AA2975
SFM 0 SPR        REV 02   710-001224   S/N AA9838        Internet Processor I
SFM 1 SPP        REV 04   710-001228   S/N AA2860
SFM 1 SPR        REV 01   710-001224   S/N AB0139        Internet Processor I
FPC 0            REV 03   710-001255   S/N AA9806        FPC Type 1
  CPU            REV 02   710-001217   S/N AA9590
  PIC 1          REV 05   750-000616   S/N AA1527        1x OC-12 ATM, MM
  PIC 2          REV 05   750-000616   S/N AA1535        1x OC-12 ATM, MM
  PIC 3          REV 01   750-000616   S/N AA1519        1x OC-12 ATM, MM
FPC 1            REV 02   710-001611   S/N AA9523        FPC Type 2
  CPU            REV 02   710-001217   S/N AA9571
  PIC 0          REV 03   750-001900   S/N AA9626        1x STM-16 SDH, SMIR
  PIC 1          REV 01   710-002381   S/N AD3633        2x G/E, 1000 BASE-SX
FPC 2                                                    FPC Type OC192
  CPU            REV 03   710-001217   S/N AB3329
  PIC 0          REV 01                                  1x OC-192 SM SR-2
Fan Tray 0                                               Rear Bottom Blower
Fan Tray 1                                               Rear Top Blower
Fan Tray 2                                               Front Top Blower
Fan Tray 3                                               Front Fan Tray
```

show chassis hardware models (M160 Router)

```
user@host> show chassis hardware models
 Hardware inventory:
Item             Version  Part number  CLEI code         FRU model number
Midplane         REV 03   710-009120                     CHAS-BP-M320-S
FPM Display      REV 02   710-009351                     CRAFT-M320-S
CIP              REV 03   710-005926                     CIP-M320-S
PEM 2            Rev X4   740-009148                     PWR-M-DC-S
PEM 3            Rev X4   740-009148                     PWR-M-DC-S
Routing Engine 0 REV 02   740-008883                     RE-1600-2048-S
Routing Engine 1 REV 02   740-008883                     RE-1600-2048-S
FPC 0            REV 02   710-010419                     M320-FPC1
  PIC 0          REV 01   750-001323                     P-TUNNEL
  PIC 1          REV 02   750-002987                     PE-1OC12-SON-SMIR
  PIC 2          REV 04   750-001894                     PB-1GE-SX
  PIC 3          REV 04   750-001896                     PB-1OC12-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-1OC12-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-4OC12-SON-SMIR
  PIC 1          REV 06   750-001900                    PB-1OC48-SON-SMSR
  PIC 2          REV 07   750-001900                    PB-1OC48-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
```


Copyright © 2016, Juniper Networks, Inc.

```
  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-1OC12-SON-SMIR
  PIC 2          REV 04   750-001894                     PB-1GE-SX
  PIC 3          REV 04   750-001896                     PB-1OC12-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-1OC12-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-4OC12-SON-SMIR
  PIC 1          REV 06   750-001900                     PB-1OC48-SON-SMSR
  PIC 2          REV 07   750-001900                     PB-1OC48-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
```

 Copyright © 2016, Juniper Networks, Inc.

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   AM1045SUAN0       SFP-SX
      Xcvr 1     REV 01   740-011613   AS0812S0719       SFP-SX
      Xcvr 2     REV 01   740-011613   AM0821SA121       SFP-SX
      Xcvr 3     REV 01   740-011613   PF21K21           SFP-SX
      Xcvr 4     REV 01   740-011613   AM0848SB69Z       SFP-SX
      Xcvr 5     REV 01   740-011782   P9P0XV3           SFP-SX
      Xcvr 6     REV 01   740-011613   AM0812S8WJN       SFP-SX
      Xcvr 7     REV 01   740-011613   PAM3G9Q           SFP-SX
      Xcvr 8     REV 01   740-011613   AM0848SB4A6       SFP-SX
      Xcvr 9     REV 01   740-011782   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
```

 Copyright © 2016, Juniper Networks, Inc.

```
  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   PBK0NK3           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   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+
    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
```

 Copyright © 2016, Juniper Networks, Inc.

```
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:               CAAX5741
 Assembly ID:  0x0560            Assembly Version:  01.28
 Date:         03-27-2013        Assembly Flags:    0x00
 Version:      REV 28            CLEI Code:         PROTOXCLEI
 ID: MX104                       FRU Model Number:  PROTO-ASSEMBLY
 Board Information Record:
  Address 0x00: ad 01 08 00 b0 a8 6e a7 f8 00 ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 05 60 01 1c 52 45 56 20 32 38 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 34 34 32 31 39 00 00
  Address 0x20: 53 2f 4e 20 43 41 41 58 35 37 34 31 00 1b 03 07
  Address 0x30: dd ff ff ff ad 01 08 00 b0 a8 6e a7 f8 00 ff ff
  Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
  Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff c2 47 33 35 30 33 00 00 00 00 00 00 00
PEM 0            REV 03   740-045933   1H072500016       AC Power Entry Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-045933        S/N:               1H072500016
 Assembly ID:  0x0475            Assembly Version:  00.03
 Date:         12-14-2012        Assembly Flags:    0x00
 Version:      REV 03            CLEI Code:         IPUPAJ9KAA
 ID: AC Power Entry Module       FRU Model Number:  PWR-AMX1100-AC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff 02 02 00 ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 75 00 03 52 45 56 20 30 33 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 34 35 39 33 33 00 00
  Address 0x20: 31 48 30 37 32 35 30 30 30 31 36 00 00 0e 0c 07
  Address 0x30: dc 30 43 ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: 02 02 00 ff 01 49 50 55 50 41 4a 39 4b 41 41 50
  Address 0x50: 57 52 2d 41 4d 58 31 31 30 30 2d 41 43 2d 53 00
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 70 ff ff ff ff ff ff ff ff ff ff ff ff
PEM 1            REV 03   740-045932   1H073050017       DC Power Entry Module
Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-045932        S/N:               1H073050017
 Assembly ID:  0x0476            Assembly Version:  00.03
 Date:         01-30-2013        Assembly Flags:    0x00
 Version:      REV 03            CLEI Code:         IPUPAJ8KAA
```

```
 ID: DC Power Entry Module       FRU Model Number:  PWR-AMX1100-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff 02 02 00 ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 76 00 03 52 45 56 20 30 33 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 34 35 39 33 32 00 00
  Address 0x20: 31 48 30 37 33 30 35 30 30 31 37 00 00 1e 01 07
  Address 0x30: dd 30 44 ff ff ff ff ff ff ff ff ff ff ff ff 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:               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       SMSC              uhub1
  usb0 (addr 3)  ATP IG eUSB SSD 44801 ATP Electronics   umass0
Routing Engine 1 REV 13   750-044228   CAAM6380          RE-MX-104
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          750-044228        S/N:               CAAM6380
 Assembly ID:  0x0b81            Assembly Version:  01.13
 Date:         09-17-2012        Assembly Flags:    0x00
 Version:      REV 13            CLEI Code:         PROTOXCLEI
 ID: RE-MX-104                   FRU Model Number:  PROTO-ASSEMBLY
 Board Information Record:
  Address 0x00: ad 01 00 08 64 87 88 27 08 18 ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 fe 0b 81 01 0d 52 45 56 20 31 33 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 34 34 32 32 38 00 00
  Address 0x20: 53 2f 4e 20 43 41 41 4d 36 33 38 30 00 11 09 07
  Address 0x30: dc ff ff ff ad 01 00 08 64 87 88 27 08 18 ff ff
  Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
  Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff c2 ff ff ff ff ff ff ff ff ff ff ff ff
  da0    7836 MB  ATP IG eUSB SSD                       Nand Flash 0
AFEB 0                    BUILTIN      BUILTIN           Forwarding Engine
Processor
FPC 0                     BUILTIN      BUILTIN           MPC BUILTIN
FPC 1                     BUILTIN      BUILTIN           MPC BUILTIN
  MIC 0          REV 15   750-036132   CAAF7948          2xOC12/8xOC3 CC-CE
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          750-036132        S/N:               CAAF7948
 Assembly ID:  0x0a1a            Assembly Version:  01.15
```


Copyright © 2016, Juniper Networks, Inc.

```
  Date:         07-03-2012        Assembly Flags:    0x00
  Version:      REV 15            CLEI Code:         IP9IAM2DAA
  ID: 2xOC12/8xOC3 CC-CE          FRU Model Number:  MIC-3D-8OC3-2OC12-ATM
  Board Information Record:
   Address 0x00: 12 01 05 03 05 ff 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           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   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                 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
  Jedec Code:   0x7fb0            EEPROM Version:    0x02
  P/N:          711-049570        S/N:               CAAX6538
  Assembly ID:  0x0b82            Assembly Version:  01.02
  Date:         03-01-2013        Assembly Flags:    0x00
  Version:      REV 02            CLEI Code:         PROTOXCLEI
  ID: Fan Tray                    FRU Model Number:  PROTO-ASSEMBLY
  Board Information Record:
   Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff 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
FPC 0                     BUILTIN
FPC 1                     BUILTIN
  MIC 0          REV 01   750-046905   PROTOXCLEI        MIC-3D-20GE-SFP-EH
FPC 2                     BUILTIN
Fan Tray        REV 02   711-049570   CAAX6538          PROTO-ASSEMBLY
```

show chassis hardware (MX240 Router)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                               JN10C7F7EAFC      MX240
Midplane         REV 01   710-021041   TR1502            MX240 Backplane
FPM Board        REV 01   710-017254   KD4017            Front Panel Display
PEM 0            Rev 02   740-017330   000332            PS 1.2-1.7kW; 100-240V
AC in
PEM 1            Rev 02   740-017330   000226            PS 1.2-1.7kW; 100-240V
AC in
Routing Engine 0 REV 06   740-013063   1000703522        RE-S-2000
Routing Engine 1 REV 06   740-015113   1000687625        RE-S-1300
CB 0             REV 07   710-013385   KC9057            MX SCB
CB 1             REV 05   710-013385   JY4760            MX SCB
FPC 1            REV 01   750-021679   KC7340            DPCE 40x 1GE R
  CPU            REV 06   710-013713   KD4078            DPC PMB
  PIC 0                   BUILTIN      BUILTIN           10x 1GE(LAN)
    Xcvr 0       REV 01   740-011613   P9F18ME           SFP-SX
  PIC 1                   BUILTIN      BUILTIN           10x 1GE(LAN)
  PIC 2                   BUILTIN      BUILTIN           10x 1GE(LAN)
  PIC 3                   BUILTIN      BUILTIN           10x 1GE(LAN)
FPC 2            REV 04   710-016669   JS4529            DPCE 40x 1GE R EQ
  CPU            REV 06   710-013713   KB3969            DPC PMB
  PIC 0                   BUILTIN      BUILTIN           10x 1GE(LAN) EQ
    Xcvr 0       REV 01   740-011613   PBG3Y79           SFP-SX
```


Copyright © 2016, Juniper Networks, Inc.

```
    Xcvr 1       REV 01   740-011613   PBG3XU8           SFP-SX
    Xcvr 2       REV 01   740-011613   PBG3YG6           SFP-SX
    Xcvr 3       REV 01   740-011613   PBG3XUG           SFP-SX
    Xcvr 4       REV 01   740-011613   PBG3XTJ           SFP-SX
  PIC 1                   BUILTIN      BUILTIN           10x 1GE(LAN) EQ
    Xcvr 0       REV 01   740-011613   PBG3ZUM           SFP-SX
    Xcvr 1       REV 01   740-011613   PBG3Y5H           SFP-SX
    Xcvr 2       REV 01   740-011613   PBG3UZT           SFP-SX
    Xcvr 3       REV 01   740-011613   PBG3US1           SFP-SX
  PIC 2                   BUILTIN      BUILTIN           10x 1GE(LAN) EQ
    Xcvr 0       REV 01   740-011613   PBG3YG7           SFP-SX
    Xcvr 1       REV 01   740-011613   PBG3XZ9           SFP-SX
    Xcvr 2       REV 01   740-011613   PBG3XTY           SFP-SX
    Xcvr 3       REV 01   740-011613   PBG3UZG           SFP-SX
  PIC 3                   BUILTIN      BUILTIN           10x 1GE(LAN) EQ
    Xcvr 0       REV 01   740-011613   PBG3Y8W           SFP-SX
    Xcvr 1       REV 01   740-011613   PBG3YVX           SFP-SX
    Xcvr 2       REV 01   740-011613   PBG3YB3           SFP-SX
    Xcvr 3       REV 01   740-011613   PBG43VQ           SFP-SX
Fan Tray 0       REV 01   710-021113   JS4642            MX240 Fan Tray
```

show chassis hardware detail (MX 240 Router with Routing Engine Displaying DIMM Information)

```
user@host> show chassis hardware detail

Item             Version  Part number  Serial number     Description
Chassis                                JN11279B4AFC      MX240 Backplane
Midplane         REV 07   760-021404   TS2474            MX240 Backplane
FPM Board        REV 03   760-021392   XC2643            Front Panel Display
PEM 0            Rev 03   740-017343   QCS0908A068       DC Power Entry Module
Routing Engine 0 REV 01   740-031117   AARCHOO           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
```

 Copyright © 2016, Juniper Networks, Inc.

```
Chassis                                  JN10C7F7FAFB      MX480
Midplane          REV 04   710-017414   TR2071            MX480 Midplane
FPM Board         REV 02   710-017254   KB8459            Front Panel Display
PEM 0             Rev 02   740-017330   QCS07519029       PS 1.2-1.7kW; 100-240V
AC in
PEM 1             Rev 02   740-017330   QCS07519041       PS 1.2-1.7kW; 100-240V
AC in
PEM 2             Rev 02   740-017330   QCS07519097       PS 1.2-1.7kW; 100-240V
AC in
Routing Engine 0 REV 07   740-013063   1000733381        RE-S-2000
Routing Engine 1 REV 07   740-013063   1000733540        RE-S-2000
CB 0              REV 07   710-013385   KA8022            Enhanced MX SCB
CB 1              REV 07   710-013385   KA8303            Enhanced MX SCB
FPC 0             REV 09   750-020452   KA8660            DPCE 40x 1GE X EQ
  CPU             REV 06   710-013713   KA8185            DPC PMB
  PIC 0                    BUILTIN      BUILTIN           10x 1GE(LAN) EQ
  PIC 1                    BUILTIN      BUILTIN           10x 1GE(LAN) EQ
  PIC 2                    BUILTIN      BUILTIN           10x 1GE(LAN) EQ
  PIC 3                    BUILTIN      BUILTIN           10x 1GE(LAN) EQ
Fan Tray                                                   Left Fan Tray
```

show chassis hardware (MX480 Routers with MPC5E and Built-in OTN PIC)

```
user@host> show chassis hardware
Hardware inventory:
Item              Version  Part number  Serial number     Description
Chassis                                 JN11C0338AFB      MX480
Midplane          REV 05   710-017414   ABAB8430          MX480 Midplane
FPM Board         REV 02   710-017254   ZS8005            Front Panel Display
PEM 0             Rev 05   740-029970   QCS1024U089       PS 1.4-2.52kW; 90-264V
AC in
PEM 1             Rev 10   740-029970   QCS1314U0FJ       PS 1.4-2.52kW; 90-264V
AC in
PEM 2             Rev 07   740-029970   QCS1121U076       PS 1.4-2.52kW; 90-264V
AC in
Routing Engine 0 REV 05   740-031116   9009092471        RE-S-1800x4
Routing Engine 1 REV 05   740-031116   9009097958        RE-S-1800x4
CB 0              REV 16   750-031391   CAAX0789          Enhanced MX SCB
CB 1              REV 16   750-031391   CAAX0856          Enhanced MX SCB
FPC 0             REV 32   750-028467   ABBP1782          MPC 3D 16x 10GE
  CPU             REV 10   711-029089   ABBP5410          AMPC PMB
  PIC 0                    BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0        REV 01   740-021308   983152A00038      SFP+-10G-SR
    Xcvr 1        REV 01   740-031980   B11F00211         SFP+-10G-SR
    Xcvr 2        REV 01   740-031980   AQ72LPB           SFP+-10G-SR
    Xcvr 3        REV 01   740-031980   AHN0WR5           SFP+-10G-SR
  PIC 1                    BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0        REV 01   740-031980   B11J03627         SFP+-10G-SR
    Xcvr 1        REV 01   740-031980   B11F00300         SFP+-10G-SR
    Xcvr 2        REV 01   740-021308   AQ42WSS           SFP+-10G-SR
    Xcvr 3        REV 01   740-021308   AQ43HGC           SFP+-10G-SR
  PIC 2                    BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0        REV 01   740-021308   ANA0ND0           SFP+-10G-SR
    Xcvr 1        REV 01   740-021308   ANA0NGF           SFP+-10G-SR
    Xcvr 2        REV 01   740-021308   ANA0NG9           SFP+-10G-SR
    Xcvr 3        REV 01   740-021308   ANA0MP9           SFP+-10G-SR
  PIC 3                    BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0        REV 01   740-021308   AQA06CG           SFP+-10G-SR
    Xcvr 1        REV 01   740-021308   19T511100493      SFP+-10G-SR
    Xcvr 2        REV 01   740-031980   APR040J           SFP+-10G-SR
FPC 1             REV 26   750-046005   CACN1894          MPC5E 3D Q 2CGE+4XGE
```

```
  CPU            REV 09   711-045719   CACN8698          RMPC PMB
  PIC 0                   BUILTIN      BUILTIN           2X10GE SFPP OTN
    Xcvr 0       REV 01   740-031980   163363A03046      SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AJ40JS8           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           1X100GE CFP2 OTN
  PIC 2                   BUILTIN      BUILTIN           2X10GE SFPP OTN
    Xcvr 0       REV 01   740-031980   153363A00593      SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AJ40JUJ           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           1X100GE CFP2 OTN
    Xcvr 0                NON-JNPR     UQC0B53           CFP2-100G-LR4-D
FPC 2            REV 26   750-046005   CACN1891          MPC5E 3D Q 2CGE+4XGE
  CPU            REV 09   711-045719   CACN8694          RMPC PMB
  PIC 0                   BUILTIN      BUILTIN           2X10GE SFPP OTN
    Xcvr 0                NON-JNPR     URA012A           SFP+-10G-LR
  PIC 1                   BUILTIN      BUILTIN           1X100GE CFP2 OTN
    Xcvr 0                NON-JNPR     J13F47042         CFP2-100G-LR4-D
  PIC 2                   BUILTIN      BUILTIN           2X10GE SFPP OTN
    Xcvr 0       REV 01   740-031980   AJC0BM3           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   11T511100917      SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           1X100GE CFP2 OTN
    Xcvr 0                NON-JNPR     UQK07SU           CFP2-100G-LR4-D
FPC 3            REV 03   750-045372   CAAD9425          MPCE Type 3 3D
CPU            REV 08   711-035209   CAAD9094          HMPC PMB 2G
  MIC 0          REV 14   750-033196   CAAW9204          1X100GE CXP
    PIC 0                 BUILTIN      BUILTIN           1X100GE CXP
      Xcvr 0     REV 01   740-046563   XD16FC034         CFP2-100G-SR10
  MIC 1          REV 19   750-033199   CAAJ1814          1X100GE CFP
    PIC 2                 BUILTIN      BUILTIN           1X100GE CFP
FPC 4            REV 21.0.11 750-045715 CAAY3568         MPC5E 3D Q 24XGE+6XLGE
  CPU            REV 07   711-045719   CAAW7430          RMPC PMB
  PIC 0                   BUILTIN      BUILTIN           12X10GE SFPP OTN
    Xcvr 0       REV 01   740-031980   AP406NG           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AR41NLP           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11D05630         SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           12X10GE SFPP OTN
  PIC 2                   BUILTIN      BUILTIN           3X40GE QSFPP
  PIC 3                   BUILTIN      BUILTIN           3X40GE QSFPP
  WAN MEZZ       REV 12   750-049136   CACM6678          MPC5E 24XGE OTN Mezz
FPC 5            REV 11   750-045372   CABK7539          MPCE Type 3 3D
  CPU            REV 08   711-035209   CABJ2466          HMPC PMB 2G
  MIC 0          REV 19   750-033199   CAAJ9719          1X100GE CFP
    PIC 0                 BUILTIN      BUILTIN           1X100GE CFP
      Xcvr 0     REV 01   740-035329   UP1020P           CFP-100G-SR10
  MIC 1          REV 07   750-033196   YZ0797            1X100GE CXP
    PIC 2                 BUILTIN      BUILTIN           1X100GE CXP
      Xcvr 0     REV 01   740-046563   XC42FC022         CFP2-100G-SR10
Fan Tray                                                 Enhanced Left Fan Tray
```

show chassis hardware detail (MX480 Routers with MPC5E and Built-in OTN PIC)

```
user@host> show chassis hardware detail
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                               JN11C0338AFB      MX480
Midplane         REV 05   710-017414   ABAB8430          MX480 Midplane
FPM Board        REV 02   710-017254   ZS8005            Front Panel Display
PEM 0            Rev 05   740-029970   QCS1024U089       PS 1.4-2.52kW; 90-264V
AC in
PEM 1            Rev 10   740-029970   QCS1314U0FJ       PS 1.4-2.52kW; 90-264V
AC in
PEM 2            Rev 07   740-029970   QCS1121U076       PS 1.4-2.52kW; 90-264V
```


Copyright © 2016, Juniper Networks, Inc.

```
AC in
Routing Engine 0 REV 05   740-031116   9009092471        RE-S-1800x4
  ad0    3896 MB  VRFCF14096DIHK1      VM4096MB 6862     Compact Flash
  ad1   30533 MB  UGB94ARF32H0S3-KC    UNIGEN-478612-001127 Disk 1
  usb0 (addr 1)  EHCI root hub 0       Intel             uhub0
  usb0 (addr 2)  product 0x0020 32     vendor 0x8087     uhub1
  DIMM 0         SGU04G72H1BB2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 1         SGU04G72H1BB2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 2         SGU04G72H1BB2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 3         SGU04G72H1BB2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
Routing Engine 1 REV 05   740-031116   9009097958        RE-S-1800x4
  ad0    3896 MB  VRFCF14096DIHK1      VM4096MB 6145     Compact Flash
  ad1   30533 MB  UGB94ARF32H0S3-KC    UNIGEN-499551-000273 Disk 1
CB 0             REV 16   750-031391   CAAX0789          Enhanced MX SCB
CB 1             REV 16   750-031391   CAAX0856          Enhanced MX SCB
FPC 0            REV 32   750-028467   ABBP1782          MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ABBP5410          AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   983152A00038      SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11F00211         SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AQ72LPB           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AHN0WR5           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   B11J03627         SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11F00300         SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQ42WSS           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQ43HGC           SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   ANA0ND0           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   ANA0NGF           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   ANA0NG9           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   ANA0MP9           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AQA06CG           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   19T511100493      SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   APR040J           SFP+-10G-SR
FPC 1            REV 26   750-046005   CACN1894          MPC5E 3D Q 2CGE+4XGE
  CPU            REV 09   711-045719   CACN8698          RMPC PMB
  PIC 0                   BUILTIN      BUILTIN           2X10GE SFPP OTN
    Xcvr 0       REV 01   740-031980   163363A03046      SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AJ40JS8           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           1X100GE CFP2 OTN
  PIC 2                   BUILTIN      BUILTIN           2X10GE SFPP OTN
    Xcvr 0       REV 01   740-031980   153363A00593      SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AJ40JUJ           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           1X100GE CFP2 OTN
    Xcvr 0                NON-JNPR     UQC0B53           CFP2-100G-LR4-D
FPC 2            REV 26   750-046005   CACN1891          MPC5E 3D Q 2CGE+4XGE
  CPU            REV 09   711-045719   CACN8694          RMPC PMB
PIC 0                   BUILTIN      BUILTIN           2X10GE SFPP OTN
    Xcvr 0                NON-JNPR     URA012A           SFP+-10G-LR
  PIC 1                   BUILTIN      BUILTIN           1X100GE CFP2 OTN
    Xcvr 0                NON-JNPR     J13F47042         CFP2-100G-LR4-D
  PIC 2                   BUILTIN      BUILTIN           2X10GE SFPP OTN
    Xcvr 0       REV 01   740-031980   AJC0BM3           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   11T511100917      SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           1X100GE CFP2 OTN
    Xcvr 0                NON-JNPR     UQK07SU           CFP2-100G-LR4-D
FPC 3            REV 03   750-045372   CAAD9425          MPCE Type 3 3D
  CPU            REV 08   711-035209   CAAD9094          HMPC PMB 2G
  MIC 0          REV 14   750-033196   CAAW9204          1X100GE CXP
```

```
    PIC 0                 BUILTIN      BUILTIN           1X100GE CXP
      Xcvr 0     REV 01   740-046563   XD16FC034         CFP2-100G-SR10
  MIC 1          REV 19   750-033199   CAAJ1814          1X100GE CFP
    PIC 2                 BUILTIN      BUILTIN           1X100GE CFP
FPC 4            REV 21.0.11 750-045715 CAAY3568         MPC5E 3D Q 24XGE+6XLGE
  CPU            REV 07   711-045719   CAAW7430          RMPC PMB
  PIC 0                   BUILTIN      BUILTIN           12X10GE SFPP OTN
    Xcvr 0       REV 01   740-031980   AP406NG           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AR41NLP           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11D05630         SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           12X10GE SFPP OTN
  PIC 2                   BUILTIN      BUILTIN           3X40GE QSFPP
  PIC 3                   BUILTIN      BUILTIN           3X40GE QSFPP
  WAN MEZZ       REV 12   750-049136   CACM6678          MPC5E 24XGE OTN Mezz
FPC 5            REV 11   750-045372   CABK7539          MPCE Type 3 3D
  CPU            REV 08   711-035209   CABJ2466          HMPC PMB 2G
  MIC 0          REV 19   750-033199   CAAJ9719          1X100GE CFP
    PIC 0                 BUILTIN      BUILTIN           1X100GE CFP
      Xcvr 0     REV 01   740-035329   UP1020P           CFP-100G-SR10
  MIC 1          REV 07   750-033196   YZ0797            1X100GE CXP
    PIC 2                 BUILTIN      BUILTIN           1X100GE CXP
      Xcvr 0     REV 01   740-046563   XC42FC022         CFP2-100G-SR10
Fan Tray                                                 Enhanced Left Fan Tray
```

show chassis hardware extensive (MX480 Routers with MPC5E and Built-in OTN PIC)

```
user@host> show chassis hardware extensive
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN11C0338AFB      MX480
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
                                 S/N:               JN11C0338AFB
 Assembly ID:  0x01fe            Assembly Version:  00.00
 Date:         00-00-0000        Assembly Flags:    0x02
 ID: MX480
 Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 01 fe 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x20: 4a 4e 31 31 43 30 33 33 38 41 46 42 02 00 00 00
  Address 0x30: 00 00 00 ff 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Midplane         REV 05   710-017414   ABAB8430          MX480 Midplane
 Jedec Code:   0x7fb0            EEPROM Version:    0x01
 P/N:          710-017414        S/N:               ABAB8430
 Assembly ID:  0x01fe            Assembly Version:  01.05
 Date:         12-13-2011        Assembly Flags:    0x00
 Version:      REV 05
 ID: MX480 Midplane              FRU Model Number:  CHAS-BP-MX480-S
 Board Information Record:
  Address 0x00: ad 01 08 00 00 23 9c fc 98 00 ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 01 fe 01 05 52 45 56 20 30 35 00 00
  Address 0x10: 00 00 00 00 37 31 30 2d 30 31 37 34 31 34 00 00
  Address 0x20: 53 2f 4e 20 41 42 41 42 38 34 33 30 00 0d 0c 07
  Address 0x30: db ff ff ff ad 01 08 00 00 23 9c fc 98 00 ff ff
```


Copyright © 2016, Juniper Networks, Inc.

```
  Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 43
  Address 0x50: 48 41 53 2d 42 50 2d 4d 58 34 38 30 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
FPM Board        REV 02   710-017254   ZS8005           Front Panel Display
 Jedec Code:   0x7fb0            EEPROM Version:    0x01
 P/N:          710-017254        S/N:               ZS8005
 Assembly ID:  0x01ff            Assembly Version:  01.02
 Date:         11-21-2011        Assembly Flags:    0x00
 Version:      REV 02
 ID: Front Panel Display         FRU Model Number:  CRAFT-MX480-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 01 ff 01 02 52 45 56 20 30 32 00 00
  Address 0x10: 00 00 00 00 37 31 30 2d 30 31 37 32 35 34 00 00
  Address 0x20: 53 2f 4e 20 5a 53 38 30 30 35 00 00 00 15 0b 07
  Address 0x30: db ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 43
  Address 0x50: 52 41 46 54 2d 4d 58 34 38 30 2d 53 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
PEM 0            Rev 05   740-029970   QCS1024U089       PS 1.4-2.52kW; 90-264V
AC in
 Jedec Code:   0x7fb0            EEPROM Version:    0x01
 P/N:          740-029970        S/N:               QCS1024U089
 Assembly ID:  0x0432            Assembly Version:  01.05
 Date:         06-17-2010        Assembly Flags:    0x00
 Version:      Rev 05
 ID: PS 1.4-2.52kW; 90-264V AC in FRU Model Number:  PWR-MX480-2520-AC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 04 32 01 05 52 65 76 20 30 35 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 32 39 39 37 30 00 00
  Address 0x20: 51 43 53 31 30 32 34 55 30 38 39 00 00 11 06 07
  Address 0x30: da ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 50
  Address 0x50: 57 52 2d 4d 58 34 38 30 2d 32 35 32 30 2d 41 43
  Address 0x60: 2d 53 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
PEM 1            Rev 10   740-029970   QCS1314U0FJ       PS 1.4-2.52kW; 90-264V
AC in
 Jedec Code:   0x7fb0            EEPROM Version:    0x01
 P/N:          740-029970        S/N:               QCS1314U0FJ
 Assembly ID:  0x0432            Assembly Version:  01.10
 Date:         04-04-2013        Assembly Flags:    0x00
 Version:      Rev 10
 ID: PS 1.4-2.52kW; 90-264V AC in FRU Model Number:  PWR-MX480-2520-AC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 04 32 01 0a 52 65 76 20 31 30 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 32 39 39 37 30 00 00
  Address 0x20: 51 43 53 31 33 31 34 55 30 46 4a 00 00 04 04 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 50
  Address 0x50: 57 52 2d 4d 58 34 38 30 2d 32 35 32 30 2d 41 43
  Address 0x60: 2d 53 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
PEM 2            Rev 07   740-029970   QCS1121U076       PS 1.4-2.52kW; 90-264V
```

```
AC in
 Jedec Code:   0x7fb0            EEPROM Version:    0x01
 P/N:          740-029970        S/N:               QCS1121U076
 Assembly ID:  0x0432            Assembly Version:  01.07
 Date:         05-23-2011        Assembly Flags:    0x00
 Version:      Rev 07
 ID: PS 1.4-2.52kW; 90-264V AC in FRU Model Number:  PWR-MX480-2520-AC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 04 32 01 07 52 65 76 20 30 37 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 32 39 39 37 30 00 00
  Address 0x20: 51 43 53 31 31 32 31 55 30 37 36 00 00 17 05 07
  Address 0x30: db ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 50
  Address 0x50: 57 52 2d 4d 58 34 38 30 2d 32 35 32 30 2d 41 43
  Address 0x60: 2d 53 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Routing Engine 0 REV 05   740-031116   9009092471        RE-S-1800x4
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-031116        S/N:               9009092471
 Assembly ID:  0x09c0            Assembly Version:  01.05
 Date:         11-01-2011        Assembly Flags:    0x00
 Version:      REV 05            CLEI Code:         COUCALDBAA
 ID: RE-S-1800x4                 FRU Model Number:  RE-S-1800X4-16G-S
 Board Information Record:
  Address 0x00: 54 32 30 32 37 43 41 2d 34 32 46 42 23 23 23 00
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 09 c0 01 05 52 45 56 20 30 35 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 33 31 31 31 36 00 00
  Address 0x20: 39 30 30 39 30 39 32 34 37 31 00 00 00 01 0b 07
  Address 0x30: db ff ff ff 54 32 30 32 37 43 41 2d 34 32 46 42
  Address 0x40: 23 23 23 00 01 43 4f 55 43 41 4c 44 42 41 41 52
  Address 0x50: 45 2d 53 2d 31 38 30 30 58 34 2d 31 36 47 2d 53
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 4b ff ff ff ff ff ff ff ff ff ff ff ff
  ad0    3896 MB  VRFCF14096DIHK1      VM4096MB 6862     Compact Flash
  ad1   30533 MB  UGB94ARF32H0S3-KC    UNIGEN-478612-001127 Disk 1
  usb0 (addr 1)  EHCI root hub 0       Intel             uhub0
  usb0 (addr 2)  product 0x0020 32     vendor 0x8087     uhub1
  DIMM 0         SGU04G72H1BB2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 1         SGU04G72H1BB2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 2         SGU04G72H1BB2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 3         SGU04G72H1BB2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
Routing Engine 1 REV 05   740-031116   9009097958        RE-S-1800x4
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-031116        S/N:               9009097958
 Assembly ID:  0x09c0            Assembly Version:  01.05
 Date:         02-06-2012        Assembly Flags:    0x00
 Version:      REV 05            CLEI Code:         COUCALDBAA
 ID: RE-S-1800x4                 FRU Model Number:  RE-S-1800X4-16G-S
 Board Information Record:
  Address 0x00: 54 32 30 32 37 43 41 2d 34 32 46 42 23 23 23 00
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 09 c0 01 05 52 45 56 20 30 35 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 33 31 31 31 36 00 00
  Address 0x20: 39 30 30 39 30 39 37 39 35 38 00 00 00 06 02 07
  Address 0x30: dc ff ff ff 54 32 30 32 37 43 41 2d 34 32 46 42
  Address 0x40: 23 23 23 00 01 43 4f 55 43 41 4c 44 42 41 41 52
  Address 0x50: 45 2d 53 2d 31 38 30 30 58 34 2d 31 36 47 2d 53
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
```


Copyright © 2016, Juniper Networks, Inc.

```
  Address 0x70: ff ff ff 4b ff ff ff ff ff ff ff ff ff ff ff ff
  ad0    3896 MB  VRFCF14096DIHK1      VM4096MB 6145     Compact Flash
  ad1   30533 MB  UGB94ARF32H0S3-KC    UNIGEN-499551-000273 Disk 1

...
```

show chassis hardware (MX960 Router)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                                  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   P9M0TL9           SFP-SX
    Xcvr 7       REV 01   740-011782   P9P0XXH           SFP-SX
    Xcvr 9       REV 01   740-011782   P9M0TN1           SFP-SX
  PIC 1                   BUILTIN      BUILTIN           10x 1GE(LAN)
    Xcvr 0       REV 01   740-011613   PAJ4UHC           SFP-SX
  PIC 2                   BUILTIN      BUILTIN           10x 1GE(LAN)
    Xcvr 0       REV 01   740-011613   PFF2CD0           SFP-SX
    Xcvr 1       REV 01   740-011613   PBG3ZUT           SFP-SX
    Xcvr 2       REV 01   740-011613   PFF2DDV           SFP-SX
    Xcvr 5       REV 01   740-011613   P8E2SST           SFP-SX
    Xcvr 9       REV 01   740-011782   PB8329N           SFP-SX
  PIC 3                   BUILTIN      BUILTIN           10x 1GE(LAN)
    Xcvr 0       REV 01   740-026192   1U0201084503342   SFP-100BASE-BX10-U
    Xcvr 1       REV 01   740-026193   1U1201084503313   SFP-100BASE-BX10-D
    Xcvr 2       REV 01   740-011613   PAJ4Y5B           SFP-SX
```

 Copyright © 2016, Juniper Networks, Inc.

```
    Xcvr 6       REV 01   740-011782   P9M0U3M           SFP-SX
    Xcvr 7       REV 01   740-011782   P9M0TLA           SFP-SX
FPC 1            REV 16   750-031089   YL0719            MPC Type 2 3D
  CPU            REV 06   711-030884   YL1463            MPC PMB 2G
  MIC 0          REV 07   750-028387   JR6500            3D 4x 10GE  XFP
    PIC 0                 BUILTIN      BUILTIN           2x 10GE  XFP
      Xcvr 0     REV 01   740-014279   733019A00154      XFP-10G-LR
      Xcvr 1     REV 02   740-014289   T09F55034         XFP-10G-SR
    PIC 1                 BUILTIN      BUILTIN           2x 10GE  XFP
      Xcvr 0     REV 01   740-014279   913019B00791      XFP-10G-LR
      Xcvr 1     REV 01   740-014289   98S803A90384      XFP-10G-SR
  MIC 1          REV 24   750-028387   YJ3950            3D 4x 10GE  XFP
    PIC 2                 BUILTIN      BUILTIN           2x 10GE  XFP
      Xcvr 0     REV 02   740-014279   T10B36134         XFP-10G-LR
      Xcvr 1     REV 01   740-014289   T07M86354         XFP-10G-SR
    PIC 3                 BUILTIN      BUILTIN           2x 10GE  XFP
FPC 2            REV 08   710-014219   JY9654            DPCE 4x 10GE R
  CPU            REV 06   710-013713   JZ6549            DPC PMB
  PIC 0                   BUILTIN      BUILTIN           1x 10GE(LAN/WAN)
  PIC 1                   BUILTIN      BUILTIN           1x 10GE(LAN/WAN)
  PIC 2                   BUILTIN      BUILTIN           1x 10GE(LAN/WAN)
    Xcvr 0       REV 03   740-011571   C931BK028         XFP-10G-SR
  PIC 3                   BUILTIN      BUILTIN           1x 10GE(LAN/WAN)
FPC 3            REV 10   750-024199   XJ6692            MX FPC Type 3
  CPU            REV 03   710-022351   XF5182            DPC PMB
  PIC 0          REV 17   750-009553   RJ2945            4x OC-48 SONET
    Xcvr 1       REV 01   740-011785   PCP3YLL           SFP-SR
    Xcvr 3       REV 01   740-011785   PDS0MRY           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   AHN0X1Z           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   PDS0MPZ           SFP-SR
FPC 10           REV 04   710-013699   JY4654            DPCE 40x 1GE R
  CPU            REV 05   710-013713   JS9717            DPC PMB
```

```
  PIC 0                   BUILTIN      BUILTIN           10x 1GE(LAN)
    Xcvr 5       REV 01   740-011782   PAR1L72           SFP-SX
    Xcvr 6       REV 01   740-011782   P8N1YQ4           SFP-SX
  PIC 1                   BUILTIN      BUILTIN           10x 1GE(LAN)
  PIC 2                   BUILTIN      BUILTIN           10x 1GE(LAN)
    Xcvr 0       REV 01   740-011782   P8Q2AVL           SFP-SX
    Xcvr 5       REV 01   740-011782   PAR1L7B           SFP-SX
    Xcvr 6       REV 01   740-011782   PAR1L2J           SFP-SX
    Xcvr 8       REV 01   740-011782   P8N1YMY           SFP-SX
  PIC 3                   BUILTIN      BUILTIN           10x 1GE(LAN)
Fan Tray 0       REV 03   740-014971   TP0567            Fan Tray
Fan Tray 1       REV 03   740-014971   TP0702            Fan Tray
```

show chassis hardware models (MX960 Router with Enhanced MX SCB)

```
user@host> show chassis hardware models
Hardware inventory:
Item             Version  Part number  Serial number     FRU model number
Midplane         REV 03   710-013698   TR0183            CHAS-BP-MX960-S
Fan Extender     REV 02   710-018051   JY5227            ECM-MX960
FPM Board        REV 03   710-014974   JZ6876            CRAFT-MX960-S
Routing Engine 0 REV 06   740-013063   1000687969        RE-S-2000-4096-S
Routing Engine 1 REV 06   740-013063   1000687955        RE-S-2000-4096-S
CB 0             REV 11   750-031391   YZ6072            SCBE-MX-S
CB 1             REV 11   750-031391   YZ6068            SCBE-MX-S
CB 2             REV 11   750-031391   YZ6081            SCBE-MX-S
FPC 0            REV 01   750-018122   KA5576            DPCE-R-40GE-SFP
FPC 1            REV 16   750-031089   YL0719            MX-MPC2-3D
  MIC 0          REV 07   750-028387   JR6500            MIC-3D-4XGE-XFP
  MIC 1          REV 24   750-028387   YJ3950            MIC-3D-4XGE-XFP
FPC 2            REV 08   710-014219   JY9654            DPC-R-4XGE-XFP
FPC 3            REV 10   750-024199   XJ6692            MX-FPC3
  PIC 0          REV 17   750-009553   RJ2945            PC-4OC48-SON-SFP
  PIC 1          REV 32   750-003700   DP2113            PC-1OC192-SON-VSR
FPC 5            REV 25   750-028467   YM8256            MPC-3D-16XGE-SFPP
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-4OC3-1OC12-SON2-SFP
  PIC 1          REV 08   750-014637   DM3671            PB-4OC3-4OC12-SON-SFP
FPC 10           REV 04   710-013699   JY4654            DPC-R-40GE-SFP
Fan Tray 0       REV 03   740-014971   TP0567            FFANTRAY-MX960-S
Fan Tray 1       REV 03   740-014971   TP0702            FFANTRAY-MX960-S
```

show chassis hardware (MX960 Router with MPC5EQ)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN1214852AFA      MX960
Midplane         REV 01   710-030012   ACAX3674          MX960 Backplane
FPM Board        REV 03   710-014974   CAAZ9326          Front Panel Display
PDM             Rev 03   740-013110   QCS17025017       Power Distribution Module
PEM 0            Rev 10   740-027760   QCS1702N062       PS 4.1kW; 200-240V AC
in
PEM 1            Rev 04   740-027760   QCS1422N02C       PS 4.1kW; 200-240V AC
in
PEM 2            Rev 09   740-027760   QCS1614N01X       PS 4.1kW; 200-240V AC
in
Routing Engine 0 REV 08   740-031116   9009131803        RE-S-1800x4
Routing Engine 1 REV 08   740-031116   9009124913        RE-S-1800x4
```


Copyright © 2016, Juniper Networks, Inc.

```
CB 0             REV 18   750-031391   CABF0579          Enhanced MX SCB
CB 1             REV 16   750-031391   CAAZ2471          Enhanced MX SCB
CB 2             REV 16   750-031391   CAAW9595          Enhanced MX SCB
FPC 0            REV 18   750-046005   CACE6574          MPC5E 3D Q 2CGE+4XGE
  CPU            REV 09   711-045719   CACG8908          RMPC PMB
  PIC 0                   BUILTIN      BUILTIN           2X10GE SFPP OTN
    Xcvr 0       REV 01   740-021308   AQA0DYT           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQG0MS7           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           1X100GE CFP2 OTN
    Xcvr 0       REV 01   740-046563   XD16FC03Z         CFP2-100G-SR10
  PIC 2                   BUILTIN      BUILTIN           2X10GE SFPP OTN
    Xcvr 0       REV 01   740-021308   ANA0NAJ           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQG0MRQ           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           1X100GE CFP2 OTN
    Xcvr 0       REV 01   740-049775   J13K72993         CFP2-100G-LR4
FPC 1            REV 11   750-045372   CABK8154          MPCE Type 3 3D
  CPU            REV 08   711-035209   CABE7370          HMPC PMB 2G
  MIC 0          REV 07   750-033307   CABD5255          10X10GE SFPP
    PIC 0                 BUILTIN      BUILTIN           10X10GE SFPP
      Xcvr 0     REV 01   740-021308   AQ50319           SFP+-10G-SR
      Xcvr 1     REV 01   740-021308   AQ5035V           SFP+-10G-SR
      Xcvr 2     REV 01   740-021308   AQ502XJ           SFP+-10G-SR
      Xcvr 3     REV 01   740-021308   AQ43HHR           SFP+-10G-SR
      Xcvr 4     REV 01   740-021308   AQ502YA           SFP+-10G-SR
      Xcvr 5     REV 01   740-021308   AQ502EU           SFP+-10G-SR
      Xcvr 6     REV 01   740-021308   AQ502HR           SFP+-10G-SR
      Xcvr 7     REV 01   740-021308   AQ502A6           SFP+-10G-SR
      Xcvr 8     REV 01   740-021308   AQ43H8M           SFP+-10G-SR
  MIC 1          REV 14   750-033196   CAAP1398          1X100GE CXP
    PIC 2                 BUILTIN      BUILTIN           1X100GE CXP
      Xcvr 0     REV 01   740-046563   XD16FC064         CFP-100G-SR10
FPC 3            REV 35   750-028467   CAAT9156          MPC 3D 16x 10GE
  CPU            REV 11   711-029089   CAAV4645          AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AQ43HZ1           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQ43HZC           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQ43HD2           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQ502HN           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AQ43HGF           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQ501RZ           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQ5029V           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQ501X9           SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AQ502ZN           SFP+-10G-SR
 Xcvr 1       REV 01   740-021308   AQ43H86           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQ502ZY           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQ502PZ           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AQ503E6           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQ502XN           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11F00213         SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQ50336           SFP+-10G-SR
FPC 4            REV 18   750-046005   CACE6568          MPC5E 3D Q 2CGE+4XGE
  CPU            REV 09   711-045719   CACG8900          RMPC PMB
  PIC 0                   BUILTIN      BUILTIN           2X10GE SFPP OTN
    Xcvr 0       REV 01   740-021308   AQA095A           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQG0M1E           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           1X100GE CFP2 OTN
    Xcvr 0                NON-JNPR     FE13F000F         CFP2-100G-SR10
  PIC 2                   BUILTIN      BUILTIN           2X10GE SFPP OTN
```

```
    Xcvr 0       REV 01   740-021308   AQG0LYC           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQG0LYB           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           1X100GE CFP2 OTN
    Xcvr 0       REV 01   740-048813   XD32FE00Z         CFP2-100G-SR10
FPC 5            REV 18   750-046005   CACE6577          MPC5E 3D Q 2CGE+4XGE
  CPU            REV 09   711-045719   CACG8902          RMPC PMB
  PIC 0                   BUILTIN      BUILTIN           2X10GE SFPP OTN
    Xcvr 0       REV 01   740-021308   AQG0MXE           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQG0LVY           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           1X100GE CFP2 OTN
    Xcvr 0       REV 01   740-046563   XD16FC03T         CFP2-100G-SR10
  PIC 2                   BUILTIN      BUILTIN           2X10GE SFPP OTN
    Xcvr 0       REV 01   740-021308   AQG0LW1           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQG0LW3           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           1X100GE CFP2 OTN
    Xcvr 0                NON-JNPR     FE13F000J         CFP2-100G-SR10
FPC 7            REV 09   750-037355   CAAF0937          MPC4E 3D 2CGE+8XGE
  CPU            REV 08   711-035209   CAAD8004          HMPC PMB 2G
  PIC 0                   BUILTIN      BUILTIN           4x10GE SFPP
    Xcvr 0       REV 01   740-021308   ANA0MM3           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           1X100GE CFP
    Xcvr 0       REV 01   740-035329   X000C163          CFP-100G-SR10
  PIC 2                   BUILTIN      BUILTIN           4x10GE SFPP
    Xcvr 0       REV 01   740-021308   AQG0MS6           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQG0MRX           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQG0M6Y           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQG0LZM           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           1X100GE CFP
    Xcvr 0       REV 01   740-035329   X12J00499         CFP-100G-SR10
FPC 8            REV 39   750-045715   CACD1903          MPC5E 3D Q 24XGE+6XLGE
  CPU            REV 09   711-045719   CACD1815          RMPC PMB
  PIC 0                   BUILTIN      BUILTIN           12X10GE SFPP OTN
  PIC 1                   BUILTIN      BUILTIN           12X10GE SFPP OTN
  PIC 2                   BUILTIN      BUILTIN           3X40GE QSFPP
    Xcvr 0       REV 01   740-046565   QC480289          QSFP+-40G-SR4
    Xcvr 1       REV 01   740-046565   QC480274          QSFP+-40G-SR4
    Xcvr 2       REV 01   740-046565   QD130190          QSFP+-40G-SR4
  PIC 3                   BUILTIN      BUILTIN           3X40GE QSFPP
    Xcvr 0       REV 01   740-046565   QD130197          QSFP+-40G-SR4
    Xcvr 1       REV 01   740-046565   QD130180          QSFP+-40G-SR4
 Xcvr 2       REV 01   740-046565   QD130199          QSFP+-40G-SR4
  WAN MEZZ       REV 09   750-049136   CABN0415          MPC5E 24XGE OTN Mezz
FPC 9            REV 05   750-044444   CAAY9801          MPCE Type 2 3D P
  CPU            REV 04   711-038484   CAAW3673          MPCE PMB 2G
  MIC 0          REV 28   750-028387   CAAX1071          3D 4x 10GE  XFP
    PIC 0                 BUILTIN      BUILTIN           2x 10GE  XFP
      Xcvr 0              NON-JNPR     T12L92342         XFP-10G-SR
      Xcvr 1              NON-JNPR     T12L92303         XFP-10G-SR
    PIC 1                 BUILTIN      BUILTIN           2x 10GE  XFP
      Xcvr 0              NON-JNPR     CC07BK02X         XFP-10G-SR
  QXM 0          REV 06   711-028408   CAAW4883          MPC QXM
  QXM 1          REV 06   711-028408   CAAW4603          MPC QXM
FPC 10           REV 21.0.11 750-045715 CAAY3541         MPC5E 3D Q 24XGE+6XLGE
  CPU            REV 07   711-045719   CAAW7426          RMPC PMB
  PIC 0                   BUILTIN      BUILTIN           12X10GE SFPP
    Xcvr 0       REV 01   740-031980   AHK01AP           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQ502ZU           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AP41BLS           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQA08YA           SFP+-10G-SR
    Xcvr 4       REV 01   740-021308   AQA0K26           SFP+-10G-SR
    Xcvr 6       REV 01   740-021308   AQA06S3           SFP+-10G-SR
```


Copyright © 2016, Juniper Networks, Inc.

```
    Xcvr 7       REV 01   740-021308   AQA06AS           SFP+-10G-SR
    Xcvr 8       REV 01   740-021308   AQA053N           SFP+-10G-SR
    Xcvr 9       REV 01   740-021308   AQA0E97           SFP+-10G-SR
    Xcvr 10      REV 01   740-021308   AQA0GS4           SFP+-10G-SR
    Xcvr 11      REV 01   740-021308   AQA0JVA           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           12X10GE SFPP
    Xcvr 0       REV 01   740-021308   AQA057A           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   ANA0MLS           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQA093A           SFP+-10G-SR
    Xcvr 3       REV 01   740-021309   943153A00075      SFP+-10G-LR
    Xcvr 4       REV 01   740-021308   AQA077B           SFP+-10G-SR
    Xcvr 5       REV 01   740-021308   AQA0JSC           SFP+-10G-SR
    Xcvr 6       REV 01   740-021308   AQA0735           SFP+-10G-SR
    Xcvr 7       REV 01   740-021308   AQ5028N           SFP+-10G-SR
    Xcvr 8       REV 01   740-031980   AP40VN5           SFP+-10G-SR
    Xcvr 9       REV 01   740-021308   AQA0K0J           SFP+-10G-SR
    Xcvr 10      REV 01   740-021308   AQA07AP           SFP+-10G-SR
    Xcvr 11      REV 01   740-021308   AQA08YB           SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           3X40GE QSFPP
  PIC 3                   BUILTIN      BUILTIN           3X40GE QSFPP
  WAN MEZZ       REV 07   750-045717   CAAX3123          MPC5E 24XGE Mezz
FPC 11           REV 17   750-037355   CAAT3986          MPC4E 3D 2CGE+8XGE
  CPU            REV 08   711-035209   CAAR3972          HMPC PMB 2G
  PIC 0                   BUILTIN      BUILTIN           4x10GE SFPP
    Xcvr 0       REV 01   740-021308   AQA0DSE           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQ501Y3           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQ501XU           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQ5036Y           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           1X100GE CFP
    Xcvr 0                NON-JNPR     X12J00247         CFP-100G-SR10
  PIC 2                   BUILTIN      BUILTIN           4x10GE SFPP
    Xcvr 0       REV 01   740-031980   ALQ1DKF           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AJ403YA           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AP40TY0           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   ALQ14G0           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           1X100GE CFP
    Xcvr 0       REV 01   740-035329   X12J00095         CFP-100G-SR10
Fan Tray 0       REV 08   740-031521   ACAF4219          Enhanced Fan Tray
Fan Tray 1       REV 08   740-031521   ACAF4225          Enhanced Fan Tray
```

show chassis hardware detail (MX960 Router)

```
user@host> show chassis hardware detail
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                                  MX960
Midplane         REV 01   710-013698   AA6082            MX960 Midplane
PIM              Rev 01   740-013110   000008            Power Inlet Module
PEM 2
PEM 3            Rev 01   740-013682   000038            PS 1.7kW; 200-240VAC in
Routing Engine 0 REV 00   740-015113   1000617944        RE-S-1300
  ad0     245 MB  SanDisk SDCFB-256    111419E1805T1141  Compact Flash
  ad2   38154 MB  FUJITSU MHT2040BH    NR0WT5925N77      Hard Disk
CB 0             REV 05   710-013725   JK6947            MX960 Test SCB
FPC 4            REV 01   710-013305   JM7617            MX960 Test DPC
  CPU
  PIC 0                   BUILTIN      BUILTIN           1x 10GE(LAN/WAN)
  PIC 1                   BUILTIN      BUILTIN           10x 1GE
FPC 7            REV 01   710-013305   JL9634            MX960 Test DPC
  CPU
  PIC 0                   BUILTIN      BUILTIN           1x 10GE(LAN/WAN)
```

```
    Xcvr 0                NON-JNPR     MYBG65I82C        XFP-10G-SR
  PIC 1                   BUILTIN      BUILTIN           10x 1GE
    Xcvr 1       REV 01   740-011782   P7N0368           SFP-SX
    Xcvr 4       REV 01   740-011782   P8J1W27           SFP-SX
    Xcvr 6       REV 01   740-011782   P8J1VSD           SFP-SX
    Xcvr 9       REV 01   740-011782   P8J1W25           SFP-SX
Fan Tray 0
Fan Tray 1
```

show chassis hardware detail (MX960 Router with MPC5EQ)

```
user@host> show chassis hardware detail
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN1214852AFA      MX960
Midplane         REV 01   710-030012   ACAX3674          MX960 Backplane
FPM Board        REV 03   710-014974   CAAZ9326          Front Panel Display
PDM             Rev 03   740-013110   QCS17025017       Power Distribution Module
PEM 0            Rev 10   740-027760   QCS1702N062       PS 4.1kW; 200-240V AC
in
PEM 1            Rev 04   740-027760   QCS1422N02C       PS 4.1kW; 200-240V AC
in
PEM 2            Rev 09   740-027760   QCS1614N01X       PS 4.1kW; 200-240V AC
in
Routing Engine 0 REV 08   740-031116   9009131803        RE-S-1800x4
  ad0    3831 MB  UGB30SFA4000T1       SFA4000T1 000016CD Compact Flash
  ad1   30533 MB  UGB94BPH32H0S1-KCI   11000061346       Disk 1
  usb0 (addr 1)  EHCI root hub 0       Intel             uhub0
  usb0 (addr 2)  product 0x0020 32     vendor 0x8087     uhub1
  DIMM 0         VL31B5263F-F8SD DIE REV-0 PCB REV-0     MFR ID-ce80
  DIMM 1         VL31B5263F-F8SD DIE REV-0 PCB REV-0     MFR ID-ce80
  DIMM 2         VL31B5263F-F8SD DIE REV-0 PCB REV-0     MFR ID-ce80
  DIMM 3         VL31B5263F-F8SD DIE REV-0 PCB REV-0     MFR ID-ce80
Routing Engine 1 REV 08   740-031116   9009124913        RE-S-1800x4
  ad0    3831 MB  UGB30SFA4000T1       SFA4000T1 0000106D Compact Flash
  ad1   30533 MB  UGB94BPH32H0S1-KCI   11000052402       Disk 1
CB 0             REV 18   750-031391   CABF0579          Enhanced MX SCB
CB 1             REV 16   750-031391   CAAZ2471          Enhanced MX SCB
CB 2             REV 16   750-031391   CAAW9595          Enhanced MX SCB
FPC 0            REV 18   750-046005   CACE6574          MPC5E 3D Q 2CGE+4XGE
  CPU            REV 09   711-045719   CACG8908          RMPC PMB
  PIC 0                   BUILTIN      BUILTIN           2X10GE SFPP OTN
    Xcvr 0       REV 01   740-021308   AQA0DYT           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQG0MS7           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           1X100GE CFP2 OTN
    Xcvr 0       REV 01   740-046563   XD16FC03Z         CFP2-100G-SR10
  PIC 2                   BUILTIN      BUILTIN           2X10GE SFPP OTN
    Xcvr 0       REV 01   740-021308   ANA0NAJ           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQG0MRQ           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           1X100GE CFP2 OTN
    Xcvr 0       REV 01   740-049775   J13K72993         CFP2-100G-LR4
FPC 1            REV 11   750-045372   CABK8154          MPCE Type 3 3D
  CPU            REV 08   711-035209   CABE7370          HMPC PMB 2G
  MIC 0          REV 07   750-033307   CABD5255          10X10GE SFPP
    PIC 0                 BUILTIN      BUILTIN           10X10GE SFPP
      Xcvr 0     REV 01   740-021308   AQ50319           SFP+-10G-SR
      Xcvr 1     REV 01   740-021308   AQ5035V           SFP+-10G-SR
      Xcvr 2     REV 01   740-021308   AQ502XJ           SFP+-10G-SR
      Xcvr 3     REV 01   740-021308   AQ43HHR           SFP+-10G-SR
      Xcvr 4     REV 01   740-021308   AQ502YA           SFP+-10G-SR
      Xcvr 5     REV 01   740-021308   AQ502EU           SFP+-10G-SR
```


Copyright © 2016, Juniper Networks, Inc.

```
      Xcvr 6     REV 01   740-021308   AQ502HR           SFP+-10G-SR
      Xcvr 7     REV 01   740-021308   AQ502A6           SFP+-10G-SR
      Xcvr 8     REV 01   740-021308   AQ43H8M           SFP+-10G-SR
  MIC 1          REV 14   750-033196   CAAP1398          1X100GE CXP
    PIC 2                 BUILTIN      BUILTIN           1X100GE CXP
      Xcvr 0     REV 01   740-046563   XD16FC064         CFP2-100G-SR10
FPC 3            REV 35   750-028467   CAAT9156          MPC 3D 16x 10GE
  CPU            REV 11   711-029089   CAAV4645          AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AQ43HZ1           SFP+-10G-SR
Xcvr 1       REV 01   740-021308   AQ43HZC           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQ43HD2           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQ502HN           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AQ43HGF           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQ501RZ           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQ5029V           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQ501X9           SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AQ502ZN           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQ43H86           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQ502ZY           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQ502PZ           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AQ503E6           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQ502XN           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11F00213         SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQ50336           SFP+-10G-SR
FPC 4            REV 18   750-046005   CACE6568          MPC5E 3D Q 2CGE+4XGE
  CPU            REV 09   711-045719   CACG8900          RMPC PMB
  PIC 0                   BUILTIN      BUILTIN           2X10GE SFPP OTN
    Xcvr 0       REV 01   740-021308   AQA095A           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQG0M1E           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           1X100GE CFP2 OTN
    Xcvr 0                NON-JNPR     FE13F000F         CFP2-100G-SR10
  PIC 2                   BUILTIN      BUILTIN           2X10GE SFPP OTN
    Xcvr 0       REV 01   740-021308   AQG0LYC           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQG0LYB           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           1X100GE CFP2 OTN
    Xcvr 0       REV 01   740-048813   XD32FE00Z         CFP2-100G-SR10
FPC 5            REV 18   750-046005   CACE6577          MPC5E 3D Q 2CGE+4XGE
  CPU            REV 09   711-045719   CACG8902          RMPC PMB
  PIC 0                   BUILTIN      BUILTIN           2X10GE SFPP OTN
    Xcvr 0       REV 01   740-021308   AQG0MXE           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQG0LVY           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           1X100GE CFP2 OTN
    Xcvr 0       REV 01   740-046563   XD16FC03T         CFP2-100G-SR10
  PIC 2                   BUILTIN      BUILTIN           2X10GE SFPP OTN
    Xcvr 0       REV 01   740-021308   AQG0LW1           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQG0LW3           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           1X100GE CFP2 OTN
    Xcvr 0                NON-JNPR     FE13F000J         CFP2-100G-SR10
FPC 7            REV 09   750-037355   CAAF0937          MPC4E 3D 2CGE+8XGE
  CPU            REV 08   711-035209   CAAD8004          HMPC PMB 2G
  PIC 0                   BUILTIN      BUILTIN           4x10GE SFPP
    Xcvr 0       REV 01   740-021308   ANA0MM3           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           1X100GE CFP
    Xcvr 0       REV 01   740-035329   X000C163          CFP-100G-SR10
  PIC 2                   BUILTIN      BUILTIN           4x10GE SFPP
    Xcvr 0       REV 01   740-021308   AQG0MS6           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQG0MRX           SFP+-10G-SR
```

```
    Xcvr 2       REV 01   740-021308   AQG0M6Y           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQG0LZM           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           1X100GE CFP
    Xcvr 0       REV 01   740-035329   X12J00499         CFP-100G-SR10
FPC 8            REV 39   750-045715   CACD1903          MPC5E 3D Q 24XGE+6XLGE
  CPU            REV 09   711-045719   CACD1815          RMPC PMB
  PIC 0                   BUILTIN      BUILTIN           12X10GE SFPP OTN
 PIC 1                   BUILTIN      BUILTIN           12X10GE SFPP OTN
  PIC 2                   BUILTIN      BUILTIN           3X40GE QSFPP
    Xcvr 0       REV 01   740-046565   QC480289          QSFP+-40G-SR4
    Xcvr 1       REV 01   740-046565   QC480274          QSFP+-40G-SR4
    Xcvr 2       REV 01   740-046565   QD130190          QSFP+-40G-SR4
  PIC 3                   BUILTIN      BUILTIN           3X40GE QSFPP
    Xcvr 0       REV 01   740-046565   QD130197          QSFP+-40G-SR4
    Xcvr 1       REV 01   740-046565   QD130180          QSFP+-40G-SR4
    Xcvr 2       REV 01   740-046565   QD130199          QSFP+-40G-SR4
  WAN MEZZ       REV 09   750-049136   CABN0415          MPC5E 24XGE OTN Mezz
FPC 9            REV 05   750-044444   CAAY9801          MPCE Type 2 3D P
  CPU            REV 04   711-038484   CAAW3673          MPCE PMB 2G
  MIC 0          REV 28   750-028387   CAAX1071          3D 4x 10GE  XFP
    PIC 0                 BUILTIN      BUILTIN           2x 10GE  XFP
      Xcvr 0              NON-JNPR     T12L92342         XFP-10G-SR
      Xcvr 1              NON-JNPR     T12L92303         XFP-10G-SR
    PIC 1                 BUILTIN      BUILTIN           2x 10GE  XFP
      Xcvr 0              NON-JNPR     CC07BK02X         XFP-10G-SR
  QXM 0          REV 06   711-028408   CAAW4883          MPC QXM
  QXM 1          REV 06   711-028408   CAAW4603          MPC QXM
FPC 10           REV 21.0.11 750-045715 CAAY3541         MPC5E 3D Q 24XGE+6XLGE
  CPU            REV 07   711-045719   CAAW7426          RMPC PMB
  PIC 0                   BUILTIN      BUILTIN           12X10GE SFPP
    Xcvr 0       REV 01   740-031980   AHK01AP           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQ502ZU           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AP41BLS           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQA08YA           SFP+-10G-SR
    Xcvr 4       REV 01   740-021308   AQA0K26           SFP+-10G-SR
    Xcvr 6       REV 01   740-021308   AQA06S3           SFP+-10G-SR
    Xcvr 7       REV 01   740-021308   AQA06AS           SFP+-10G-SR
    Xcvr 8       REV 01   740-021308   AQA053N           SFP+-10G-SR
    Xcvr 9       REV 01   740-021308   AQA0E97           SFP+-10G-SR
    Xcvr 10      REV 01   740-021308   AQA0GS4           SFP+-10G-SR
    Xcvr 11      REV 01   740-021308   AQA0JVA           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           12X10GE SFPP
    Xcvr 0       REV 01   740-021308   AQA057A           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   ANA0MLS           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQA093A           SFP+-10G-SR
    Xcvr 3       REV 01   740-021309   943153A00075      SFP+-10G-LR
    Xcvr 4       REV 01   740-021308   AQA077B           SFP+-10G-SR
    Xcvr 5       REV 01   740-021308   AQA0JSC           SFP+-10G-SR
    Xcvr 6       REV 01   740-021308   AQA0735           SFP+-10G-SR
    Xcvr 7       REV 01   740-021308   AQ5028N           SFP+-10G-SR
    Xcvr 8       REV 01   740-031980   AP40VN5           SFP+-10G-SR
    Xcvr 9       REV 01   740-021308   AQA0K0J           SFP+-10G-SR
    Xcvr 10      REV 01   740-021308   AQA07AP           SFP+-10G-SR
    Xcvr 11      REV 01   740-021308   AQA08YB           SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           3X40GE QSFPP
  PIC 3                   BUILTIN      BUILTIN           3X40GE QSFPP
  WAN MEZZ       REV 07   750-045717   CAAX3123          MPC5E 24XGE Mezz
FPC 11           REV 17   750-037355   CAAT3986          MPC4E 3D 2CGE+8XGE
  CPU            REV 08   711-035209   CAAR3972          HMPC PMB 2G
  PIC 0                   BUILTIN      BUILTIN           4x10GE SFPP
    Xcvr 0       REV 01   740-021308   AQA0DSE           SFP+-10G-SR
```


Copyright © 2016, Juniper Networks, Inc.

```
    Xcvr 1       REV 01   740-021308   AQ501Y3           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQ501XU           SFP+-10G-SR
  Xcvr 3       REV 01   740-021308   AQ5036Y           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           1X100GE CFP
    Xcvr 0                NON-JNPR     X12J00247         CFP-100G-SR10
  PIC 2                   BUILTIN      BUILTIN           4x10GE SFPP
    Xcvr 0       REV 01   740-031980   ALQ1DKF           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AJ403YA           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AP40TY0           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   ALQ14G0           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           1X100GE CFP
    Xcvr 0       REV 01   740-035329   X12J00095         CFP-100G-SR10
Fan Tray 0       REV 08   740-031521   ACAF4219          Enhanced Fan Tray
Fan Tray 1       REV 08   740-031521   ACAF4225          Enhanced Fan Tray
```

show chassis hardware extensive (MX960 Router with MPC5EQ)

```
user@host> show chassis hardware extensive
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN1214852AFA      MX960
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
                                 S/N:               JN1214852AFA
 Assembly ID:  0x0512            Assembly Version:  00.00
 Date:         00-00-0000        Assembly Flags:    0x00
 ID: MX960
 Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 05 12 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x20: 4a 4e 31 32 31 34 38 35 32 41 46 41 00 00 00 00
  Address 0x30: 00 00 00 ff 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Midplane         REV 01   710-030012   ACAX3674          MX960 Backplane
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          710-030012        S/N:               ACAX3674
 Assembly ID:  0x01df            Assembly Version:  01.01
 Date:         01-19-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         COM8T00CRB
 ID: MX960 Backplane             FRU Model Number:  CHAS-BP-MX960-S
 Board Information Record:
  Address 0x00: ad 01 08 00 54 e0 32 bc 68 00 ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 01 df 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 31 30 2d 30 33 30 30 31 32 00 00
  Address 0x20: 53 2f 4e 20 41 43 41 58 33 36 37 34 00 13 01 07
  Address 0x30: dd ff ff ff ad 01 08 00 54 e0 32 bc 68 00 ff ff
  Address 0x40: ff ff ff ff 01 43 4f 4d 38 54 30 30 43 52 42 43
  Address 0x50: 48 41 53 2d 42 50 2d 4d 58 39 36 30 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 42 00 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff aa ff ff ff ff ff ff ff ff ff ff ff ff
FPM Board        REV 03   710-014974   CAAZ9326          Front Panel Display
 Jedec Code:   0x7fb0            EEPROM Version:    0x01
 P/N:          710-014974        S/N:               CAAZ9326
 Assembly ID:  0x01e6            Assembly Version:  01.03
 Date:         12-31-2012        Assembly Flags:    0x00
 Version:      REV 03
```

```
 ID: Front Panel Display         FRU Model Number:  CRAFT-MX960-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 01 e6 01 03 52 45 56 20 30 33 00 00
  Address 0x10: 00 00 00 00 37 31 30 2d 30 31 34 39 37 34 00 00
  Address 0x20: 53 2f 4e 20 43 41 41 5a 39 33 32 36 00 1f 0c 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 43
  Address 0x50: 52 41 46 54 2d 4d 58 39 36 30 2d 53 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
PDM             Rev 03   740-013110   QCS17025017       Power Distribution Module
Jedec Code:   0x7fb0            EEPROM Version:    0x01
 P/N:          740-013110        S/N:               QCS17025017
 Assembly ID:  0x0416            Assembly Version:  01.03
 Date:         01-10-2013        Assembly Flags:    0x00
 Version:      Rev 03
 ID: Power Distribution Module
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 04 16 01 03 52 65 76 20 30 33 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 31 33 31 31 30 00 00
  Address 0x20: 51 43 53 31 37 30 32 35 30 31 37 00 00 0a 01 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
PEM 0            Rev 10   740-027760   QCS1702N062       PS 4.1kW; 200-240V AC
in
 Jedec Code:   0x7fb0            EEPROM Version:    0x01
 P/N:          740-027760        S/N:               QCS1702N062
 Assembly ID:  0x0430            Assembly Version:  01.10
 Date:         01-15-2013        Assembly Flags:    0x00
 Version:      Rev 10
 ID: PS 4.1kW; 200-240V AC in    FRU Model Number:  PWR-MX960-4100-AC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 04 30 01 0a 52 65 76 20 31 30 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 32 37 37 36 30 00 00
  Address 0x20: 51 43 53 31 37 30 32 4e 30 36 32 00 00 0f 01 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 50
  Address 0x50: 57 52 2d 4d 58 39 36 30 2d 34 31 30 30 2d 41 43
  Address 0x60: 2d 53 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
PEM 1            Rev 04   740-027760   QCS1422N02C       PS 4.1kW; 200-240V AC
in
 Jedec Code:   0x7fb0            EEPROM Version:    0x01
 P/N:          740-027760        S/N:               QCS1422N02C
 Assembly ID:  0x0430            Assembly Version:  01.04
 Date:         06-04-2010        Assembly Flags:    0x00
 Version:      Rev 04
 ID: PS 4.1kW; 200-240V AC in    FRU Model Number:  PWR-MX960-4100-AC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 04 30 01 04 52 65 76 20 30 34 00 00
```


Copyright © 2016, Juniper Networks, Inc.

```
  Address 0x10: 00 00 00 00 37 34 30 2d 30 32 37 37 36 30 00 00
  Address 0x20: 51 43 53 31 34 32 32 4e 30 32 43 00 00 04 06 07
  Address 0x30: da ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 50
  Address 0x50: 57 52 2d 4d 58 39 36 30 2d 34 31 30 30 2d 41 43
  Address 0x60: 2d 53 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
PEM 2            Rev 09   740-027760   QCS1614N01X       PS 4.1kW; 200-240V AC
in
 Jedec Code:   0x7fb0            EEPROM Version:    0x01
 P/N:          740-027760        S/N:               QCS1614N01X
Assembly ID:  0x0430            Assembly Version:  01.09
 Date:         04-07-2012        Assembly Flags:    0x00
 Version:      Rev 09
 ID: PS 4.1kW; 200-240V AC in    FRU Model Number:  PWR-MX960-4100-AC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 04 30 01 09 52 65 76 20 30 39 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 32 37 37 36 30 00 00
  Address 0x20: 51 43 53 31 36 31 34 4e 30 31 58 00 00 07 04 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 50
  Address 0x50: 57 52 2d 4d 58 39 36 30 2d 34 31 30 30 2d 41 43
  Address 0x60: 2d 53 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Routing Engine 0 REV 08   740-031116   9009131803        RE-S-1800x4
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-031116        S/N:               9009131803
 Assembly ID:  0x09c0            Assembly Version:  01.08
 Date:         03-04-2013        Assembly Flags:    0x00
 Version:      REV 08            CLEI Code:         COUCASKBAA
 ID: RE-S-1800x4                 FRU Model Number:  RE-S-1800X4-16G-S
 Board Information Record:
  Address 0x00: 54 32 30 32 37 44 42 2d 34 34 47 42 23 42 23 00
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 09 c0 01 08 52 45 56 20 30 38 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 33 31 31 31 36 00 00
  Address 0x20: 39 30 30 39 31 33 31 38 30 33 00 00 00 04 03 07
  Address 0x30: dd ff ff ff 54 32 30 32 37 44 42 2d 34 34 47 42
  Address 0x40: 23 42 23 00 01 43 4f 55 43 41 53 4b 42 41 41 52
  Address 0x50: 45 2d 53 2d 31 38 30 30 58 34 2d 31 36 47 2d 53
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 59 ff ff ff ff ff ff ff ff ff ff ff ff
  ad0    3831 MB  UGB30SFA4000T1       SFA4000T1 000016CD Compact Flash
  ad1   30533 MB  UGB94BPH32H0S1-KCI   11000061346       Disk 1
  usb0 (addr 1)  EHCI root hub 0       Intel             uhub0
  usb0 (addr 2)  product 0x0020 32     vendor 0x8087     uhub1
  DIMM 0         VL31B5263F-F8SD DIE REV-0 PCB REV-0     MFR ID-ce80
  DIMM 1         VL31B5263F-F8SD DIE REV-0 PCB REV-0     MFR ID-ce80
  DIMM 2         VL31B5263F-F8SD DIE REV-0 PCB REV-0     MFR ID-ce80
  DIMM 3         VL31B5263F-F8SD DIE REV-0 PCB REV-0     MFR ID-ce80
Routing Engine 1 REV 08   740-031116   9009124913        RE-S-1800x4
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-031116        S/N:               9009124913
 Assembly ID:  0x09c0            Assembly Version:  01.08
 Date:         01-09-2013        Assembly Flags:    0x00
 Version:      REV 08            CLEI Code:         COUCASKBAA
 ID: RE-S-1800x4                 FRU Model Number:  RE-S-1800X4-16G-S
 Board Information Record:
  Address 0x00: 54 32 30 32 37 44 42 2d 34 34 47 42 23 42 23 00
```

```
  I2C Hex Data:
   Address 0x00: 7f b0 02 ff 09 c0 01 08 52 45 56 20 30 38 00 00
   Address 0x10: 00 00 00 00 37 34 30 2d 30 33 31 31 31 36 00 00
   Address 0x20: 39 30 30 39 31 32 34 39 31 33 00 00 00 09 01 07
   Address 0x30: dd ff ff ff 54 32 30 32 37 44 42 2d 34 34 47 42
   Address 0x40: 23 42 23 00 01 43 4f 55 43 41 53 4b 42 41 41 52
  Address 0x50: 45 2d 53 2d 31 38 30 30 58 34 2d 31 36 47 2d 53
   Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
   Address 0x70: ff ff ff 59 ff ff ff ff ff ff ff ff ff ff ff ff
   ad0    3831 MB  UGB30SFA4000T1       SFA4000T1 0000106D Compact Flash
   ad1   30533 MB  UGB94BPH32H0S1-KCI   11000052402       Disk 1
CB 0             REV 18   750-031391   CABF0579          Enhanced MX SCB
  Jedec Code:   0x7fb0            EEPROM Version:    0x02
  P/N:          750-031391        S/N:               CABF0579
  Assembly ID:  0x09b0            Assembly Version:  01.18
  Date:         04-15-2013        Assembly Flags:    0x00
  Version:      REV 18            CLEI Code:         COUCASRBAA
  ID: Enhanced MX SCB             FRU Model Number:  SCBE-MX-S
  Board Information Record:
   Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  I2C Hex Data:
   Address 0x00: 7f b0 02 ff 09 b0 01 12 52 45 56 20 31 38 00 00
   Address 0x10: 00 00 00 00 37 35 30 2d 30 33 31 33 39 31 00 00
   Address 0x20: 53 2f 4e 20 43 41 42 46 30 35 37 39 00 0f 04 07
   Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
   Address 0x40: ff ff ff ff 01 43 4f 55 43 41 53 52 42 41 41 53
   Address 0x50: 43 42 45 2d 4d 58 2d 53 00 00 00 00 00 00 00 00
   Address 0x60: 00 00 00 00 00 00 43 00 00 ff ff ff ff ff ff ff
   Address 0x70: ff ff ff 7d ff ff ff ff ff ff ff ff ff ff ff ff
CB 1             REV 16   750-031391   CAAZ2471          Enhanced MX SCB
  Jedec Code:   0x7fb0            EEPROM Version:    0x02
  P/N:          750-031391        S/N:               CAAZ2471
  Assembly ID:  0x09b0            Assembly Version:  01.16
  Date:         03-09-2013        Assembly Flags:    0x00
  Version:      REV 16            CLEI Code:         COUCARCBAB
  ID: Enhanced MX SCB             FRU Model Number:  SCBE-MX-S
  Board Information Record:
   Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  I2C Hex Data:
   Address 0x00: 7f b0 02 ff 09 b0 01 10 52 45 56 20 31 36 00 00
   Address 0x10: 00 00 00 00 37 35 30 2d 30 33 31 33 39 31 00 00
   Address 0x20: 53 2f 4e 20 43 41 41 5a 32 34 37 31 00 09 03 07
   Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
   Address 0x40: ff ff ff ff 01 43 4f 55 43 41 52 43 42 41 42 53
   Address 0x50: 43 42 45 2d 4d 58 2d 53 00 00 00 00 00 00 00 00
   Address 0x60: 00 00 00 00 00 00 42 00 00 ff ff ff ff ff ff ff
   Address 0x70: ff ff ff 6d ff ff ff ff ff ff ff ff ff ff ff ff
CB 2             REV 16   750-031391   CAAW9595          Enhanced MX SCB
  Jedec Code:   0x7fb0            EEPROM Version:    0x02
  P/N:          750-031391        S/N:               CAAW9595
  Assembly ID:  0x09b0            Assembly Version:  01.16
  Date:         02-01-2013        Assembly Flags:    0x00
  Version:      REV 16            CLEI Code:         COUCARCBAB
  ID: Enhanced MX SCB             FRU Model Number:  SCBE-MX-S
  Board Information Record:
   Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  I2C Hex Data:
   Address 0x00: 7f b0 02 ff 09 b0 01 10 52 45 56 20 31 36 00 00
   Address 0x10: 00 00 00 00 37 35 30 2d 30 33 31 33 39 31 00 00
   Address 0x20: 53 2f 4e 20 43 41 41 57 39 35 39 35 00 01 02 07
   Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
```

 Copyright © 2016, Juniper Networks, Inc.

```
  Address 0x40: ff ff ff ff 01 43 4f 55 43 41 52 43 42 41 42 53
 Address 0x50: 43 42 45 2d 4d 58 2d 53 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 42 00 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 6d ff ff ff ff ff ff ff ff ff ff ff ff
FPC 0            REV 18   750-046005   CACE6574          MPC5E 3D Q 2CGE+4XGE
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          750-046005        S/N:               CACE6574
 Assembly ID:  0x0b8c            Assembly Version:  01.18
 Date:         11-20-2013        Assembly Flags:    0x00
 Version:      REV 18            CLEI Code:         PROTOXCLEI
 ID: MPC5E 3D Q 2CGE+4XGE        FRU Model Number:  PROTO-ASSEMBLY
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b 8c 01 12 52 45 56 20 31 38 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 34 36 30 30 35 00 00
  Address 0x20: 53 2f 4e 20 43 41 43 45 36 35 37 34 00 14 0b 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
  Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff c2 ff ff ff ff ff ff ff ff ff ff ff ff
  CPU            REV 09   711-045719   CACG8908          RMPC PMB
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          711-045719        S/N:               CACG8908
 Assembly ID:  0x0b85            Assembly Version:  01.09
 Date:         11-13-2013        Assembly Flags:    0x00
 Version:      REV 09
 ID: RMPC PMB
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b 85 01 09 52 45 56 20 30 39 00 00
  Address 0x10: 00 00 00 00 37 31 31 2d 30 34 35 37 31 39 00 00
  Address 0x20: 53 2f 4e 20 43 41 43 47 38 39 30 38 00 0d 0b 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 00 50 52 4f 54 4f 58 43 4c 45 49 50
  Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff c2 00 00 00 00 00 00 00 00 00 00 00 00
  PIC 0                  BUILTIN      BUILTIN           2X10GE SFPP OTN
 Jedec Code:   0x0000            EEPROM Version:    0x00
 P/N:          BUILTIN           S/N:               BUILTIN
 Assembly ID:  0x0a90            Assembly Version:  00.00
 Date:         00-00-0000        Assembly Flags:    0x00
 ID: 2X10GE SFPP OTN
 Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 I2C Hex Data:
  Address 0x00: 00 00 00 00 0a 90 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
  Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
  Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 c0 02 ae dc 00 00 00 00 0a 6e 00 00
 Xcvr 0       REV 01   740-021308   AQA0DYT           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQG0MS7           SFP+-10G-SR
  PIC 1                  BUILTIN      BUILTIN           1X100GE CFP2 OTN
 Jedec Code:   0x0000            EEPROM Version:    0x00
```

```
  P/N:          BUILTIN           S/N:               BUILTIN
  Assembly ID:  0x0a6e            Assembly Version:  00.00
  Date:         00-00-0000        Assembly Flags:    0x00
  ID: 1X100GE CFP2 OTN
  Board Information Record:
   Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  I2C Hex Data:
   Address 0x00: 00 00 00 00 0a 6e 00 00 00 00 00 00 00 00 00 00
   Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
   Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
   Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
   Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
   Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
   Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
   Address 0x70: 00 00 00 00 c0 03 f3 8c 31 5c e7 80 00 00 00 02
     Xcvr 0       REV 01   740-046563   XD16FC03Z         CFP2-100G-SR10
   PIC 2                   BUILTIN      BUILTIN           2X10GE SFPP OTN
  Jedec Code:   0x0000            EEPROM Version:    0x00
  P/N:          BUILTIN           S/N:               BUILTIN
  Assembly ID:  0x0a90            Assembly Version:  00.00
  Date:         00-00-0000        Assembly Flags:    0x00
  ID: 2X10GE SFPP OTN
  Board Information Record:
   Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  I2C Hex Data:
   Address 0x00: 00 00 00 00 0a 90 00 00 00 00 00 00 00 00 00 00
   Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
   Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
   Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
   Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
   Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
   Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
   Address 0x70: 00 00 00 00 c0 03 f5 6c 31 5c db 40 00 00 00 02
     Xcvr 0       REV 01   740-021308   ANA0NAJ           SFP+-10G-SR
     Xcvr 1       REV 01   740-021308   AQG0MRQ           SFP+-10G-SR
   PIC 3                   BUILTIN      BUILTIN           1X100GE CFP2 OTN
  Jedec Code:   0x0000            EEPROM Version:    0x00
  P/N:          BUILTIN           S/N:               BUILTIN
  Assembly ID:  0x0a6e            Assembly Version:  00.00
  Date:         00-00-0000        Assembly Flags:    0x00
  ID: 1X100GE CFP2 OTN
  Board Information Record:
   Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  I2C Hex Data:
   Address 0x00: 00 00 00 00 0a 6e 00 00 00 00 00 00 00 00 00 00
   Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
   Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
   Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
   Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
   Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
   Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
   Address 0x70: 00 00 00 00 c0 03 ed ec 31 5c e2 e8 00 00 00 02
  Xcvr 0       REV 01   740-049775   J13K72993         CFP2-100G-LR4
 FPC 1            REV 11   750-045372   CABK8154          MPCE Type 3 3D
  Jedec Code:   0x7fb0            EEPROM Version:    0x02
  P/N:          750-045372        S/N:               CABK8154
  Assembly ID:  0x09db            Assembly Version:  04.11
  Date:         05-18-2013        Assembly Flags:    0x00
  Version:      REV 11            CLEI Code:         COUIBBNBAA
  ID: MPCE Type 3 3D              FRU Model Number:  MX-MPC3E-3D
  Board Information Record:
```


Copyright © 2016, Juniper Networks, Inc.

```
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 09 db 04 0b 52 45 56 20 31 31 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 34 35 33 37 32 00 00
  Address 0x20: 53 2f 4e 20 43 41 42 4b 38 31 35 34 00 12 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 43 4f 55 49 42 42 4e 42 41 41 4d
  Address 0x50: 58 2d 4d 50 43 33 45 2d 33 44 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 44 00 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff cf ff ff ff ff ff ff ff ff ff ff ff ff
  CPU            REV 08   711-035209   CABE7370          HMPC PMB 2G
 Jedec Code:   0x7fb0            EEPROM Version:    0x01
 P/N:          711-035209        S/N:               CABE7370
 Assembly ID:  0x0b04            Assembly Version:  01.08
 Date:         05-08-2013        Assembly Flags:    0x00
 Version:      REV 08
 ID: HMPC PMB 2G
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 0b 04 01 08 52 45 56 20 30 38 00 00
  Address 0x10: 00 00 00 00 37 31 31 2d 30 33 35 32 30 39 00 00
  Address 0x20: 53 2f 4e 20 43 41 42 45 37 33 37 30 00 08 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
  Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
  MIC 0          REV 07   750-033307   CABD5255          10X10GE SFPP
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          750-033307        S/N:               CABD5255
 Assembly ID:  0x0a2a            Assembly Version:  02.07
 Date:         04-25-2013        Assembly Flags:    0x00
 Version:      REV 07            CLEI Code:         COUIBBJBAA
 ID: 10X10GE SFPP                FRU Model Number:  MIC3-3D-10XGE-SFPP
 Board Information Record:
  Address 0x00: 34 01 03 03 05 ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 fe 0a 2a 02 07 52 45 56 20 30 37 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 33 33 33 30 37 00 00
  Address 0x20: 53 2f 4e 20 43 41 42 44 35 32 35 35 00 19 04 07
  Address 0x30: dd ff ff ff 34 01 03 03 05 ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 43 4f 55 49 42 42 4a 42 41 41 4d
  Address 0x50: 49 43 33 2d 33 44 2d 31 30 58 47 45 2d 53 46 50
  Address 0x60: 50 00 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 82 c0 03 f0 bc 57 79 83 80 00 00 00 02
    PIC 0                 BUILTIN      BUILTIN           10X10GE SFPP
Xcvr 0     REV 01   740-021308   AQ50319           SFP+-10G-SR
      Xcvr 1     REV 01   740-021308   AQ5035V           SFP+-10G-SR
      Xcvr 2     REV 01   740-021308   AQ502XJ           SFP+-10G-SR
      Xcvr 3     REV 01   740-021308   AQ43HHR           SFP+-10G-SR
      Xcvr 4     REV 01   740-021308   AQ502YA           SFP+-10G-SR
      Xcvr 5     REV 01   740-021308   AQ502EU           SFP+-10G-SR
      Xcvr 6     REV 01   740-021308   AQ502HR           SFP+-10G-SR
      Xcvr 7     REV 01   740-021308   AQ502A6           SFP+-10G-SR
      Xcvr 8     REV 01   740-021308   AQ43H8M           SFP+-10G-SR
  MIC 1          REV 14   750-033196   CAAP1398          1X100GE CXP
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          750-033196        S/N:               CAAP1398
 Assembly ID:  0x0a29            Assembly Version:  03.14
 Date:         10-27-2012        Assembly Flags:    0x00
```

```
  Version:      REV 14            CLEI Code:         COUIBBKBAA
  ID: 1X100GE CXP                 FRU Model Number:  MIC3-3D-1X100GE-CXP
  Board Information Record:
   Address 0x00: 34 01 07 07 08 ff ff ff ff ff ff ff ff ff ff ff
  I2C Hex Data:
   Address 0x00: 7f b0 02 fe 0a 29 03 0e 52 45 56 20 31 34 00 00
   Address 0x10: 00 00 00 00 37 35 30 2d 30 33 33 31 39 36 00 00
   Address 0x20: 53 2f 4e 20 43 41 41 50 31 33 39 38 00 1b 0a 07
   Address 0x30: dc ff ff ff 34 01 07 07 08 ff ff ff ff ff ff ff
   Address 0x40: ff ff ff ff 01 43 4f 55 49 42 42 4b 42 41 41 4d
   Address 0x50: 49 43 33 2d 33 44 2d 31 58 31 30 30 47 45 2d 43
   Address 0x60: 58 50 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
   Address 0x70: ff ff ff 96 c0 03 ef cc 57 79 85 08 00 00 00 02
     PIC 2                 BUILTIN      BUILTIN           1X100GE CXP
       Xcvr 0     REV 01   740-046563   XD16FC064         CFP2-100G-SR10
FPC 3            REV 35   750-028467   CAAT9156          MPC 3D 16x 10GE
  Jedec Code:   0x7fb0            EEPROM Version:    0x01
  P/N:          750-028467        S/N:               CAAT9156
  Assembly ID:  0x0997            Assembly Version:  01.35
  Date:         12-17-2012        Assembly Flags:    0x00
  Version:      REV 35
  ID: MPC 3D 16x 10GE             FRU Model Number:  MPC-3D-16XGE-SFPP
  Board Information Record:
   Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  I2C Hex Data:
   Address 0x00: 7f b0 01 ff 09 97 01 23 52 45 56 20 33 35 00 00
   Address 0x10: 00 00 00 00 37 35 30 2d 30 32 38 34 36 37 00 00
   Address 0x20: 53 2f 4e 20 43 41 41 54 39 31 35 36 00 11 0c 07
   Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
   Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 4d
   Address 0x50: 50 43 2d 33 44 2d 31 36 58 47 45 2d 53 46 50 50
   Address 0x60: 00 00 00 00 00 00 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
   CPU            REV 11   711-029089   CAAV4645          AMPC PMB
  Jedec Code:   0x7fb0            EEPROM Version:    0x01
  P/N:          711-029089        S/N:               CAAV4645
  Assembly ID:  0x0998            Assembly Version:  01.11
  Date:         12-13-2012        Assembly Flags:    0x00
  Version:      REV 11
  ID: AMPC PMB
  Board Information Record:
   Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  I2C Hex Data:
   Address 0x00: 7f b0 01 ff 09 98 01 0b 52 45 56 20 31 31 00 00
   Address 0x10: 00 00 00 00 37 31 31 2d 30 32 39 30 38 39 00 00
   Address 0x20: 53 2f 4e 20 43 41 41 56 34 36 34 35 00 0d 0c 07
   Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
   Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
   Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
   Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
   Address 0x70: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
   PIC 0                 BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
  Jedec Code:   0x0000            EEPROM Version:    0x00
  P/N:          BUILTIN           S/N:               BUILTIN
  Assembly ID:  0x02fe            Assembly Version:  00.00
  Date:         00-00-0000        Assembly Flags:    0x00
  ID: 4x 10GE(LAN) SFP+
  Board Information Record:
   Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  I2C Hex Data:
   Address 0x00: 00 00 00 00 02 fe 00 00 00 00 00 00 00 00 00 00
```


Copyright © 2016, Juniper Networks, Inc.

```
  Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
  Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
  Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 c0 02 6b 94 00 00 00 00 02 fe 00 00
    Xcvr 0       REV 01   740-021308   AQ43HZ1           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQ43HZC           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQ43HD2           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQ502HN           SFP+-10G-SR
  PIC 1                  BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
 Jedec Code:   0x0000            EEPROM Version:    0x00
 P/N:          BUILTIN           S/N:               BUILTIN
 Assembly ID:  0x02fe            Assembly Version:  00.00
 Date:         00-00-0000        Assembly Flags:    0x00
 ID: 4x 10GE(LAN) SFP+
 Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 I2C Hex Data:
  Address 0x00: 00 00 00 00 02 fe 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
  Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
  Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 c0 02 ac 0c 00 00 00 00 02 fe 00 00
    Xcvr 0       REV 01   740-021308   AQ43HGF           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQ501RZ           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQ5029V           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQ501X9           SFP+-10G-SR
  PIC 2                  BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
 Jedec Code:   0x0000            EEPROM Version:    0x00
 P/N:          BUILTIN           S/N:               BUILTIN
 Assembly ID:  0x02fe            Assembly Version:  00.00
 Date:         00-00-0000        Assembly Flags:    0x00
......
```

show chassis hardware models (MX960 Router with MPC5EQ)

```
user@host> show chassis hardware models
Hardware inventory:
Item             Version  Part number  Serial number     FRU model number
Midplane         REV 01   710-030012   ACAX3674          CHAS-BP-MX960-S
FPM Board        REV 03   710-014974   CAAZ9326          CRAFT-MX960-S
PEM 0            Rev 10   740-027760   QCS1702N062       PWR-MX960-4100-AC-S
PEM 1            Rev 04   740-027760   QCS1422N02C       PWR-MX960-4100-AC-S
PEM 2            Rev 09   740-027760   QCS1614N01X       PWR-MX960-4100-AC-S
Routing Engine 0 REV 08   740-031116   9009131803        RE-S-1800X4-16G-S
Routing Engine 1 REV 08   740-031116   9009124913        RE-S-1800X4-16G-S
CB 0             REV 18   750-031391   CABF0579          SCBE-MX-S
CB 1             REV 16   750-031391   CAAZ2471          SCBE-MX-S
CB 2             REV 16   750-031391   CAAW9595          SCBE-MX-S
FPC 0            REV 18   750-046005   CACE6574          PROTO-ASSEMBLY
FPC 1            REV 11   750-045372   CABK8154          MX-MPC3E-3D
  MIC 0          REV 07   750-033307   CABD5255          MIC3-3D-10XGE-SFPP
  MIC 1          REV 14   750-033196   CAAP1398          MIC3-3D-1X100GE-CXP
FPC 3            REV 35   750-028467   CAAT9156          MPC-3D-16XGE-SFPP
FPC 4            REV 18   750-046005   CACE6568          PROTO-ASSEMBLY
FPC 5            REV 18   750-046005   CACE6577          PROTO-ASSEMBLY
```

```
FPC 7            REV 09   750-037355   CAAF0937          MPC4E-2CGE-8XGE
FPC 8            REV 39   750-045715   CACD1903          PROTO-ASSEMBLY
FPC 9            REV 05   750-044444   CAAY9801          MX-MPC2E-3D-P
  MIC 0          REV 28   750-028387   CAAX1071          MIC-3D-4XGE-XFP
FPC 10           REV 21.0.11 750-045715 CAAY3541         PROTO-ASSEMBLY
FPC 11           REV 17   750-037355   CAAT3986          MPC4E-3D-2CGE-8XGE
Fan Tray 0       REV 08   740-031521   ACAF4219          FFANTRAY-MX960-HC-S
Fan Tray 1       REV 08   740-031521   ACAF4225          FFANTRAY-MX960-HC-S
```

show chassis hardware clei-models (MX960 Router with MPC5EQ)

```
user@host> show chassis hardware clei-models
Hardware inventory:
Item             Version  Part number  CLEI code         FRU model number
Midplane         REV 01   710-030012   COM8T00CRB        CHAS-BP-MX960-S
FPM Board        REV 03   710-014974                     CRAFT-MX960-S
PEM 0            Rev 10   740-027760                     PWR-MX960-4100-AC-S
PEM 1            Rev 04   740-027760                     PWR-MX960-4100-AC-S
PEM 2            Rev 09   740-027760                     PWR-MX960-4100-AC-S
Routing Engine 0 REV 08   740-031116   COUCASKBAA        RE-S-1800X4-16G-S
Routing Engine 1 REV 08   740-031116   COUCASKBAA        RE-S-1800X4-16G-S
CB 0             REV 18   750-031391   COUCASRBAA        SCBE-MX-S
CB 1             REV 16   750-031391   COUCARCBAB        SCBE-MX-S
CB 2             REV 16   750-031391   COUCARCBAB        SCBE-MX-S
FPC 0            REV 18   750-046005   PROTOXCLEI        PROTO-ASSEMBLY
FPC 1            REV 11   750-045372   COUIBBNBAA        MX-MPC3E-3D
  MIC 0          REV 07   750-033307   COUIBBJBAA        MIC3-3D-10XGE-SFPP
  MIC 1          REV 14   750-033196   COUIBBKBAA        MIC3-3D-1X100GE-CXP
FPC 3            REV 35   750-028467                     MPC-3D-16XGE-SFPP
FPC 4            REV 18   750-046005   PROTOXCLEI        PROTO-ASSEMBLY
FPC 5            REV 18   750-046005   PROTOXCLEI        PROTO-ASSEMBLY
FPC 7            REV 09   750-037355   PROTOXCLEI        MPC4E-2CGE-8XGE
FPC 8            REV 39   750-045715   PROTOXCLEI        PROTO-ASSEMBLY
FPC 9            REV 05   750-044444   COUIBBGBAA        MX-MPC2E-3D-P
  MIC 0          REV 28   750-028387   COUIA16BAA        MIC-3D-4XGE-XFP
FPC 10           REV 21.0.11 750-045715 PROTOXCLEI       PROTO-ASSEMBLY
FPC 11           REV 17   750-037355   IPU3A4DHAA        MPC4E-3D-2CGE-8XGE
Fan Tray 0       REV 08   740-031521                     FFANTRAY-MX960-HC-S
Fan Tray 1       REV 08   740-031521                     FFANTRAY-MX960-HC-S
```

show chassis hardware (MX960 Router with MPC3E and 100-Gigabit DWDM OTN MIC)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                               JN123F6D9AFA      MX960
Midplane         REV 04   750-047849   ACRC8764          Enhanced MX960 Backplane
FPM Board        REV 03   710-014974   CACS4395          Front Panel Display
PDM              Rev 03   740-013110   QCS1809500Z       Power Distribution Module
PEM 0            Rev 08   740-029344   QCS1817V0LK       DC 4.1kW Power Entry
Module
PEM 1            Rev 08   740-029344   QCS1814V01F       DC 4.1kW Power Entry
Module
PEM 2            Rev 08   740-029344   QCS1810V1EW       DC 4.1kW Power Entry
Module
PEM 3            Rev 08   740-029344   QCS1810V1K5       DC 4.1kW Power Entry
Module
Routing Engine 0 REV 11   740-031116   9013103483        RE-S-1800x4
Routing Engine 1 REV 10   740-031116   9009198513        RE-S-1800x4
CB 0             REV 23   750-031391   CADW3218          Enhanced MX SCB
CB 1             REV 14   750-031391   ABBK5220          Enhanced MX SCB
```


Copyright © 2016, Juniper Networks, Inc.

```
FPC 1            REV 14   750-045372   CADK0464          MPCE Type 3 3D
  CPU            REV 10   711-035209   CADM9839          HMPC PMB 2G
  MIC 0          REV 19   750-033199   CAAE5870          1X100GE CFP
    PIC 0                 BUILTIN      BUILTIN           1X100GE CFP
      Xcvr 0     REV 01   740-032210   UTH0H0W           CFP-100G-LR4
FPC 2            REV 14   750-045372   CADN3262          MPCE Type 3 3D
  CPU            REV 10   711-035209   CADN8129          HMPC PMB 2G
FPC 3            REV 14   750-045372   CADH0146          MPCE Type 3 3D
  CPU            REV 10   711-035209   CADT2458          HMPC PMB 2G
  MIC 0          REV 03   750-057666   CADP1386          1X100GE DWDM CFP2-ACO
    PIC 0                 BUILTIN      BUILTIN           1X100GE DWDM CFP2-ACO
      Xcvr 0     REV 01   740-062357   SMD5136.1         OTN-100G-LH
FPC 4            REV 18   750-045372   CAEV5668          MPCE Type 3 3D
  CPU            REV 10   711-035209   CAET7827          HMPC PMB 2G
FPC 7            REV 14   750-045372   CADJ1947          MPCE Type 3 3D
  CPU            REV 10   711-035209   CADJ1561          HMPC PMB 2G
  MIC 0          REV 05   750-057666   CAEB5763          1X100GE DWDM CFP2-ACO
    PIC 0                 BUILTIN      BUILTIN           1X100GE DWDM CFP2-ACO
      Xcvr 0     REV 01   740-062357   1DJBZ052002       OTN-100G-LH
FPC 8            REV 14   750-045372   CADK0485          MPCE Type 3 3D
  CPU            REV 10   711-035209   CADM9828          HMPC PMB 2G
  MIC 0          REV 03   750-057666   CADP1390          1X100GE DWDM CFP2-ACO
    PIC 0                 BUILTIN      BUILTIN           1X100GE DWDM CFP2-ACO
FPC 9            REV 14   750-045372   CADJ1936          MPCE Type 3 3D
  CPU            REV 10   711-035209   CADJ1566          HMPC PMB 2G
  MIC 0          REV 14   750-057666   CAFF7544          1X100GE DWDM CFP2-ACO
    PIC 0                 BUILTIN      BUILTIN           1X100GE DWDM CFP2-ACO
      Xcvr 0     REV 01   740-062357   1DJBZ05100K       OTN-100G-LH
FPC 10           REV 14   750-054901   CADJ3846          MPC3E NG HQoS
  CPU            REV 11   711-045719   CADN5471          RMPC PMB
  MIC 0          REV 05   750-057666   CAEB5760          1X100GE DWDM CFP2-ACO
 PIC 0                 BUILTIN      BUILTIN           1X100GE DWDM CFP2-ACO
      Xcvr 0     REV 01   740-062357   SMD5091.1         CFP-Loopback
Fan Tray 0       REV 08   740-031521   ACDB4083          Enhanced Fan Tray
Fan Tray 1       REV 08   740-031521   ACDB3995          Enhanced Fan Tray
```

show chassis hardware clei-models(MX960 Router with MPC3E and 100-Gigabit DWDM OTN MIC)

```
user@host> show chassis hardware clei-models
Hardware inventory:
Item             Version  Part number  CLEI code         FRU model number
Midplane         REV 04   750-047849   CMMJA10BRA        CHAS-BP3-MX960-S
FPM Board        REV 03   710-014974                      CRAFT-MX960-S
PEM 0            Rev 08   740-029344                      PWR-MX960-4100-DC-S
PEM 1            Rev 08   740-029344                      PWR-MX960-4100-DC-S
PEM 2            Rev 08   740-029344                      PWR-MX960-4100-DC-S
PEM 3            Rev 08   740-029344                      PWR-MX960-4100-DC-S
Routing Engine 0 REV 11   740-031116   COUCASYBAB        RE-S-1800X4-16G-S
Routing Engine 1 REV 10   740-031116   COUCASYBAA        RE-S-1800X4-16G-S
CB 0             REV 23   750-031391   COUCATXBAA        SCBE-MX-S
CB 1             REV 14   750-031391   COUCARCBAA        SCBE-MX-S
FPC 1            REV 14   750-045372   COUIBBNBAB        MX-MPC3E-3D
  MIC 0          REV 19   750-033199   COUIBA8BAA        MIC3-3D-1X100GE-CFP
FPC 2            REV 14   750-045372   COUIBBNBAB        MX-MPC3E-3D
FPC 3            REV 14   750-045372   COUIBBNBAB        MX-MPC3E-3D
  MIC 0          REV 03   750-057666   PROTOXCLEI        PROTO-ASSEMBLY
FPC 4            REV 18   750-045372   COUIBBNBAC        MX-MPC3E-3D
FPC 7            REV 14   750-045372   COUIBBNBAB        MX-MPC3E-3D
  MIC 0          REV 05   750-057666   PROTOXCLEI        PROTO-ASSEMBLY
FPC 8            REV 14   750-045372   COUIBBNBAB        MX-MPC3E-3D
  MIC 0          REV 03   750-057666   PROTOXCLEI        PROTO-ASSEMBLY
```

```
FPC 9            REV 14   750-045372   COUIBBNBAB        MX-MPC3E-3D
  MIC 0          REV 14   750-057666   PROTOXCLEI        PROTO-ASSEMBLY
FPC 10           REV 14   750-054901   PROTOXCLEI        PROTO-ASSEMBLY
  MIC 0          REV 05   750-057666   PROTOXCLEI        PROTO-ASSEMBLY
Fan Tray 0       REV 08   740-031521                     FFANTRAY-MX960-HC-S
Fan Tray 1       REV 08   740-031521                     FFANTRAY-MX960-HC-S
```

show chassis hardware (PTX3000 Router with 5-port 100-Gigabit DWDM OTN PIC)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN123AC42AJC      PTX3000
Midplane         REV 22   750-044645   ACLP6640          Backplane
FPM              REV 07   760-044663   ACMX2146          Front Panel Display
PSM 1            REV 02   740-044980   1EDD3080169       DC 12V Power Supply
PSM 2            REV 06   740-044981   1EDK5040563       AC 12V Power Supply
PSM 3            REV 06   740-044981   1EDK5040313       AC 12V Power Supply
PSM 4            REV 04   740-044980   1EDJ3330088       DC 12V Power Supply
Routing Engine 0 REV 12   740-026942   P737A-006029      RE-DUO-2600
CB 0             REV 18   750-044656   ACMZ3179          Control Board
FPC 2            REV 06   750-057064   ACAM6098          FPC3-SFF-PTX-1X
  CPU                     BUILTIN      BUILTIN           SMPC PMB
  PIC 0          REV 17   750-059747   ACNW3510          5X100GE DWDM CFP2-ACO
    Xcvr 0       REV 01   740-062357   1DJBZ040003       OTN-100G-LH
    Xcvr 2       REV 01   740-062357   1DJBZ044004       OTN-100G-LH
    Xcvr 3       REV 01   740-062357   1DJBZ03500P       OTN-100G-LH
    Xcvr 4       REV 01   740-062357   1DJBZ03700C       OTN-100G-LH
FPC 4            REV 12   750-057064   ACAM7153          FPC3-SFF-PTX-1X
  CPU                     BUILTIN      BUILTIN           SMPC PMB
  PIC 0          REV 17   750-059747   ACNW3511          5X100GE DWDM CFP2-ACO
    Xcvr 0       REV 01   740-061663   47                OTN-100G-LH
    Xcvr 1       REV 01   740-061663   39                OTN-100G-LH
    Xcvr 2       REV 01   740-062357   1DJBZ044002       OTN-100G-LH
    Xcvr 3       REV 01   740-062357   1DJBZ03700G       OTN-100G-LH
    Xcvr 4       REV 01   740-062357   1DJBZ041001       OTN-100G-LH
FPC 8            REV 11   750-057064   ACAM6808          FPC3-SFF-PTX-1X
  CPU                     BUILTIN      BUILTIN           SMPC PMB
  PIC 0          REV 17   750-059747   ACNW3508          5X100GE DWDM CFP2-ACO
    Xcvr 0       REV 01   740-061663   194               OTN-100G-LH
    Xcvr 1       REV 01   740-061663   168               OTN-100G-LH
    Xcvr 2       REV 01   740-061663   52                OTN-100G-LH
    Xcvr 3       REV 01   740-061663   85                OTN-100G-LH
    Xcvr 4       REV 01   740-061663   218               OTN-100G-LH
SIB 0            REV 03   750-057067   ACAM8513          SIB3-SFF-PTX
SIB 1            REV 01   750-057067   ACAM5918          SIB3-SFF-PTX
SIB 2            REV 01   711-057066   ACAM4325          SIB3-SFF-PTX
SIB 3            REV 01   711-057066   ACAM4328          SIB3-SFF-PTX
SIB 4            REV 01   711-057066   ACAM4349          SIB3-SFF-PTX
SIB 5            REV 01   711-057066   ACAM4323          SIB3-SFF-PTX
SIB 6            REV 01   711-057066   ACAM4344          SIB3-SFF-PTX
SIB 7            REV 01   750-057067   ACAM4346          SIB3-SFF-PTX
SIB 8            REV 01   750-057067   ACAM5911          SIB3-SFF-PTX
Fan Tray 0       REV 13   760-044659   ACMP6395          Fan Tray (Exhaust)
Fan Tray 1       REV 13   760-044659   ACMZ6957          Fan Tray (Exhaust)
```

show chassis hardware clei-models (PTX3000 Router with 5-port 100-Gigabit DWDM OTN PIC)

```
user@host> show chassis hardware clei-models
Hardware inventory:
Item             Version  Part number  CLEI code         FRU model number
```

 Copyright © 2016, Juniper Networks, Inc.

```
Midplane         REV 22   750-044645   IPMVN10FRA        CHAS-MP-PTX3000-S
FPM              REV 07   760-044663   IPUCBE5CAA        FPD-SFF-PTX-S
PSM 1            REV 02   740-044980   PROTOPWRDC        PSM-SFF-PTX-DC-2200-S
PSM 2            REV 06   740-044981   IPUPAK0KAB        PSM-SFF-PTX-AC-S
PSM 3            REV 06   740-044981   IPUPAK0KAB        PSM-SFF-PTX-AC-S
PSM 4            REV 04   740-044980   IPUPAK1KAA        PSM-SFF-PTX-DC-S
Routing Engine 0 REV 12   740-026942                     RE-DUO-C2600-16G-S
CB 0             REV 18   750-044656   IPUCBE6CAB        CB-SFF-PTX-S
FPC 2            REV 06   750-057064   PROTOXCLEI        PROTO-ASSEMBLY
  PIC 0          REV 17   750-059747   IPU3BC5HAA        PTX-5-100G-WDM
FPC 4            REV 12   750-057064
  PIC 0          REV 17   750-059747   IPU3BC5HAA        PTX-5-100G-WDM
FPC 8            REV 11   750-057064
  PIC 0          REV 17   750-059747   IPU3BC5HAA        PTX-5-100G-WDM
SIB 0            REV 03   750-057067   PROTOXCLEI        PROTO-ASSEMBLY
SIB 1            REV 01   750-057067   PROTOXCLEI        PROTO-ASSEMBLY
SIB 2            REV 01   711-057066   PROTOXCLEI        PROTO-ASSEMBLY
SIB 3            REV 01   711-057066   PROTOXCLEI        PROTO-ASSEMBLY
SIB 4            REV 01   711-057066   PROTOXCLEI        PROTO-ASSEMBLY
SIB 5            REV 01   711-057066   PROTOXCLEI        PROTO-ASSEMBLY
SIB 6            REV 01   711-057066   PROTOXCLEI        PROTO-ASSEMBLY
SIB 7            REV 01   750-057067   PROTOXCLEI        PROTO-ASSEMBLY
SIB 8            REV 01   750-057067   PROTOXCLEI        PROTO-ASSEMBLY
Fan Tray 0       REV 13   760-044659   IPUCBE8CAA        FAN-SFF-PTX-S
Fan Tray 1       REV 13   760-044659   IPUCBE8CAA        FAN-SFF-PTX-S
```

show chassis hardware (MX2010 Router)

```
user@host > show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN11E3217AFK      MX2010
Midplane         REV 01   750-044636   ABAB8506          Lower Backplane
Midplane 1       REV 01   711-044557   ZY8296            Upper Backplane
PMP              REV 03   711-032426   ACAJ1388          Power Midplane
FPM Board        REV 06   711-032349   ZX8744            Front Panel Display
PSM 4            REV 0C   740-033727   VK00254           DC 52V Power Supply
Module
PSM 5            REV 0B   740-033727   VG00015           DC 52V Power Supply
Module
PSM 6            REV 0B   740-033727   VH00097           DC 52V Power Supply
Module
PSM 7            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   CAAA6135          PMB Board
SPMB 1           REV 02   711-041855   CAAA6137          PMB Board
SFB 0            REV 06   711-032385   ZV1828            Switch Fabric Board
SFB 1            REV 07   711-032385   ZZ2568            Switch Fabric Board
SFB 2            REV 07   711-032385   ZZ2563            Switch Fabric Board
SFB 3            REV 07   711-032385   ZZ2564            Switch Fabric Board
SFB 4            REV 07   711-032385   ZZ2580            Switch Fabric Board
SFB 5            REV 07   711-032385   ZZ2579            Switch Fabric Board
SFB 6            REV 07   711-032385   CAAB4882          Switch Fabric Board
```

```
SFB 7            REV 07   711-032385   CAAB4898          Switch Fabric Board
FPC 0            REV 33   750-028467   CAAB1919          MPC 3D 16x 10GE
  CPU            REV 11   711-029089   CAAB7174          AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AMH02RE           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AMH038C           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AMH0390           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AMG0SUA           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AMH0579           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AMG0SGP           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AMH04SV           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AMH04X3           SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AMH0135           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AMH02NC           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AMH02XB           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AMH02PN           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AMH057Y           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AMG0JHE           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AMH02HT           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AMH04V4           SFP+-10G-SR
FPC 1            REV 21   750-033205   ZG5027            MPC Type 3
  CPU            REV 04   711-035209   YT4780            HMPC PMB 2G
  MIC 0          REV 03   750-033307   ZV6299            10X10GE SFPP
    PIC 0                 BUILTIN      BUILTIN           10X10GE SFPP
      Xcvr 0     REV 01   740-031980   083363A00410      SFP+-10G-SR
      Xcvr 1     REV 01   740-031980   083363A00334      SFP+-10G-SR
      Xcvr 2     REV 01   740-031980   113363A00125      SFP+-10G-SR
      Xcvr 3     REV 01   740-031980   083363A00953      SFP+-10G-SR
      Xcvr 4     REV 01   740-031980   AHR013D           SFP+-10G-SR
      Xcvr 5     REV 01   740-031980   AJ40JUR           SFP+-10G-SR
      Xcvr 6     REV 01   740-031980   AJ40JKL           SFP+-10G-SR
      Xcvr 7     REV 01   740-031980   AJ30ECK           SFP+-10G-SR
      Xcvr 8     REV 01   740-021308   19T511100864      SFP+-10G-SR
      Xcvr 9     REV 01   740-021308   19T511100868      SFP+-10G-SR
  MIC 1          REV 03   750-033307   ZV6268            10X10GE SFPP
    PIC 2                 BUILTIN      BUILTIN           10X10GE SFPP
      Xcvr 0     REV 01   740-031980   AJC0JML           SFP+-10G-SR
      Xcvr 1     REV 01   740-031980   AJ403PC           SFP+-10G-SR
      Xcvr 2     REV 01   740-031980   AJ10N25           SFP+-10G-SR
      Xcvr 3     REV 01   740-031980   AJ40JF4           SFP+-10G-SR
      Xcvr 4     REV 01   740-031980   AJ40JSJ           SFP+-10G-SR
      Xcvr 5     REV 01   740-031980   AJ403V7           SFP+-10G-SR
      Xcvr 6     REV 01   740-031980   AJ40JN3           SFP+-10G-SR
      Xcvr 7     REV 01   740-031980   AJ40JSU           SFP+-10G-SR
      Xcvr 8     REV 01   740-021308   19T511100468      SFP+-10G-SR
      Xcvr 9     REV 01   740-021308   19T511101363      SFP+-10G-SR
FPC 8            REV 22   750-031089   ZT9746            MPC Type 2 3D
  CPU            REV 06   711-030884   ZS1271            MPC PMB 2G
  MIC 0          REV 26   750-028392   ABBS1150          3D 20x 1GE(LAN) SFP
    PIC 0                 BUILTIN      BUILTIN           10x 1GE(LAN) SFP
      Xcvr 0     REV 01   740-031851   PLG023C           SFP-SX
      Xcvr 1     REV 01   740-031851   PLG09C6           SFP-SX
      Xcvr 2     REV 02   740-011613   AM0950SF9L7       SFP-SX
      Xcvr 3     REV 02   740-011613   AM1001SFN1H       SFP-SX
      Xcvr 4     REV 02   740-011613   AM1001SFM9D       SFP-SX
      Xcvr 5     REV 02   740-011613   AM1001SFLTJ       SFP-SX
      Xcvr 6     REV 01   740-031851   AC1108S03L9       SFP-SX
      Xcvr 7     REV 01   740-031851   AC1102S00NC       SFP-SX
```


Copyright © 2016, Juniper Networks, Inc.

```
      Xcvr 8     REV 01   740-031851   AC1102S00MX       SFP-SX
      Xcvr 9     REV 01   740-031851   AC1102S0085       SFP-SX
    PIC 1                 BUILTIN      BUILTIN           10x 1GE(LAN) SFP
      Xcvr 0     REV 01   740-031851   AC1102S00KU       SFP-SX
      Xcvr 1     REV 01   740-031851   AC1102S00NG       SFP-SX
      Xcvr 2     REV 01   740-031851   AC1102S00K3       SFP-SX
      Xcvr 3     REV 01   740-031851   AC1102S008R       SFP-SX
      Xcvr 4     REV 01   740-031851   AM1107SUFVJ       SFP-SX
      Xcvr 5     REV 01   740-031851   AC1108S03LG       SFP-SX
  MIC 1          REV 26   750-028387   ABBR9582          3D 4x 10GE  XFP
    PIC 2                 BUILTIN      BUILTIN           2x 10GE  XFP
      Xcvr 0              NON-JNPR     T10A91703         XFP-10G-SR
      Xcvr 1              NON-JNPR     T09L42604         XFP-10G-SR
    PIC 3                 BUILTIN      BUILTIN           2x 10GE  XFP
FPC 9            REV 11   750-036284   ZL3591            MPC 3D 16x 10GE EM
  CPU            REV 10   711-029089   ZL0513            AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   1YT517101825      SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   1YT517101821      SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   1YT517101682      SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   ALQ13R6           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   1YT517101828      SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   1YT517101716      SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   1YT517101732      SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   ALP0TR1           SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   1YT517101741      SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   1YT517101829      SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   1YT517101669      SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   ALQ14E3           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   1YT517101826      SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   1YT517101817      SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   1YT517101735      SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   ALQ159A           SFP+-10G-SR
ADC 0            REV 05   750-043596   CAAC2073          Adapter Card
ADC 1            REV 01   750-043596   ZV4117            Adapter Card
ADC 8            REV 01   750-043596   ZV4107            Adapter Card
ADC 9            REV 02   750-043596   ZW1555            Adapter Card
Fan Tray 0       REV 2A   760-046960   ACAY0015          172mm FanTray - 6 Fans
Fan Tray 1       REV 2A   760-046960   ACAY0019          172mm FanTray - 6 Fans
Fan Tray 2       REV 2A   760-046960   ACAY0020          172mm FanTray - 6 Fans
Fan Tray 3       REV 2A   760-046960   ACAY0021          172mm FanTray - 6 Fans
```

show chassis hardware detail (MX2010 Router)

```
user@host > show chassis hardware detail
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN11E233DAFK      MX2010
Midplane         REV 26   750-044636   ABAB9357          Lower Backplane
Midplane 1       REV 01   711-044557   ABAB8643          Upper Backplane
PMP              REV 04   711-032426   ACAJ1677          Power Midplane
FPM Board        REV 08   760-044634   ABBV9726          Front Panel Display
PSM 0            REV 01   740-045050   1E02224000P       DC 52V Power Supply
Module
PSM 1            REV 01   740-045050   1E02224000M       DC 52V Power Supply
Module
PSM 2            REV 01   740-045050   1E022240010       DC 52V Power Supply
Module
```

```
PSM 3            REV 01   740-045050   1E02224000G       DC 52V Power Supply
Module
PSM 4            REV 01   740-045050   1E022240013       DC 52V Power Supply
Module
PSM 5            REV 01   740-045050   1E022240007       DC 52V Power Supply
Module
PSM 6            REV 01   740-045050   1E02224001C       DC 52V Power Supply
Module
PSM 7            REV 01   740-045050   1E02224001D       DC 52V Power Supply
Module
PSM 8            REV 01   740-045050   1E02224001B       DC 52V Power Supply
Module
PDM 0            REV 01   740-045234   1E262250067       DC Power Dist Module
Routing Engine 0 REV 02   740-041821   9009099704        RE-S-1800x4
  ad0    3831 MB  UGB30SFA4000T1       SFA4000T1 00000651 Compact Flash
  ad1   30533 MB  UGB94BPH32H0S1-KCI   11000019592       Disk 1
  usb0 (addr 1)  EHCI root hub 0       Intel             uhub0
  usb0 (addr 2)  product 0x0020 32     vendor 0x8087     uhub1
  DIMM 0         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 1         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 2         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 3         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
Routing Engine 1 REV 02   740-041821   9009099706        RE-S-1800x4
  ad0    3998 MB  Virtium - TuffDrive VCF P1T0200262860208 114 Compact Flash
  ad1   30533 MB  UGB94ARF32H0S3-KC    UNIGEN-499551-000404 Disk 1
CB 0             REV 13   750-040257   CAAF8436          Control Board
CB 1             REV 13   750-040257   CAAF8434          Control Board
SPMB 0           REV 02   711-041855   ABBV3825          PMB Board
SPMB 1           REV 02   711-041855   ABBV3833          PMB Board
SFB 0            REV 05   711-044466   ABBX5682          Switch Fabric Board
SFB 1            REV 05   711-044466   ABBX5676          Switch Fabric Board
SFB 2            REV 05   711-044466   ABBX5665          Switch Fabric Board
SFB 3            REV 05   711-044466   ABBX5699          Switch Fabric Board
SFB 4            REV 05   711-044466   ABBX5603          Switch Fabric Board
SFB 5            REV 05   711-044466   ABBX5587          Switch Fabric Board
SFB 6            REV 05   711-044466   ABBX5607          Switch Fabric Board
SFB 7            REV 05   711-044466   ABBX5669          Switch Fabric Board
FPC 0            REV 09   750-037355   CAAF0924          MPC Type 4-2
  CPU            REV 08   711-035209   CAAB9842          HMPC PMB 2G
  PIC 0                   BUILTIN      BUILTIN           4x10GE SFPP
    Xcvr 0       REV 01   740-021308   19T511101656      SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AMA04RU           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   193363A00558      SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B10M00202         SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           1X100GE CFP
    Xcvr 0                NON-JNPR     X12J00328         CFP-100G-SR10
  PIC 2                   BUILTIN      BUILTIN           4x10GE SFPP
    Xcvr 0       REV 01   740-031980   AMA088W           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B10L04211         SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   19T511101602      SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B10L04151         SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           1X100GE CFP
Xcvr 0                NON-JNPR     X12J00332         CFP-100G-SR10
FPC 1            REV 18   750-033205   ZE0128            MPC Type 3
  CPU            REV 06   711-035209   ZG5431            HMPC PMB 2G
  MIC 0          REV 15   750-033199   ZP6435            1X100GE CFP
    PIC 0                 BUILTIN      BUILTIN           1X100GE CFP
      Xcvr 0     REV 01   740-032210   J11E46118         CFP-100G-LR4
  MIC 1          REV 15   750-033199   ZP6442            1X100GE CFP
    PIC 2                 BUILTIN      BUILTIN           1X100GE CFP
      Xcvr 0     REV 01   740-032210   UMN03T4           CFP-100G-LR4
```


Copyright © 2016, Juniper Networks, Inc.

```
FPC 2            REV 16   750-037358   CAAL1001          MPC Type 4-1
  CPU            REV 08   711-035209   CAAK7927          HMPC PMB 2G
  PIC 0                   BUILTIN      BUILTIN           8X10GE SFPP
    Xcvr 0       REV 01   740-031980   193363A00589      SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   973152A00028      SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   193363A00376      SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   973152A00016      SFP+-10G-SR
    Xcvr 4       REV 01   740-031980   193363A00499      SFP+-10G-SR
    Xcvr 5       REV 01   740-021308   973152A00039      SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   B11E01239         SFP+-10G-SR
    Xcvr 7       REV 01   740-021308   973152A00058      SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           8X10GE SFPP
    Xcvr 0       REV 01   740-031980   B10M00075         SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   973152A00014      SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AMA0638           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   973152A00063      SFP+-10G-SR
    Xcvr 4       REV 01   740-031980   AMA0629           SFP+-10G-SR
    Xcvr 5       REV 01   740-021308   973152A00053      SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   193363A00344      SFP+-10G-SR
    Xcvr 7       REV 01   740-021308   973152A00046      SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           8X10GE SFPP
    Xcvr 0       REV 01   740-031980   AMA062M           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   973152A00080      SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   193363A00580      SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   973152A00064      SFP+-10G-SR
    Xcvr 4       REV 01   740-031980   093363A01494      SFP+-10G-SR
    Xcvr 5       REV 01   740-021308   973152A00020      SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   123363A00047      SFP+-10G-SR
    Xcvr 7       REV 01   740-021308   973152A00072      SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           8X10GE SFPP
    Xcvr 0       REV 01   740-021308   03DZ06A01033      SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   973152A00022      SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   03DZ06A01026      SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   973152A00013      SFP+-10G-SR
    Xcvr 4       REV 01   740-021308   03DZ06A01028      SFP+-10G-SR
    Xcvr 5       REV 01   740-021308   973152A00079      SFP+-10G-SR
    Xcvr 6       REV 01   740-021308   03DZ06A01018      SFP+-10G-SR
    Xcvr 7       REV 01   740-021308   973152A00025      SFP+-10G-SR
FPC 3            REV 33   750-028467   CAAF5400          MPC 3D 16x 10GE
  CPU            REV 11   711-029089   CAAH7626          AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   973152A00066      SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   973152A00021      SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   973152A00062      SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   973152A00027      SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   973152A00065      SFP+-10G-SR
 Xcvr 1       REV 01   740-021308   973152A00069      SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   973152A00026      SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   973152A00003      SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   973152A00035      SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   973152A00004      SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   973152A00049      SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   973152A00055      SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   973152A00010      SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   973152A00001      SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   973152A00073      SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   973152A00012      SFP+-10G-SR
FPC 4            REV 21   750-033205   ZG5028            MPC Type 3
```

```
  CPU            REV 05   711-035209   YX3911           HMPC PMB 2G
  MIC 0          REV 03   750-036233   ZL2036           2X40GE QSFP
    PIC 0                 BUILTIN      BUILTIN          2X40GE QSFP
      Xcvr 0     REV 01   740-032986   QB220708         QSFP+-40G-SR4
      Xcvr 1     REV 01   740-032986   QB220735         QSFP+-40G-SR4
  MIC 1          REV 03   750-036233   ZL2028           2X40GE QSFP
    PIC 2                 BUILTIN      BUILTIN          2X40GE QSFP
      Xcvr 0     REV 01   740-032986   QB220727         QSFP+-40G-SR4
      Xcvr 1     REV 01   740-032986   QB220715         QSFP+-40G-SR4
FPC 5            REV 11   750-037358   CAAE2196         MPC Type 4-1
  CPU            REV 08   711-035209   CAAD9074         HMPC PMB 2G
  PIC 0                   BUILTIN      BUILTIN          8X10GE SFPP
    Xcvr 0       REV 01   740-031980   AMA062S          SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AMA062P          SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AMA052R          SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AMA0632          SFP+-10G-SR
    Xcvr 4       REV 01   740-031980   193363A00564     SFP+-10G-SR
    Xcvr 5       REV 01   740-031980   193363A00229     SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   193363A00363     SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   193363A00278     SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN          8X10GE SFPP
    Xcvr 0       REV 01   740-031980   AMA04CC          SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AD0927A001W      SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AMA04N2          SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AMA062U          SFP+-10G-SR
    Xcvr 4       REV 01   740-031980   193363A00491     SFP+-10G-SR
    Xcvr 5       REV 01   740-031980   183363A01511     SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   193363A00565     SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   193363A00405     SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN          8X10GE SFPP
    Xcvr 0       REV 01   740-031980   AMA07QX          SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AMA06MS          SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   193363A00318     SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   193363A00402     SFP+-10G-SR
    Xcvr 4       REV 01   740-031980   193363A00174     SFP+-10G-SR
    Xcvr 5       REV 01   740-031980   193363A00388     SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   193363A00377     SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   193363A00234     SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN          8X10GE SFPP
    Xcvr 0       REV 01   740-031980   AMA062T          SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   193363A00550     SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   193363A00364     SFP+-10G-SR
Xcvr 3       REV 01   740-031980   AMA0630          SFP+-10G-SR
    Xcvr 4       REV 01   740-031980   193363A00509     SFP+-10G-SR
    Xcvr 5       REV 01   740-031980   193363A00459     SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   113363A00191     SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   193363A00352     SFP+-10G-SR
FPC 6            REV 33   750-028467   CAAF5552         MPC 3D 16x 10GE
  CPU            REV 11   711-029089   CAAH7601         AMPC PMB
  PIC 0                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AD0927A0036      SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AD0927A003M      SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AD0927A003G      SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AD0927A0031      SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   193363A00331     SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   193363A00325     SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   193363A00417     SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   183363A02509     SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   T09K75140        SFP+-10G-SR
```


Copyright © 2016, Juniper Networks, Inc.

```
    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   AJ40JKK           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 00
  Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x20: 4a 4e 31 31 45 32 33 33 44 41 46 4b 00 00 00 00
  Address 0x30: 00 00 00 ff 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Midplane         REV 26   750-044636   ABAB9357          Lower Backplane
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          750-044636        S/N:               ABAB9357
 Assembly ID:  0x0b66            Assembly Version:  01.26
 Date:         08-28-2012        Assembly Flags:    0x00
 Version:      REV 26            CLEI Code:         PROTOXCLEI
 ID: Lower Backplane             FRU Model Number:  PROTO-ASSEMBLY
 Board Information Record:
  Address 0x00: ad 01 08 00 2c 21 72 70 a0 00 ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b 66 01 1a 52 45 56 20 32 36 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 34 34 36 33 36 00 00
  Address 0x20: 53 2f 4e 20 41 42 41 42 39 33 35 37 00 1c 08 07
  Address 0x30: dc ff ff ff ad 01 08 00 2c 21 72 70 a0 00 ff ff
  Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
```

 Copyright © 2016, Juniper Networks, Inc.

```
  Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff c2 ff ff ff ff ff ff ff ff ff ff ff ff
Midplane 1       REV 01   711-044557   ABAB8643          Upper Backplane
 Jedec Code:   0x7fb0            EEPROM Version:    0x01
 P/N:          711-044557        S/N:               ABAB8643
 Assembly ID:  0x0b65            Assembly Version:  01.01
 Date:         07-27-2012        Assembly Flags:    0x00
 Version:      REV 01
 ID: Upper Backplane
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 0b 65 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 31 31 2d 30 34 34 35 35 37 00 00
  Address 0x20: 53 2f 4e 20 41 42 41 42 38 36 34 33 00 1b 07 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
  Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
PMP              REV 04   711-032426   ACAJ1677          Power Midplane
Jedec Code:   0x7fb0            EEPROM Version:    0x01
 P/N:          711-032426        S/N:               ACAJ1677
 Assembly ID:  0x045d            Assembly Version:  01.04
 Date:         07-20-2012        Assembly Flags:    0x00
 Version:      REV 04
 ID: Power Midplane
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 04 5d 01 04 52 45 56 20 30 34 00 00
  Address 0x10: 00 00 00 00 37 31 31 2d 30 33 32 34 32 36 00 00
  Address 0x20: 53 2f 4e 20 41 43 41 4a 31 36 37 37 00 14 07 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
  Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
FPM Board        REV 08   760-044634   ABBV9726          Front Panel Display
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          760-044634        S/N:               ABBV9726
 Assembly ID:  0x0b64            Assembly Version:  01.08
 Date:         09-10-2012        Assembly Flags:    0x00
 Version:      REV 08            CLEI Code:         IPMYA4EJRA
 ID: Front Panel Display         FRU Model Number:  MX2010-CRAFT-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b 64 01 08 52 45 56 20 30 38 00 00
  Address 0x10: 00 00 00 00 37 36 30 2d 30 34 34 36 33 34 00 00
  Address 0x20: 53 2f 4e 20 41 42 42 56 39 37 32 36 00 0a 09 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 4d 59 41 34 45 4a 52 41 4d
  Address 0x50: 58 32 30 31 30 2d 43 52 41 46 54 2d 53 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 93 ff ff ff ff ff ff ff ff ff ff ff ff
PSM 0            REV 01   740-045050   1E02224000P       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-045050        S/N:               1E02224000P
```

```
 Assembly ID:  0x0478            Assembly Version:  01.01
 Date:         12-06-2012        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         XXXXXXXXXX
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-HC-DC-S-A
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 34 35 30 35 30 00 00
  Address 0x20: 31 45 30 32 32 32 34 30 30 30 50 00 00 06 0c 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 58 58 58 58 58 58 58 58 58 58 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 48 43 2d 44 43 2d
  Address 0x60: 53 2d 41 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 4a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 1            REV 01   740-045050   1E02224000M       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-045050        S/N:               1E02224000M
Assembly ID:  0x0478            Assembly Version:  01.01
 Date:         12-06-2012        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         XXXXXXXXXX
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-HC-DC-S-A
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 34 35 30 35 30 00 00
  Address 0x20: 31 45 30 32 32 32 34 30 30 30 4d 00 00 06 0c 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 58 58 58 58 58 58 58 58 58 58 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 48 43 2d 44 43 2d
  Address 0x60: 53 2d 41 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 4a 00 00 00 00 00 00 00 00 00 00 00 00
...
PDM 0            REV 01   740-045234   1E262250067       DC Power Dist Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-045234        S/N:               1E262250067
 Assembly ID:  0x047b            Assembly Version:  01.01
 Date:         06-28-2012        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         IPUPAJSKAA
 ID: DC Power Dist Module        FRU Model Number:  MX2000-PDM-DC-S-A
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 7b 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 34 35 32 33 34 00 00
  Address 0x20: 31 45 32 36 32 32 35 30 30 36 37 00 00 1c 06 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4a 53 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 44 4d 2d 44 43 2d 53 2d 41
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 89 00 00 00 00 00 00 00 00 00 00 00 00
Routing Engine 0 REV 02   740-041821   9009099704        RE-S-1800x4
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-041821        S/N:               9009099704
 Assembly ID:  0x09c0            Assembly Version:  01.02
 Date:         03-15-2012        Assembly Flags:    0x00
 Version:      REV 02
 ID: RE-S-1800x4                 FRU Model Number:  RE-S-1800X4-16G-S
 Board Information Record:
```


Copyright © 2016, Juniper Networks, Inc.

```
  Address 0x00: 54 32 30 32 37 44 41 2d 34 34 47 42 23 41 23 00
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 09 c0 01 02 52 45 56 20 30 32 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 34 31 38 32 31 00 00
  Address 0x20: 39 30 30 39 30 39 39 37 30 34 00 00 00 0f 03 07
  Address 0x30: dc ff ff ff 54 32 30 32 37 44 41 2d 34 34 47 42
  Address 0x40: 23 41 23 00 01 00 00 00 00 00 00 00 00 00 00 52
  Address 0x50: 45 2d 53 2d 31 38 30 30 58 34 2d 31 36 47 2d 53
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 8c ff ff ff ff ff ff ff ff ff ff ff ff
  ad0    3831 MB  UGB30SFA4000T1       SFA4000T1 00000651 Compact Flash
  ad1   30533 MB  UGB94BPH32H0S1-KCI   11000019592       Disk 1
  usb0 (addr 1)  EHCI root hub 0       Intel             uhub0
  usb0 (addr 2)  product 0x0020 32     vendor 0x8087     uhub1
  DIMM 0         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 1         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 2         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 3         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
Routing Engine 1 REV 02   740-041821   9009099706        RE-S-1800x4
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-041821        S/N:               9009099706
 Assembly ID:  0x09c0            Assembly Version:  01.02
 Date:         02-23-2012        Assembly Flags:    0x00
 Version:      REV 02
 ID: RE-S-1800x4                 FRU Model Number:  RE-S-1800X4-16G-S
 Board Information Record:
  Address 0x00: 54 32 30 32 37 44 41 2d 34 34 47 42 23 41 23 00
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 09 c0 01 02 52 45 56 20 30 32 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 34 31 38 32 31 00 00
 Address 0x20: 39 30 30 39 30 39 39 37 30 36 00 00 00 17 02 07
  Address 0x30: dc ff ff ff 54 32 30 32 37 44 41 2d 34 34 47 42
  Address 0x40: 23 41 23 00 01 00 00 00 00 00 00 00 00 00 00 52
  Address 0x50: 45 2d 53 2d 31 38 30 30 58 34 2d 31 36 47 2d 53
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 8c ff ff ff ff ff ff ff ff ff ff ff ff
  ad0    3998 MB  Virtium - TuffDrive VCF P1T0200262860208 114 Compact Flash
  ad1   30533 MB  UGB94ARF32H0S3-KC    UNIGEN-499551-000404 Disk 1
CB 0             REV 13   750-040257   CAAF8436          Control Board
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          750-040257        S/N:               CAAF8436
 Assembly ID:  0x0b26            Assembly Version:  01.13
 Date:         08-29-2012        Assembly Flags:    0x00
 Version:      REV 13            CLEI Code:         PROTOXCLEI
 ID: Control Board               FRU Model Number:  PROTO-ASSEMBLY
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b 26 01 0d 52 45 56 20 31 33 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 34 30 32 35 37 00 00
  Address 0x20: 53 2f 4e 20 43 41 41 46 38 34 33 36 00 1d 08 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
  Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff c2 ff ff ff ff ff ff ff ff ff ff ff ff
...
SPMB 0           REV 02   711-041855   ABBV3825          PMB Board
 Jedec Code:   0x7fb0            EEPROM Version:    0x01
 P/N:          711-041855        S/N:               ABBV3825
 Assembly ID:  0x0b29            Assembly Version:  01.02
```

```
 Date:         08-14-2012        Assembly Flags:    0x00
 Version:      REV 02
 ID: PMB Board
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 0b 29 01 02 52 45 56 20 30 32 00 00
  Address 0x10: 00 00 00 00 37 31 31 2d 30 34 31 38 35 35 00 00
  Address 0x20: 53 2f 4e 20 41 42 42 56 33 38 32 35 00 0e 08 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
  Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
...
SFB 0            REV 05   711-044466   ABBX5682          Switch Fabric Board
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          711-044466        S/N:               ABBX5682
 Assembly ID:  0x0b25            Assembly Version:  01.05
 Date:         09-07-2012        Assembly Flags:    0x00
 Version:      REV 05            CLEI Code:         PROTOXCLEI
 ID: Switch Fabric Board         FRU Model Number:  PROTO-ASSEMBLY
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b 25 01 05 52 45 56 20 30 35 00 00
  Address 0x10: 00 00 00 00 37 31 31 2d 30 34 34 34 36 36 00 00
  Address 0x20: 53 2f 4e 20 41 42 42 58 35 36 38 32 00 07 09 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
  Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff c2 00 00 00 01 00 00 00 00 00 00 48 00
...
FPC 0            REV 09   750-037355   CAAF0924          MPC Type 4-2
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          750-037355        S/N:               CAAF0924
 Assembly ID:  0x0b4e            Assembly Version:  01.09
 Date:         05-21-2012        Assembly Flags:    0x00
 Version:      REV 09            CLEI Code:         PROTOXCLEI
 ID: MPC Type 4-2                FRU Model Number:  MPC4E-2CGE-8XGE
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff 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 ff
  Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 4d
  Address 0x50: 50 43 34 45 2d 32 43 47 45 2d 38 58 47 45 00 00
  Address 0x60: 00 00 00 00 00 00 30 39 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff c6 ff ff ff ff ff ff ff ff ff ff ff ff
  CPU            REV 08   711-035209   CAAB9842          HMPC PMB 2G
 Jedec Code:   0x7fb0            EEPROM Version:    0x01
 P/N:          711-035209        S/N:               CAAB9842
 Assembly ID:  0x0b04            Assembly Version:  01.08
 Date:         05-17-2012        Assembly Flags:    0x00
 Version:      REV 08
 ID: HMPC PMB 2G
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
```

 Copyright © 2016, Juniper Networks, Inc.

```
 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 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:               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           00000000000000000000000
PSM 5            REV 0B   740-033727   VG00015           00000000000000000000000
PSM 6            REV 0B   740-033727   VH00097           00000000000000000000000
PSM 7            REV 0C   740-033727   VJ00151           00000000000000000000000
```

```
PSM 8            REV 0C   740-033727   VJ00149          00000000000000000000000
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       00000000000000000000000
PSM 5            REV 0B   740-033727   0000000000       00000000000000000000000
PSM 6            REV 0B   740-033727   0000000000       00000000000000000000000
PSM 7            REV 0C   740-033727   0000000000       00000000000000000000000
PSM 8            REV 0C   740-033727   0000000000       00000000000000000000000
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
```


Copyright © 2016, Juniper Networks, Inc.

```
FPC 8            REV 22   750-031089   COUIBAYBAA        MX-MPC2-3D
  MIC 0          REV 26   750-028392   COUIA15BAA        MIC-3D-20GE-SFP
  MIC 1          REV 26   750-028387   COUIA16BAA        MIC-3D-4XGE-XFP
FPC 9            REV 11   750-036284   CMUIACGBAA        MPCE-3D-16XGE-SFPP
ADC 0            REV 05   750-043596   PROTOXCLEI        750-043596
ADC 1            REV 01   750-043596   PROTOXCLEI        750-043596
ADC 8            REV 01   750-043596   PROTOXCLEI        750-043596
ADC 9            REV 02   750-043596   PROTOXCLEI        750-043596
Fan Tray 0       REV 2A   760-046960
Fan Tray 1       REV 2A   760-046960
Fan Tray 2       REV 2A   760-046960
Fan Tray 3       REV 2A   760-046960
```

show chassis hardware (MX2010 Routers with MPC6E and OTN MIC)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN11C9AFEAFK      MX2010
Midplane         REV 35   750-044636   ABAB9188          Lower Backplane
Midplane 1       REV 02   711-044557   ABAB8729          Upper Backplane
PMP              REV 04   711-032426   ACAJ2432          Power Midplane
FPM Board        REV 09   760-044634   ABCA4314          Front Panel Display
PSM 0            REV 01   740-050037   1EDB321015C       DC 52V Power Supply
Module
PSM 1            REV 01   740-050037   1EDB321015J       DC 52V Power Supply
Module
PSM 2            REV 01   740-050037   1EDB32000K8       DC 52V Power Supply
Module
PSM 3            REV 01   740-050037   1EDB32101JW       DC 52V Power Supply
Module
PSM 4            REV 01   740-050037   1EDB321015G       DC 52V Power Supply
Module
PSM 5            REV 01   740-050037   1EDB32101HH       DC 52V Power Supply
Module
PSM 6            REV 01   740-050037   1EDB32101HD       DC 52V Power Supply
Module
PSM 7            REV 01   740-050037   1EDB321015F       DC 52V Power Supply
Module
PSM 8            REV 01   740-050037   1EDB321015B       DC 52V Power Supply
Module
PDM 0            REV 03   740-045234   1EFA3220433       DC Power Dist Module
PDM 1            REV 03   740-045234   1EFA3220425       DC Power Dist Module
Routing Engine 0 REV 02   740-041821   9009115685        RE-S-1800x4
Routing Engine 1 REV 02   740-041821   9009099711        RE-S-1800x4
CB 0             REV 23   750-040257   CABE8395          Control Board
CB 1             REV 12   750-040257   CAAD9499          Control Board
SPMB 0           REV 02   711-041855   ABCG8426          PMB Board
SPMB 1           REV 02   711-041855   ABBS1481          PMB Board
SFB 0            REV 06   711-044466   ABCD5013          Switch Fabric Board
SFB 1            REV 06   711-044466   ABCD5160          Switch Fabric Board
SFB 2            REV 06   711-044466   ABCD5175          Switch Fabric Board
SFB 3            REV 06   711-044466   ABCD4938          Switch Fabric Board
SFB 4            REV 06   711-044466   ABCD4944          Switch Fabric Board
SFB 5            REV 06   711-044466   ABCD4968          Switch Fabric Board
SFB 6            REV 06   711-044466   ABCD5267          Switch Fabric Board
SFB 7            REV 06   711-044466   ABCD4997          Switch Fabric Board
FPC 0            REV 59   750-044130   ABCT7676          MPC6E 3D
  CPU            REV 10   711-045719   ABCK8527          RMPC PMB
  XLM 0          REV 13   711-046638   ABCT7810          MPC6E XL
  XLM 1          REV 13   711-046638   ABCT7811          MPC6E XL
```

```
FPC 2            REV 27   750-033205   ZL6014            MPCE Type 3 3D
  CPU            REV 07   711-035209   ZK9068            HMPC PMB 2G
  MIC 0          REV 14   750-033196   CAAW9214          1X100GE CXP
    PIC 0                 BUILTIN      BUILTIN           1X100GE CXP
      Xcvr 0     REV 01   740-046563   XC49FC030         CFP2-100G-SR10
  MIC 1          REV 18   750-033199   CAAC3231          1X100GE CFP
    PIC 2                 BUILTIN      BUILTIN           1X100GE CFP
FPC 3            REV 59   750-044130   ABCT7682          MPC6E 3D
  CPU            REV 10   711-045719   ABCK8531          RMPC PMB
  XLM 0          REV 13   711-046638   ABCT7818          MPC6E XL
  XLM 1          REV 13   711-046638   ABCT7819          MPC6E XL
FPC 4            REV 33   750-044130   ABBY9278          MPC6E 3D
  CPU            REV 09   711-045719   ABBY8677          RMPC PMB
  XLM 0          REV 06.2.00 711-046638 ABBY8844         MPC6E XL
  XLM 1          REV 06.2.00 711-046638 ABBY8830         MPC6E XL
FPC 5            REV 59   750-044130   ABCT7675          MPC6E 3D
  CPU            REV 10   711-045719   ABCK8526          RMPC PMB
  XLM 0          REV 13   711-046638   ABCT7808          MPC6E XL
  XLM 1          REV 13   711-046638   ABCT7809          MPC6E XL
FPC 6            REV 30   750-028467   ZM4986            MPC 3D 16x 10GE
 CPU            REV 10   711-029089   ZP6541            AMPC PMB
  PIC 0                 BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AQ43GAC           SFP+-10G-SR
  PIC 1                 BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   ALM0A6D           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AQF0RB3           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   153363A00333      SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AN10KYE           SFP+-10G-SR
  PIC 2                 BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   APK04YM           SFP+-10G-SR
  PIC 3                 BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AQF0H44           SFP+-10G-SR
FPC 8            REV 38   750-031090   CABF7313          MPC Type 2 3D EQ
  CPU            REV 08   711-030884   CABE6727          MPC PMB 2G
  MIC 0          REV 18   750-028380   YK8253            3D 2x 10GE XFP
    PIC 0                 BUILTIN      BUILTIN           1x 10GE XFP
      Xcvr 0     REV 03   740-014289   AD1148M00TP       XFP-10G-SR
    PIC 1                 BUILTIN      BUILTIN           1x 10GE XFP
  QXM 0          REV 06   711-028408   CABC5614          MPC QXM
  QXM 1          REV 06   711-028408   CABC5550          MPC QXM
FPC 9            REV 39   750-044130   ABCK1652          MPC6E 3D
  CPU            REV 09   711-045719   ABCK1655          RMPC PMB
  MIC 0          REV 09   750-049457   ABCP1230          2X100GE CFP2 OTN
    PIC 0                 BUILTIN      BUILTIN           2X100GE CFP2 OTN
      Xcvr 0               NON-JNPR     37300222WP0002    CFP2-100G-LR4-D
      Xcvr 1               NON-JNPR     FD46F001Y         CFP2-100G-SR10
  MIC 1          REV 07   750-049457   ABCV6662          2X100GE CFP2 OTN
    PIC 1                 BUILTIN      BUILTIN           2X100GE CFP2 OTN
      Xcvr 0               NON-JNPR     UQD0014           CFP2-100G-LR4-D
      Xcvr 1               NON-JNPR     J13J68335         CFP2-100G-LR4-D
  XLM 0          REV 07.2.00 711-046638 ABCK5491          MPC6E XL
  XLM 1          REV 07.2.00 711-046638 ABCK5475          MPC6E XL
ADC 1            REV 17   750-043596   ABCG9023          Adapter Card
ADC 2            REV 01   750-043596   ZV4079            Adapter Card
ADC 6            REV 17   750-043596   ABCG8866          Adapter Card
ADC 8            REV 17   750-043596   ABCA8993          Adapter Card
Fan Tray 0       REV 06   760-046960   ACAY0354          172mm FanTray - 6 Fans
Fan Tray 1       REV 06   760-046960   ACAY0831          172mm FanTray - 6 Fans
Fan Tray 2       REV 06   760-046960   ACAY0892          172mm FanTray - 6 Fans
Fan Tray 3       REV 06   760-046960   ACAY0839          172mm FanTray - 6 Fans
```


Copyright © 2016, Juniper Networks, Inc.

show chassis hardware detail (MX2010 Routers with MPC6E and OTN MIC)

```
user@host> show chassis hardware detail
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN11C9AFEAFK      MX2010
Midplane         REV 35   750-044636   ABAB9188          Lower Backplane
Midplane 1       REV 02   711-044557   ABAB8729          Upper Backplane
PMP              REV 04   711-032426   ACAJ2432          Power Midplane
FPM Board        REV 09   760-044634   ABCA4314          Front Panel Display
PSM 0            REV 01   740-050037   1EDB321015C       DC 52V Power Supply
Module
PSM 1            REV 01   740-050037   1EDB321015J       DC 52V Power Supply
Module
PSM 2            REV 01   740-050037   1EDB32000K8       DC 52V Power Supply
Module
PSM 3            REV 01   740-050037   1EDB32101JW       DC 52V Power Supply
Module
PSM 4            REV 01   740-050037   1EDB321015G       DC 52V Power Supply
Module
PSM 5            REV 01   740-050037   1EDB32101HH       DC 52V Power Supply
Module
PSM 6            REV 01   740-050037   1EDB32101HD       DC 52V Power Supply
Module
PSM 7            REV 01   740-050037   1EDB321015F       DC 52V Power Supply
Module
PSM 8            REV 01   740-050037   1EDB321015B       DC 52V Power Supply
Module
PDM 0            REV 03   740-045234   1EFA3220433       DC Power Dist Module
PDM 1            REV 03   740-045234   1EFA3220425       DC Power Dist Module
Routing Engine 0 REV 02   740-041821   9009115685        RE-S-1800x4
  ad0    3998 MB  Virtium - TuffDrive VCF P1T0200274310822 191 Compact Flash
  ad1   30533 MB  UGB94BPH32H0S1-KCI   11000043190       Disk 1
  usb0 (addr 1)  EHCI root hub 0       Intel             uhub0
  usb0 (addr 2)  product 0x0020 32     vendor 0x8087     uhub1
  DIMM 0         VL31B5263F-F8SD DIE REV-0 PCB REV-0     MFR ID-ce80
  DIMM 1         VL31B5263F-F8SD DIE REV-0 PCB REV-0     MFR ID-ce80
  DIMM 2         VL31B5263F-F8SD DIE REV-0 PCB REV-0     MFR ID-ce80
  DIMM 3         VL31B5263F-F8SD DIE REV-0 PCB REV-0     MFR ID-ce80
Routing Engine 1 REV 02   740-041821   9009099711        RE-S-1800x4
  ad0    3998 MB  Virtium - TuffDrive VCF P1T0200262860208 30 Compact Flash
  ad1   30533 MB  UGB94ARF32H0S3-KC    UNIGEN-499551-000146 Disk 1
CB 0             REV 23   750-040257   CABE8395          Control Board
CB 1             REV 12   750-040257   CAAD9499          Control Board
SPMB 0           REV 02   711-041855   ABCG8426          PMB Board
SPMB 1           REV 02   711-041855   ABBS1481          PMB Board
SFB 0            REV 06   711-044466   ABCD5013          Switch Fabric Board
SFB 1            REV 06   711-044466   ABCD5160          Switch Fabric Board
SFB 2            REV 06   711-044466   ABCD5175          Switch Fabric Board
SFB 3            REV 06   711-044466   ABCD4938          Switch Fabric Board
SFB 4            REV 06   711-044466   ABCD4944          Switch Fabric Board
SFB 5            REV 06   711-044466   ABCD4968          Switch Fabric Board
SFB 6            REV 06   711-044466   ABCD5267          Switch Fabric Board
SFB 7            REV 06   711-044466   ABCD4997          Switch Fabric Board
FPC 0            REV 59   750-044130   ABCT7676          MPC6E 3D
  CPU            REV 10   711-045719   ABCK8527          RMPC PMB
  XLM 0          REV 13   711-046638   ABCT7810          MPC6E XL
  XLM 1          REV 13   711-046638   ABCT7811          MPC6E XL
FPC 2            REV 27   750-033205   ZL6014            MPCE Type 3 3D
  CPU            REV 07   711-035209   ZK9068            HMPC PMB 2G
  MIC 0          REV 14   750-033196   CAAW9214          1X100GE CXP
```

```
    PIC 0                 BUILTIN      BUILTIN           1X100GE CXP
      Xcvr 0     REV 01   740-046563   XC49FC030         CFP2-100G-SR10
  MIC 1          REV 18   750-033199   CAAC3231          1X100GE CFP
    PIC 2                 BUILTIN      BUILTIN           1X100GE CFP
FPC 3            REV 59   750-044130   ABCT7682          MPC6E 3D
  CPU            REV 10   711-045719   ABCK8531          RMPC PMB
  XLM 0          REV 13   711-046638   ABCT7818          MPC6E XL
 XLM 1          REV 13   711-046638   ABCT7819          MPC6E XL
FPC 4            REV 33   750-044130   ABBY9278          MPC6E 3D
  CPU            REV 09   711-045719   ABBY8677          RMPC PMB
  XLM 0          REV 06.2.00 711-046638 ABBY8844         MPC6E XL
  XLM 1          REV 06.2.00 711-046638 ABBY8830         MPC6E XL
FPC 5            REV 59   750-044130   ABCT7675          MPC6E 3D
  CPU            REV 10   711-045719   ABCK8526          RMPC PMB
  XLM 0          REV 13   711-046638   ABCT7808          MPC6E XL
  XLM 1          REV 13   711-046638   ABCT7809          MPC6E XL
FPC 6            REV 30   750-028467   ZM4986            MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ZP6541            AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AQ43GAC           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   ALM0A6D           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AQF0RB3           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   153363A00333      SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AN10KYE           SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   APK04YM           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AQF0H44           SFP+-10G-SR
FPC 8            REV 38   750-031090   CABF7313          MPC Type 2 3D EQ
  CPU            REV 08   711-030884   CABE6727          MPC PMB 2G
  MIC 0          REV 18   750-028380   YK8253            3D 2x 10GE XFP
    PIC 0                 BUILTIN      BUILTIN           1x 10GE XFP
      Xcvr 0     REV 03   740-014289   AD1148M00TP       XFP-10G-SR
    PIC 1                 BUILTIN      BUILTIN           1x 10GE XFP
  QXM 0          REV 06   711-028408   CABC5614          MPC QXM
  QXM 1          REV 06   711-028408   CABC5550          MPC QXM
FPC 9            REV 39   750-044130   ABCK1652          MPC6E 3D
  CPU            REV 09   711-045719   ABCK1655          RMPC PMB
  MIC 0          REV 09   750-049457   ABCP1230          2X100GE CFP2 OTN
    PIC 0                 BUILTIN      BUILTIN           2X100GE CFP2 OTN
      Xcvr 0              NON-JNPR     37300222WP0002    CFP2-100G-LR4-D
      Xcvr 1              NON-JNPR     FD46F001Y         CFP2-100G-SR10
  MIC 1          REV 07   750-049457   ABCV6662          2X100GE CFP2 OTN
    PIC 1                 BUILTIN      BUILTIN           2X100GE CFP2 OTN
      Xcvr 0              NON-JNPR     UQD0014           CFP2-100G-LR4-D
      Xcvr 1              NON-JNPR     J13J68335         CFP2-100G-LR4-D
  XLM 0          REV 07.2.00 711-046638 ABCK5491         MPC6E XL
  XLM 1          REV 07.2.00 711-046638 ABCK5475         MPC6E XL
ADC 1            REV 17   750-043596   ABCG9023          Adapter Card
ADC 2            REV 01   750-043596   ZV4079            Adapter Card
ADC 6            REV 17   750-043596   ABCG8866          Adapter Card
ADC 8            REV 17   750-043596   ABCA8993          Adapter Card
Fan Tray 0       REV 06   760-046960   ACAY0354          172mm FanTray - 6 Fans
Fan Tray 1       REV 06   760-046960   ACAY0831          172mm FanTray - 6 Fans
Fan Tray 2       REV 06   760-046960   ACAY0892          172mm FanTray - 6 Fans
Fan Tray 3       REV 06   760-046960   ACAY0839          172mm FanTray - 6 Fans
```

show chassis hardware extensive (MX2010 Routers with MPC6E and OTN MIC)

```
user@host> show chassis hardware extensive
```

 Copyright © 2016, Juniper Networks, Inc.

```
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN11C9AFEAFK      MX2010
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
                                 S/N:               JN11C9AFEAFK
 Assembly ID:  0x0557            Assembly Version:  00.00
 Date:         00-00-0000        Assembly Flags:    0x00
 ID: MX2010
 Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 05 57 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x20: 4a 4e 31 31 43 39 41 46 45 41 46 4b 00 00 00 00
  Address 0x30: 00 00 00 ff 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Midplane         REV 35   750-044636   ABAB9188          Lower Backplane
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          750-044636        S/N:               ABAB9188
 Assembly ID:  0x0b66            Assembly Version:  01.35
 Date:         06-21-2013        Assembly Flags:    0x00
 Version:      REV 35            CLEI Code:         IPMU810ARA
 ID: Lower Backplane             FRU Model Number:  CHAS-BP-MX2010-S
 Board Information Record:
  Address 0x00: ad 01 08 00 3c 8a b0 38 68 00 ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b 66 01 23 52 45 56 20 33 35 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 34 34 36 33 36 00 00
  Address 0x20: 53 2f 4e 20 41 42 41 42 39 31 38 38 00 15 06 07
  Address 0x30: dd ff ff ff ad 01 08 00 3c 8a b0 38 68 00 ff ff
  Address 0x40: ff ff ff ff 01 49 50 4d 55 38 31 30 41 52 41 43
  Address 0x50: 48 41 53 2d 42 50 2d 4d 58 32 30 31 30 2d 53 00
  Address 0x60: 00 00 00 00 00 00 30 36 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff f8 ff ff ff ff ff ff ff ff ff ff ff ff
Midplane 1       REV 02   711-044557   ABAB8729          Upper Backplane
 Jedec Code:   0x7fb0            EEPROM Version:    0x01
 P/N:          711-044557        S/N:               ABAB8729
 Assembly ID:  0x0b65            Assembly Version:  01.02
 Date:         03-21-2013        Assembly Flags:    0x00
 Version:      REV 02
 ID: Upper Backplane
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 0b 65 01 02 52 45 56 20 30 32 00 00
  Address 0x10: 00 00 00 00 37 31 31 2d 30 34 34 35 35 37 00 00
  Address 0x20: 53 2f 4e 20 41 42 41 42 38 37 32 39 00 15 03 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
PMP              REV 04   711-032426   ACAJ2432          Power Midplane
 Jedec Code:   0x7fb0            EEPROM Version:    0x01
 P/N:          711-032426        S/N:               ACAJ2432
 Assembly ID:  0x045d            Assembly Version:  01.04
 Date:         03-28-2013        Assembly Flags:    0x00
 Version:      REV 04
```

```
 ID: Power Midplane
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 04 5d 01 04 52 45 56 20 30 34 00 00
  Address 0x10: 00 00 00 00 37 31 31 2d 30 33 32 34 32 36 00 00
  Address 0x20: 53 2f 4e 20 41 43 41 4a 32 34 33 32 00 1c 03 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
FPM Board        REV 09   760-044634   ABCA4314          Front Panel Display
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          760-044634        S/N:               ABCA4314
 Assembly ID:  0x0b64            Assembly Version:  01.09
 Date:         03-28-2013        Assembly Flags:    0x00
 Version:      REV 09            CLEI Code:         IPMYA4EJRA
 ID: Front Panel Display         FRU Model Number:  MX2010-CRAFT-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b 64 01 09 52 45 56 20 30 39 00 00
  Address 0x10: 00 00 00 00 37 36 30 2d 30 34 34 36 33 34 00 00
  Address 0x20: 53 2f 4e 20 41 42 43 41 34 33 31 34 00 1c 03 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 4d 59 41 34 45 4a 52 41 4d
  Address 0x50: 58 32 30 31 30 2d 43 52 41 46 54 2d 53 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 93 ff ff ff ff ff ff ff ff ff ff ff ff
PSM 0            REV 01   740-050037   1EDB321015C       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-050037        S/N:               1EDB321015C
 Assembly ID:  0x0478            Assembly Version:  01.01
 Date:         05-28-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 32 31 30 31 35 43 00 00 1c 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 1            REV 01   740-050037   1EDB321015J       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-050037        S/N:               1EDB321015J
Assembly ID:  0x0478            Assembly Version:  01.01
 Date:         05-28-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
```


Copyright © 2016, Juniper Networks, Inc.

```
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 32 31 30 31 35 4a 00 00 1c 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 2            REV 01   740-050037   1EDB32000K8       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-050037        S/N:               1EDB32000K8
 Assembly ID:  0x0478            Assembly Version:  01.01
 Date:         05-23-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 32 30 30 30 4b 38 00 00 17 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 3            REV 01   740-050037   1EDB32101JW       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-050037        S/N:               1EDB32101JW
 Assembly ID:  0x0478            Assembly Version:  01.01
 Date:         05-30-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 32 31 30 31 4a 57 00 00 1e 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 4            REV 01   740-050037   1EDB321015G       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-050037        S/N:               1EDB321015G
 Assembly ID:  0x0478            Assembly Version:  01.01
 Date:         05-28-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 32 31 30 31 35 47 00 00 1c 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
```

```
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 5            REV 01   740-050037   1EDB32101HH       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-050037        S/N:               1EDB32101HH
 Assembly ID:  0x0478            Assembly Version:  01.01
 Date:         05-30-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 32 31 30 31 48 48 00 00 1e 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 6            REV 01   740-050037   1EDB32101HD       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-050037        S/N:               1EDB32101HD
 Assembly ID:  0x0478            Assembly Version:  01.01
 Date:         05-30-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 32 31 30 31 48 44 00 00 1e 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 7            REV 01   740-050037   1EDB321015F       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-050037        S/N:               1EDB321015F
 Assembly ID:  0x0478            Assembly Version:  01.01
 Date:         05-28-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 32 31 30 31 35 46 00 00 1c 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 8            REV 01   740-050037   1EDB321015B       DC 52V Power Supply
```


Copyright © 2016, Juniper Networks, Inc.

```
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-050037        S/N:               1EDB321015B
 Assembly ID:  0x0478            Assembly Version:  01.01
 Date:         05-28-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 32 31 30 31 35 42 00 00 1c 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PDM 0            REV 03   740-045234   1EFA3220433       DC Power Dist Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-045234        S/N:               1EFA3220433
 Assembly ID:  0x047b            Assembly Version:  01.03
 Date:         05-30-2013        Assembly Flags:    0x00
 Version:      REV 03            CLEI Code:         IPUPAJSKAA
 ID: DC Power Dist Module        FRU Model Number:  MX2000-PDM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 7b 01 03 52 45 56 20 30 33 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 34 35 32 33 34 00 00
  Address 0x20: 31 45 46 41 33 32 32 30 34 33 33 00 00 1e 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4a 53 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 44 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 33 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 1d 00 00 00 00 00 00 00 00 00 00 00 00
PDM 1            REV 03   740-045234   1EFA3220425       DC Power Dist Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-045234        S/N:               1EFA3220425
 Assembly ID:  0x047b            Assembly Version:  01.03
 Date:         05-30-2013        Assembly Flags:    0x00
 Version:      REV 03            CLEI Code:         IPUPAJSKAA
 ID: DC Power Dist Module        FRU Model Number:  MX2000-PDM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
..
```

show chassis hardware (MX2020 Router)

```
user@host > show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN11E2227AFJ      MX2020
Midplane         REV 27   750-040240   ABAB9384          Lower Power Midplane
Midplane 1       REV 04   711-032386   ABAB9386          Upper Backplane
PMP 1            REV 05   711-032428   ACAJ1579          Upper Power Midplane
PMP 0            REV 04   711-032426   ACAJ1524          Lower Power Midplane
FPM Board        REV 06   760-040242   ABBT8837          Front Panel Display
PSM 0            REV 01   740-045050   1E022240056       DC 52V Power Supply
Module
PSM 1            REV 01   740-045050   1E022240054       DC 52V Power Supply
```

```
Module
PSM 2            REV 01   740-045050   1E02224005H       DC 52V Power Supply
Module
PSM 3            REV 01   740-045050   1E022240053       DC 52V Power Supply
Module
PSM 4            REV 01   740-045050   1E02224004K       DC 52V Power Supply
Module
PSM 7            REV 01   740-045050   1E02224006W       DC 52V Power Supply
Module
PSM 8            REV 01   740-045050   1E022240062       DC 52V Power Supply
Module
PSM 9            REV 01   740-045050   1E02224005B       DC 52V Power Supply
Module
PSM 10           REV 01   740-045050   1E02224005A       DC 52V Power Supply
Module
PSM 11           REV 01   740-045050   1E022240052       DC 52V Power Supply
Module
PSM 12           REV 01   740-045050   1E022240051       DC 52V Power Supply
Module
PSM 13           REV 01   740-045050   1E022240058       DC 52V Power Supply
Module
PSM 14           REV 01   740-045050   1E02224004L       DC 52V Power Supply
Module
PSM 15           REV 01   740-045050   1E02224005M       DC 52V Power Supply
Module
PSM 16           REV 01   740-045050   1E02224006S       DC 52V Power Supply
Module
PSM 17           REV 01   740-045050   1E02224005Z       DC 52V Power Supply
Module
PDM 0            REV 01   740-045234   1E012150033       DC Power Dist Module
PDM 1            REV 01   740-045234   1E012150027       DC Power Dist Module
PDM 2            REV 01   740-045234   1E012150028       DC Power Dist Module
PDM 3            REV 01   740-045234   1E012150045       DC Power Dist Module
Routing Engine 0 REV 02   740-041821   9009089704        RE-S-1800x4
Routing Engine 1 REV 02   740-041821   9009094138        RE-S-1800x4
CB 0             REV 14   750-040257   CAAF8430          Control Board
CB 1             REV 08   750-040257   CAAB3482          Control Board
SPMB 0           REV 01   711-041855   ZS2290            PMB Board
SPMB 1           REV 02   711-041855   CAAA6141          PMB Board
SFB 0            REV 03   711-044466   ABBV6789          Switch Fabric Board
SFB 1            REV 05   711-044466   ABBX5666          Switch Fabric Board
SFB 2            REV 05   711-044466   ABBX5678          Switch Fabric Board
SFB 3            REV 05   711-044466   ABBX5687          Switch Fabric Board
SFB 4            REV 05   711-044466   ABBX5609          Switch Fabric Board
SFB 5            REV 05   711-044466   ABBX5675          Switch Fabric Board
SFB 6            REV 03   711-044466   ABBV6805          Switch Fabric Board
SFB 7            REV 05   711-044466   ABBX5701          Switch Fabric Board
FPC 0            REV 30   750-028467   ABBN0284          MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ABBN0507          AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E00990         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E04357         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11F01327         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E04375         SFP+-10G-USR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E02760         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E02904         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E03963         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E00756         SFP+-10G-USR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E04418         SFP+-10G-USR
```


Copyright © 2016, Juniper Networks, Inc.

```
    Xcvr 1       REV 01   740-030658   B11E01077         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E01128         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11F01253         SFP+-10G-USR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E01140         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11F01626         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E01075         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E01177         SFP+-10G-USR
FPC 1            REV 30   750-028467   ABBN0208          MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ABBJ1084          AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E04745         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11F01570         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E04388         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11F01439         SFP+-10G-USR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E04739         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11F01869         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11F01675         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11F01901         SFP+-10G-USR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11F01346         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11F01288         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11F01824         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E04312         SFP+-10G-USR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E02811         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E03847         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11F01495         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11F01265         SFP+-10G-USR
FPC 2            REV 30   750-028467   ZM5111            MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ZP6607            AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80LJA           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80MFZ           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80NKL           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80KF4           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80FBJ           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80MM2           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80LJV           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80NXV           SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80N1H           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80NLS           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80FL5           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80NL9           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80NG2           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80KDU           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80MG1           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80MM0           SFP+-10G-SR
FPC 3            REV 30   750-028467   ABBN0302          MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ABBN0495          AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11F01581         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E01176         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11F01251         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E02752         SFP+-10G-USR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E00786         SFP+-10G-USR
```

```
    Xcvr 1       REV 01   740-030658   B11E01020         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E01023         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E02819         SFP+-10G-USR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E02812         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11D04437         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11F01279         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11F01333         SFP+-10G-USR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E00978         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E01018         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11F01784         SFP+-10G-USR
    Xcvr 3       REV 01   740-031980   AK80NKP           SFP+-10G-SR
FPC 4            REV 30   750-028467   ABBN0308          MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ABBJ1095          AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E04305         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E01147         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E01195         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11F01743         SFP+-10G-USR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11F01892         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E02880         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E00725         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E01057         SFP+-10G-USR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E02816         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11C04501         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E02764         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E00789         SFP+-10G-USR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11F01250         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E02847         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E00787         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E03803         SFP+-10G-USR
FPC 5            REV 30   750-028467   ABBN0316          MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ABBJ1082          AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   B11K00523         SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11K01848         SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11K01865         SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B11K00540         SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   B11K00422         SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11K00428         SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11K00423         SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B11K01855         SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   B11K01847         SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11K00526         SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11K00529         SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B11K00525         SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   B11K00425         SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11K00530         SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11K01851         SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B11K00528         SFP+-10G-SR
FPC 6            REV 32   750-028467   ABBN6832          MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ABBK6534          AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80MB4           SFP+-10G-SR
```


Copyright © 2016, Juniper Networks, Inc.

```
    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
```


Copyright © 2016, Juniper Networks, Inc.

```
    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   AJQ0Q5G           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
```


Copyright © 2016, Juniper Networks, Inc.

```
    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
```


Copyright © 2016, Juniper Networks, Inc.

```
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+
```


Copyright © 2016, Juniper Networks, Inc.

```
    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
```


Copyright © 2016, Juniper Networks, Inc.

```
    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   AJQ0Q5G           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   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 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
```


Copyright © 2016, Juniper Networks, Inc.

```
    Xcvr 2       REV 01   740-021308   AD0915E003K       SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AD0915E003A       SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80MRC           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80NL5           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80NKN           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80N3U           SFP+-10G-SR
 PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80N1T           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AJ808DJ           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80NG4           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80FND           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80FKQ           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80NLT           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80NKR           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80LKM           SFP+-10G-SR
FPC 16           REV 30   750-028467   ABBN0270          MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ABBJ0966          AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80NL1           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80NXW           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80KD2           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80FMD           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80NKQ           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80MGH           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80N38           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80NL7           SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80M5J           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80NKD           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80KCY           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80LHK           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80LEL           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80MBE           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80NLG           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80LFH           SFP+-10G-SR
FPC 17           REV 32   750-028467   ABBN6796          MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ABBN7259          AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   B11K01856         SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11K01853         SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11K01863         SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   163363A02863      SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   163363A02668      SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   163363A02881      SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   163363A01671      SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   163363A02627      SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   163363A02725      SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   163363A02692      SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   163363A02730      SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   163363A03081      SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   163363A02736      SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   163363A02568      SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   163363A02747      SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   163363A02579      SFP+-10G-SR
```

```
FPC 18           REV 30   750-028467   ABBN0281          MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ABBN0526          AMPC PMB
PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11F01326         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E03973         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E00950         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E00674         SFP+-10G-USR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E00775         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E04461         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E01074         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E02821         SFP+-10G-USR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E04501         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E00757         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11F01623         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E01022         SFP+-10G-USR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E04359         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E02751         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E02736         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E01178         SFP+-10G-USR
FPC 19           REV 32   750-028467   ABBN6813          MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ABBK6542          AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80NA3           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80NLF           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80MRH           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80KE4           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   973152A00030      SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80L9H           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80ME8           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80NLR           SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80NG1           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80MCA           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80LFC           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80LEM           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80N9X           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80LAC           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80LF2           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80N8T           SFP+-10G-SR
ADC 0            REV 13   750-043596   ABBX5561          Adapter Card
ADC 1            REV 13   750-043596   ABBX5546          Adapter Card
ADC 2            REV 13   750-043596   ABBX5535          Adapter Card
ADC 3            REV 13   750-043596   ABBX5552          Adapter Card
ADC 4            REV 13   750-043596   ABBX5581          Adapter Card
ADC 5            REV 13   750-043596   ABBX5545          Adapter Card
ADC 6            REV 13   750-043596   ABBX5554          Adapter Card
ADC 7            REV 07   750-043596   ABBV7194          Adapter Card
ADC 8            REV 07   750-043596   ABBV7251          Adapter Card
ADC 9            REV 07   750-043596   ABBV7202          Adapter Card
ADC 10           REV 13   750-043596   ABBX5579          Adapter Card
ADC 11           REV 13   750-043596   ABBX5548          Adapter Card
ADC 12           REV 13   750-043596   ABBX5575          Adapter Card
ADC 13           REV 13   750-043596   ABBX5539          Adapter Card
ADC 14           REV 13   750-043596   ABBX5555          Adapter Card
ADC 15           REV 13   750-043596   ABBX5557          Adapter Card
ADC 16           REV 13   750-043596   ABBX5536          Adapter Card
```


Copyright © 2016, Juniper Networks, Inc.

```
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
```


Copyright © 2016, Juniper Networks, Inc.

```
FPC 0            REV 30   750-028467                      MPC-3D-16XGE-SFPP
FPC 1            REV 30   750-028467                      MPC-3D-16XGE-SFPP
FPC 2            REV 30   750-028467                      MPC-3D-16XGE-SFPP
FPC 3            REV 32   750-028467                      MPC-3D-16XGE-SFPP
FPC 4            REV 32   750-028467                      MPC-3D-16XGE-SFPP
FPC 5            REV 32   750-028467                      MPC-3D-16XGE-SFPP
FPC 6            REV 30   750-028467                      MPC-3D-16XGE-SFPP
FPC 7            REV 32   750-028467                      MPC-3D-16XGE-SFPP
FPC 8            REV 30   750-028467                      MPC-3D-16XGE-SFPP
FPC 9            REV 32   750-028467                      MPC-3D-16XGE-SFPP
FPC 10           REV 30   750-028467                      MPC-3D-16XGE-SFPP
FPC 11           REV 32   750-028467                      MPC-3D-16XGE-SFPP
FPC 12           REV 30   750-028467                      MPC-3D-16XGE-SFPP
FPC 13           REV 30   750-028467                      MPC-3D-16XGE-SFPP
FPC 14           REV 23   750-028467                      MPC-3D-16XGE-SFPP
FPC 15           REV 32   750-028467                      MPC-3D-16XGE-SFPP
FPC 16           REV 30   750-028467                      MPC-3D-16XGE-SFPP
FPC 17           REV 32   750-028467                      MPC-3D-16XGE-SFPP
FPC 18           REV 30   750-028467                      MPC-3D-16XGE-SFPP
FPC 19           REV 32   750-028467                      MPC-3D-16XGE-SFPP
ADC 0            REV 13   750-043596   PROTOXCLEI        PROTO-ASSEMBLY
ADC 1            REV 13   750-043596   PROTOXCLEI        PROTO-ASSEMBLY
ADC 2            REV 13   750-043596   IPUCBA8CAA        MX2000-LC-ADAPTER
ADC 3            REV 13   750-043596   IPUCBA8CAA        MX2000-LC-ADAPTER
ADC 4            REV 13   750-043596   IPUCBA8CAA        MX2000-LC-ADAPTER
ADC 5            REV 13   750-043596   PROTOXCLEI        PROTO-ASSEMBLY
ADC 6            REV 13   750-043596   PROTOXCLEI        PROTO-ASSEMBLY
ADC 7            REV 07   750-043596   PROTOXCLEI        MX2000-LC-ADAPTER
ADC 8            REV 07   750-043596   PROTOXCLEI        MX2000-LC-ADAPTER
ADC 9            REV 07   750-043596   PROTOXCLEI        MX2000-LC-ADAPTER
ADC 10           REV 13   750-043596   IPUCBA8CAA        MX2000-LC-ADAPTER
ADC 12           REV 13   750-043596   IPUCBA8CAA        MX2000-LC-ADAPTER
ADC 13           REV 13   750-043596   PROTOXCLEI        PROTO-ASSEMBLY
ADC 14           REV 13   750-043596   PROTOXCLEI        PROTO-ASSEMBLY
ADC 15           REV 13   750-043596   IPUCBA8CAA        MX2000-LC-ADAPTER
ADC 16           REV 13   750-043596   PROTOXCLEI        PROTO-ASSEMBLY
ADC 17           REV 13   750-043596   PROTOXCLEI        PROTO-ASSEMBLY
ADC 18           REV 13   750-043596   PROTOXCLEI        PROTO-ASSEMBLY
ADC 19           REV 11   750-043596   PROTOXCLEI        PROTO-ASSEMBLY
Fan Tray 0       REV 04   760-046960
Fan Tray 1       REV 04   760-046960
Fan Tray 2       REV 04   760-046960
Fan Tray 3       REV 04   760-046960
```

show chassis hardware (MX2020 Router with MPC5EQ and MPC6E)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN120BADBAFJ      MX2020
Midplane         REV 51   750-040240   ABAB9243          Lower Backplane
Midplane 1       REV 04   711-032386   ABAB9399          Upper Backplane
PMP 1            REV 05   711-032428   ACAJ2541          Upper Power Midplane
PMP 0            REV 04   711-032426   ACAJ2194          Lower Power Midplane
FPM Board        REV 13   760-040242   ABCA8835          Front Panel Display
PSM 0            REV 01   740-050037   1EDB32403L5       DC 52V Power Supply
Module
PSM 1            REV 01   740-050037   1EDB32403L3       DC 52V Power Supply
Module
PSM 2            REV 01   740-050037   1EDB32403KM       DC 52V Power Supply
Module
```

```
PSM 3            REV 01   740-050037   1EDB3130079       DC 52V Power Supply
Module
PSM 4            REV 01   740-050037   1EDB3130077       DC 52V Power Supply
Module
PSM 5            REV 01   740-050037   1EDB3130020       DC 52V Power Supply
Module
PSM 6            REV 01   740-050037   1EDB313009S       DC 52V Power Supply
Module
PSM 7            REV 01   740-050037   1EDB313008E       DC 52V Power Supply
Module
PSM 8            REV 01   740-050037   1EDB3130063       DC 52V Power Supply
Module
PSM 12           REV 01   740-050037   1EDB3130026       DC 52V Power Supply
Module
PSM 13           REV 01   740-050037   1EDB3130074       DC 52V Power Supply
Module
PSM 14           REV 01   740-050037   1EDB313009D       DC 52V Power Supply
Module
PSM 15           REV 01   740-050037   1EDB3130024       DC 52V Power Supply
Module
PSM 16           REV 01   740-050037   1EDB3130054       DC 52V Power Supply
Module
PSM 17           REV 01   740-050037   1EDB3130080       DC 52V Power Supply
Module
PDM 0            REV 03   740-045234   1EGA3170144       DC Power Dist Module
PDM 1            REV 03   740-045234   1EGA3170158       DC Power Dist Module
PDM 2            REV 03   740-045234   1EGA3170182       DC Power Dist Module
PDM 3            REV 03   740-045234   1EGA3170207       DC Power Dist Module
Routing Engine 0 REV 02   740-041821   9009112112        RE-S-1800x4
Routing Engine 1 REV 02   740-041821   9009112087        RE-S-1800x4
CB 0             REV 23   750-040257   CABA2295          Control Board
CB 1             REV 23   750-040257   CABE8379          Control Board
SPMB 0           REV 02   711-041855   ABCE8851          PMB Board
SPMB 1           REV 02   711-041855   ABCE8839          PMB Board
SFB 0            REV 06   711-044466   ABCD5001          Switch Fabric Board
SFB 1            REV 06   711-044466   ABCD5034          Switch Fabric Board
SFB 2            REV 06   711-044466   ABCH3899          Switch Fabric Board
SFB 3            REV 06   711-044466   ABCD5020          Switch Fabric Board
SFB 4            REV 06   711-044466   ABCD4975          Switch Fabric Board
SFB 5            REV 06   711-044466   ABCH3881          Switch Fabric Board
SFB 6            REV 06   711-044466   ABCD5026          Switch Fabric Board
SFB 7            REV 06   711-044466   ABCD5032          Switch Fabric Board
FPC 0            REV 39   750-045715   CACD1902          MPC5E 3D Q 24XGE+6XLGE
  CPU            REV 09   711-045719   CACB1933          RMPC PMB
  PIC 0                   BUILTIN      BUILTIN           12X10GE SFPP OTN
    Xcvr 0       REV 01   740-031980   B11F00361         SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   19T511101854      SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   19T511100377      SFP+-10G-SR
    Xcvr 4       REV 01   740-031980   ANT0878           SFP+-10G-SR
    Xcvr 5       REV 01   740-021308   19T511100398      SFP+-10G-SR
    Xcvr 6       REV 01   740-021308   AQ4363J           SFP+-10G-SR
    Xcvr 7       REV 01   740-021308   19T511101377      SFP+-10G-SR
    Xcvr 8       REV 01   740-031980   ANT072M           SFP+-10G-SR
    Xcvr 9       REV 01   740-021308   AG90C7N           SFP+-10G-SR
    Xcvr 10      REV 01   740-031980   AM30M09           SFP+-10G-SR
    Xcvr 11      REV 01   740-031980   B10E01016         SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           12X10GE SFPP OTN
 Xcvr 0       REV 01   740-031980   B10L04151         SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   19T511101379      SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQ5036J           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AG90C4M           SFP+-10G-SR
```


Copyright © 2016, Juniper Networks, Inc.

```
    Xcvr 4       REV 01   740-021308   19T511101104      SFP+-10G-SR
    Xcvr 5       REV 01   740-021308   AQ502ZM           SFP+-10G-SR
    Xcvr 6       REV 01   740-021308   AN10KY2           SFP+-10G-SR
    Xcvr 7       REV 01   740-021308   AQ43G41           SFP+-10G-SR
    Xcvr 8       REV 01   740-021308   AQ41F04           SFP+-10G-SR
    Xcvr 9       REV 01   740-031980   AMS16N3           SFP+-10G-SR
    Xcvr 10      REV 01   740-021308   AMH04Y3           SFP+-10G-SR
    Xcvr 11      REV 01   740-021308   ANA093E           SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           3X40GE QSFPP
  PIC 3                   BUILTIN      BUILTIN           3X40GE QSFPP
  WAN MEZZ       REV 09   750-049136   CABN0410          MPC5E 24XGE OTN Mezz
FPC 1            REV 11   750-045372   CABK8112          MPCE Type 3 3D
  CPU            REV 08   711-035209   CABJ6621          HMPC PMB 2G
  MIC 0          REV 07   750-033307   CAAZ2897          10X10GE SFPP
    PIC 0                 BUILTIN      BUILTIN           10X10GE SFPP
      Xcvr 0     REV 01   740-021308   AQ501VK           SFP+-10G-SR
      Xcvr 1     REV 01   740-021308   AQ501YC           SFP+-10G-SR
      Xcvr 2     REV 01   740-021308   AQ43HJF           SFP+-10G-SR
      Xcvr 3     REV 01   740-021308   AQ43H8D           SFP+-10G-SR
      Xcvr 4     REV 01   740-021308   19T511100370      SFP+-10G-SR
      Xcvr 5     REV 01   740-031980   153363A00763      SFP+-10G-SR
      Xcvr 6     REV 01   740-021308   APH2LXB           SFP+-10G-SR
      Xcvr 7     REV 01   740-031980   AMC0LVV           SFP+-10G-SR
      Xcvr 8     REV 01   740-031980   B11F00230         SFP+-10G-SR
  MIC 1          REV 14   750-033196   CAAP1390          1X100GE CXP
    PIC 2                 BUILTIN      BUILTIN           1X100GE CXP
      Xcvr 0     REV 01   740-032166   XB11F000M         CFP2-100G-SR10
FPC 2            REV 17   750-037355   CAAS5826          MPC4E 3D 2CGE+8XGE
  CPU            REV 08   711-035209   CAAR3986          HMPC PMB 2G
  PIC 0                   BUILTIN      BUILTIN           4x10GE SFPP
    Xcvr 0       REV 01   740-021308   T09F43722         SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   ALP0KXF           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQ502FG           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQ502T7           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           1X100GE CFP
    Xcvr 0       REV 01   740-035329   X12J00571         CFP-100G-SR10
  PIC 2                   BUILTIN      BUILTIN           4x10GE SFPP
    Xcvr 0       REV 01   740-031980   AJ71KEH           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11E01355         SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B11F00249         SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           1X100GE CFP
FPC 3            REV 05   750-044444   CAAY9920          MPCE Type 2 3D P
  CPU            REV 04   711-038484   CAAW3639          MPCE PMB 2G
  MIC 0          REV 28   750-028387   CAAX1083          3D 4x 10GE  XFP
    PIC 0                 BUILTIN      BUILTIN           2x 10GE  XFP
      Xcvr 0               NON-JNPR     CC07BK05B         XFP-10G-SR
      Xcvr 1     REV 01   740-011571   C728XJ00U         XFP-10G-SR
    PIC 1                 BUILTIN      BUILTIN           2x 10GE  XFP
      Xcvr 0               NON-JNPR     T12L92339         XFP-10G-SR
  QXM 0          REV 06   711-028408   CAAW4915          MPC QXM
  QXM 1          REV 06   711-028408   CAAW4894          MPC QXM
FPC 4            REV 18   750-046005   CACH5661          MPC5E 3D Q 2CGE+4XGE
 CPU            REV 09   711-045719   CACF2880          RMPC PMB
  PIC 0                   BUILTIN      BUILTIN           2X10GE SFPP OTN
  PIC 1                   BUILTIN      BUILTIN           1X100GE CFP2 OTN
    Xcvr 0       REV 01   740-046563   XD16FC03Y         CFP2-100G-SR10
  PIC 2                   BUILTIN      BUILTIN           2X10GE SFPP OTN
  PIC 3                   BUILTIN      BUILTIN           1X100GE CFP2 OTN
    Xcvr 0       REV 01   740-049775   J13K72997         CFP2-100G-LR4-D
FPC 5            REV 35   750-028467   CAAR2623          MPC 3D 16x 10GE
  CPU            REV 11   711-029089   CAAR0491          AMPC PMB
```

```
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AQ5027T           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQ502J0           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQ5027S           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQ501Y7           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AQ501YB           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQ503EB           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQ43HJH           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQ43J0Y           SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AQ50352           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQ501X6           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQ502NV           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQ502ZJ           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AQ502H4           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQ43HJK           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AJ30CU7           SFP+-10G-SR
FPC 9            REV 30   750-044130   ABCF5773          MPC6E 3D
  CPU            REV 09   711-045719   ABCF1270          RMPC PMB
  MIC 0          REV 05   750-049457   ABCD7829          2X100GE CFP2 OTN
    PIC 0                 BUILTIN      BUILTIN           2X100GE CFP2 OTN
      Xcvr 0              NON-JNPR     FE13F000K         CFP2-100G-SR10
      Xcvr 1     REV 01   740-048813   XD32FE017         CFP2-100G-LR-D
  MIC 1          REV 07   750-049457   ABCK2812          2X100GE CFP2 OTN
    PIC 1                 BUILTIN      BUILTIN           2X100GE CFP2 OTN
      Xcvr 0     REV 01   740-048813   XD32FE018         CFP2-100G-SR10
      Xcvr 1              NON-JNPR     FE13F000E         CFP2-100G-LR4-D
  XLM 0          REV 05.2.00 711-046638 ABCF5915         MPC6E XL
  XLM 1          REV 05.2.00 711-046638 ABCF5916         MPC6E XL
FPC 10           REV 36   750-044130   ABCS8602          MPC6E 3D
  CPU            REV 09   711-045719   ABCS8779          RMPC PMB
  MIC 0          REV 06   750-049979   ABCK2656          24X10GE SFPP OTN
    PIC 0                 BUILTIN      BUILTIN           24X10GE SFPP OTN
      Xcvr 0     REV 01   740-021308   AQ43J08           SFP+-10G-SR
      Xcvr 1     REV 01   740-021308   AQE1Y2E           SFP+-10G-SR
      Xcvr 2     REV 01   740-021308   AQE1UW4           SFP+-10G-SR
      Xcvr 3     REV 01   740-021308   AQE1MQF           SFP+-10G-SR
      Xcvr 4     REV 01   740-021308   AQG0MN1           SFP+-10G-SR
      Xcvr 5     REV 01   740-021308   AQE1L9M           SFP+-10G-SR
      Xcvr 6     REV 01   740-021308   AQG0MPD           SFP+-10G-SR
      Xcvr 7     REV 01   740-021308   AQE1Y2B           SFP+-10G-SR
      Xcvr 8     REV 01   740-021308   AQG0LT5           SFP+-10G-SR
      Xcvr 9     REV 01   740-021308   AQD2ET4           SFP+-10G-SR
      Xcvr 10    REV 01   740-021308   AQG0MPC           SFP+-10G-SR
      Xcvr 11    REV 01   740-021308   AQG0M63           SFP+-10G-SR
      Xcvr 12    REV 01   740-021308   AQG0LT1           SFP+-10G-SR
      Xcvr 13    REV 01   740-021308   AQG0M4L           SFP+-10G-SR
      Xcvr 14    REV 01   740-021308   AQG0LS7           SFP+-10G-SR
      Xcvr 15    REV 01   740-021308   AQE1MQB           SFP+-10G-SR
      Xcvr 16    REV 01   740-021308   AQG0LZP           SFP+-10G-SR
      Xcvr 17    REV 01   740-021308   AQE1LU9           SFP+-10G-SR
      Xcvr 18    REV 01   740-021308   AQG0MRZ           SFP+-10G-SR
      Xcvr 19    REV 01   740-021308   AQE1MQ9           SFP+-10G-SR
      Xcvr 20    REV 01   740-021308   AQG0LRX           SFP+-10G-SR
      Xcvr 21    REV 01   740-021308   AQE1UWD           SFP+-10G-SR
      Xcvr 22    REV 01   740-021308   AQG0LT4           SFP+-10G-SR
      Xcvr 23    REV 01   740-021308   AQE1MQL           SFP+-10G-SR
  MIC 1          REV 12   750-050008   ABCK5372          4X100GE CXP
    PIC 1                 BUILTIN      BUILTIN           4X100GE CXP
```


Copyright © 2016, Juniper Networks, Inc.

```
      Xcvr 3     REV 01   740-046563   XD16FC02Z         CFP2-100G-SR10
  XLM 0          REV 07.2.00 711-046638 ABCK3481         MPC6E XL
  XLM 1          REV 07.2.00 711-046638 ABCK4725         MPC6E XL
FPC 17           REV 28   750-044130   ABBZ3873          MPC6E 3D
  CPU            REV 08   711-045719   ABBZ3770          RMPC PMB
  MIC 0          REV 11   750-046535   ABCC7731          24X10GE SFPP
    PIC 0                 BUILTIN      BUILTIN           24X10GE SFPP
      Xcvr 1     REV 01   740-021308   APK0543           SFP+-10G-SR
      Xcvr 2     REV 01   740-031980   B10G01119         SFP+-10G-SR
      Xcvr 3     REV 01   740-021308   AQ502SX           SFP+-10G-SR
      Xcvr 4     REV 01   740-021308   AQ43H84           SFP+-10G-SR
      Xcvr 5     REV 01   740-021308   AQ501TB           SFP+-10G-SR
      Xcvr 6     REV 01   740-021308   AQ502JZ           SFP+-10G-SR
      Xcvr 7     REV 01   740-021308   AQ502SC           SFP+-10G-SR
      Xcvr 8     REV 01   740-021308   AQ502JW           SFP+-10G-SR
      Xcvr 9     REV 01   740-021308   AQ502RM           SFP+-10G-SR
      Xcvr 10    REV 01   740-031980   AHK013B           SFP+-10G-SR
      Xcvr 11    REV 01   740-021308   AQG0MRT           SFP+-10G-SR
      Xcvr 13    REV 01   740-031980   AMC0JTC           SFP+-10G-SR
      Xcvr 14    REV 01   740-021308   ANA0MQ0           SFP+-10G-SR
      Xcvr 15    REV 01   740-021308   AQ502GS           SFP+-10G-SR
      Xcvr 16    REV 01   740-021308   AQG0M0J           SFP+-10G-SR
      Xcvr 17    REV 01   740-021308   AQG0MUR           SFP+-10G-SR
      Xcvr 18    REV 01   740-021308   AQG0MRR           SFP+-10G-SR
      Xcvr 19    REV 01   740-021308   AQG0M0F           SFP+-10G-SR
      Xcvr 20    REV 01   740-021308   AQ50312           SFP+-10G-SR
      Xcvr 21    REV 01   740-021308   AQ5032U           SFP+-10G-SR
      Xcvr 22    REV 01   740-021308   APE17B5           SFP+-10G-SR
      Xcvr 23    REV 01   740-021309   91D104A00011      SFP+-10G-LR
  MIC 1          REV 03   750-050008   ABCC4522          4X100GE CXP
    PIC 1                 BUILTIN      BUILTIN           4X100GE CXP
      Xcvr 0     REV 01   740-046563   XD16FC02U         CFP2-100G-SR10
      Xcvr 1     REV 01   740-046563   XC42FC03K         CFP2-100G-SR10
      Xcvr 2     REV 01   740-046563   XC42FC01Z         CFP2-100G-SR10
      Xcvr 3     REV 01   740-046563   XC42FC02U         CFP2-100G-SR10
  XLM 0          REV 04.2.00 711-046638 ABBZ3779         MPC6E XL
  XLM 1          REV 04.2.00 711-046638 ABBZ3780         MPC6E XL
FPC 18           REV 39   750-045715   CACD1910          MPC5E 3D Q 24XGE+6XLGE
  CPU            REV 09   711-045719   CACD1817          RMPC PMB
  PIC 0                 BUILTIN      BUILTIN           12X10GE SFPP OTN
  PIC 1                 BUILTIN      BUILTIN           12X10GE SFPP OTN
  PIC 2                 BUILTIN      BUILTIN           3X40GE QSFPP
 Xcvr 0       REV 01   740-046565   QD130194          QSFP+-40G-SR4
    Xcvr 1       REV 01   740-046565   QD130193          QSFP+-40G-SR4
    Xcvr 2       REV 01   740-046565   QD130196          QSFP+-40G-SR4
  PIC 3                 BUILTIN      BUILTIN           3X40GE QSFPP
    Xcvr 0       REV 01   740-046565   QD130191          QSFP+-40G-SR4
    Xcvr 1       REV 01   740-046565   QD130198          QSFP+-40G-SR4
    Xcvr 2       REV 01   740-046565   QD130192          QSFP+-40G-SR4
  WAN MEZZ       REV 09   750-049136   CABN0411          MPC5E 24XGE OTN Mezz
FPC 19           REV 39   750-045715   CACD1908          MPC5E 3D Q 24XGE+6XLGE
  CPU            REV 09   711-045719   CACD1820          RMPC PMB
  PIC 0                 BUILTIN      BUILTIN           12X10GE SFPP OTN
    Xcvr 0       REV 01   740-021308   AQA0EXJ           SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AQG0M6D           SFP+-10G-SR
    Xcvr 2       REV 01   740-021308   AQG0LW7           SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   AQA0JKB           SFP+-10G-SR
    Xcvr 4       REV 01   740-021308   AQG0MTM           SFP+-10G-SR
    Xcvr 5       REV 01   740-021308   AQA07NE           SFP+-10G-SR
    Xcvr 6       REV 01   740-021308   AQG0M41           SFP+-10G-SR
    Xcvr 7       REV 01   740-021308   AQG0MU7           SFP+-10G-SR
```

```
    Xcvr 8       REV 01   740-021308   AQG0MUG           SFP+-10G-SR
    Xcvr 9       REV 01   740-021308   AQG0MMX           SFP+-10G-SR
    Xcvr 10      REV 01   740-021308   AQG0M5K           SFP+-10G-SR
    Xcvr 11      REV 01   740-021308   AQG0LVZ           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           12X10GE SFPP OTN
  PIC 2                   BUILTIN      BUILTIN           3X40GE QSFPP
  PIC 3                   BUILTIN      BUILTIN           3X40GE QSFPP
    Xcvr 0       REV 01   740-046565   QD130242          QSFP+-40G-SR4
    Xcvr 1       REV 01   740-046565   QD130245          QSFP+-40G-SR4
    Xcvr 2       REV 01   740-046565   QD130613          QSFP+-40G-SR4
  WAN MEZZ       REV 09   750-049136   CABN0418          MPC5E 24XGE OTN Mezz
ADC 0            REV 17   750-043596   ABCD5378          Adapter Card
ADC 1            REV 17   750-043596   ABCD5465          Adapter Card
ADC 2            REV 17   750-043596   ABCD5431          Adapter Card
ADC 3            REV 17   750-043596   ABCD5356          Adapter Card
ADC 4            REV 02   750-043596   ZW1545            Adapter Card
ADC 5            REV 17   750-043596   ABCD5517          Adapter Card
ADC 18           REV 17   750-043596   ABCD5535          Adapter Card
ADC 19           REV 01   750-043596   ZV4127            Adapter Card
Fan Tray 0       REV 06   760-046960   ACAY0791          172mm FanTray - 6 Fans
Fan Tray 1       REV 06   760-046960   ACAY0788          172mm FanTray - 6 Fans
Fan Tray 2       REV 06   760-046960   ACAY0755          172mm FanTray - 6 Fans
Fan Tray 3       REV 06   760-046960   ACAY0441          172mm FanTray - 6 Fans
```

show chassis hardware detail (MX2020 Router with MPC5EQ and MPC6E)

```
user@host>show chassis hardware detail
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN120BADBAFJ      MX2020
Midplane         REV 51   750-040240   ABAB9243          Lower Backplane
Midplane 1       REV 04   711-032386   ABAB9399          Upper Backplane
PMP 1            REV 05   711-032428   ACAJ2541          Upper Power Midplane
PMP 0            REV 04   711-032426   ACAJ2194          Lower Power Midplane
FPM Board        REV 13   760-040242   ABCA8835          Front Panel Display
PSM 0            REV 01   740-050037   1EDB32403L5       DC 52V Power Supply
Module
PSM 1            REV 01   740-050037   1EDB32403L3       DC 52V Power Supply
Module
PSM 2            REV 01   740-050037   1EDB32403KM       DC 52V Power Supply
Module
PSM 3            REV 01   740-050037   1EDB3130079       DC 52V Power Supply
Module
PSM 4            REV 01   740-050037   1EDB3130077       DC 52V Power Supply
Module
PSM 5            REV 01   740-050037   1EDB3130020       DC 52V Power Supply
Module
PSM 6            REV 01   740-050037   1EDB313009S       DC 52V Power Supply
Module
PSM 7            REV 01   740-050037   1EDB313008E       DC 52V Power Supply
Module
PSM 8            REV 01   740-050037   1EDB3130063       DC 52V Power Supply
Module
PSM 12           REV 01   740-050037   1EDB3130026       DC 52V Power Supply
Module
PSM 13           REV 01   740-050037   1EDB3130074       DC 52V Power Supply
Module
PSM 14           REV 01   740-050037   1EDB313009D       DC 52V Power Supply
Module
PSM 15           REV 01   740-050037   1EDB3130024       DC 52V Power Supply
Module
```

 Copyright © 2016, Juniper Networks, Inc.

```
PSM 16           REV 01   740-050037   1EDB3130054       DC 52V Power Supply
Module
PSM 17           REV 01   740-050037   1EDB3130080       DC 52V Power Supply
Module
PDM 0            REV 03   740-045234   1EGA3170144       DC Power Dist Module
PDM 1            REV 03   740-045234   1EGA3170158       DC Power Dist Module
PDM 2            REV 03   740-045234   1EGA3170182       DC Power Dist Module
PDM 3            REV 03   740-045234   1EGA3170207       DC Power Dist Module
Routing Engine 0 REV 02   740-041821   9009112112        RE-S-1800x4
  ad0    3998 MB  Virtium - TuffDrive VCF P1T0200274310822 113 Compact Flash
  ad1   30533 MB  UGB94BPH32H0S1-KCI   11000031656       Disk 1
  usb0 (addr 1)  EHCI root hub 0       Intel             uhub0
  usb0 (addr 2)  product 0x0020 32     vendor 0x8087     uhub1
  DIMM 0         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 1         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 2         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 3         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
Routing Engine 1 REV 02   740-041821   9009112087        RE-S-1800x4
  ad0    3998 MB  Virtium - TuffDrive VCF P1T0200274310822 366 Compact Flash
  ad1   30533 MB  UGB94BPH32H0S1-KCI   11000039979       Disk 1
CB 0             REV 23   750-040257   CABA2295          Control Board
CB 1             REV 23   750-040257   CABE8379          Control Board
SPMB 0
SPMB 1
FPC 0            REV 39   750-045715   CACD1902          MPC5E 3D Q 24XGE+6XLGE
  CPU
FPC 1            REV 11   750-045372   CABK8112          MPCE Type 3 3D
  CPU
FPC 2            REV 17   750-037355   CAAS5826          MPC4E 3D 2CGE+8XGE
  CPU
FPC 3            REV 05   750-044444   CAAY9920          MPCE Type 2 3D P
  CPU
FPC 4            REV 18   750-046005   CACH5661          MPC5E 3D Q 2CGE+4XGE
  CPU
FPC 5            REV 35   750-028467   CAAR2623          MPC 3D 16x 10GE
 CPU
FPC 9            REV 30   750-044130   ABCF5773          MPC6E 3D
  CPU
FPC 10           REV 36   750-044130   ABCS8602          MPC6E 3D
  CPU
FPC 17           REV 28   750-044130   ABBZ3873          MPC6E 3D
  CPU
FPC 18           REV 39   750-045715   CACD1910          MPC5E 3D Q 24XGE+6XLGE
  CPU
FPC 19           REV 39   750-045715   CACD1908          MPC5E 3D Q 24XGE+6XLGE
  CPU
Fan Tray 0       REV 06   760-046960   ACAY0791          172mm FanTray - 6 Fans
Fan Tray 1       REV 06   760-046960   ACAY0788          172mm FanTray - 6 Fans
Fan Tray 2       REV 06   760-046960   ACAY0755          172mm FanTray - 6 Fans
Fan Tray 3       REV 06   760-046960   ACAY0441          172mm FanTray - 6 Fans
```

show chassis hardware extensive (MX2020 Router with MPC5EQ and MPC6E)

```
user@host> show chassis hardware extensive
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN120BADBAFJ      MX2020
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
                                 S/N:               JN120BADBAFJ
 Assembly ID:  0x0557            Assembly Version:  00.00
 Date:         00-00-0000        Assembly Flags:    0x00
```

```
  ID: MX2020
  Board Information Record:
   Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  I2C Hex Data:
   Address 0x00: 7f b0 02 ff 05 57 00 00 00 00 00 00 00 00 00 00
   Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
   Address 0x20: 4a 4e 31 32 30 42 41 44 42 41 46 4a 00 00 00 00
   Address 0x30: 00 00 00 ff 00 00 00 00 00 00 00 00 00 00 00 00
   Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
   Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
   Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
   Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Midplane         REV 51   750-040240   ABAB9243          Lower Backplane
  Jedec Code:   0x7fb0            EEPROM Version:    0x02
  P/N:          750-040240        S/N:               ABAB9243
  Assembly ID:  0x0b22            Assembly Version:  01.51
  Date:         05-30-2013        Assembly Flags:    0x00
  Version:      REV 51            CLEI Code:         IPMU710ARA
  ID: Lower Backplane             FRU Model Number:  CHAS-BP-MX2020-S
  Board Information Record:
   Address 0x00: ad 01 10 00 4c 96 14 72 30 08 ff ff ff ff ff ff
  I2C Hex Data:
   Address 0x00: 7f b0 02 ff 0b 22 01 33 52 45 56 20 35 31 00 00
   Address 0x10: 00 00 00 00 37 35 30 2d 30 34 30 32 34 30 00 00
   Address 0x20: 53 2f 4e 20 41 42 41 42 39 32 34 33 00 1e 05 07
   Address 0x30: dd ff ff ff ad 01 10 00 4c 96 14 72 30 08 ff ff
   Address 0x40: ff ff ff ff 01 49 50 4d 55 37 31 30 41 52 41 43
   Address 0x50: 48 41 53 2d 42 50 2d 4d 58 32 30 32 30 2d 53 00
   Address 0x60: 00 00 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
   Address 0x70: ff ff ff d3 ff ff ff ff ff ff ff ff ff ff ff ff
Midplane 1       REV 04   711-032386   ABAB9399          Upper Backplane
  Jedec Code:   0x7fb0            EEPROM Version:    0x01
  P/N:          711-032386        S/N:               ABAB9399
  Assembly ID:  0x0b23            Assembly Version:  01.04
  Date:         10-22-2012        Assembly Flags:    0x00
  Version:      REV 04
  ID: Upper Backplane
  Board Information Record:
   Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  I2C Hex Data:
   Address 0x00: 7f b0 01 fe 0b 23 01 04 52 45 56 20 30 34 00 00
   Address 0x10: 00 00 00 00 37 31 31 2d 30 33 32 33 38 36 00 00
   Address 0x20: 53 2f 4e 20 41 42 41 42 39 33 39 39 00 16 0a 07
   Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff 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 1            REV 05   711-032428   ACAJ2541          Upper Power Midplane
  Jedec Code:   0x7fb0            EEPROM Version:    0x01
  P/N:          711-032428        S/N:               ACAJ2541
  Assembly ID:  0x045c            Assembly Version:  01.05
  Date:         04-26-2013        Assembly Flags:    0x00
  Version:      REV 05
  ID: Upper Power Midplane
  Board Information Record:
   Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  I2C Hex Data:
   Address 0x00: 7f b0 01 ff 04 5c 01 05 52 45 56 20 30 35 00 00
   Address 0x10: 00 00 00 00 37 31 31 2d 30 33 32 34 32 38 00 00
   Address 0x20: 53 2f 4e 20 41 43 41 4a 32 35 34 31 00 1a 04 07
```

 Copyright © 2016, Juniper Networks, Inc.

```
  Address 0x30: dd 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 0            REV 04   711-032426   ACAJ2194          Lower Power Midplane
 Jedec Code:   0x7fb0            EEPROM Version:    0x01
 P/N:          711-032426        S/N:               ACAJ2194
 Assembly ID:  0x045d            Assembly Version:  01.04
 Date:         01-29-2013        Assembly Flags:    0x00
 Version:      REV 04
 ID: Lower Power Midplane
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 04 5d 01 04 52 45 56 20 30 34 00 00
  Address 0x10: 00 00 00 00 37 31 31 2d 30 33 32 34 32 36 00 00
  Address 0x20: 53 2f 4e 20 41 43 41 4a 32 31 39 34 00 1d 01 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
  Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
FPM Board        REV 13   760-040242   ABCA8835          Front Panel Display
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          760-040242        S/N:               ABCA8835
 Assembly ID:  0x0b24            Assembly Version:  01.13
 Date:         04-13-2013        Assembly Flags:    0x00
 Version:      REV 13            CLEI Code:         IPMYAE5JRA
 ID: Front Panel Display         FRU Model Number:  MX2020-CRAFT-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b 24 01 0d 52 45 56 20 31 33 00 00
  Address 0x10: 00 00 00 00 37 36 30 2d 30 34 30 32 34 32 00 00
  Address 0x20: 53 2f 4e 20 41 42 43 41 38 38 33 35 00 0d 04 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 4d 59 41 45 35 4a 52 41 4d
  Address 0x50: 58 32 30 32 30 2d 43 52 41 46 54 2d 53 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 95 ff ff ff ff ff ff ff ff ff ff ff ff
PSM 0            REV 01   740-050037   1EDB32403L5       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-050037        S/N:               1EDB32403L5
 Assembly ID:  0x0478            Assembly Version:  01.01
 Date:         06-21-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 32 34 30 33 4c 35 00 00 15 06 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 1            REV 01   740-050037   1EDB32403L3       DC 52V Power Supply
```

```
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-050037        S/N:               1EDB32403L3
 Assembly ID:  0x0478            Assembly Version:  01.01
 Date:         06-21-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 32 34 30 33 4c 33 00 00 15 06 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 2            REV 01   740-050037   1EDB32403KM       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-050037        S/N:               1EDB32403KM
 Assembly ID:  0x0478            Assembly Version:  01.01
 Date:         06-21-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 32 34 30 33 4b 4d 00 00 15 06 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 3            REV 01   740-050037   1EDB3130079       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-050037        S/N:               1EDB3130079
 Assembly ID:  0x0478            Assembly Version:  01.01
 Date:         05-16-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 31 33 30 30 37 39 00 00 10 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 4            REV 01   740-050037   1EDB3130077       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-050037        S/N:               1EDB3130077
 Assembly ID:  0x0478            Assembly Version:  01.01
```

 Copyright © 2016, Juniper Networks, Inc.

```
 Date:         05-17-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 31 33 30 30 37 37 00 00 11 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 5            REV 01   740-050037   1EDB3130020       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-050037        S/N:               1EDB3130020
 Assembly ID:  0x0478            Assembly Version:  01.01
 Date:         05-16-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 31 33 30 30 32 30 00 00 10 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 6            REV 01   740-050037   1EDB313009S       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-050037        S/N:               1EDB313009S
 Assembly ID:  0x0478            Assembly Version:  01.01
 Date:         05-17-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 31 33 30 30 39 53 00 00 11 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 7            REV 01   740-050037   1EDB313008E       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-050037        S/N:               1EDB313008E
 Assembly ID:  0x0478            Assembly Version:  01.01
 Date:         05-17-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
```

```
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 31 33 30 30 38 45 00 00 11 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 8            REV 01   740-050037   1EDB3130063       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-050037        S/N:               1EDB3130063
 Assembly ID:  0x0478            Assembly Version:  01.01
 Date:         05-17-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 31 33 30 30 36 33 00 00 11 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 12           REV 01   740-050037   1EDB3130026       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-050037        S/N:               1EDB3130026
 Assembly ID:  0x0478            Assembly Version:  01.01
 Date:         05-16-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 31 33 30 30 32 36 00 00 10 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 13           REV 01   740-050037   1EDB3130074       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-050037        S/N:               1EDB3130074
 Assembly ID:  0x0478            Assembly Version:  01.01
 Date:         05-17-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
```


Copyright © 2016, Juniper Networks, Inc.

```
  Address 0x20: 31 45 44 42 33 31 33 30 30 37 34 00 00 11 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 14           REV 01   740-050037   1EDB313009D       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-050037        S/N:               1EDB313009D
 Assembly ID:  0x0478            Assembly Version:  01.01
 Date:         05-17-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 31 33 30 30 39 44 00 00 11 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 15           REV 01   740-050037   1EDB3130024       DC 52V Power Supply
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-050037        S/N:               1EDB3130024
 Assembly ID:  0x0478            Assembly Version:  01.01
 Date:         05-16-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         IPUPAKRKAA
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
...
```

show chassis hardware models (MX2020 Routers with MPC5EQ and MPC6E)

```
user@host> show chassis hardware models
Hardware inventory:
Item             Version  Part number  Serial number     FRU model number
Midplane         REV 51   750-040240   ABAB9243          CHAS-BP-MX2020-S
FPM Board        REV 13   760-040242   ABCA8835          MX2020-CRAFT-S
PSM 0            REV 01   740-050037   1EDB32403L5       MX2000-PSM-DC-S
PSM 1            REV 01   740-050037   1EDB32403L3       MX2000-PSM-DC-S
PSM 2            REV 01   740-050037   1EDB32403KM       MX2000-PSM-DC-S
PSM 3            REV 01   740-050037   1EDB3130079       MX2000-PSM-DC-S
PSM 4            REV 01   740-050037   1EDB3130077       MX2000-PSM-DC-S
PSM 5            REV 01   740-050037   1EDB3130020       MX2000-PSM-DC-S
PSM 6            REV 01   740-050037   1EDB313009S       MX2000-PSM-DC-S
PSM 7            REV 01   740-050037   1EDB313008E       MX2000-PSM-DC-S
PSM 8            REV 01   740-050037   1EDB3130063       MX2000-PSM-DC-S
PSM 12           REV 01   740-050037   1EDB3130026       MX2000-PSM-DC-S
PSM 13           REV 01   740-050037   1EDB3130074       MX2000-PSM-DC-S
PSM 14           REV 01   740-050037   1EDB313009D       MX2000-PSM-DC-S
PSM 15           REV 01   740-050037   1EDB3130024       MX2000-PSM-DC-S
PSM 16           REV 01   740-050037   1EDB3130054       MX2000-PSM-DC-S
PSM 17           REV 01   740-050037   1EDB3130080       MX2000-PSM-DC-S
```

```
PDM 0            REV 03   740-045234   1EGA3170144       MX2000-PDM-DC-S
PDM 1            REV 03   740-045234   1EGA3170158       MX2000-PDM-DC-S
PDM 2            REV 03   740-045234   1EGA3170182       MX2000-PDM-DC-S
PDM 3            REV 03   740-045234   1EGA3170207       MX2000-PDM-DC-S
Routing Engine 0 REV 02   740-041821   9009112112        RE-MX2000-1800X4-S
Routing Engine 1 REV 02   740-041821   9009112087        RE-MX2000-1800X4-S
CB 0             REV 23   750-040257   CABA2295          RE-MX2000-1800X4-S
CB 1             REV 23   750-040257   CABE8379          RE-MX2000-1800X4-S
SFB 0            REV 06   711-044466   ABCD5001          MX2000-SFB-S
SFB 1            REV 06   711-044466   ABCD5034          MX2000-SFB-S
SFB 2            REV 06   711-044466   ABCH3899          MX2000-SFB-S
SFB 3            REV 06   711-044466   ABCD5020          MX2000-SFB-S
SFB 4            REV 06   711-044466   ABCD4975          MX2000-SFB-S
SFB 5            REV 06   711-044466   ABCH3881          MX2000-SFB-S
SFB 6            REV 06   711-044466   ABCD5026          MX2000-SFB-S
SFB 7            REV 06   711-044466   ABCD5032          MX2000-SFB-S
FPC 0            REV 39   750-045715   CACD1902          PROTO-ASSEMBLY
FPC 1            REV 11   750-045372   CABK8112          MX-MPC3E-3D
FPC 2            REV 17   750-037355   CAAS5826          MPC4E-3D-2CGE-8XGE
FPC 3            REV 05   750-044444   CAAY9920          MX-MPC2E-3D-P
FPC 4            REV 18   750-046005   CACH5661          PROTO-ASSEMBLY
FPC 5            REV 35   750-028467   CAAR2623          MPC-3D-16XGE-SFPP
FPC 9            REV 30   750-044130   ABCF5773          PROTO-ASSEMBLY
FPC 10           REV 36   750-044130   ABCS8602          PROTO-ASSEMBLY
FPC 17           REV 28   750-044130   ABBZ3873          PROTO-ASSEMBLY
FPC 18           REV 39   750-045715   CACD1910          PROTO-ASSEMBLY
FPC 19           REV 39   750-045715   CACD1908          PROTO-ASSEMBLY
ADC 0            REV 17   750-043596   ABCD5378          MX2000-LC-ADAPTER
ADC 1            REV 17   750-043596   ABCD5465          MX2000-LC-ADAPTER
ADC 2            REV 17   750-043596   ABCD5431          MX2000-LC-ADAPTER
ADC 3            REV 17   750-043596   ABCD5356          MX2000-LC-ADAPTER
ADC 4            REV 02   750-043596   ZW1545            750-043596
ADC 5            REV 17   750-043596   ABCD5517          MX2000-LC-ADAPTER
ADC 18           REV 17   750-043596   ABCD5535          MX2000-LC-ADAPTER
ADC 19           REV 01   750-043596   ZV4127            750-043596
Fan Tray 0       REV 06   760-046960   ACAY0791          MX2000-FANTRAY-S
Fan Tray 1       REV 06   760-046960   ACAY0788          MX2000-FANTRAY-S
Fan Tray 2       REV 06   760-046960   ACAY0755          MX2000-FANTRAY-S
Fan Tray 3       REV 06   760-046960   ACAY0441          MX2000-FANTRAY-S
```

show chassis hardware clei-models (MX2020 Router with MPC5EQ and MPC6E)

```
user@host> show chassis hardware clei-models
Hardware inventory:
Item             Version  Part number  CLEI code         FRU model number
Midplane         REV 51   750-040240   IPMU710ARA        CHAS-BP-MX2020-S
FPM Board        REV 13   760-040242   IPMYAE5JRA        MX2020-CRAFT-S
PSM 0            REV 01   740-050037   IPUPAKRKAA        MX2000-PSM-DC-S
PSM 1            REV 01   740-050037   IPUPAKRKAA        MX2000-PSM-DC-S
PSM 2            REV 01   740-050037   IPUPAKRKAA        MX2000-PSM-DC-S
PSM 3            REV 01   740-050037   IPUPAKRKAA        MX2000-PSM-DC-S
PSM 4            REV 01   740-050037   IPUPAKRKAA        MX2000-PSM-DC-S
PSM 5            REV 01   740-050037   IPUPAKRKAA        MX2000-PSM-DC-S
PSM 6            REV 01   740-050037   IPUPAKRKAA        MX2000-PSM-DC-S
PSM 7            REV 01   740-050037   IPUPAKRKAA        MX2000-PSM-DC-S
PSM 8            REV 01   740-050037   IPUPAKRKAA        MX2000-PSM-DC-S
PSM 12           REV 01   740-050037   IPUPAKRKAA        MX2000-PSM-DC-S
PSM 13           REV 01   740-050037   IPUPAKRKAA        MX2000-PSM-DC-S
PSM 14           REV 01   740-050037   IPUPAKRKAA        MX2000-PSM-DC-S
PSM 15           REV 01   740-050037   IPUPAKRKAA        MX2000-PSM-DC-S
PSM 16           REV 01   740-050037   IPUPAKRKAA        MX2000-PSM-DC-S
```


Copyright © 2016, Juniper Networks, Inc.

```
PSM 17          REV 01   740-050037   IPUPAKRKAA        MX2000-PSM-DC-S
PDM 0           REV 03   740-045234   IPUPAJSKAA        MX2000-PDM-DC-S
PDM 1           REV 03   740-045234   IPUPAJSKAA        MX2000-PDM-DC-S
PDM 2           REV 03   740-045234   IPUPAJSKAA        MX2000-PDM-DC-S
PDM 3           REV 03   740-045234   IPUPAJSKAA        MX2000-PDM-DC-S
CB 0            REV 23   750-040257   IPUCBA7CTA        RE-MX2000-1800X4-S
CB 1            REV 23   750-040257   IPUCBA7CTA        RE-MX2000-1800X4-S
SFB 0           REV 06   711-044466   IPUCBA6CAA        MX2000-SFB-S
SFB 1           REV 06   711-044466   IPUCBA6CAA        MX2000-SFB-S
SFB 2           REV 06   711-044466   IPUCBA6CAA        MX2000-SFB-S
SFB 3           REV 06   711-044466   IPUCBA6CAA        MX2000-SFB-S
SFB 4           REV 06   711-044466   IPUCBA6CAA        MX2000-SFB-S
SFB 5           REV 06   711-044466   IPUCBA6CAA        MX2000-SFB-S
SFB 6           REV 06   711-044466   IPUCBA6CAA        MX2000-SFB-S
SFB 7           REV 06   711-044466   IPUCBA6CAA        MX2000-SFB-S
FPC 0           REV 39   750-045715   PROTOXCLEI        PROTO-ASSEMBLY
FPC 1           REV 11   750-045372   COUIBBNBAA        MX-MPC3E-3D
FPC 2           REV 17   750-037355   IPU3A4DHAA        MPC4E-3D-2CGE-8XGE
FPC 3           REV 05   750-044444   COUIBBGBAA        MX-MPC2E-3D-P
  MIC 0         REV 28   750-028387   COUIA16BAA        MIC-3D-4XGE-XFP
FPC 4           REV 18   750-046005   PROTOXCLEI        PROTO-ASSEMBLY
FPC 5           REV 35   750-028467                     MPC-3D-16XGE-SFPP
FPC 9           REV 30   750-044130   PROTOXCLEI        PROTO-ASSEMBLY
  MIC 0         REV 05   750-049457   PROTOXCLEI        PROTO-ASSEMBLY
FPC 10          REV 36   750-044130   PROTOXCLEI        PROTO-ASSEMBLY
  MIC 0         REV 06   750-049979   PROTOXCLEI        PROTO-ASSEMBLY
  MIC 1         REV 12   750-050008   PROTOXCLEI        PROTO-ASSEMBLY
FPC 17          REV 28   750-044130   PROTOXCLEI        PROTO-ASSEMBLY
  MIC 1         REV 03   750-050008   PROTOXCLEI        PROTO-ASSEMBLY
FPC 18          REV 39   750-045715   PROTOXCLEI        PROTO-ASSEMBLY
FPC 19          REV 39   750-045715   PROTOXCLEI        PROTO-ASSEMBLY
ADC 0           REV 17   750-043596   IPUCBA8CAA        MX2000-LC-ADAPTER
ADC 1           REV 17   750-043596   IPUCBA8CAA        MX2000-LC-ADAPTER
ADC 2           REV 17   750-043596   IPUCBA8CAA        MX2000-LC-ADAPTER
ADC 3           REV 17   750-043596   IPUCBA8CAA        MX2000-LC-ADAPTER
ADC 4           REV 02   750-043596   PROTOXCLEI        750-043596
ADC 5           REV 17   750-043596   IPUCBA8CAA        MX2000-LC-ADAPTER
ADC 18          REV 17   750-043596   IPUCBA8CAA        MX2000-LC-ADAPTER
ADC 19          REV 01   750-043596   PROTOXCLEI        750-043596
Fan Tray 0      REV 06   760-046960   IPUCBA5CAA        MX2000-FANTRAY-S
Fan Tray 1      REV 06   760-046960   IPUCBA5CAA        MX2000-FANTRAY-S
Fan Tray 2      REV 06   760-046960   IPUCBA5CAA        MX2000-FANTRAY-S
Fan Tray 3      REV 06   760-046960   IPUCBA5CAA        MX2000-FANTRAY-S
```

show chassis hardware (MX Series routers with ATM MIC)

```
user@host> show chassis hardware
Hardware inventory:
Item            Version  Part number  Serial number     Description
Chassis                               JN115736EAFC      MX240
Midplane        REV 07   760-021404   ABAA5038          MX240 Backplane
FPM Board       REV 03   760-021392   ABBA2758          Front Panel Display
PEM 0           Rev 01   740-022697   QCS0937C07K       PS 1.2-1.7kW; 100-240V
AC in
PEM 1           Rev 01   740-022697   QCS0939C04X       PS 1.2-1.7kW; 100-240V
AC in
PEM 2           Rev 01   740-022697   QCS0937C06B       PS 1.2-1.7kW; 100-240V
AC in
PEM 3           Rev 01   740-022697   QCS0937C07U       PS 1.2-1.7kW; 100-240V
AC in
```

```
Routing Engine 0 REV 12   740-013063   9009042291        RE-S-2000
Routing Engine 1 REV 12   740-013063   9009042266        RE-S-2000
CB 0             REV 06   710-021523   ABBC1435          MX SCB
CB 1             REV 06   710-021523   ABBC1497          MX SCB
FPC 2     REV 14   750-031088   YH8446            MPC Type 2 3D Q
  CPU            REV 06   711-030884   YH9612            MPC PMB 2G
  MIC 0
  MIC 1          REV 10   750-036132   ZP7062            2xOC12/8xOC3 CC-CE
    PIC 2                 BUILTIN      BUILTIN           2xOC12/8xOC3 CC-CE

  Xcvr 0              NON-JNPR     23393-00492       UNKNOWN
      Xcvr 1              NON-JNPR     23393-00500       UNKNOWN
      Xcvr 2              NON-JNPR     23393-00912       UNKNOWN
      Xcvr 3     REV 01   740-015638   22216-00575       Load SFP
      Xcvr 4     REV 01   740-015638   24145-00110       Load SFP
      Xcvr 5     REV 01   740-015638   24145-00016       Load SFP
      Xcvr 6     REV 01   740-015638   24145-00175       Load SFP
      Xcvr 7              NON-JNPR     23393-00627       UNKNOWN
  QXM 0          REV 05   711-028408   YF4681            MPC QXM
  QXM 1          REV 05   711-028408   YF4817            MPC QXM
Fan Tray 0       REV 01   710-021113   XL3645            MX240 Fan Tray
```

show chassis hardware (MX240, MX480, MX960 routers with Application Services Modular Line Card)

```
user@host>show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN11D969BAFA      MX960
Midplane         REV 03   710-013698   ACAA2362          MX960 Backplane
FPM Board        REV 03   710-014974   ZR0639            Front Panel Display
PDM             Rev 03   740-013110   QCS152250SX       Power Distribution Module
PEM 0            Rev 10   740-013683   QCS1512718W       DC Power Entry Module
PEM 1            Rev 10   740-013683   QCS1512702Y       DC Power Entry Module
Routing Engine 0 REV 15   740-013063   9012024667        RE-S-2000
Routing Engine 1 REV 15   740-013063   9012024649        RE-S-2000
CB 0             REV 14   750-031391   ZJ7749            Enhanced MX SCB
CB 1             REV 14   750-031391   ZJ7750            Enhanced MX SCB
CB 2             REV 14   750-031391   ZY9233            Enhanced MX SCB
FPC 0            REV 17   750-031089   YR7434            MPC Type 2 3D
  CPU
FPC 1            REV 11   750-037207   ZW9727            AS-MCC
  CPU            REV 04   711-038173   ZW4817            AS-MCC-PMB
  MIC 0          REV 01   750-037214   ZH3764            AS-MSC
    PIC 0                 BUILTIN      BUILTIN           AS-MSC
  MIC 1          REV 01   711-028408   JZ9200            AS-MXC
    PIC 2                 BUILTIN      BUILTIN           AS-MXC
FPC 4            REV 30   750-028467   ABBN0232          MPC 3D 16x 10GE
  CPU
FPC 5            REV 04   750-037207   ZK9074            AS-MCC
  CPU
Fan Tray 0       REV 05   740-014971   VT5683            Fan Tray
Fan Tray 1       REV 05   740-014971   VT5684            Fan Tray
```

show chassis hardware extensive (MX240, MX480, MX960 Routers with Application Services Modular Line Card)

```
user@host>  show chassis hardware extensive

ID: AS-MCC                      FRU Model Number:  750-037207
 Board Information Record:
```


Copyright © 2016, Juniper Networks, Inc.

```
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff  I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b 37 01 0b 52 45 56 20 31 31 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 33 37 32 30 37 00 00
  Address 0x20: 53 2f 4e 20 5a 57 39 37 32 37 00 00 00 11 02 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 37
  Address 0x50: 35 30 2d 30 33 37 32 30 37 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 31 31 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 5e ff ff ff ff ff ff ff ff ff ff ff ff
  CPU            REV 04   711-038173   ZW4817            AS-MCC-PMB
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          711-038173        S/N:               ZW4817
 Assembly ID:  0x0b38            Assembly Version:  01.04
 Date:         12-30-2011        Assembly Flags:    0x00
 Version:      REV 04
 ID: AS-MCC-PMB
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff  I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b 38 01 04 52 45 56 20 30 34 00 00
  Address 0x10: 00 00 00 00 37 31 31 2d 30 33 38 31 37 33 00 00
  Address 0x20: 53 2f 4e 20 5a 57 34 38 31 37 00 00 00 1e 0c 07
  Address 0x30: db ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 00 50 52 4f 54 4f 58 43 4c 45 49 37
  Address 0x50: 31 31 2d 30 33 38 31 37 33 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 30 34 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 60 00 00 00 00 00 00 00 00 00 00 00 00
  MIC 0          REV 01   750-037214   ZH3764            AS-MSC
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          750-037214        S/N:               ZH3764
 Assembly ID:  0x0a44            Assembly Version:  01.01
 Date:         07-04-2011        Assembly Flags:    0x00
 Version:      REV 01
 ID: AS-MSC
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff  I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0a 44 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 33 37 32 31 34 00 00
  Address 0x20: 53 2f 4e 20 5a 48 33 37 36 34 00 00 00 04 07 07
  Address 0x30: db ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff f6 c0 03 e1 bc 00 00 00 00 00 00 00 00
    PIC 0                 BUILTIN      BUILTIN           AS-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
```


Copyright © 2016, Juniper Networks, Inc.

```
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-8OC3OC12-4OC48
    PIC 2                BUILTIN      BUILTIN          MIC-3D-8OC3OC12-4OC48
      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   AHP0GPM          SFP+-10G-SR
    Xcvr 2      REV 01   740-031980   123363A00032     SFP+-10G-SR
    Xcvr 3      REV 01   740-021308   19T511100477     SFP+-10G-SR
  PIC 1                  BUILTIN      BUILTIN          1X100GE CFP
    Xcvr 0               NON-JNPR     X12J00260        CFP-100G-SR10
  PIC 2                  BUILTIN      BUILTIN          4x10GE SFPP
    Xcvr 0      REV 01   740-021308   21T511104086     SFP+-10G-SR
    Xcvr 1      REV 01   740-021308   21T511104627     SFP+-10G-SR
    Xcvr 3      REV 01   740-021308   21T511104644     SFP+-10G-SR
  PIC 3                  BUILTIN      BUILTIN          1X100GE CFP
FPC 19          REV 32   750-028467   ZR2008           MPC 3D 16x 10GE
  CPU           REV 10   711-029089   ZT6933           AMPC PMB
```

```
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   19T511100291      SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   AMH02VE           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   23T511102128      SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AMS15PP           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   123363A00716      SFP+-10G-SR
ADC 0            REV 05   750-043596   CAAC2072          Adapter Card
ADC 9            REV 01   750-043596   ZV4111            Adapter Card
ADC 10           REV 05   750-043596   CAAC2058          Adapter Card
ADC 14           REV 02   750-043596   ZW1561            Adapter Card
ADC 19           REV 01   750-043596   ZV4127            Adapter Card
Fan Tray 0       REV 03   760-046960   ACAY0124          172mm FanTray - 6 Fans
Fan Tray 1       REV 2A   760-046960   ACAY0022          172mm FanTray - 6 Fans
Fan Tray 2       REV 2A   760-046960   ACAY0023          172mm FanTray - 6 Fans
Fan Tray 3       REV 2A   760-046960   ACAY0025          172mm FanTray - 6 Fans
```

show chassis hardware (MX5, MX10, MX40, MX80, MX240, MX480, and MX960 Routers with Enhanced 20-Port Gigabit Ethernet MIC)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                F3434             MX80-P
Midplane         REV 01   711-044315   ZK2681            MX80-P
PEM 0            Rev 04   740-028288   VE05267           AC Power Entry Module
PEM 1            Rev 04   740-028288   VE05270           AC Power Entry Module
Routing Engine            BUILTIN      BUILTIN           Routing Engine
TFEB 0                    BUILTIN      BUILTIN           Forwarding Engine
Processor
  QXM 0          REV 05   711-028408   ZK0952            MPC QXM
FPC 0                     BUILTIN      BUILTIN           MPC BUILTIN
  MIC 0                   BUILTIN      BUILTIN           4x 10GE XFP
    PIC 0                 BUILTIN      BUILTIN           4x 10GE XFP
FPC 1                     BUILTIN      BUILTIN           MPC BUILTIN
  MIC 0          REV 02   750-049846   CAAV2153          3D 20x 1GE(LAN)-E,SFP
    PIC 0                 BUILTIN      BUILTIN           10x 1GE(LAN) -E  SFP
      Xcvr 0     REV 01   740-011613   AM0816S9B81       SFP-SX
      Xcvr 1     REV 02   740-011613   AM0925SBLK7       SFP-SX
      Xcvr 2     REV 01   740-011613   UAQ0005           SFP-SX
      Xcvr 3     REV 01   740-011613   UAQ000C           SFP-SX
      Xcvr 4     REV 01   740-011613   P9F195E           SFP-SX
      Xcvr 5     REV 01   740-011613   UAQ0003           SFP-SX
      Xcvr 6     REV 01   740-031851   AM1041SU1LD       SFP-SX
      Xcvr 8     REV 02   740-013111   B101501           SFP-T
    PIC 1                 BUILTIN      BUILTIN           10x 1GE(LAN) -E  SFP
      Xcvr 0     REV 01   740-011613   PFM1ML7           SFP-SX
      Xcvr 4     REV 01   740-011613   PE729P6           SFP-SX
      Xcvr 6     REV 02   740-011613   AM1014SGC84       SFP-SX
      Xcvr 9     REV 01   740-011613   AM0812S8UK3       SFP-SX
  MIC 1          REV 26   750-028392   ZY0187            3D 20x 1GE(LAN) SFP
    PIC 2                 BUILTIN      BUILTIN           10x 1GE(LAN) SFP
      Xcvr 0     REV 01   740-011613   P9F1AN9           SFP-SX
      Xcvr 5     REV 02   740-011613   AM1003SFUF4       SFP-SX
      Xcvr 9     REV 01   740-031851   AM1041SU1LM       SFP-SX
    PIC 3                 BUILTIN      BUILTIN           10x 1GE(LAN) SFP
      Xcvr 4     REV 01   740-011613   PAJ4MYT           SFP-SX
      Xcvr 7     +        NON-JNPR     XG32A024          SFP-SX
      Xcvr 8              NON-JNPR     PFR0V6J           SFP-SX
```

 Copyright © 2016, Juniper Networks, Inc.

```
      Xcvr 9      REV 01   740-031851   AM1041SU02U       SFP-SX
Fan Tray
```

show chassis hardware models (MX5, MX10, MX40, MX80, MX240, MX480, and MX960 Routers with Enhanced 20-Port Gigabit Ethernet MIC)

```
user@host> show chassis hardware models
Hardware inventory:
Item             Version  Part number  Serial number     FRU model number
PEM 0            Rev 04   740-028288   VE05267           PWR-MX80-AC-S
PEM 1            Rev 04   740-028288   VE05270           PWR-MX80-AC-S
Routing Engine            BUILTIN      BUILTIN
TFEB 0                    BUILTIN      BUILTIN
FPC 0                     BUILTIN      BUILTIN
FPC 1                     BUILTIN      BUILTIN
  MIC 0          REV 02   750-049846   CAAV2153          MIC-3D-20GE-SFP-E
  MIC 1          REV 26   750-028392   ZY0187            MIC-3D-20GE-SFP
Fan Tray                                                  FANTRAY-MX80-S
```

show chassis hardware (T320 Router)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                               19093             T320
Midplane         REV 04   710-004339   BC1436            T320 Backplane
FPM GBUS         REV 03   710-004461   BC1407            T320 FPM Board
FPM Display      REV 04   710-002897   BE0763            FPM Display
CIP              REV 05   710-002895   BB2311            T Series CIP
PEM 0            Rev 01   740-004359   NB12546           Power Entry Module
SCG 0            REV 06   710-004455   AY4522            T320 Sonet
Clock Gen.
Routing Engine 0                                         unknown
CB 0             REV 13   710-002728   BC1577            T Series
Control Board
CB 1             REV 13   710-002728   BC1595            T Series
Control Board
FPC 1            REV 09   710-007531   HS1572            FPC Type 2
   CPU            REV 15   710-001726   HR8763            FPC CPU
   PIC 0          REV 01   750-010618   CB5579            4x G/E SFP,
1000 BASE
     SFP 0        REV 01   740-007326   P5809Z1           SFP-SX
     SFP 1        REV 01   740-007326   P4Q10XU           SFP-SX
     SFP 2                 NON-JNPR     RA45020031        SFP-SX
     SFP 3                 NON-JNPR     RA45020032        SFP-SX
   PIC 1          REV 01   750-010618   CD9587            4x G/E SFP,
1000 BASE
     SFP 0                 NON-JNPR     P5A08QZ           SFP-T
     SFP 1        REV 01   740-007326   P4Q133K           SFP-SX
     SFP 2        REV 01   740-007326   P5809YY           SFP-SX
     SFP 3        REV 01   740-007327   4C81704           SFP-LX
   MMB 1          REV 03   710-005555   HR9401            MMB-288mbit
   PPB 0          REV 04   710-003758   HR2886            PPB Type 2
FPC 2            REV 07   710-005860   HP2392            FPC Type 1
   CPU            REV 14   710-001726   HP7797            FPC CPU
   PIC 0          REV 02   750-007643   HM0853            1x G/E QPP,
1000 BASE
     SFP 0        REV 01   740-007326   P11E9JJ           SFP-SX
   MMB 1          REV 02   710-005555   HN2379            MMB-288mbit
   PPB 0          REV 04   710-003758   HP8092            PPB Type 2
FPC 3            REV 07   710-005860   HP2393            FPC Type 1
```

```
   CPU            REV 14   710-001726   HP0968            FPC CPU
   PIC 0          REV 01   750-010240   CB5363            1x G/E SFP,
1000 BASE
     SFP 0        REV 01   740-007326   P4R0PNH           SFP-SX
   PIC 1          REV 03   750-003034   HD2832            4x OC-3 SONET,
SMIR
   MMB 1          REV 02   710-005555   HN6307            MMB-288mbit
   PPB 0          REV 04   710-003758   HP5051            PPB Type 2
FPC 4            REV 01   710-010845   JD3872            FPC Type 4
   CPU            REV 02   710-011481   JB6042            FPC CPU
 5            REV 01   710-005802   BC1566            FPC Type 2
   CPU            REV 09   710-001726   AY4922            FPC CPU
   PIC 0          REV 02   750-008155   BE2114            2x G/E QPP,
1000 BASE
     SFP 0        REV 01   740-007326   P4R0PMQ           SFP-SX
     SFP 1        REV 01   740-007326   P4R0PN9           SFP-SX
   PIC 1          REV 01   750-008155   BE2116            2x G/E QPP,
1000 BASE
     SFP 0        REV 01   740-007326   P4R0PNZ           SFP-SX
     SFP 1                 NON-JNPR     2908              SFP-T
   MMB 1          REV 01   710-005555   AZ2246            MMB-288mbit
   PPB 0          REV 03   710-003758   AY4839            PPB Type 2
FPC 7            REV 01   710-005803   AZ2123            FPC Type 3
...
```

show chassis hardware (T640 Router)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                19182             T640
Midplane         REV 04   710-002726   AX5608            T640 Backplane
FPM GBUS         REV 02   710-002901   HE3064            T640 FPM Board
FPM Display      REV 02   710-002897   HE7864            FPM Display
CIP              REV 05   710-002895   HA5024            T Series CIP
PEM 0            Rev 02   740-029522   VH26235           AC PEM 10kW US
PEM 1            Rev 02   740-029522   VH26230           AC PEM 10kW US
SCG 0            REV 03   710-003423   HA4508            T640 Sonet Clock Gen.
Routing Engine 0 REV 02   740-005022   210865700483      RE-3.0 (RE-600)
CB 0             REV 01   710-002728   HD3044            T Series Control Board
FPC 2            REV 04   710-001721   HD5572            FPC Type 3
  CPU            REV 06   710-001726   HA4712            FPC CPU
  PIC 1          REV 03   750-009567   HV2331            1x 10GE(LAN),XENPAK
    SFP 0        REV 01   740-009898   USC202R103        XENPAK-SR
  PIC 2          REV 03   750-009567   HV2332            1x 10GE(LAN),XENPAK
    SFP 0        REV 01   740-011268   USC202R112        XENPAK-ZR
  PIC 3          REV 03   750-009567   HX4416            1x 10GE(LAN),XENPAK
    SFP 0        REV 01   740-012056   434TC004          XENPAK-CX4
  PIC 4          REV 03   750-009567   HX4420            1x 10GE(LAN),XENPAK
    SFP 0        REV 01   740-012058   434TC124          XENPAK-LX4
FPC 5            REV 01   710-013553   JE4839            E2-FPC Type 1
  CPU            REV 01   710-013569   JW9163            FPC CPU
  PIC 0          REV 01   750-009567   HX4419            1x 10GE(LAN),XENPAK
    SFP 0        REV 01   740-009898   USC202RT05        XENPAK-LR
  PIC 1          REV 03   750-009567   HN7426            1x 10GE(LAN),XENPAK
    SFP 0        REV 01   740-009550   03L90051          XENPAK-ER
  PIC 2          REV 03   750-009467   HT7423            1x 10GE(LAN),XENPAK
    SFP 0                 NON-JNPR                       UNKNOWON
  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
```


Copyright © 2016, Juniper Networks, Inc.

```
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-4OC12-SON-SMIR
FPC 6            REV 03   710-001721                     T640-FPC3
  PIC 1          REV 01   750-009553                     PC-4OC48-SON-SFP
SIB 4            REV 02   750-005486                     SIB-I-T640-S
Fan Tray 0                                               FANTRAY-T-S
Fan Tray 1                                               FANTRAY-T-S
Fan Tray 2                                               FAN-REAR-TX-T640-S
```

show chassis hardware extensive (T640 Router)

```
user@host> show chassis hardware extensive
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                                   T640
 Jedec Code:   0x7fb0           EEPROM Version:    0x01
 P/N:        ...........       S/N:             ...........
 Assembly ID:  0x0507           Assembly Version:  00.00
 Date:         00-00-0000       Assembly Flags:    0x00
 Version:    ...........
 ID: Gibson LCC Chassis
 Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 05 07 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x20: ff ff ff ff ff ff ff ff ff ff ff ff 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
Midplane         REV 04   710-002726   AX5633
 Jedec Code:   0x7fb0           EEPROM Version:    0x01
 P/N:          710-002726.      S/N:               AX5633.
 Assembly ID:  0x0127           Assembly Version:  01.04
 Date:         06-27-2001       Assembly Flags:    0x00
 Version:      REV 04.....
 ID: Gibson Backplane
 Board Information Record:
  Address 0x00: ad 01 08 00 00 90 69 0e f8 00 ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 01 27 01 04 52 45 56 20 30 34 00 00
  Address 0x10: 00 00 00 00 37 31 30 2d 30 30 32 37 32 36 00 00
```

```
  Address 0x20: 53 2f 4e 20 41 58 35 36 33 33 00 00 00 1b 06 07
  Address 0x30: d1 ff ff ff ad 01 08 00 00 90 69 0e f8 00 ff ff
  Address 0x40: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
FPM GBUS         REV 02   710-002901   HE3245
 ...
FPM Display      REV 02   710-002897   HA4873
 ...
CIP              REV 05   710-002895   HA4729
...
PEM 1            RevX02   740-002595   MD21815           Power Entry Module
 ...
SCG 0            REV 04   710-003423   HF6023
 ...
SCG 1            REV 04   710-003423   HF6061
 ...
Routing Engine 0 REV 01   740-005022   210865700292      RE-3.0
...
CB 0             REV 06   710-002728   HE3614
...
FPC 1            REV 01   710-002385   HE3009            FPC Type 1
...              REV 06   710-001726   HC0010
```

show chassis hardware (T4000 Router)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN1172F25AHA      T4000
Midplane         REV 01   710-027486   RC8355            T-series Backplane
FPM GBUS         REV 13   710-002901   BBAE0927          T640 FPM Board
FPM Display      REV 01   710-021387   EF6764            T1600 FPM Display
CIP              REV 06   710-002895   BBAD9210          T-series CIP
PEM 0            REV 01   740-036442   VA00016           Power Entry Module 6x60
SCG 0            REV 18   710-003423   BBAD7248          T640 Sonet Clock Gen.
SCG 1            REV 18   710-003423   BBAE3874          T640 Sonet Clock Gen.
Routing Engine 0 REV 05   740-026941   P737F-002248      RE-DUO-1800
Routing Engine 1 REV 06   740-026941   P737F-002653      RE-DUO-1800
CB 0             REV 09   710-022597   ED0295            LCC Control Board
CB 1             REV 09   710-022597   EA6050            LCC Control Board
FPC 0            REV 26   750-032819   EK1173            FPC Type 5-3D
  CPU            REV 12   711-030686   EJ8584            SNG PMB
  PIC 0          REV 07   750-034624   EF6837            12x10GE (LAN/WAN) SFPP
    Xcvr 0       REV 01   740-031980   123363A01145      SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   123363A01147      SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AJJ01P3           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B10M03256         SFP+-10G-SR
    Xcvr 4       REV 01   740-031980   AJJ01M2           SFP+-10G-SR
    Xcvr 5       REV 01   740-031980   123363A01137      SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   AJJ01PN           SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   AJJ01NW           SFP+-10G-SR
    Xcvr 8       REV 01   740-031980   123363A01139      SFP+-10G-SR
    Xcvr 9       REV 01   740-031980   AJJ01KE           SFP+-10G-SR
    Xcvr 10      REV 01   740-031980   123363A01336      SFP+-10G-SR
    Xcvr 11      REV 01   740-031980   B10M01325         SFP+-10G-SR
  PIC 1          REV 07   750-034624   EF6800            12x10GE (LAN/WAN) SFPP
    Xcvr 0       REV 01   740-031980   AJJ01SA           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AJJ01QZ           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AJH0217           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AJJ01TE           SFP+-10G-SR
    Xcvr 4       REV 01   740-031980   AJJ01KV           SFP+-10G-SR
    Xcvr 5       REV 01   740-031980   AJJ01MU           SFP+-10G-SR
```

 Copyright © 2016, Juniper Networks, Inc.

```
    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-GB Line Card Chassis (LCC) Routing Engine)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN11BDF2CAHA      T1600
Midplane         REV 01   710-027486   ACAJ0774          T640 Backplane
FPM GBUS         REV 13   710-002901   BBAL6812          T640 FPM Board
FPM Display      REV 04   710-021387   BBAP2679          T1600 FPM Display
CIP              REV 06   710-002895   BBAP4758          T-series CIP
PEM 0            Rev 03   740-026384   XF86421           Power Entry Module 3x80
PEM 1            Rev 03   740-026384   XF86429           Power Entry Module 3x80
SCG 0            REV 18   710-003423   BBAP1896          T640 Sonet Clock Gen.
SCG 1            REV 18   710-003423   BBAN8659          T640 Sonet Clock Gen.
Routing Engine 0 REV 01   740-042243   737F-002238       RE-DUO-1800-16G
Routing Engine 1 REV 01   740-042243   737F-002403       RE-DUO-1800-16G
CB 1             REV 11   710-022597   EK4526            LCC Control Board
CB 1             REV 11   710-022597   EK4527            LCC Control Board
FPC 0            REV 05   710-033871   EK5644            FPC Type 4-ES
  CPU            REV 11   710-016744   EK3428            ST-PMB2
  PIC 0          REV 20   750-017405   EJ3041            4x 10GE (LAN/WAN) XFP
  PIC 1          REV 17   750-026962   EH7536            10x10GE(LAN/WAN) SFPP
  MMB 0          REV 07   710-025563   EK6039            ST-MMB2
  MMB 1          REV 07   710-025563   EK6086            ST-MMB2
FPC 1            REV 05   710-033871   EK6583            FPC Type 4-ES
  CPU            REV 11   710-016744   EK3401            ST-PMB2
  PIC 0          REV 17   750-026962   EJ8948            10x10GE(LAN/WAN) SFPP
  MMB 0          REV 07   710-025563   EK6202            ST-MMB2
  MMB 1          REV 07   710-025563   EK6112            ST-MMB2
SPMB 1           REV 05   710-023321   EK4900            LCC Switch CPU
SIB 0            REV 11   710-013074   EK5958            SIB-I8-SF
SIB 1            REV 11   710-013074   EK4606            SIB-I8-SF
SIB 2            REV 11   710-013074   EK5971            SIB-I8-SF
SIB 3            REV 11   710-013074   EK4609            SIB-I8-SF
SIB 4            REV 11   710-013074   EK4602            SIB-I8-SF
Fan Tray 0                                               Front Top Fan Tray
Fan Tray 1                                               Front Bottom Fan Tray
Fan Tray 2                                               Rear Fan Tray -- Rev 2
```

show chassis hardware (T4000 Router with LSR FPC)

```
user@host> show chassis hardware
```

 Copyright © 2016, Juniper Networks, Inc.

```
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   IPUIBKLMAA        PD-1CE-CFP-FPC4
FPC 6
  PIC 0          REV 10   750-034624   XXXXXXXXCC        PF-12XGE-SFPP
Fan Tray 0                                               FANTRAY-T-S
Fan Tray 1                                               FANTRAY-T4000-S
Fan Tray 2                                               FANTRAY-TXP-R-S
```

show chassis hardware detail (T4000 Router)

```
user@host> show chassis hardware detail
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN1172F25AHA      T4000
Midplane         REV 01   710-027486   RC8355            T-series Backplane
FPM GBUS         REV 13   710-002901   BBAE0927          T640 FPM Board
FPM Display      REV 01   710-021387   EF6764            T1600 FPM Display
CIP              REV 06   710-002895   BBAD9210          T-series CIP
PEM 0            REV 01   740-036442   VA00016           Power Entry Module 6x60
SCG 0            REV 18   710-003423   BBAD7248          T640 Sonet Clock Gen.
SCG 1            REV 18   710-003423   BBAE3874          T640 Sonet Clock Gen.
Routing Engine 0 REV 05   740-026941   P737F-002248      RE-DUO-1800
  ad0    3823 MB  SMART CF             2009121602A661576157 Compact Flash
  ad1   59690 MB  STEC MACH-8 SSD      STM000103FDB      Disk 1
Routing Engine 1 REV 06   740-026941   P737F-002653      RE-DUO-1800
  ad0    3823 MB  SMART CF             201011150153F52CF52C Compact Flash
  ad1   62720 MB  SMART Lite SATA Drive 2010110900150A880A88 Disk 1
CB 0             REV 09   710-022597   ED0295            LCC Control Board
CB 1             REV 09   710-022597   EA6050            LCC Control Board
FPC 0            REV 26   750-032819   EK1173            FPC Type 5-3D
  CPU            REV 12   711-030686   EJ8584            SNG PMB
  PIC 0          REV 07   750-034624   EF6837            12x10GE (LAN/WAN) SFPP
    Xcvr 0       REV 01   740-031980   123363A01145      SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   123363A01147      SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AJJ01P3           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B10M03256         SFP+-10G-SR
```

```
    Xcvr 4       REV 01   740-031980   AJJ01M2          SFP+-10G-SR
    Xcvr 5       REV 01   740-031980   123363A01137     SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   AJJ01PN          SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   AJJ01NW          SFP+-10G-SR
    Xcvr 8       REV 01   740-031980   123363A01139     SFP+-10G-SR
    Xcvr 9       REV 01   740-031980   AJJ01KE          SFP+-10G-SR
    Xcvr 10      REV 01   740-031980   123363A01336     SFP+-10G-SR
    Xcvr 11      REV 01   740-031980   B10M01325        SFP+-10G-SR
  PIC 1          REV 07   750-034624   EF6800           12x10GE (LAN/WAN) SFPP
    Xcvr 0       REV 01   740-031980   AJJ01SA          SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AJJ01QZ          SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   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
```

 Copyright © 2016, Juniper Networks, Inc.

```
    Xcvr 6       REV 01   740-031980   B11J04016         SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   B11J04017         SFP+-10G-SR
    Xcvr 8       REV 01   740-031980   B11J04887         SFP+-10G-SR
    Xcvr 9       REV 01   740-031980   B11J04297         SFP+-10G-SR
    Xcvr 10      REV 01   740-031980   B11J04893         SFP+-10G-SR
    Xcvr 11      REV 01   740-031980   B11J04022         SFP+-10G-SR
  PIC 1          REV 02   750-034624   EE3711            12x10GE (LAN/WAN) SFPP
    Xcvr 0       REV 01   740-031980   AJH033X           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AJJ01N0           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AJJ01SV           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AJJ032L           SFP+-10G-SR
    Xcvr 4       REV 01   740-031980   B10M01593         SFP+-10G-SR
    Xcvr 5       REV 01   740-031980   AJD0FF1           SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   AJJ01NU           SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   123363A01305      SFP+-10G-SR
    Xcvr 8       REV 01   740-031980   B10M00361         SFP+-10G-SR
    Xcvr 9       REV 01   740-031980   AJJ01M7           SFP+-10G-SR
    Xcvr 10      REV 01   740-031980   AJJ032X           SFP+-10G-SR
    Xcvr 11      REV 01   740-031980   AJJ01PG           SFP+-10G-SR
  LMB 0          REV 04   711-034381   EF3838            Type-0 LMB
  LMB 1          REV 03   711-035774   EF3821            Type-1 LMB
  LMB 2          REV 04   711-034381   EF3834            Type-0 LMB
SPMB 0           REV 05   710-023321   ED1990            LCC Switch CPU
SPMB 1           REV 05   710-023321   EA2768            LCC Switch CPU
SIB 0            REV 02   711-036340   EF8802            SIB-HC-3D
SIB 1            REV 07   711-036340   EG2286            SIB-HC-3D
SIB 2            REV 07   711-036340   EG2252            SIB-HC-3D
SIB 3            REV 02   711-036340   EF1358            SIB-HC-3D
SIB 4            REV 02   711-036340   EF8806            SIB-HC-3D
Fan Tray 0                                               Front Top Fan Tray
Fan Tray 1                                               Front Bottom Fan Tray
-- Rev 2
Fan Tray 2                                               Rear Fan Tray -- Rev 3
```

show chassis hardware models (T4000 Router)

```
user@host> show chassis hardware models

Hardware inventory:
Item             Version  Part number  Serial number     FRU model number
Midplane         REV 01   710-027486   RC8355            CHAS-BP-T1600-S
FPM Display      REV 01   710-021387   EF6764            CRAFT-T1600-S
CIP              REV 06   710-002895   BBAD9210          CIP-L-T640-S
PEM 0            REV 01   740-036442   VA00016           PWR-T-6-60-DC
SCG 0            REV 18   710-003423   BBAD7248          SCG-T-S
SCG 1            REV 18   710-003423   BBAE3874          SCG-T-S
Routing Engine 0 REV 05   740-026941   P737F-002248      RE-DUO-C1800-8G-S
Routing Engine 1 REV 06   740-026941   P737F-002653      RE-DUO-C1800-8G-S
CB 0             REV 09   710-022597   ED0295            CB-LCC-S
CB 1             REV 09   710-022597   EA6050            CB-LCC-S
FPC 3
  PIC 0          REV 08   750-035293   EF3657            PF-1CGE-CFP
  PIC 1          REV 10   750-034624   BBAN4098          PF-12XGE-SFPP
FPC 5            REV 03   710-033871   BBAJ0768          T1600-FPC4-ES
  PIC 1          REV 03   750-034781   EE6655            PD-1CE-CFP-FPC4
FPC 6
  PIC 0          REV 10   750-034624   BBAN4109          PF-12XGE-SFPP
Fan Tray 0                                               FANTRAY-T-S
Fan Tray 1                                               FANTRAY-T4000-S
Fan Tray 2                                               FAN-REAR-TXP-LCC
```

show chassis hardware lcc (TX Matrix Router)

```
user@host> show chassis hardware lcc 0
lcc0-re0:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                65751             T640
Midplane         REV 03   710-005608   RA1408            T640 Backplane
FPM GBUS         REV 09   710-002901   RA2784            T640 FPM Board
FPM Display      REV 05   710-002897   RA2825            FPM Display
CIP              REV 06   710-002895   HT0684            T Series CIP
PEM 0            Rev 11   740-002595   PM18483           Power Entry Module
PEM 1            Rev 11   740-002595   qb13984           Power Entry Module
SCG 0            REV 11   710-003423   HT0022            T640 Sonet Clock Gen.
Routing Engine 0 REV 13   740-005022   210865700363      RE-3.0 (RE-600)
CB 0             REV 03   710-007655   HW1195            Control Board (CB-T)
FPC 1            REV 05   710-007527   HM3245            FPC Type 2
  CPU            REV 14   710-001726   HM1084            FPC CPU
  PIC 0          REV 02   750-007218   AZ1112            2x OC-12 ATM2 IQ, SMIR
  PIC 1          REV 02   750-007745   HG3462            4x OC-3 SONET, SMIR
  PIC 2          REV 14   750-001901   BA5390            4x OC-12 SONET, SMIR
  PIC 3          REV 09   750-008155   HS3012            2x G/E IQ, 1000 BASE
    SFP 0                 NON-JNPR     P1186TY           SFP-S
    SFP 1        REV 01   740-007326   P11WLTF           SFP-SX
  MMB 1          REV 02   710-005555   HL7514            MMB-288mbit
  PPB 0          REV 04   710-003758   HM4405            PPB Type 2
  PPB 1          REV 04   710-003758   AV1960            PPB Type 2
FPC 2            REV 08   710-010154   HZ3578            E-FPC Type 3
  CPU            REV 05   710-010169   HZ3219            FPC CPU-Enhanced
  PIC 0          REV 02   750-009567   HX2882            1x 10GE(LAN),XENPAK
    SFP 0        REV 01   740-009898   USC202U709        XENPAK-LR
  PIC 1          REV 03   750-003336   HJ9954            4x OC-48 SONET, SMSR
  PIC 2          REV 01   750-004535   HC0235            1x OC-192 SM SR1
  PIC 3          REV 07   750-007141   HX1699            10x 1GE(LAN), 1000 BASE

    SFP 0        REV 01   740-007326   2441042           SFP-SX
    SFP 1        REV 01   740-007326   2441027           SFP-SX
  MMB 0          REV 03   710-010171   HV2365            MMB-5M3-288mbit
  MMB 1          REV 03   710-010171   HZ3888            MMB-5M3-288mbit
SPMB 0           REV 09   710-003229   HW5245            T Series Switch CPU
SIB 3            REV 07   710-005781   HR5927            SIB-L8-F16
  B Board        REV 06   710-005782   HR5971            SIB-L8-F16 (B)
SIB 4            REV 07   710-005781   HR5903            SIB-L8-F16
  B Board        REV 06   710-005782   HZ5275            SIB-L8-F16 (B)
```

show chassis hardware scc (TX Matrix Router)

```
user@host> show chassis hardware scc
scc-re0:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                                  TX Matrix
Midplane         REV 04   710-004396   RB0014            SCC Midplane
FPM GBUS         REV 04   710-004617   HW9141            SCC FPM Board
FPM Display      REV 04   710-004619   HS5950            SCC FPM
CIP 0            REV 01   710-010218   HV9151            SCC CIP
CIP 1            REV 01   710-010218   HV9152            SCC CIP
PEM 1            Rev 11   740-002595   QB13977           Power Entry Module
Routing Engine 0 REV 05   740-008883   P11123900153      RE-4.0 (RE-1600)
```


Copyright © 2016, Juniper Networks, Inc.

```
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
```

 Copyright © 2016, Juniper Networks, Inc.

```
  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
```


Copyright © 2016, Juniper Networks, Inc.

```
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-DUO-1800
Routing Engine 1 REV 01   740-026941   737F-1104         RE-DUO-1800
CB 0             REV 06   710-022597   DW8542            LCC Control Board
CB 1             REV 06   710-022597   DW8530            LCC Control Board
FPC 0            REV 02   710-010845   JE2392            FPC Type 4
  CPU            REV 02   710-011481   JF6820            FPC CPU-Enhanced
  PIC 0          REV 11   750-017405   DP7259            4x 10GE (LAN/WAN) XFP
    Xcvr 0       REV 01   740-014279   AA0741N1C8T       XFP-10G-LR
    Xcvr 1       REV 01   740-014279   AA0746N1GAM       XFP-10G-LR
    Xcvr 2       REV 01   740-014279   AA0747N1H0B       XFP-10G-LR
    Xcvr 3       REV 01   740-014279   AA0748N1HZ5       XFP-10G-LR
  MMB 0          REV 03   710-010842   HY7601            ST-MMB
FPC 1            REV 16   710-013037   BBAA7398          FPC Type 4-ES
  CPU            REV 09   710-016744   BBAA2329          ST-PMB2
  PIC 0          REV 03   711-029996   EB1575            100GE
  PIC 1          REV 06   750-034781   EB9980            100GE CFP
  MMB 0          REV 04   710-025563   BBAA5325          ST-MMB2
  MMB 1          REV 04   710-025563   BBAA5444          ST-MMB2
FPC 2            REV 16   710-013037   BBAA7185          FPC Type 4-ES
```


Copyright © 2016, Juniper Networks, Inc.

```
  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   P4T0WLR           SFP-SX
    Xcvr 3       REV 01   740-011782   PAR1LRL           SFP-SX
    Xcvr 4       REV 01   740-011782   P9M0U3Z           SFP-SX
    Xcvr 5       REV 01   740-011782   P9M0U0C           SFP-SX
    Xcvr 6       REV 01   740-011782   P9M0TLG           SFP-SX
    Xcvr 7       REV 01   740-011782   P9M0U0F           SFP-SX
    Xcvr 8       REV 01   740-011613   PFA6LAP           SFP-SX
    Xcvr 9       REV 01   740-011782   PCH2P0U           SFP-SX
  PIC 1          REV 16   750-009450   CV2565            1x OC-192 SM SR2
  PIC 2          REV 05   750-004424   HH3057            1x 10GE(LAN),10GBASE-LR

  PIC 3          REV 12   750-013423   DP0403            MultiServices 500
  MMB 0          REV 04   710-016036   DK1988            ST-MMB2
FPC 5            REV 07   710-013560   DR0004            E2-FPC Type 3
  CPU            REV 05   710-013563   DR0089            FPC CPU-Enhanced
  PIC 0          REV 11   750-012793   DR6107            1x 10GE(LAN/WAN) IQ2
    Xcvr 0       REV 01   740-014289   C743XU074         XFP-10G-SR
  PIC 1          REV 01   750-004695   HD5980            1x Tunnel
  PIC 2          REV 32   750-003700   DL3770            1x OC-192 12xMM VSR
  PIC 3          REV 12   750-009553   WB8901            4x OC-48 SONET
    Xcvr 0       REV 01   740-011785   P9D1GTQ           SFP-SR
    Xcvr 1       REV 01   740-011785   PDS0MMB           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
```


Copyright © 2016, Juniper Networks, Inc.

```
  B Board        REV 05   710-023787   DW7526            NEO PMB
SIB F2S 0/4      REV 05   710-022603   DW7875            F2S SIB
  B Board        REV 05   710-023787   DW7588            NEO PMB
SIB F2S 0/6      REV 05   710-022603   DW7860            F2S SIB
  B Board        REV 05   710-023787   DW7589            NEO PMB
SIB F2S 1/0      REV 04   710-022603   DW4820            F2S SIB
  B Board        REV 05   710-023787   DW8510            NEO PMB
SIB F2S 1/2      REV 05   710-022603   DW7849            F2S SIB
  B Board        REV 05   710-023787   DW7525            NEO PMB
SIB F2S 1/4      REV 05   710-022603   DW7927            F2S SIB
  B Board        REV 05   710-023787   DW7556            F2S SIB Mezz
SIB F2S 1/6      REV 05   710-022603   DW7866            F2S SIB
  B Board        REV 05   710-023787   DW7651            NEO PMB
SIB F2S 2/0      REV 05   710-022603   DW7880            F2S SIB
  B Board        REV 05   710-023787   DW7523            NEO PMB
SIB F2S 2/2      REV 05   710-022603   DW7895            F2S SIB
  B Board        REV 05   710-023787   DW7591            NEO PMB
SIB F2S 2/4      REV 05   710-022603   DW7907            F2S SIB
  B Board        REV 05   710-023787   DW7590            NEO PMB
SIB F2S 2/6      REV 05   710-022603   DW7785            F2S SIB
  B Board        REV 05   710-023787   DW7524            NEO PMB
SIB F2S 3/0      REV 05   710-022603   DW7782            F2S SIB
  B Board        REV 05   710-023787   DW7634            NEO PMB
SIB F2S 3/2      REV 05   710-022603   DW7793            F2S SIB
  B Board        REV 05   710-023787   DW7548            NEO PMB
SIB F2S 3/4      REV 05   710-022603   DW7779            F2S SIB
  B Board        REV 05   710-023787   DW7587            NEO PMB
SIB F2S 3/6      REV 05   710-022603   DW7930            F2S SIB
  B Board        REV 05   710-023787   DW7505            NEO PMB
SIB F2S 4/0      REV 05   710-022603   DW7867            F2S SIB
  B Board        REV 05   710-023787   DW7656            NEO PMB
SIB F2S 4/2      REV 05   710-022603   DW7917            F2S SIB
  B Board        REV 05   710-023787   DW7640            NEO PMB
SIB F2S 4/4      REV 05   710-022603   DW7929            F2S SIB
  B Board        REV 05   710-023787   DW7643            NEO PMB
SIB F2S 4/6      REV 05   710-022603   DW7870            F2S SIB
  B Board        REV 05   710-023787   DW7635            NEO PMB
Fan Tray 0       REV 06   760-024497   DV7831            Front Fan Tray
Fan Tray 1       REV 06   760-024497   DV9614            Front Fan Tray
Fan Tray 2       REV 06   760-024502   DV9618            Rear Fan Tray
Fan Tray 3       REV 06   760-024502   DV9616            Rear Fan Tray
Fan Tray 4       REV 06   760-024502   DV7807            Rear Fan Tray
Fan Tray 5       REV 06   760-024502   DV7828            Rear Fan Tray
```

show chassis hardware extensive (TX Matrix Plus Router)

```
user@host> show chassis hardware extensive
sfc0-re0:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN112F007AHB      TXP
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
                                 S/N:               JN112F007AHB
 Assembly ID:  0x052c            Assembly Version:  00.00
 Date:         00-00-0000        Assembly Flags:    0x00
 ID: TXP
 Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 05 2c 00 00 00 00 00 00 00 00 00 00
```

```
  Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x20: 4a 4e 31 31 32 46 30 30 37 41 48 42 00 00 00 00
  Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Midplane         REV 05   710-022574   TS4027            SFC Midplane
 Jedec Code:   0x7fb0            EEPROM Version:    0x01
 P/N:          710-022574        S/N:               TS4027
 Assembly ID:  0x0962            Assembly Version:  01.05
 Date:         03-23-2009        Assembly Flags:    0x00
 Version:      REV 05
 ID: SFC Midplane
 Board Information Record:
  Address 0x00: ad 01 ff ff 00 1d b5 14 00 00 ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 09 62 01 05 52 45 56 20 30 35 00 00
  Address 0x10: 00 00 00 00 37 31 30 2d 30 32 32 35 37 34 00 00
  Address 0x20: 53 2f 4e 20 54 53 34 30 32 37 00 00 00 17 03 07
  Address 0x30: d9 ff ff ff ad 01 ff ff 00 1d b5 14 00 00 ff ff
  Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff 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:               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 ff
  Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
CIP 0            REV 04   710-023792   DW4889            TXP CIP
 Jedec Code:   0x7fb0            EEPROM Version:    0x01
 P/N:          710-023792        S/N:               DW4889
 Assembly ID:  0x0969            Assembly Version:  01.04
 Date:         01-26-2009        Assembly Flags:    0x00
 Version:      REV 04
 ID: TXP CIP                     FRU Model Number:  CIP-TXP
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
```

show chassis hardware clei-models (TX Matrix Plus Router)

```
user@host> show chassis hardware clei-models
sfc0-re0:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  CLEI code         FRU model number
Midplane         REV 05   710-022574                     CHAS-BP-TXP-S
```

 Copyright © 2016, Juniper Networks, Inc.

```
FPM Display      REV 03   710-024027                     CRAFT-TXP-S
CIP 0            REV 05   710-023792                     CIP-TXP-S
CIP 1            REV 05   710-023792                     CIP-TXP-S
PEM 0            Rev 04   740-027463   IPUPAFGKTA        PWR-TXP-7-60-DC
PEM 1            Rev 04   740-027463   IPUPAFGKTA        PWR-TXP-7-60-DC
Routing Engine 0 REV 06   740-026942                     RE-DUO-C2600-16G-S
Routing Engine 1 REV 06   740-026942                     RE-DUO-C2600-16G-S
CB 0             REV 05   710-022606                     CB-TXP-S
CB 1             REV 09   710-022606                     CB-TXP-S
SIB F13 0        REV 04   750-024564                     SIB-TXP-F13
SIB F13 3        REV 04   750-024564                     SIB-TXP-F13
SIB F13 8        REV 04   750-024564                     SIB-TXP-F13
SIB F13 11       REV 04   750-024564                     SIB-TXP-F13
SIB F13 12       REV 03   750-024564                     SIB-TXP-F13
SIB F2S 0/0      REV 05   710-022603                     SIB-TXP-F2S-S
SIB F2S 0/2      REV 05   710-022603                     SIB-TXP-F2S-S
SIB F2S 0/4      REV 04   710-022603                     SIB-TXP-F2S-S
SIB F2S 0/6      REV 04   710-022603                     SIB-TXP-F2S-S
SIB F2S 1/0      REV 04   710-022603                     SIB-TXP-F2S-S
SIB F2S 1/2      REV 05   710-022603                     SIB-TXP-F2S-S
SIB F2S 1/4      REV 04   710-022603                     SIB-TXP-F2S-S
SIB F2S 1/6      REV 05   710-022603                     SIB-TXP-F2S-S
SIB F2S 2/0      REV 04   710-022603                     SIB-TXP-F2S-S
SIB F2S 2/2      REV 04   710-022603                     SIB-TXP-F2S-S
SIB F2S 2/4      REV 05   710-022603                     SIB-TXP-F2S-S
SIB F2S 2/6      REV 04   710-022603                     SIB-TXP-F2S-S
SIB F2S 3/0      REV 05   710-022603                     SIB-TXP-F2S-S
SIB F2S 3/2      REV 03   710-022603                     SIB-TXP-F2S-S
SIB F2S 3/4      REV 05   710-022603                     SIB-TXP-F2S-S
SIB F2S 3/6      REV 03   710-022603                     SIB-TXP-F2S-S
SIB F2S 4/0      REV 03   710-022603                     SIB-TXP-F2S-S
SIB F2S 4/2      REV 05   710-022603                     SIB-TXP-F2S-S
SIB F2S 4/4      REV 04   710-022603                     SIB-TXP-F2S-S
SIB F2S 4/6      REV 03   710-022603                     SIB-TXP-F2S-S
Fan Tray 0       REV 02   760-024497                     FANTRAY-TXP-H-S
Fan Tray 1       REV 02   760-024497                     FANTRAY-TXP-H-S
Fan Tray 2       REV 05   760-024502                     FANTRAY-TXP-V-S
Fan Tray 3
Fan Tray 4       REV 05   760-024502                     FANTRAY-TXP-V-S
Fan Tray 5       REV 02   760-024502                     FANTRAY-TXP-V-S

lcc0-re0:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  CLEI code         FRU model number
Midplane         REV 03   710-017247                     CHAS-BP-T1600-S
FPM Display      REV 01   710-021387                     CRAFT-T1600-S
CIP              REV 06   710-002895                     CIP-L-T640-S
PEM 1            Rev 02   740-023211   IPUPAC8KTA        PWR-T1600-4-60-DC-S
SCG 0            REV 15   710-003423                     SCG-T-S
SCG 1            REV 15   710-003423                     SCG-T-S
Routing Engine 0 REV 01   740-026941                     RE-DUO-C1800-8G-S
Routing Engine 1 REV 01   740-026941                     RE-DUO-C1800-8G-S
CB 0             REV 06   710-022597                     CB-LCC-S
CB 1             REV 06   710-022597                     CB-LCC-S
FPC 1            REV 07   710-013035                     T640-FPC3-ES
  PIC 0          REV 05   750-015217                     PC-8GE-TYPE3-SFP-IQ2
  PIC 1          REV 03   750-004424                     PC-1XGE-LR
  PIC 2          REV 01   750-003336                     PC-4OC48-SON-SMSR
FPC 3            REV 12   710-013037                     T1600-FPC4-ES
  PIC 0          REV 02   750-010850                     PD-1OC768-SON-SR
```

```
FPC 4            REV 05   710-021534                    T640-FPC1-ES
  PIC 0          REV 04   750-014627                    PB-4OC3-1OC12-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-4OC12-SON-SMIR
  PIC 1          REV 05   750-001900                    PB-1OC48-SON-SMSR
  PIC 2          REV 10   750-008155                    PB-2GE-SFP-QPP
  PIC 3          REV 03   750-014638                    PB-1OC48-SON-B-SFP
SIB 0            REV 07   710-022594                    SIB-TXP-T1600-S
SIB 1            REV 07   710-022594                    SIB-TXP-T1600-S
SIB 3            REV 06   710-022594                    SIB-TXP-T1600-S
SIB 4            REV 08   710-022594                    SIB-TXP-T1600-S
Fan Tray 0                                              FANTRAY-T-S
Fan Tray 1                                              FANTRAY-T-S
Fan Tray 2                                              FANTRAY-TXP-R-S

lcc1-re0:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  CLEI code         FRU model number
Midplane         REV 04   710-017247                     CHAS-BP-T1600-S
FPM Display      REV 01   710-021387                     CRAFT-T1600-S
CIP              REV 06   710-002895                     CIP-L-T640-S
PEM 0            Rev 02   740-023211   IPUPAC8KTA        PWR-T1600-4-60-DC-S
SCG 0            REV 15   710-003423                     SCG-T-S
SCG 1            REV 15   710-003423                     SCG-T-S
Routing Engine 0 REV 01   740-026941                     RE-DUO-C1800-8G-S
Routing Engine 1 REV 01   740-026941                     RE-DUO-C1800-8G-S
CB 0             REV 06   710-022597                     CB-LCC-S
CB 1             REV 06   710-022597                     CB-LCC-S
FPC 0            REV 02   710-010845                     T640-FPC4-ES
  PIC 0          REV 11   750-017405                     PD-4XGE-XFP
FPC 1            REV 16   710-013037                     T1600-FPC4-ES
  PIC 1          REV 06   750-034781                     PD-1CE-CFP
FPC 2            REV 16   710-013037                     T1600-FPC4-ES
  PIC 1          REV 05   750-034781                     PD-1CE-CFP
FPC 3            REV 10   710-021534                     T640-FPC1-ES
  PIC 0          REV 13   750-012266                     PB-4GE-TYPE1-SFP-IQ2
  PIC 1          REV 01   750-007641                     PE-1GE-SFP-QPP
  PIC 3          REV 17   750-007444                     PB-1CHSTM1-SMIR-QPP
FPC 4            REV 06   710-013035                     T640-FPC3-ES
  PIC 0          REV 22   750-007141                     PC-10GE-SFP
  PIC 1          REV 16   750-009450                     PC-1OC192-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-1OC192-SON-VSR
  PIC 3          REV 12   750-009553                     PC-4OC48-SON-SFP
FPC 6            REV 07   710-013035                     T640-FPC3-ES
```


Copyright © 2016, Juniper Networks, Inc.

```
  PIC 0          REV 07   750-015217                    PC-8GE-TYPE3-SFP-IQ2
  PIC 1          REV 03   750-003336                    PC-4OC48-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:
--------------------------------------------------------------------------
```

 Copyright © 2016, Juniper Networks, Inc.

```
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           ÿÿÿÿÿÿÿÿÿÿÿÿÿÿÿÿÿÿÿÿÿÿ
Routing Engine 0 REV 01   740-026942   737A-1064         RE-TXP-SFC-DUO-2600-16G
Routing Engine 1 REV 01   740-026942   737A-1082         RE-TXP-SFC-DUO-2600-16G
CB 0             REV 09   710-022606   DW6099            CB-TXP
CB 1             REV 09   710-022606   DW6096            CB-TXP
SIB F13 1        REV 04   750-024564   DW5776            SIB-TXP-F13
SIB F13 3        REV 04   750-024564   DW5762            SIB-TXP-F13
SIB F13 4        REV 04   750-024564   DW5797            SIB-TXP-F13
SIB F13 6        REV 04   750-024564   DW5770            SIB-TXP-F13
SIB F13 7        REV 04   750-024564   DW5758            SIB-TXP-F13
SIB F13 8        REV 04   750-024564   DW5761            SIB-TXP-F13
SIB F13 9        REV 04   750-024564   DW5754            SIB-TXP-F13
SIB F13 12       REV 04   750-024564   DW5794            SIB-TXP-F13
SIB F2S 0/0      REV 05   710-022603   DW7897
SIB F2S 0/2      REV 05   710-022603   DW7833
SIB F2S 0/4      REV 05   710-022603   DW7875
SIB F2S 0/6      REV 05   710-022603   DW7860
SIB F2S 1/0      REV 04   710-022603   DW4820
SIB F2S 1/2      REV 05   710-022603   DW7849
SIB F2S 1/4      REV 05   710-022603   DW7927            SIB-TXP-F2S
SIB F2S 1/6      REV 05   710-022603   DW7866
SIB F2S 2/0      REV 05   710-022603   DW7880
SIB F2S 2/2      REV 05   710-022603   DW7895
SIB F2S 2/4      REV 05   710-022603   DW7907
SIB F2S 2/6      REV 05   710-022603   DW7785
SIB F2S 3/0      REV 05   710-022603   DW7782
SIB F2S 3/2      REV 05   710-022603   DW7793
SIB F2S 3/4      REV 05   710-022603   DW7779
SIB F2S 3/6      REV 05   710-022603   DW7930
SIB F2S 4/0      REV 05   710-022603   DW7867
SIB F2S 4/2      REV 05   710-022603   DW7917
SIB F2S 4/4      REV 05   710-022603   DW7929
SIB F2S 4/6      REV 05   710-022603   DW7870
Fan Tray 0       REV 06   760-024497   DV7831            FANTRAY-TXP-F
Fan Tray 1       REV 06   760-024497   DV9614            FANTRAY-TXP-F
Fan Tray 2       REV 06   760-024502   DV9618            FANTRAY-TXP-R
Fan Tray 3       REV 06   760-024502   DV9616            FANTRAY-TXP-R
Fan Tray 4       REV 06   760-024502   DV7807            FANTRAY-TXP-R
Fan Tray 5       REV 06   760-024502   DV7828            FANTRAY-TXP-R

lcc0-re0:
--------------------------------------------------------------------------
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-1OC192-SON-XFP
  PIC 2          REV 10   750-009450   HX6466            PC-1OC192-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
```

 Copyright © 2016, Juniper Networks, Inc.

```
  PIC 0          REV 14   750-012518   JY9924            PD-4OC192-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-4OC192-SON-XFP
FPC 5            REV 14   710-013037   DT0016            T1600-FPC4-ES
  PIC 0          REV 14   750-012518   JY9918            PD-4OC192-SON-XFP
FPC 7            REV 07   710-013035   DM0967            T1600-FPC3-ES
  PIC 0          REV 16   750-007141   JJ8059            PC-10GE-SFP
  PIC 1          REV 13   750-004695   DM5712            PC-TUNNEL
SIB 0            REV 07   710-022594   DW4174            SIB-TXP-T1600-S
SIB 1            REV 07   710-022594   DW4207            SIB-TXP-T1600-S
SIB 2            REV 06   710-022594   DT8231            SIB-TXP-T1600-S
SIB 3            REV 07   710-022594   DW4175            SIB-TXP-T1600-S
SIB 4            REV 07   710-022594   DW4209            SIB-TXP-T1600-S
Fan Tray 0                                               FANTRAY-T-S
Fan Tray 1                                               FANTRAY-T-S
Fan Tray 2                                               FANTRAY-TXP-R-S
```

show chassis hardware (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis hardware
sfc0-re0:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                               JN11CAAA4AHB      TXP
Midplane         REV 05   710-022574   ABAC4696          SFC Midplane
FPM Display      REV 09   710-024027   EH3138            TXP FPM Display
CIP 0            REV 12   710-023792   EF6349            TXP CIP
```

```
CIP 1            REV 12   710-023792   EG5294           TXP CIP
PEM 0            Rev 06   740-027463   XH04595          Power Entry Module
PEM 1            Rev 06   740-027463   XH04592          Power Entry Module
Routing Engine 0 REV 07   740-026942   P737A-002541     RE-DUO-2600
Routing Engine 1 REV 07   740-026942   P737A-002602     RE-DUO-2600
CB 0             REV 15   710-022606   EH4376           SFC Control Board
CB 1             REV 15   710-022606   EH4379           SFC Control Board
SPMB 0                    BUILTIN                       SFC Switch CPU
SPMB 1                    BUILTIN                       SFC Switch CPU
SIB F13 0        REV 10   750-035002   EM9305           F13 SIB 3D
  B Board        REV 06   711-035082   EM9667           F13 SIB 3D Mezz
  P Board        REV 05   711-043544   EM9708           F13 SIB 3D Power
  Xcvr 0         REV 01   740-047547   XB34FB00S        CXP Module
  Xcvr 2         REV 01   740-047547   XB48FB01H        CXP Module
  Xcvr 4         REV 01   740-047547   XB34FB02W        CXP Module
  Xcvr 6         REV 01   740-047547   XB34FB01T        CXP Module
  Xcvr 8         REV 01   740-047547   XB48FB00W        CXP Module
  Xcvr 10        REV 01   740-047547   XB34FB01S        CXP Module
  Xcvr 12        REV 01   740-047547   XB34FB03H        CXP Module
  Xcvr 14        REV 01   740-047547   XB34FB023        CXP Module
SIB F13 3        REV 01   710-035001   EJ2612           F13 SIB 3D
  B Board        REV 01   711-035082   EJ3815           F13 SIB 3D Mezz
  P Board        REV 01   711-043544   EJ2678           F13 SIB 3D Power
  Xcvr 0         REV 01   740-047547   XB48FB04C        CXP Module
  Xcvr 2         REV 01   740-047547   XB48FB00Z        CXP Module
  Xcvr 4         REV 01   740-047547   XB47FB036        CXP Module
  Xcvr 6         REV 01   740-047547   XB47FB029        CXP Module
  Xcvr 8         REV 01   740-047547   XB48FB02N        CXP Module
  Xcvr 10        REV 01   740-047547   XB42FB0CS        CXP Module
  Xcvr 12        REV 01   740-047547   XB47FB01X        CXP Module
  Xcvr 14        REV 01   740-047547   XB48FB02F        CXP Module
SIB F13 6        REV 05   750-035002   EK2675           F13 SIB 3D
  B Board        REV 03   711-035082   EK2612           F13 SIB 3D Mezz
  P Board        REV 04   711-043544   EK1179           F13 SIB 3D Power
  Xcvr 0         REV 01   740-047547   XB48FB01T        CXP Module
  Xcvr 2         REV 01   740-047547   XB48FB02M        CXP Module
  Xcvr 4         REV 01   740-047547   XB48FB031        CXP Module
  Xcvr 6         REV 01   740-047547   XB48FB04P        CXP Module
  Xcvr 8         REV 01   740-047547   XB48FB02T        CXP Module
  Xcvr 10        REV 01   740-047547   XB34FB01V        CXP Module
  Xcvr 12        REV 01   740-047547   XB48FB02C        CXP Module
  Xcvr 14                 NON-JNPR                      No Module
SIB F13 12       REV 01   710-035001   EJ2631           F13 SIB 3D
  B Board        REV 01   711-035082   EJ3808           F13 SIB 3D Mezz
  P Board        REV 01   711-043544   EJ2676           F13 SIB 3D Power
SIB F2S 0/0      REV 01   711-034977   EH9829           F2S SIB 3D
  B Board        REV 01   711-034979   EH9927           F2S SIB 3D Mezz
SIB F2S 0/2      REV 01   711-034977   EH9791           F2S SIB 3D
  B Board        REV 01   711-034979   EH9852           F2S SIB 3D Mezz
SIB F2S 0/4      REV 01   711-034977   EH9803           F2S SIB 3D
  B Board        REV 01   711-034979   EH9915           F2S SIB 3D Mezz
SIB F2S 0/6      REV 01   711-034977   EH9763           F2S SIB 3D
  B Board        REV 01   711-034979   EH9880           F2S SIB 3D Mezz
SIB F2S 1/0      REV 01   711-034977   EH9757           F2S SIB 3D
  B Board        REV 01   711-034979   EH9889           F2S SIB 3D Mezz
SIB F2S 1/2      REV 01   711-034977   EH9815           F2S SIB 3D
  B Board        REV 01   711-034979   EH9890           F2S SIB 3D Mezz
SIB F2S 1/4      REV 08   750-034978   EN1954           F2S SIB 3D
  B Board        REV 02   711-034979   EN1436           F2S SIB 3D Mezz
SIB F2S 1/6      REV 01   711-034977   EJ7054           F2S SIB 3D
  B Board        REV 01   711-034979   EJ8238           F2S SIB 3D Mezz
```

 Copyright © 2016, Juniper Networks, Inc.

```
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                                JN11B3975AHA      T1600
Midplane         REV 01   710-027486   RC9826            T-series Backplane
FPM GBUS         REV 13   710-002901   BBAG5124          T640 FPM Board
FPM Display      REV 03   710-021387   BBAJ1112          T1600 FPM Display
CIP              REV 06   710-002895   BBAL3744          T-series CIP
PEM 0            REV 05   740-036442   1G022060081       Power Entry Module 6x60
PEM 1            REV 05   740-036442   1G022060188       Power Entry Module 6x60
SCG 0            REV 18   710-003423   BBAH8775          T640 Sonet Clock Gen.
SCG 1            REV 18   710-003423   BBAL7272          T640 Sonet Clock Gen.
Routing Engine 0 REV 07   740-026941   P737F-002992      RE-DUO-1800
Routing Engine 1 REV 07   740-026941   P737F-002938      RE-DUO-1800
CB 0             REV 11   710-022597   EH4805            LCC Control Board
CB 1             REV 11   710-022597   EH4786            LCC Control Board
FPC 1            REV 01   710-033873   BBAH0320          FPC Type 3-ES
  CPU            REV 11   710-016744   BBAF3281          ST-PMB2
  MMB 0          REV 06   710-025563   BBAF5061          ST-MMB2
FPC 5            REV 04   710-033871   BBAM5070          FPC Type 4-ES
  CPU            REV 11   710-016744   BBAM6653          ST-PMB2
  PIC 1          REV 20   750-017405   BBAM1296          4x 10GE (LAN/WAN) XFP
    Xcvr 0       REV 03   740-014289   T10B42981         XFP-10G-SR
  MMB 0          REV 07   710-025563   BBAN2631          ST-MMB2
  MMB 1          REV 07   710-025563   BBAN2538          ST-MMB2
SPMB 0           REV 05   710-023321   EH3903            LCC Switch CPU
SPMB 1           REV 05   710-023321   EH3902            LCC Switch CPU
SIB 0            REV 01   750-041657   EH8019            LCC SIB 3D
  B Board        REV 01   711-042424   EH7680            LCC SIB 3D Mezz
  Xcvr 0         REV 01   740-047547   XB48FB04F         CXP Module
  Xcvr 2         REV 01   740-047547   XB48FB04S         CXP Module
  Xcvr 4         REV 01   740-047547   XB48FB04B         CXP Module
  Xcvr 6         REV 01   740-047547   XB48FB043         CXP Module
SIB 1            REV 01   750-041657   EH8012            LCC SIB 3D
  B Board        REV 01   711-042424   EH7658            LCC SIB 3D Mezz
  Xcvr 0         REV 01   740-047547   XB48FB05E         CXP Module
  Xcvr 2         REV 01   740-047547   XB48FB01Z         CXP Module
  Xcvr 4         REV 01   740-047547   XB48FB018         CXP Module
  Xcvr 6         REV 01   740-047547   XB48FB054         CXP Module
SIB 2            REV 01   750-041657   EH7993            LCC SIB 3D
  B Board        REV 01   711-042424   EH7678            LCC SIB 3D Mezz
  Xcvr 0         REV 01   740-047547   XB48FB05C         CXP Module
  Xcvr 2         REV 01   740-047547   XB47FB00N         CXP Module
  Xcvr 4         REV 01   740-047547   XB48FB05U         CXP Module
  Xcvr 6         REV 01   740-047547   XB48FB05L         CXP Module
Fan Tray 0                                               Front Top Fan Tray
Fan Tray 1                                               Front Bottom Fan Tray
Fan Tray 2                                               Rear Fan Tray -- Rev 4
```

 Copyright © 2016, Juniper Networks, Inc.

show chassis hardware clei-models (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis hardware clei-models
sfc0-re0:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  CLEI code         FRU model number
Midplane         REV 05   710-022574                     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
```


Copyright © 2016, Juniper Networks, Inc.

```
  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-LLC
  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                                            FANTRAY-T-S
```


Copyright © 2016, Juniper Networks, Inc.

```
Fan Tray 1                                                FANTRAY-T-S
Fan Tray 2                                                FANTRAY-TXP3D-LCC-R-S
[Output Truncated]
```

show chassis hardware detail (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis hardware detail
sfc0-re0:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN11CAAA4AHB      TXP
Midplane         REV 05   710-022574   ABAC4696          SFC Midplane
FPM Display      REV 09   710-024027   EH3138            TXP FPM Display
CIP 0            REV 12   710-023792   EF6349            TXP CIP
CIP 1            REV 12   710-023792   EG5294            TXP CIP
PEM 0            Rev 06   740-027463   XH04595           Power Entry Module
PEM 1            Rev 06   740-027463   XH04592           Power Entry Module
Routing Engine 0 REV 07   740-026942   P737A-002541      RE-DUO-2600
  ad0    3823 MB  SMART CF             2011030400062C132C13 Compact Flash
  ad1   62720 MB  SMART Lite SATA Drive 201105100009A452A452 Disk 1
Routing Engine 1 REV 07   740-026942   P737A-002602      RE-DUO-2600
  ad0    3823 MB  SMART CF             20110508085EE471E471 Compact Flash
  ad1   62720 MB  SMART Lite SATA Drive 201110210089DF39DF39 Disk 1
CB 0             REV 15   710-022606   EH4376            SFC Control Board
CB 1             REV 15   710-022606   EH4379            SFC Control Board
SPMB 0                    BUILTIN                        SFC Switch CPU
SPMB 1                    BUILTIN                        SFC Switch CPU
SIB F13 0        REV 10   750-035002   EM9305            F13 SIB 3D
  B Board        REV 06   711-035082   EM9667            F13 SIB 3D Mezz
  P Board        REV 05   711-043544   EM9708            F13 SIB 3D Power
  Xcvr 0         REV 01   740-047547   XB34FB00S         CXP Module
  Xcvr 2         REV 01   740-047547   XB48FB01H         CXP Module
  Xcvr 4         REV 01   740-047547   XB34FB02W         CXP Module
  Xcvr 6         REV 01   740-047547   XB34FB01T         CXP Module
  Xcvr 8         REV 01   740-047547   XB48FB00W         CXP Module
  Xcvr 10        REV 01   740-047547   XB34FB01S         CXP Module
  Xcvr 12        REV 01   740-047547   XB34FB03H         CXP Module
  Xcvr 14        REV 01   740-047547   XB34FB023         CXP Module
SIB F13 3        REV 01   710-035001   EJ2612            F13 SIB 3D
  B Board        REV 01   711-035082   EJ3815            F13 SIB 3D Mezz
  P Board        REV 01   711-043544   EJ2678            F13 SIB 3D Power
  Xcvr 0         REV 01   740-047547   XB48FB04C         CXP Module
  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
```


Copyright © 2016, Juniper Networks, Inc.

```
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             20110303035632 9E329E 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
```


Copyright © 2016, Juniper Networks, Inc.

```
SIB 1            REV 01   750-041657   EH8023           LCC SIB 3D
  B Board        REV 01   711-042424   EH7659           LCC SIB 3D Mezz
  Xcvr 0         REV 01   740-047547   XB48FB05J        CXP Module
  Xcvr 2         REV 01   740-047547   XB48FB01E        CXP Module
  Xcvr 4         REV 01   740-047547   XB48FB01J        CXP Module
  Xcvr 6         REV 01   740-047547   XB48FB02S        CXP Module
SIB 2            REV 03   750-041657   EJ6554           LCC SIB 3D
  B Board        REV 02   711-042424   EJ5756           LCC SIB 3D Mezz
  Xcvr 0         REV 01   740-047547   XB34FB01Z        CXP Module
  Xcvr 2         REV 01   740-047547   XB34FB013        CXP Module
  Xcvr 4         REV 01   740-047547   XB48FB04Z        CXP Module
  Xcvr 6         REV 01   740-047547   XB48FB05N        CXP Module
Fan Tray 0                                              Front Top Fan Tray
Fan Tray 1                                              Front Bottom Fan Tray
Fan Tray 2                                              Rear Fan Tray -- Rev 4
```

show chassis hardware sfc (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis hardware sfc 0
sfc0-re0:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN11CAAA4AHB      TXP
Midplane         REV 05   710-022574   ABAC4696          SFC Midplane
FPM Display      REV 09   710-024027   EH3138            TXP FPM Display
CIP 0            REV 12   710-023792   EF6349            TXP CIP
CIP 1            REV 12   710-023792   EG5294            TXP CIP
PEM 0            Rev 06   740-027463   XH04595           Power Entry Module
PEM 1            Rev 06   740-027463   XH04592           Power Entry Module
Routing Engine 0 REV 07   740-026942   P737A-002541      RE-DUO-2600
Routing Engine 1 REV 07   740-026942   P737A-002602      RE-DUO-2600
CB 0             REV 15   710-022606   EH4376            SFC Control Board
CB 1             REV 15   710-022606   EH4379            SFC Control Board
SPMB 0                    BUILTIN                        SFC Switch CPU
SPMB 1                    BUILTIN                        SFC Switch CPU
SIB F13 0        REV 10   750-035002   EM9305            F13 SIB 3D
  B Board        REV 06   711-035082   EM9667            F13 SIB 3D Mezz
  P Board        REV 05   711-043544   EM9708            F13 SIB 3D Power
  Xcvr 0         REV 01   740-047547   XB34FB00S         CXP Module
  Xcvr 2         REV 01   740-047547   XB48FB01H         CXP Module
  Xcvr 4         REV 01   740-047547   XB34FB02W         CXP Module
  Xcvr 6         REV 01   740-047547   XB34FB01T         CXP Module
  Xcvr 8         REV 01   740-047547   XB48FB00W         CXP Module
  Xcvr 10        REV 01   740-047547   XB34FB01S         CXP Module
  Xcvr 12        REV 01   740-047547   XB34FB03H         CXP Module
  Xcvr 14        REV 01   740-047547   XB34FB023         CXP Module
SIB F13 3        REV 01   710-035001   EJ2612            F13 SIB 3D
  B Board        REV 01   711-035082   EJ3815            F13 SIB 3D Mezz
  P Board        REV 01   711-043544   EJ2678            F13 SIB 3D Power
  Xcvr 0         REV 01   740-047547   XB48FB04C         CXP Module
  Xcvr 2         REV 01   740-047547   XB48FB00Z         CXP Module
  Xcvr 4         REV 01   740-047547   XB47FB036         CXP Module
  Xcvr 6         REV 01   740-047547   XB47FB029         CXP Module
  Xcvr 8         REV 01   740-047547   XB48FB02N         CXP Module
  Xcvr 10        REV 01   740-047547   XB42FB0CS         CXP Module
  Xcvr 12        REV 01   740-047547   XB47FB01X         CXP Module
  Xcvr 14        REV 01   740-047547   XB48FB02F         CXP Module
SIB F13 6        REV 05   750-035002   EK2675            F13 SIB 3D
  B Board        REV 03   711-035082   EK2612            F13 SIB 3D Mezz
  P Board        REV 04   711-043544   EK1179            F13 SIB 3D Power
```

```
  Xcvr 0          REV 01   740-047547   XB48FB01T         CXP Module
  Xcvr 2          REV 01   740-047547   XB48FB02M         CXP Module
  Xcvr 4          REV 01   740-047547   XB48FB031         CXP Module
  Xcvr 6          REV 01   740-047547   XB48FB04P         CXP Module
  Xcvr 8          REV 01   740-047547   XB48FB02T         CXP Module
  Xcvr 10         REV 01   740-047547   XB34FB01V         CXP Module
  Xcvr 12         REV 01   740-047547   XB48FB02C         CXP Module
  Xcvr 14                  NON-JNPR                       No Module
SIB F13 12        REV 01   710-035001   EJ2631            F13 SIB 3D
  B Board         REV 01   711-035082   EJ3808            F13 SIB 3D Mezz
  P Board         REV 01   711-043544   EJ2676            F13 SIB 3D Power
SIB F2S 0/0       REV 01   711-034977   EH9829            F2S SIB 3D
  B Board         REV 01   711-034979   EH9927            F2S SIB 3D Mezz
SIB F2S 0/2       REV 01   711-034977   EH9791            F2S SIB 3D
  B Board         REV 01   711-034979   EH9852            F2S SIB 3D Mezz
SIB F2S 0/4       REV 01   711-034977   EH9803            F2S SIB 3D
  B Board         REV 01   711-034979   EH9915            F2S SIB 3D Mezz
SIB F2S 0/6       REV 01   711-034977   EH9763            F2S SIB 3D
  B Board         REV 01   711-034979   EH9880            F2S SIB 3D Mezz
SIB F2S 1/0       REV 01   711-034977   EH9757            F2S SIB 3D
  B Board         REV 01   711-034979   EH9889            F2S SIB 3D Mezz
SIB F2S 1/2       REV 01   711-034977   EH9815            F2S SIB 3D
  B Board         REV 01   711-034979   EH9890            F2S SIB 3D Mezz
SIB F2S 1/4       REV 08   750-034978   EN1954            F2S SIB 3D
  B Board         REV 02   711-034979   EN1436            F2S SIB 3D Mezz
SIB F2S 1/6       REV 01   711-034977   EJ7054            F2S SIB 3D
  B Board         REV 01   711-034979   EJ8238            F2S SIB 3D Mezz
SIB F2S 2/0       REV 01   711-034977   EH9830            F2S SIB 3D
  B Board         REV 01   711-034979   EH9844            F2S SIB 3D Mezz
SIB F2S 2/2       REV 01   711-034977   EH9818            F2S SIB 3D
  B Board         REV 01   711-034979   EH9888            F2S SIB 3D Mezz
SIB F2S 2/4       REV 01   711-034977   EH9795            F2S SIB 3D
  B Board         REV 01   711-034979   EH9869            F2S SIB 3D Mezz
SIB F2S 2/6       REV 01   711-034977   EJ7026            F2S SIB 3D
  B Board         REV 01   711-034979   EJ8273            F2S SIB 3D Mezz
SIB F2S 3/0       REV 01   711-034977   EH9811            F2S SIB 3D
  B Board         REV 01   711-034979   EH9892            F2S SIB 3D Mezz
SIB F2S 3/2       REV 01   711-034977   EH9812            F2S SIB 3D
  B Board         REV 01   711-034979   EH9877            F2S SIB 3D Mezz
SIB F2S 3/4       REV 08   750-034978   EN1947            F2S SIB 3D
  B Board         REV 02   711-034979   EN1471            F2S SIB 3D Mezz
Fan Tray 0        REV 10   760-024497   EH3313            Front Fan Tray
Fan Tray 1        REV 10   760-024497   EH3290            Front Fan Tray
Fan Tray 2        REV 10   760-024502   EH3292            Rear Fan Tray
Fan Tray 3        REV 10   760-024502   EH3287            Rear Fan Tray
Fan Tray 4        REV 10   760-024502   EH3286            Rear Fan Tray
Fan Tray 5        REV 10   760-024502   EH3285            Rear Fan Tray
```

show chassis hardware (16-Port 10-Gigabit Ethernet MPC with SFP+ Optics [MX Series Routers])

```
user@host> show chassis hardware
Hardware inventory:
    Item             Version  Part number  Serial number     Description
    Chassis                                JN112D865AFA      MX960
    Midplane         REV 03   710-013698   TS3339            MX960 Backplane
    FPM Board        REV 03   710-014974   WW6267            Front Panel Display

    PDM              Rev 03   740-013110   QCS12485026       Power Distribution
Module
    PEM 0           Rev 04   740-013682   QCS12434086       PS 1.7kW; 200-240VAC
 in
```

 Copyright © 2016, Juniper Networks, Inc.

```
   PEM 1            Rev 04   740-013682   QCS1243408Z       PS 1.7kW; 200-240VAC
in
   PEM 2            Rev 04   740-013682   QCS1243407X       PS 1.7kW; 200-240VAC
in
   Routing Engine 0 REV 07   740-015113   9009009677        RE-S-1300
   Routing Engine 1 REV 07   740-015113   9009011510        RE-S-1300
   CB 0              REV 03   710-021523   XF0394            MX SCB
   CB 1              REV 03   710-021523   XF0550            MX SCB
   CB 2              REV 03   710-021523   XD7455            MX SCB
   FPC 4             REV 02   750-028467   JR6127            MPC M 16x 10GE
     CPU             REV 02   711-029089   JX0129            AS PMB
     PIC 0                    BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
     PIC 1                    BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
     PIC 2                    BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
     PIC 3                    BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
   Fan Tray 0        REV 05   740-014971   TP9990            Fan Tray
   Fan Tray 1        REV 05   740-014971   VS1709            Fan Tray
```

show chassis hardware (MPC3E [MX Series Routers])

```
user@host> show chassis hardware
Hardware inventory:
   Item             Version  Part number   Serial number     Description
   Chassis                                 JN1101AFEAFB      MX480
   Midplane         REV 05   710-017414    TR4444            MX480 Midplane
   FPM Board        REV 02   710-017254    KG6056            Front Panel Display

   PEM 0           Rev 03   740-017330    QCS082090FC      PS 1.2-1.7kW; 100-240V

   PEM 1           Rev 03   740-017330    QCS082090FD      PS 1.2-1.7kW; 100-240V

   Routing Engine 0 REV 07   740-013063    9009004124        RE-S-2000
   Routing Engine 1 REV 07   740-013063    9009005569        RE-S-2000
   CB 0             REV 07   710-021523    XZ3587            MX SCB
   CB 1             REV 03   710-021523    KH8306            MX SCB
   FPC 1            REV 04.1.07 750-033205 P1240            MPC Type 3
    CPU             REV 01   711-035209    YL0504            HMPC PMB 2G
    MIC 1           REV 10   750-033199    YX4495            1X100GE CFP
     PIC 2                   BUILTIN       BUILTIN           1X100GE CFP
      Xcvr 0        REV 01   740-032210    C22CQNE           CFP-100G-LR4
   FPC 2            REV 26   750-016670    KH0045            DPCE 40x 1GE R EQ
    CPU             REV 07   710-013713    KF5448            DPC PMB
    PIC 0                    BUILTIN       BUILTIN           10x 1GE(LAN) EQ
     Xcvr 0         REV 01   740-011613    PF21JHU           SFP-SX
    PIC 1                    BUILTIN       BUILTIN           10x 1GE(LAN) EQ
     Xcvr 9         REV 01   740-011613    AM0813S8ZL6       SFP-SX
    PIC 2                    BUILTIN       BUILTIN           10x 1GE(LAN) EQ
     Xcvr 0         REV 02   740-011613    PGL2KYF           SFP-SX
     Xcvr 2         REV 01   740-011613    AM0806S8N4P       SFP-SX
    PIC 3                    BUILTIN       BUILTIN           10x 1GE(LAN) EQ
     Xcvr 5         REV 01   740-011613    AM0815S967N       SFP-SX
     Xcvr 7         REV 01   740-011613    AM0806S8N1X       SFP-SX
     Xcvr 8         REV 01   740-011613    AM0815S967J       SFP-SX
     Xcvr 9         REV 01   740-011613    AM0815S967M       SFP-SX
   FPC 3            REV 12.2.09 750-033205 YR9443            MPC Type 3
    CPU             REV 03   711-035209    YL6931            HMPC 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-AFO
    Xcvr 0        REV 01   740-011614   AC0946S0BD1       SFP-LX10
    Xcvr 1        REV 02   740-013111   A281922           SFP-T
Power Supply 0   Rev 04   740-032091   UI00677           JPSU-650W-AC-AFI
Power Supply 1   REV 00   740-041741   VJ00162           JPSU-650W-AC-AFO
Fan Tray 0                                               QFX Fan Tray, Back to
Front Airlfow
Fan Tray 1                                               QFX Fan Tray, Back to
Front Airlfow
Fan Tray 2                                               QFX Fan Tray, Back to
Front Airlfow
```

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
```


Copyright © 2016, Juniper Networks, Inc.

```
  CPU                     BUILTIN      BUILTIN           FPC CPU
  PIC 0                   BUILTIN      BUILTIN           48x 10G-SFP+
    Xcvr 0       REV 01   740-030589   S99E270079        SFP+-10G-LPBK
    Xcvr 1       REV 01   740-030589   S9AK450099        SFP+-10G-LPBK
    Xcvr 2       REV 01   740-030589   S99E270078        SFP+-10G-LPBK
    Xcvr 3       REV 01   740-030589   S9AK450098        SFP+-10G-LPBK
    Xcvr 4       REV 01   740-030589   S99E270075        SFP+-10G-LPBK
    Xcvr 5       REV 01   740-030589   S9AK450093        SFP+-10G-LPBK
    Xcvr 6       REV 01   740-030589   S9AK450097        SFP+-10G-LPBK
    Xcvr 7       REV 01   740-030589   S9AK450095        SFP+-10G-LPBK
    Xcvr 8       REV 01   740-030589   S99E270072        SFP+-10G-LPBK
    Xcvr 9       REV 01   740-030589   S99E270073        SFP+-10G-LPBK
    Xcvr 10      REV 01   740-030589   S99E270080        SFP+-10G-LPBK
    Xcvr 11      REV 01   740-030589   S9AK450169        SFP+-10G-LPBK
    Xcvr 12      REV 01   740-030589   S99E270076        SFP+-10G-LPBK
    Xcvr 13      REV 01   740-030589   S9AK450167        SFP+-10G-LPBK
    Xcvr 14      REV 01   740-030589   S9AK450170        SFP+-10G-LPBK
    Xcvr 15      REV 01   740-030589   S9AK450166        SFP+-10G-LPBK
    Xcvr 16      REV 01   740-030589   S9AK450092        SFP+-10G-LPBK
    Xcvr 17      REV 01   740-030589   S9AK450163        SFP+-10G-LPBK
    Xcvr 18      REV 01   740-030589   S9AK450094        SFP+-10G-LPBK
    Xcvr 19      REV 01   740-030589   S9AK450100        SFP+-10G-LPBK
    Xcvr 20      REV 01   740-030589   S9AK450168        SFP+-10G-LPBK
    Xcvr 21      REV 01   740-030589   S9AK450165        SFP+-10G-LPBK
    Xcvr 22      REV 01   740-030589   S9AK450073        SFP+-10G-LPBK
    Xcvr 23      REV 01   740-030589   S9AK450164        SFP+-10G-LPBK
    Xcvr 24      REV 01   740-030589   S9AK450074        SFP+-10G-LPBK
    Xcvr 25      REV 01   740-030589   SA62270195        SFP+-10G-LPBK
    Xcvr 26      REV 01   740-030589   S9AK450078        SFP+-10G-LPBK
    Xcvr 27      REV 01   740-030589   S9AK450024        SFP+-10G-LPBK
    Xcvr 28      REV 01   740-030589   S9AK450027        SFP+-10G-LPBK
    Xcvr 29      REV 01   740-030589   S9AK450080        SFP+-10G-LPBK
    Xcvr 30      REV 01   740-030589   S9AK450030        SFP+-10G-LPBK
    Xcvr 31      REV 01   740-030589   S9AK450025        SFP+-10G-LPBK
    Xcvr 32      REV 01   740-030589   S9AK450023        SFP+-10G-LPBK
    Xcvr 33      REV 01   740-030589   S9AK450075        SFP+-10G-LPBK
    Xcvr 34      REV 01   740-030589   S9AK450161        SFP+-10G-LPBK
    Xcvr 35      REV 01   740-030589   S9AK450071        SFP+-10G-LPBK
    Xcvr 36      REV 01   740-030589   S9AK450072        SFP+-10G-LPBK
    Xcvr 37      REV 01   740-030589   S9AK450022        SFP+-10G-LPBK
    Xcvr 38      REV 01   740-030589   S9AK450021        SFP+-10G-LPBK
    Xcvr 39      REV 01   740-030589   S9AK450175        SFP+-10G-LPBK
    Xcvr 40      REV 01   740-030589   S9AK450162        SFP+-10G-LPBK
    Xcvr 41      REV 01   740-030589   S99E270074        SFP+-10G-LPBK
    Xcvr 42      REV 01   740-030589   S9AK450174        SFP+-10G-LPBK
    Xcvr 43      REV 01   740-030589   S9AK450077        SFP+-10G-LPBK
    Xcvr 44      REV 01   740-030589   S9AK450076        SFP+-10G-LPBK
    Xcvr 45      REV 01   740-030589   S9AK450026        SFP+-10G-LPBK
    Xcvr 46      REV 01   740-030589   S9AK450079        SFP+-10G-LPBK
    Xcvr 47      REV 01   740-030589   S9AK450029        SFP+-10G-LPBK
  PIC 1                   BUILTIN      BUILTIN           15x 10G-SFP+
    Xcvr 1       REV 01   740-032986   QA170087          QSFP+-40G-SR4
    Xcvr 4       REV 01   740-032986   QA360442          QSFP+-40G-SR4
    Xcvr 8       REV 01   740-032986   QA170091          QSFP+-40G-SR4
    Xcvr 12      REV 01   740-032986   QA170042          QSFP+-40G-SR4
MGMT BRD       REV 08   750-036946   EE0731            QFX3500-MB
Power Supply 0   Rev 04   740-032091   UI00690           QFX PS 650W AC
Power Supply 1   Rev 04   740-032091   UI00679           QFX PS 650W AC
Fan Tray 0                                               QFX Fan Tray
Fan Tray 1                                               QFX Fan Tray
```

show chassis hardware models (QFX3500 Switches)

```
user@switch> show chassis hardware models
Hardware inventory:
Item             Version  Part number  Serial number     FRU model number
Routing Engine 0          BUILTIN      BUILTIN
FPC 0            REV 02   711-032234   EC4074
Power Supply 0   PSMI 2C  11-d65800    --
```

show chassis hardware clei-models (QFX3500 Switches)

```
user@switch> show chassis hardware clei-models
Hardware inventory:
Item             Version  Part number  CLEI code         FRU model number
Routing Engine 0          BUILTIN
FPC 0            REV 02   711-032234
Power Supply 0   PSMI 2C  11-d65800
```

show chassis hardware clei-models (QFX5100 Switches)

```
user@switch> show chassis hardware clei-models
Hardware inventory:
Item             Version  Part number  CLEI code         FRU model number
Routing Engine 0          BUILTIN      CMMNV10BRA
FPC 0            REV 01   611-053010   CMMNV10BRA
  PIC 0                   BUILTIN      CMMNV10BRA
Power Supply 0   REV 03   740-053352   MUPABHBAA         JPSU-850W-AC-AFO
Power Supply 1   REV 03   740-053352   MUPABHBAA         JPSU-850W-AC-AFO
Fan Tray 0                                               QFX5100-96S-FANAFO
Fan Tray 1                                               QFX5100-96S-FANAFO
Fan Tray 2                                               QFX5100-96S-FANAFO
```

show chassis hardware interconnect-device (QFabric Systems)

```
user@switch> show chassis hardware interconnect-device interconnect1
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis          REV 07                                  QFX_olive
Midplane         REV 07   750-021261   BH0208188289      QFX Midplane
CB 0             REV 07   750-021261   BH0208188289      QFXIC08-CB4S
```

show chassis hardware node-device (QFabric Systems)

```
user@switch> show chassis hardware node-device node1
Routing Engine 0   BUILTIN      BUILTIN           QFX Routing Engine
node1            REV 05   711-032234   ED3694            QFX3500-48S4Q-AFI


  CPU                     BUILTIN      BUILTIN           FPC CPU
  PIC 0                   BUILTIN      BUILTIN           48x 10G-SFP+
    Xcvr 8       REV 01   740-030658   AD0946A028B       SFP+-10G-USR
...
```

show chassis hardware (PTX3000 Packet Transport Router with the IPLC module)

```
user@switch> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                               JN121852AAJC      PTX3000
Midplane         REV 11   750-044645   ACAL0016          Backplane
FPM              REV 03   760-044663   ACAR0137          Front Panel Display
```


Copyright © 2016, Juniper Networks, Inc.

```
PSM 1            REV 02   740-044981   1EDD3240017       AC 12V Power Supply
PSM 2            REV 02   740-044981   1ETW3150019       AC 12V Power Supply
PSM 3            REV 02   740-044981   1EDD3240018       AC 12V Power Supply
Routing Engine 0 REV 10   740-026942   P737A-004090      RE-DUO-2600
CB 0             REV 07   750-044656   ACAR0311
CB 1             REV 01   750-044656   ACAM0060          Hendricks CB P1
FPC 2            REV 30   750-044650   ACDM8219          FPC
  CPU            REV 09   711-044647   ACDM4300          PMB
  PIC 0          REV 22   750-031913   ACAP8608          24x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   B11C01363         SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AQ71CB0           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AQR367X           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   ANT00GV           SFP+-10G-SR
    Xcvr 4       REV 01   740-031980   ANT080L           SFP+-10G-SR
    Xcvr 5       REV 01   740-031980   ANT080T           SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   ANS0ELT           SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   ANT08NM           SFP+-10G-SR
    Xcvr 8       REV 01   740-031980   ANT00DL           SFP+-10G-SR
    Xcvr 9       REV 01   740-031980   ANS02H0           SFP+-10G-SR
    Xcvr 10      REV 01   740-031980   AK80LAL           SFP+-10G-SR
    Xcvr 11      REV 01   740-031980   APJ2B48           SFP+-10G-SR
    Xcvr 12      REV 01   740-021308   ANA0MM3           SFP+-10G-SR
    Xcvr 13      REV 01   740-031980   B11J00674         SFP+-10G-SR
    Xcvr 14      REV 01   740-021308   9ZDZ06A00046      SFP+-10G-SR
    Xcvr 15      REV 01   740-031980   ANT07E3           SFP+-10G-SR
    Xcvr 16      REV 01   740-031980   ANT00L8           SFP+-10G-SR
    Xcvr 17      REV 01   740-031980   ALP0KDL           SFP+-10G-SR
    Xcvr 18      REV 01   740-031980   ANT07UX           SFP+-10G-SR
    Xcvr 19      REV 01   740-031980   ANT07UV           SFP+-10G-SR
    Xcvr 20      REV 01   740-031980   ANT088Y           SFP+-10G-SR
    Xcvr 21      REV 01   740-031980   ANT09JZ           SFP+-10G-SR
    Xcvr 23      REV 01   740-031980   AK80MCM           SFP+-10G-SR
FPC 5            REV 01   650-064993   ABCD0008          OPT3-SFF-PTX
  CPU
FPC 6            REV 30   750-044650   ACAR1923          FPC
  CPU            REV 09   711-044647   ACAR3284          PMB
  PIC 0          REV 21   750-031913   BBAX1094          24x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-021308   AS317HK           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   ANT00BT           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   ANT093M           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AP40VZD           SFP+-10G-SR
    Xcvr 4       REV 01   740-031980   AMB1AJ9           SFP+-10G-SR
    Xcvr 5       REV 01   740-031980   AHR02W0           SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   B11C01429         SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   AQM1VFM           SFP+-10G-SR
    Xcvr 8       REV 01   740-031980   B11K01886         SFP+-10G-SR
    Xcvr 9       REV 01   740-031980   AQR3E9A           SFP+-10G-SR
    Xcvr 10      REV 01   740-031980   ANT09KX           SFP+-10G-SR
    Xcvr 12      REV 01   740-031980   AQ31GR8           SFP+-10G-SR
    Xcvr 13      REV 01   740-031980   ALP139Q           SFP+-10G-SR
    Xcvr 14      REV 01   740-031980   ALP12SY           SFP+-10G-SR
    Xcvr 15      REV 01   740-031980   AK80LAN           SFP+-10G-SR
    Xcvr 16      REV 01   740-021308   T09K75190         SFP+-10G-SR
    Xcvr 17      REV 01   740-031980   ANS02HT           SFP+-10G-SR
    Xcvr 18      REV 01   740-031980   ALP0TVN           SFP+-10G-SR
    Xcvr 19      REV 01   740-031980   AQR0BHE           SFP+-10G-SR
    Xcvr 20      REV 01   740-031980   ALP11S0           SFP+-10G-SR
    Xcvr 21      REV 01   740-031851   PLM1L33           UNSUPPORTED
    Xcvr 22      REV 01   740-031980   AQL1RJ5           SFP+-10G-SR
    Xcvr 23      REV 01   740-031980   AD1141A04XL       SFP+-10G-SR
FPC 12           REV 31   750-044650   ACDS6321          FPC
```

```
  CPU            REV 09   711-044647   ACDP4556          PMB
  PIC 0          REV 09   750-042043   EL7910            2x100G DWDM OTN
    Xcvr 0       REV 01   740-043694   71242008-B        OTN-100G-LH
    Xcvr 1       REV 01   740-043694   71242008-B        OTN-100G-LH
FPC 15           REV 01   650-064993   ABCD0006          OPT3-SFF-PTX
  CPU
SIB 0            REV 06   750-044653   ACAM0393          Hendricks SIB P1
SIB 1            REV 17   750-044653   ACAR1704          SIB
SIB 2            REV 17   750-044653   ACAR1684          SIB
SIB 3            REV 17   750-044653   ACAR1705          SIB
SIB 4            REV 17   750-044653   ACAR1727          SIB
SIB 5            REV 17   750-044653   ACAR1675          SIB
SIB 6            REV 17   750-044653   ACAR1692          SIB
SIB 7            REV 06   750-044653   ACAM0404          Hendricks SIB P1
SIB 8            REV 17   750-044653   ACAR1700          SIB
Fan Tray 0       REV 08   760-044659   ACAR0771          Fan Tray (Exhaust)
Fan Tray 1       REV 10   760-044659   ACAR2762          Fan Tray (Exhaust)
```

show chassis hardware (PTX5000 Packet Transport Router)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN11D1FD7AJA      PTX5000
Midplane         REV 03   711-031896   ABAC5589          Midplane-8S
FPM              REV 08   760-030647   EG1679            Front Panel Display
PDU 0            Rev 05   740-032019   ZE00006           DC Power Dist Unit
  PSM 0          Rev 05   740-032022   ZJ00018           DC 12V Power Supply
  PSM 1          Rev 04   740-032022   ZC00052           DC 12V Power Supply
  PSM 2          Rev 04   740-032022   ZD00051           DC 12V Power Supply
  PSM 3          Rev 05   740-032022   ZJ00060           DC 12V Power Supply
CCG 0            REV 04   750-030653   EG3703            Clock Generator
CCG 1            REV 04   750-030653   EG3698            Clock Generator
Routing Engine 0 REV 05   740-026942   P737A-002231      RE-DUO-2600
Routing Engine 1 REV 06   740-026942   P737A-002438      RE-DUO-2600
CB 0             REV 08   750-030625   EG5519            Control Board
CB 1             REV 08   750-030625   EG5516            Control Board
FPC 0            REV 18   750-036844   EJ3080            FPC
  CPU            REV 12   711-030686   EJ3260            SNG PMB
FPC 2            REV 13   750-036844   EG5065            FPC
  CPU            REV 09   711-030686   EG4082            SNG PMB
  PIC 0          REV 14   750-031913   EG5127            24x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   143363A00240      SFP+-10G-SR
    Xcvr 1       REV 01   740-031981   UK90PZ1           SFP+-10G-LR
    Xcvr 2       REV 01   740-031980   AD1141A04XH       SFP+-10G-SR
    Xcvr 3       REV 01   740-031981   UK90Q46           SFP+-10G-LR
    Xcvr 4       REV 01   740-031980   AD1141A04X4       SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   B11H02560         SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   B11C01589         SFP+-10G-SR
    Xcvr 8       REV 01   740-031980   AD1141A04XF       SFP+-10G-SR
    Xcvr 10      REV 01   740-031980   123363A01094      SFP+-10G-SR
    Xcvr 11      REV 01   740-031980   AK80LKF           SFP+-10G-SR
    Xcvr 12      REV 01   740-031980   183363A01528      SFP+-10G-SR
    Xcvr 14      REV 01   740-031980   193363A01079      SFP+-10G-SR
    Xcvr 15      REV 01   740-031980   AK80MC8           SFP+-10G-SR
    Xcvr 16      REV 01   740-031980   AJC0BHC           SFP+-10G-SR
    Xcvr 19      REV 01   740-021309   J08D26856         SFP+-10G-LR
    Xcvr 21      REV 01   740-031980   AK80KCT           SFP+-10G-SR
    Xcvr 22      REV 01   740-031981   UK90PZL           SFP+-10G-LR
    Xcvr 23      REV 01   740-031980   AK80N1V           SFP+-10G-SR
FPC 3            REV 13   750-036844   EG5074            FPC
```

 Copyright © 2016, Juniper Networks, Inc.

```
  CPU            REV 09   711-030686   EG4064            SNG PMB
  PIC 1          REV 10   750-031903   EG0325            SNG Load
FPC 5            REV 06   750-036844   EH3198            FPC
  CPU
  PIC 0          REV 14   750-031913   EG5134            24x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80LBH           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11B03724         SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80FMH           SFP+-10G-SR
    Xcvr 5       REV 01   740-031980   B11J00818         SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   193363A00743      SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   B11B06125         SFP+-10G-SR
    Xcvr 10      REV 01   740-031980   B11H02529         SFP+-10G-SR
    Xcvr 11      REV 01   740-031980   AK80LFB           SFP+-10G-SR
    Xcvr 12      REV 01   740-031980   193363A01061      SFP+-10G-SR
    Xcvr 15      REV 01   740-031980   B11J00687         SFP+-10G-SR
    Xcvr 16      REV 01   740-031980   193363A00738      SFP+-10G-SR
    Xcvr 18      REV 01   740-031980   AK80MQX           SFP+-10G-SR
    Xcvr 19      REV 01   740-021309   J08C17257         SFP+-10G-LR
    Xcvr 22      REV 01   740-031980   B11J00730         SFP+-10G-SR
    Xcvr 23      REV 01   740-031980   AK80KEE           SFP+-10G-SR
  PIC 1          REV 08   750-036710   EG3105            2x 40GE CFP
    Xcvr 0       REV 01   740-034554   B260HLT           CFP-40G-LR4
    Xcvr 1       REV 01   740-034554   B11C02847         CFP-40G-LR4
FPC 6            REV 18   750-036844   EJ4391            FPC
  CPU            REV 12   711-030686   EJ3257            SNG PMB
FPC 7            REV 18   750-036844   EJ4382            FPC
  CPU            REV 12   711-030686   EJ3238            SNG PMB
SPMB 0           REV 10   711-030686   EG5418            SNG PMB
SPMB 1           REV 09   711-030686   EG5373            SNG PMB
SIB 0            REV 07   750-030631   EG4858            SIB-I-8S
SIB 1            REV 07   750-030631   EG4872            SIB-I-8S
SIB 2            REV 07   750-030631   EG4866            SIB-I-8S
SIB 3            REV 07   750-030631   EG6011            SIB-I-8S
SIB 4            REV 07   750-030631   EG4907            SIB-I-8S
SIB 5            REV 07   750-030631   EG4879            SIB-I-8S
SIB 6            REV 07   750-030631   EG4864            SIB-I-8S
SIB 7            REV 07   750-030631   EG4899            SIB-I-8S
SIB 8            REV 07   750-030631   EG4880            SIB-I-8S
Fan Tray 0       REV 04   760-032784   EG1496            Vertical Fan Tray
Fan Tray 1       REV 04   760-030642   EG1335            Horizontal Fan Tray
Fan Tray 2       REV 02   760-030642   ED4952            Horizontal Fan Tray
```

show chassis hardware (PTX5000 Packet Transport Router with AC PSM and PDU)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN12223A6AJA      PTX5000
Midplane         REV 16   750-035893   ACRA1350          Midplane-8S
FPM              REV 12   760-030647   BBBD5625          Front Panel Display
PDU 0           Rev 01   740-048338   1GB83360005       High Capacity AC WYE PDU

  PSM 0          Rev 01   740-048334   1GB43360074       High Capacity AC PSM
  PSM 1          Rev 01   740-048334   1GB43360001       High Capacity AC PSM
  PSM 2          Rev 01   740-048334   1GB43360104       High Capacity AC PSM
  PSM 3          Rev 01   740-048334   1GB43360042       High Capacity AC PSM
  PSM 4          Rev 01   740-048334   1GB43360068       High Capacity AC PSM
  PSM 5          Rev 01   740-048334   1GB43360080       High Capacity AC PSM
  PSM 6          Rev 01   740-048334   1GB43360046       High Capacity AC PSM
  PSM 7          Rev 01   740-048334   1GB43360100       High Capacity AC PSM
PDU 1           Rev 01   740-048338   1GB83360006       High Capacity AC WYE PDU
```

```
  PSM 0          Rev 01   740-048334   1GB43360069       High Capacity AC PSM
  PSM 1          Rev 01   740-048334   1GB43360099       High Capacity AC PSM
  PSM 2          Rev 01   740-048334   1GB43360050       High Capacity AC PSM
  PSM 3          Rev 01   740-048334   1GB43360095       High Capacity AC PSM
  PSM 4          Rev 01   740-048334   1GB43360101       High Capacity AC PSM
  PSM 5          Rev 01   740-048334   1GB43360075       High Capacity AC PSM
  PSM 6          Rev 01   740-048334   1GB43360047       High Capacity AC PSM
  PSM 7          Rev 01   740-048334   1GB43360019       High Capacity AC PSM
CCG 0            REV 09   750-030653   BBAZ5345          Clock Generator
...
```

show chassis hardware (PTX5000 Packet Transport Router with FPC2-PTX-P1A)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN1204FC0AJA      PTX5000
Midplane         REV 11   750-035893   ACAB8038          Midplane-8S
FPM              REV 12   760-030647   BBBD5619          Front Panel
Display
PDU 0            Rev 04   740-048336   1GB93470043       High Capacity DC PDU
  PSM 0          Rev 04   740-046988   1GB63500184       High Capacity DC PSM
  PSM 2          Rev 04   740-046988   1GB63500169       High Capacity DC PSM
  PSM 4          Rev 04   740-046988   1GB63500306       High Capacity DC PSM
  PSM 6          Rev 04   740-046988   1GB63500074       High Capacity DC PSM
PDU 1            Rev 04   740-048336   1GB93470045       High Capacity DC PDU
  PSM 1          Rev 04   740-046988   1GB63500193       High Capacity DC PSM
  PSM 3          Rev 04   740-046988   1GB63500143       High Capacity DC PSM
  PSM 5          Rev 04   740-046988   1GB63500146       High Capacity DC PSM
  PSM 7          Rev 04   740-046988   1GB63500192       High Capacity DC PSM
CCG 0            REV 09   750-030653   BBBC1909          Clock Generator
CCG 1            REV 09   750-030653   BBBD2970          Clock Generator
...
```

show chassis hardware clei-models (PTX5000 Packet Transport Router)

```
user@host> show chassis hardware clei-models
Hardware inventory:
Item             Version  Part number  CLEI code         FRU model number
FPM              REV 08   760-030647   PROTOXCLEI        CRAFT-PTX5000-S
PDU 0            Rev 05   740-032019   IPUPAHLKAA        PWR-SAN-PDU-DC
  PSM 0          Rev 05   740-032022   IPUPAHNKAA        PSM-PTX-DC-120-S
  PSM 1          Rev 04   740-032022   032022XXXX        PWR-SAN-12-DC
  PSM 2          Rev 04   740-032022   032022XXXX        PWR-SAN-12-DC
  PSM 3          Rev 05   740-032022   IPUPAHNKAA        PSM-PTX-DC-120-S
CCG 0            REV 04   750-030653   PROTOXCLEI        CCG-PTX-S
CCG 1            REV 04   750-030653   PROTOXCLEI        CCG-PTX-S
Routing Engine 0 REV 05   740-026942                     RE-DUO-C2600-16G-S
Routing Engine 1 REV 06   740-026942                     RE-DUO-C2600-16G-S
CB 0             REV 08   750-030625   PROTOXCLEI        CB-PTX-S
CB 1             REV 08   750-030625   PROTOXCLEI        CB-PTX-S
FPC 0            REV 18   750-036844   PROTOXCLEI        FPC-PTX-P1-A
FPC 2            REV 13   750-036844   PROTOXCLEI        FPC-PTX-P1-A
  PIC 0          REV 14   750-031913   PROTOXCLEI        P1-PTX-24-10GE-SFPP
FPC 3            REV 13   750-036844   PROTOXCLEI        FPC-PTX-P1-A
FPC 5
  PIC 0          REV 14   750-031913   PROTOXCLEI        P1-PTX-24-10GE-SFPP
FPC 6            REV 18   750-036844   PROTOXCLEI        FPC-PTX-P1-A
FPC 7            REV 18   750-036844   PROTOXCLEI        FPC-PTX-P1-A
SIB 0            REV 07   750-030631   PROTOXCLEI        SIB-I-PTX5008
```


Copyright © 2016, Juniper Networks, Inc.

```
SIB 1            REV 07   750-030631   PROTOXCLEI        SIB-I-PTX5008
SIB 2            REV 07   750-030631   PROTOXCLEI        SIB-I-PTX5008
SIB 3            REV 07   750-030631   PROTOXCLEI        SIB-I-PTX5008
SIB 4            REV 07   750-030631   PROTOXCLEI        SIB-I-PTX5008
SIB 5            REV 07   750-030631   PROTOXCLEI        SIB-I-PTX5008
SIB 6            REV 07   750-030631   PROTOXCLEI        SIB-I-PTX5008
SIB 7            REV 07   750-030631   PROTOXCLEI        SIB-I-PTX5008
SIB 8            REV 07   750-030631   PROTOXCLEI        SIB-I-PTX5008
Fan Tray 1       REV 04   760-030642   PROTOXCLEI        FAN-PTX-H-S
```

show chassis hardware clei-models (PTX5000 Packet Transport Router with AC PSM and PDU)

```
user@host> show chassis hardware clei-models
Hardware inventory:
Item             Version  Part number  CLEI code         FRU model number
Midplane         REV 16   750-035893   IPMUN00ARA        CHAS-MP-PTX5000-S
FPM              REV 12   760-030647   IPUCA7SCAA        CRAFT-PTX5000-S
PDU 0            Rev 01   740-048338   PROTOACPDU        PDU2-PTX-AC-W
  PSM 0          Rev 01   740-048334   PROTOACPSM        PSM2-PTX-AC
  PSM 1          Rev 01   740-048334   PROTOACPSM        PSM2-PTX-AC
  PSM 2          Rev 01   740-048334   PROTOACPSM        PSM2-PTX-AC
  PSM 3          Rev 01   740-048334   PROTOACPSM        PSM2-PTX-AC
  PSM 4          Rev 01   740-048334   PROTOACPSM        PSM2-PTX-AC
  PSM 5          Rev 01   740-048334   PROTOACPSM        PSM2-PTX-AC
  PSM 6          Rev 01   740-048334   PROTOACPSM        PSM2-PTX-AC
  PSM 7          Rev 01   740-048334   PROTOACPSM        PSM2-PTX-AC
PDU 1            Rev 01   740-048338   PROTOACPDU        PDU2-PTX-AC-W
  PSM 0          Rev 01   740-048334   PROTOACPSM        PSM2-PTX-AC
  PSM 1          Rev 01   740-048334   PROTOACPSM        PSM2-PTX-AC
  PSM 2          Rev 01   740-048334   PROTOACPSM        PSM2-PTX-AC
  PSM 3          Rev 01   740-048334   PROTOACPSM        PSM2-PTX-AC
  PSM 4          Rev 01   740-048334   PROTOACPSM        PSM2-PTX-AC
  PSM 5          Rev 01   740-048334   PROTOACPSM        PSM2-PTX-AC
  PSM 6          Rev 01   740-048334   PROTOACPSM        PSM2-PTX-AC
  PSM 7          Rev 01   740-048334   PROTOACPSM        PSM2-PTX-AC
CCG 0            REV 09   750-030653   IPUCA7DCAA        CCG-PTX-S
...
```

show chassis hardware clei-models (PTX5000 Packet Transport Router with FPC2-PTX-P1A)

```
user@host> show chassis hardware clei-models
Hardware inventory:
Item             Version  Part number  CLEI code         FRU model number
Midplane         REV 11   750-035893   IPMUN00ARA        CHAS-MP-PTX5000-S
FPM              REV 12   760-030647   IPUCA7SCAA        CRAFT-PTX5000-S
PDU 0            Rev 04   740-048336   IPUPAL7KAA        PDU2-PTX-DC-S
  PSM 0          Rev 04   740-046988   IPUPAL8KAA        PSM2-PTX-DC-S
  PSM 2          Rev 04   740-046988   IPUPAL8KAA        PSM2-PTX-DC-S
  PSM 4          Rev 04   740-046988   IPUPAL8KAA        PSM2-PTX-DC-S
  PSM 6          Rev 04   740-046988   IPUPAL8KAA        PSM2-PTX-DC-S
PDU 1            Rev 04   740-048336   IPUPAL7KAA        PDU2-PTX-DC-S
  PSM 1          Rev 04   740-046988   IPUPAL8KAA        PSM2-PTX-DC-S
  PSM 3          Rev 04   740-046988   IPUPAL8KAA        PSM2-PTX-DC-S
  PSM 5          Rev 04   740-046988   IPUPAL8KAA        PSM2-PTX-DC-S
  PSM 7          Rev 04   740-046988   IPUPAL8KAA        PSM2-PTX-DC-S
CCG 0            REV 09   750-030653   IPUCA7DCAA        CCG-PTX-S
CCG 1            REV 09   750-030653   IPUCA7DCAA        CCG-PTX-S
...
```

show chassis hardware detail (PTX5000 Packet Transport Router)

```
user@host> show chassis hardware detail
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN11D1FD7AJA      PTX5000
Midplane         REV 03   711-031896   ABAC5589          Midplane-8S
FPM              REV 08   760-030647   EG1679            Front Panel Display
PDU 0            Rev 05   740-032019   ZE00006           DC Power Dist Unit
  PSM 0          Rev 05   740-032022   ZJ00018           DC 12V Power Supply
  PSM 1          Rev 04   740-032022   ZC00052           DC 12V Power Supply
  PSM 2          Rev 04   740-032022   ZD00051           DC 12V Power Supply
  PSM 3          Rev 05   740-032022   ZJ00060           DC 12V Power Supply
CCG 0            REV 04   750-030653   EG3703            Clock Generator
CCG 1            REV 04   750-030653   EG3698            Clock Generator
Routing Engine 0 REV 05   740-026942   P737A-002231      RE-DUO-2600
  ad0    3823 MB  SMART CF             201006190039C02DC02D Compact Flash
  ad1   62720 MB  SMART Lite SATA Drive 2011042300CF4C6B4C6B Disk 1
Routing Engine 1 REV 06   740-026942   P737A-002438      RE-DUO-2600
  ad0    3823 MB  SMART CF             20100619053455F055F0 Compact Flash
  ad1   62720 MB  SMART Lite SATA Drive 20110423000AE8E7E8E7 Disk 1
CB 0             REV 08   750-030625   EG5519            Control Board
CB 1             REV 08   750-030625   EG5516            Control Board
FPC 0            REV 18   750-036844   EJ3080            FPC
  CPU            REV 12   711-030686   EJ3260            SNG PMB
FPC 2            REV 13   750-036844   EG5065            FPC
  CPU            REV 09   711-030686   EG4082            SNG PMB
  PIC 0          REV 14   750-031913   EG5127            24x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   143363A00240      SFP+-10G-SR
    Xcvr 1       REV 01   740-031981   UK90PZ1           SFP+-10G-LR
    Xcvr 2       REV 01   740-031980   AD1141A04XH       SFP+-10G-SR
    Xcvr 3       REV 01   740-031981   UK90Q46           SFP+-10G-LR
    Xcvr 4       REV 01   740-031980   AD1141A04X4       SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   B11H02560         SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   B11C01589         SFP+-10G-SR
    Xcvr 8       REV 01   740-031980   AD1141A04XF       SFP+-10G-SR
    Xcvr 10      REV 01   740-031980   123363A01094      SFP+-10G-SR
    Xcvr 11      REV 01   740-031980   AK80LKF           SFP+-10G-SR
    Xcvr 12      REV 01   740-031980   183363A01528      SFP+-10G-SR
    Xcvr 14      REV 01   740-031980   193363A01079      SFP+-10G-SR
    Xcvr 15      REV 01   740-031980   AK80MC8           SFP+-10G-SR
    Xcvr 16      REV 01   740-031980   AJC0BHC           SFP+-10G-SR
    Xcvr 19      REV 01   740-021309   J08D26856         SFP+-10G-LR
    Xcvr 21      REV 01   740-031980   AK80KCT           SFP+-10G-SR
    Xcvr 22      REV 01   740-031981   UK90PZL           SFP+-10G-LR
    Xcvr 23      REV 01   740-031980   AK80N1V           SFP+-10G-SR
FPC 3            REV 13   750-036844   EG5074            FPC
  CPU            REV 09   711-030686   EG4064            SNG PMB
  PIC 1          REV 10   750-031903   EG0325            SNG Load
FPC 5            REV 06   750-036844   EH3198            FPC
  CPU
  PIC 0          REV 14   750-031913   EG5134            24x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80LBH           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11B03724         SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80FMH           SFP+-10G-SR
    Xcvr 5       REV 01   740-031980   B11J00818         SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   193363A00743      SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   B11B06125         SFP+-10G-SR
    Xcvr 10      REV 01   740-031980   B11H02529         SFP+-10G-SR
    Xcvr 11      REV 01   740-031980   AK80LFB           SFP+-10G-SR
    Xcvr 12      REV 01   740-031980   193363A01061      SFP+-10G-SR
```

 Copyright © 2016, Juniper Networks, Inc.

```
    Xcvr 15      REV 01   740-031980   B11J00687         SFP+-10G-SR
    Xcvr 16      REV 01   740-031980   193363A00738      SFP+-10G-SR
    Xcvr 18      REV 01   740-031980   AK80MQX           SFP+-10G-SR
    Xcvr 19      REV 01   740-021309   J08C17257         SFP+-10G-LR
    Xcvr 22      REV 01   740-031980   B11J00730         SFP+-10G-SR
    Xcvr 23      REV 01   740-031980   AK80KEE           SFP+-10G-SR
  PIC 1          REV 08   750-036710   EG3105            2x 40GE CFP
    Xcvr 0       REV 01   740-034554   B260HLT           CFP-40G-LR4
    Xcvr 1       REV 01   740-034554   B11C02847         CFP-40G-LR4
FPC 6            REV 18   750-036844   EJ4391            FPC
  CPU            REV 12   711-030686   EJ3257            SNG PMB
FPC 7            REV 18   750-036844   EJ4382            FPC
  CPU            REV 12   711-030686   EJ3238            SNG PMB
SPMB 0           REV 10   711-030686   EG5418            SNG PMB
SPMB 1           REV 09   711-030686   EG5373            SNG PMB
SIB 0            REV 07   750-030631   EG4858            SIB-I-8S
SIB 1            REV 07   750-030631   EG4872            SIB-I-8S
SIB 2            REV 07   750-030631   EG4866            SIB-I-8S
SIB 3            REV 07   750-030631   EG6011            SIB-I-8S
SIB 4            REV 07   750-030631   EG4907            SIB-I-8S
SIB 5            REV 07   750-030631   EG4879            SIB-I-8S
SIB 6            REV 07   750-030631   EG4864            SIB-I-8S
SIB 7            REV 07   750-030631   EG4899            SIB-I-8S
SIB 8            REV 07   750-030631   EG4880            SIB-I-8S
Fan Tray 0       REV 04   760-032784   EG1496            Vertical Fan Tray
Fan Tray 1       REV 04   760-030642   EG1335            Horizontal Fan Tray
Fan Tray 2       REV 02   760-030642   ED4952            Horizontal Fan Tray
```

show chassis hardware detail (PTX5000 Packet Transport Router with AC PSM and PDU)

```
user@host> show chassis hardware detail
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN12223A6AJA      PTX5000
Midplane         REV 16   750-035893   ACRA1350          Midplane-8S
FPM              REV 12   760-030647   BBBD5625          Front Panel Display
PDU 0           Rev 01   740-048338   1GB83360005       High Capacity AC WYE PDU

  PSM 0          Rev 01   740-048334   1GB43360074       High Capacity AC PSM
  PSM 1          Rev 01   740-048334   1GB43360001       High Capacity AC PSM
  PSM 2          Rev 01   740-048334   1GB43360104       High Capacity AC PSM
  PSM 3          Rev 01   740-048334   1GB43360042       High Capacity AC PSM
  PSM 4          Rev 01   740-048334   1GB43360068       High Capacity AC PSM
  PSM 5          Rev 01   740-048334   1GB43360080       High Capacity AC PSM
  PSM 6          Rev 01   740-048334   1GB43360046       High Capacity AC PSM
  PSM 7          Rev 01   740-048334   1GB43360100       High Capacity AC PSM
PDU 1           Rev 01   740-048338   1GB83360006       High Capacity AC WYE PDU

  PSM 0          Rev 01   740-048334   1GB43360069       High Capacity AC PSM
  PSM 1          Rev 01   740-048334   1GB43360099       High Capacity AC PSM
  PSM 2          Rev 01   740-048334   1GB43360050       High Capacity AC PSM
  PSM 3          Rev 01   740-048334   1GB43360095       High Capacity AC PSM
  PSM 4          Rev 01   740-048334   1GB43360101       High Capacity AC PSM
  PSM 5          Rev 01   740-048334   1GB43360075       High Capacity AC PSM
  PSM 6          Rev 01   740-048334   1GB43360047       High Capacity AC PSM
  PSM 7          Rev 01   740-048334   1GB43360019       High Capacity AC PSM
CCG 0            REV 09   750-030653   BBAZ5345          Clock Generator
```

show chassis hardware detail (PTX5000 Packet Transport Router with FPC2-PTX-P1A)

```
user@host> show chassis hardware detail
```

```
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN1204FC0AJA      PTX5000
Midplane         REV 11   750-035893   ACAB8038          Midplane-8S
FPM              REV 12   760-030647   BBBD5619          Front Panel
Display
PDU 0            Rev 04   740-048336   1GB93470043       High Capacity DC PDU
  PSM 0          Rev 04   740-046988   1GB63500184       High Capacity DC PSM
  PSM 2          Rev 04   740-046988   1GB63500169       High Capacity DC PSM
  PSM 4          Rev 04   740-046988   1GB63500306       High Capacity DC PSM
  PSM 6          Rev 04   740-046988   1GB63500074       High Capacity DC PSM
PDU 1            Rev 04   740-048336   1GB93470045       High Capacity DC PDU
  PSM 1          Rev 04   740-046988   1GB63500193       High Capacity DC PSM
  PSM 3          Rev 04   740-046988   1GB63500143       High Capacity DC PSM
  PSM 5          Rev 04   740-046988   1GB63500146       High Capacity DC PSM
  PSM 7          Rev 04   740-046988   1GB63500192       High Capacity DC PSM
CCG 0            REV 09   750-030653   BBBC1909          Clock Generator
CCG 1            REV 09   750-030653   BBBD2970          Clock Generator
...
```

show chassis hardware models (PTX5000 Packet Transport Router)

```
user@host> show chassis hardware models
Hardware inventory:
Item             Version  Part number  Serial number     FRU model number
FPM              REV 08   760-030647   EG1679            CRAFT-PTX5000-S
PDU 0            Rev 05   740-032019   ZE00006           PWR-SAN-PDU-DC
  PSM 0          Rev 05   740-032022   ZJ00018           PSM-PTX-DC-120-S
  PSM 1          Rev 04   740-032022   ZC00052           PWR-SAN-12-DC
  PSM 2          Rev 04   740-032022   ZD00051           PWR-SAN-12-DC
  PSM 3          Rev 05   740-032022   ZJ00060           PSM-PTX-DC-120-S
CCG 0            REV 04   750-030653   EG3703            CCG-PTX-S
CCG 1            REV 04   750-030653   EG3698            CCG-PTX-S
Routing Engine 0 REV 05   740-026942   P737A-002231      RE-DUO-C2600-16G-S
Routing Engine 1 REV 06   740-026942   P737A-002438      RE-DUO-C2600-16G-S
CB 0             REV 08   750-030625   EG5519            CB-PTX-S
CB 1             REV 08   750-030625   EG5516            CB-PTX-S
FPC 0            REV 18   750-036844   EJ3080            FPC-PTX-P1-A
FPC 2            REV 13   750-036844   EG5065            FPC-PTX-P1-A
  PIC 0          REV 14   750-031913   EG5127            P1-PTX-24-10GE-SFPP
FPC 3            REV 13   750-036844   EG5074            FPC-PTX-P1-A
FPC 5
  PIC 0          REV 14   750-031913   EG5134            P1-PTX-24-10GE-SFPP
FPC 6            REV 18   750-036844   EJ4391            FPC-PTX-P1-A
FPC 7            REV 18   750-036844   EJ4382            FPC-PTX-P1-A
SIB 0            REV 07   750-030631   EG4858            SIB-I-PTX5008
SIB 1            REV 07   750-030631   EG4872            SIB-I-PTX5008
SIB 2            REV 07   750-030631   EG4866            SIB-I-PTX5008
SIB 3            REV 07   750-030631   EG6011            SIB-I-PTX5008
SIB 4            REV 07   750-030631   EG4907            SIB-I-PTX5008
SIB 5            REV 07   750-030631   EG4879            SIB-I-PTX5008
SIB 6            REV 07   750-030631   EG4864            SIB-I-PTX5008
SIB 7            REV 07   750-030631   EG4899            SIB-I-PTX5008
SIB 8            REV 07   750-030631   EG4880            SIB-I-PTX5008
Fan Tray 1       REV 04   760-030642   EG1335            FAN-PTX-H-S
```

show chassis hardware models (PTX5000 Packet Transport Router with AC PSM and PDU)

```
user@host> show chassis hardware models
Hardware inventory:
Item             Version  Part number  Serial number     FRU model number
```

 Copyright © 2016, Juniper Networks, Inc.

```
Midplane         REV 16   750-035893   ACRA1350          CHAS-MP-PTX5000-S
FPM              REV 12   760-030647   BBBD5625          CRAFT-PTX5000-S
PDU 0            Rev 01   740-048338   1GB83360005       PDU2-PTX-AC-W
  PSM 0          Rev 01   740-048334   1GB43360074       PSM2-PTX-AC
  PSM 1          Rev 01   740-048334   1GB43360001       PSM2-PTX-AC
  PSM 2          Rev 01   740-048334   1GB43360104       PSM2-PTX-AC
  PSM 3          Rev 01   740-048334   1GB43360042       PSM2-PTX-AC
  PSM 4          Rev 01   740-048334   1GB43360068       PSM2-PTX-AC
  PSM 5          Rev 01   740-048334   1GB43360080       PSM2-PTX-AC
  PSM 6          Rev 01   740-048334   1GB43360046       PSM2-PTX-AC
  PSM 7          Rev 01   740-048334   1GB43360100       PSM2-PTX-AC
PDU 1            Rev 01   740-048338   1GB83360006       PDU2-PTX-AC-W
  PSM 0          Rev 01   740-048334   1GB43360069       PSM2-PTX-AC
  PSM 1          Rev 01   740-048334   1GB43360099       PSM2-PTX-AC
  PSM 2          Rev 01   740-048334   1GB43360050       PSM2-PTX-AC
  PSM 3          Rev 01   740-048334   1GB43360095       PSM2-PTX-AC
  PSM 4          Rev 01   740-048334   1GB43360101       PSM2-PTX-AC
  PSM 5          Rev 01   740-048334   1GB43360075       PSM2-PTX-AC
  PSM 6          Rev 01   740-048334   1GB43360047       PSM2-PTX-AC
  PSM 7          Rev 01   740-048334   1GB43360019       PSM2-PTX-AC
CCG 0            REV 09   750-030653   BBAZ5345          CCG-PTX-S
...
```

show chassis hardware models (PTX5000 Packet Transport Router with FPC2-PTX-P1A)

```
user@host> show chassis hardware models
Hardware inventory:
Item             Version  Part number  Serial number     FRU model number
Midplane         REV 11   750-035893   ACAB8038          CHAS-MP-PTX5000-S
FPM              REV 12   760-030647   BBBD5619          CRAFT-PTX5000-S
PDU 0            Rev 04   740-048336   1GB93470043       PDU2-PTX-DC-S
  PSM 0          Rev 04   740-046988   1GB63500184       PSM2-PTX-DC-S
  PSM 2          Rev 04   740-046988   1GB63500169       PSM2-PTX-DC-S
  PSM 4          Rev 04   740-046988   1GB63500306       PSM2-PTX-DC-S
  PSM 6          Rev 04   740-046988   1GB63500074       PSM2-PTX-DC-S
PDU 1            Rev 04   740-048336   1GB93470045       PDU2-PTX-DC-S
  PSM 1          Rev 04   740-046988   1GB63500193       PSM2-PTX-DC-S
  PSM 3          Rev 04   740-046988   1GB63500143       PSM2-PTX-DC-S
  PSM 5          Rev 04   740-046988   1GB63500146       PSM2-PTX-DC-S
  PSM 7          Rev 04   740-046988   1GB63500192       PSM2-PTX-DC-S
CCG 0            REV 09   750-030653   BBBC1909          CCG-PTX-S
CCG 1            REV 09   750-030653   BBBD2970          CCG-PTX-S
...
```

show chassis hardware extensive (PTX5000 Packet Transport Router)

```
user@host> show chassis hardware extensive
Hardware inventory:
Item             Version  Part number  Serial number     Description
...............
PDU 0            Rev 04   740-032019   UE0003            DC Power Dist Unit
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-032019        S/N:               UE0003
 Assembly ID:  0x043d            Assembly Version:  04.00
 Date:         11-29-2010        Assembly Flags:    0x00
 Version:      Rev 04            CLEI Code:         032022XXXX
 ID: DC Power Dist Unit          FRU Model Number:  PWR-SAN-PDU-DC
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff 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 ff
  Address 0x40: ff ff ff ff 01 30 33 32 30 32 32 58 58 58 58 50
  Address 0x50: 57 52 2d 53 41 4e 2d 50 44 55 2d 44 43 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 a3 ff ff ff ff ff ff ff ff ff ff ff ff
  PSM 0          Rev 04   740-032022   YG00065           DC 12V Power Supply
Module
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-032022        S/N:               YG00065
 Assembly ID:  0x0440            Assembly Version:  04.00
 Date:         07-30-2010        Assembly Flags:    0x00
 Version:      Rev 04            CLEI Code:         032022XXXX
 ID: DC 12V Power Supply Module  FRU Model Number:  PWR-SAN-12-DC
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff 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 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 extensive (PTX1000 Packet Transport Router)

```
user@host> show chassis hardware extensive
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                UNDEFINED         PTX1000
Pseudo CB 0
Routing Engine 0          BUILTIN      BUILTIN           RE-PTX1000
FPC 0            REV 06   750-053330   ACAM4850          PTX1000-FPC-P2-BUILTIN
  CPU                     BUILTIN      BUILTIN           FPC CPU
  PIC 0                  BUILTIN      BUILTIN          288X10GE/72X40GE/24X100GE

    Xcvr 2       REV 01   740-046565   QE240845          QSFP+-40G-SR4
    Xcvr 3       REV 01   740-046565   QE240962          QSFP+-40G-SR4
    Xcvr 5       REV 01   740-032986   ES400LZ           QSFP+-40G-SR4
    Xcvr 12      REV 01   740-054053   QE419452          QSFP+-4X10G-SR
    Xcvr 18      REV 01   740-054053   QE419481          QSFP+-4X10G-SR
    Xcvr 30      REV 01   740-046565   QE440485          QSFP+-40G-SR4
    Xcvr 48      REV 01   740-032986   ES400K3           QSFP+-40G-SR4
    Xcvr 68      REV 01   740-046565   QF2805J3          QSFP+-40G-SR4
  Mezz           REV 05   711-053333   ACAM4282          Mezzanine Board
Power Supply 2   REV 01   740-054405   1EDN4470131       AC AFO 1600W PSU
Power Supply 3   REV 01   740-054405   1EDN4470112       AC AFO 1600W PSU
Fan Tray 0                                              PTX1000 Fan Tray 0, Front
 to Back Airflow - AFO
Fan Tray 1                                              PTX1000 Fan Tray 1, Front
 to Back Airflow - AFO
Fan Tray 2                                              PTX1000 Fan Tray 2, Front
 to Back Airflow - AFO
```

show chassis hardware (MX Routers with Media Services Blade [MSB])

```
user@switch> show chassis hardware
```

 Copyright © 2016, Juniper Networks, Inc.

```
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN1100FB1AFB      MX480
Midplane         REV 05   710-017414   TR3310            MX480 Midplane
FPM Board        REV 02   710-017254   KG1872            Front Panel Display
PEM 2            Rev 02   740-017343   QCS0812A00N       DC Power Entry Module
PEM 3            Rev 02   740-017343   QCS0812A00U       DC Power Entry Module
Routing Engine 0 REV 07   740-015113   1000740938        RE-S-1300
CB 0             REV 03   710-021523   KF4630            MX SCB
FPC 1            REV 11   750-037207   ZW9726            AS-MCC
  CPU            REV 04   711-038173   ZW4819            AS-MCC PMB
  MIC 0          REV 06   750-037214   ZW3574            AS-MSC
    PIC 0                 BUILTIN      BUILTIN           AS-MSC
  MIC 1          REV 00   750-037211                     AS-MXC
    PIC 2                 BUILTIN      BUILTIN           AS-MXC
```

show chassis hardware extensive (MX Routers with Media Services Blade [MSB])

```
user@switch> show chassis hardware extensive
FPC 1            REV 11   750-037207   ZW9726            AS-MCC
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          750-037207        S/N:               ZW9726
 Assembly ID:  0x0b37            Assembly Version:  01.11
 Date:         02-17-2012        Assembly Flags:    0x00
 Version:      REV 11            CLEI Code:         PROTOXCLEI
 ID: AS-MCC          FRU Model Number:  750-037207
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff 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 ff
  Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 37
  Address 0x50: 35 30 2d 30 33 37 32 30 37 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 31 31 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 5e ff ff ff ff ff ff ff ff ff ff ff ff
  CPU            REV 04   711-038173   ZW4819            AS-MCC-PMB
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          711-038173        S/N:               ZW4819
 Assembly ID:  0x0b38            Assembly Version:  01.04
 Date:         12-30-2011        Assembly Flags:    0x00
 Version:      REV 04
 ID: AS-MCC PMB
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff 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 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:               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 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 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 ff
I2C Hex Data:
 Address 0x00: 7f b0 01 ff 0a 43 01 00 52 45 56 20 30 30 00 00
 Address 0x10: 00 00 00 00 37 35 30 2d 30 33 37 32 31 31 00 00
 Address 0x20: 00 00 00 00 00 00 00 00 00 00 00 00 00 ff ff ff
 Address 0x30: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
 Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 Address 0x70: ff ff ff ff c0 02 e6 6c 7f b0 02 ff 0a 44 01 06
   PIC 2                 BUILTIN      BUILTIN           AS-MXC
```

show chassis hardware (QFX3500 Switch running Enhanced Layer 2 Software)

```
user@switch> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                P3566             QFX3500
Pseudo CB 0
Routing Engine 0          BUILTIN      BUILTIN           QFX Routing Engine
FPC 0            REV 16   750-036931   P3566-C           QFX3500-48S4Q
  CPU                     BUILTIN      BUILTIN           FPC CPU
  PIC 0                   BUILTIN      BUILTIN           48x 10G-SFP+
    Xcvr 12      REV 01   740-030658   AD1125A0438       SFP+-10G-USR
    Xcvr 13      REV 01   740-030658   AD1125A02GN       SFP+-10G-USR
  PIC 1                   BUILTIN      BUILTIN           4x 40G-QSFP+
  PIC 2
  MGMT BRD       REV 10   750-036946   BBAW0328          QFX3500-MGMT-RJ45-AFI
Power Supply 0   Rev 05   740-032091   WA13035           JPSU-650W-AC-AFI
Power Supply 1
Fan Tray 0                                               QFX3500 Fan Tray, Front
 to Back Airflow
Fan Tray 1                                               QFX3500 Fan Tray, Front
 to Back Airflow
Fan Tray 2                                               QFX3500 Fan Tray, Front
 to Back Airflow
```


Copyright © 2016, Juniper Networks, Inc.

show chassis hardware (QFX5100 Switch running Enhanced Layer 2 Software)

```
user@switch> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                TB3113280048      QFX5100-24Q-2P
Pseudo CB 0
Routing Engine 0          BUILTIN      BUILTIN           QFX Routing Engine
FPC 0            REV 02   650-049942   TB3113280048      QFX5100-24Q-2P
  CPU                     BUILTIN      BUILTIN           FPC CPU
  PIC 0                   BUILTIN      BUILTIN           24x 40G-QSFP
    Xcvr 8       REV 01   740-032986   QA470143          QSFP+-40G-SR4
    Xcvr 14      REV 01   740-032986   QB500525          QSFP+-40G-SR4
  PIC 1          REV 02   611-049555   RR3113310169      QFX-EM-4Q
    Xcvr 0       REV 01   740-032986   QC440904          QSFP+-40G-SR4
    Xcvr 1       REV 01   740-032986   QB240154          QSFP+-40G-SR4
    Xcvr 2       REV 01   740-035085   018110105         QSFP+-40G-LPBK
  PIC 2          REV 02   611-049555   RR3113310209      QFX-EM-4Q
    Xcvr 0       REV 01   740-032986   QB190270          QSFP+-40G-SR4
    Xcvr 1       REV 01   740-035085   018110063         QSFP+-40G-LPBK
    Xcvr 2       REV 01   740-032986   QB210034          QSFP+-40G-SR4
Power Supply 0   REV 03   740-041741   1GA23110973       JPSU-650W-AC-AFO
Power Supply 1   REV 03   740-041741   1GA23090878       JPSU-650W-AC-AFO
Fan Tray 0                                             QFX5100 Fan Tray 0, Front
 to Back Airflow - AFO
Fan Tray 1                                             QFX5100 Fan Tray 1, Front
 to Back Airflow - AFO
Fan Tray 2                                             QFX5100 Fan Tray 2, Front
 to Back Airflow - AFO
Fan Tray 3                                             QFX5100 Fan Tray 3, Front
 to Back Airflow - AFO
Fan Tray 4                                             QFX5100 Fan Tray 4, Front
 to Back Airflow - AFO
```

show chassis lcd

List of Syntax

show chassis lcd (EX Series) on page 838
show chassis lcd (QFX Series) on page 838
show chassis lcd (OCX Series) on page 838

show chassis lcd (EX Series)

show chassis lcd
<fpc-slot *fpc-slot-number*>
<menu <(all-members | local | member *member-id*)>>

show chassis lcd (QFX Series)

show chassis lcd
<fpc-slot *fpc-slot-number*>
<interconnect-device *device-id*>
<node-device *device-id*>

show chassis lcd (OCX Series)

show chassis lcd
<fpc-slot *fpc-slot-number*>

Release Information

Command introduced in Junos OS Release 9.0 for EX Series switches.
menu option introduced in Junos OS Release 10.2 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 13.1 for QFabric systems.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display the information that appears on the LCD panel of EX3200, EX3300, EX4200, EX4500, EX6200, and EX8200 switches, XRE200 External Routing Engines, QFX Series standalone switches, OCX Series switches, and Interconnect devices and Node devices within a QFabric system. Display the status of the currently selected port parameter of the Status LED for each network port on the device.

Options

none—Display the information that appears on the LCD panel (for any EX Series member switch in a Virtual Chassis or for XRE200 External Routing Engines, display the information for all Virtual Chassis members). Display the status of the currently selected port parameter of the Status LED for each network port.

fpc-slot <*fpc-slot-number*>—(Optional) Display the information as follows:

- (EX3200, EX3300, EX4200, and EX4500 switches, QFX Series, or OCX Series) Display the information that appears on the LCD panel for either an FPC slot with no ***fpc-slot-number*** value specified or for the FPC slot specified by **fpc-slot 0**. **fpc-slot** refers to the switch itself and **0** is the only valid value for ***fpc-slot-number***. Output for these options is the same as for the **none** option.

  Also display the status of the currently selected port parameter of the Status LED for each network port.

- (EX Series Virtual Chassis member switches or XRE200 External Routing Engines) If no ***fpc-slot-number*** value is specified, display the information that appears on the LCD panel for all members of the Virtual Chassis. Output for this option is the same as for the **none** option. If the ***fpc-slot-number*** value is specified (it equals the ***member-id*** value), display the information for the specified member.

Copyright © 2016, Juniper Networks, Inc.

Also display the status of the currently selected port parameter of the Status LED for each network port.

- (EX6200 or EX8200 switches)—Display the information that appears on the LCD panel for the line card in the line-card slot specified by the ***fpc-slot-number*** value.

  Also display the status of the currently selected port parameter of the Status LED for each network port.

interconnect-device ***device-id***—(QFabric systems only) (Optional) Display the front panel contents and LED status of all the ports on the Interconnect device.

menu—(Optional) Display the names of the menus and menu options that are currently enabled on the LCD panel.

menu all-members—(EX Series Virtual Chassis member switches or XRE200 External Routing Engines) (Optional) Display the names of the menus and menu options that are currently enabled on the LCD panel for all Virtual Chassis members.

menu local—(EX Series Virtual Chassis member switches or XRE200 External Routing Engines) (Optional) Display the names of the menus and menu options that are currently enabled on the LCD panel for the Virtual Chassis member from which you issued the command.

menu member ***member-id***—(EX Series Virtual Chassis member switches or XRE200 External Routing Engines) (Optional) Display the names of the menus and menu options that are currently enabled on the LCD panel for the specified Virtual Chassis member.

node-device ***device-id***—(QFabric systems only) (Optional) Display the front panel contents and LED status of all the ports on the Node device.

Required Privilege Level

view

Related Documentation

- *LCD Panel in EX3200 Switches*
- *LCD Panel in EX4200 Switches*
- *LCD Panel in EX4500 Switches*
- *LCD Panel in an EX8200 Switch*
- *LCD Panel in an XRE200 External Routing Engine*
- *Configuring the LCD Panel on EX Series Switches (CLI Procedure)*
- *set chassis display message*

List of Sample Output

show chassis lcd (Two-Member EX4200 Virtual Chassis) on page 841
show chassis lcd fpc-slot 1 (EX4200 Virtual Chassis) on page 842
show chassis lcd (EX8200 Switch) on page 842
show chassis lcd fpc-slot 2 (EX8200 Switch) on page 844
show chassis lcd menu (EX4200 Switch) on page 844

show chassis lcd menu (EX8200 Switch) on page 845
show chassis lcd (QFX3500 Switches) on page 845
show chassis lcd (XRE200 External Routing Engine in EX8200 Virtual Chassis) on page 845
show chassis lcd interconnect-device (QFabric Systems) on page 848
show chassis lcd node-device (QFabric Systems) on page 850

Output Fields Table 38 on page 840 lists the output fields for the **show chassis lcd** command. Output fields are listed in the approximate order in which they appear.

Table 38: show chassis lcd Output Fields

Field Name	Field Description
member*number* (XRE200 External Routing Engine)	Member ID of the device whose content is being displayed.
Front panel contents for slot **Front panel contents** (EX6200, EX8200 switch, XRE200 External Routing Engine, and QFX Series)	FPC slot number of the switch whose content is being displayed. The number is always **0**, except for EX4200 switches in a Virtual Chassis, where it is the member ID value. On EX6200 switches, EX8200 switches, and XRE200 External Routing Engines, no slot number is displayed. On XRE200 External Routing Engines, this field appears under the **member *number*** field for each member device in the EX8200 Virtual Chassis.
LCD screen	The first line displays the hostname (for Virtual Chassis members, displays the member ID, the current role, and hostname; for EX8200 switches, displays **RE** and the hostname). The second line displays the currently selected port parameter of the Status LED and the alarms counter. The Status LED port parameters are: • **ADM**—Administrative • **SPD**—Speed • **DPX**—Duplex • **POE**—Power over Ethernet (EX3200 and EX4200 switches only)
LEDs status	Current state of the Alarms, System, and Master LEDs (chassis status LEDs).
Interface	Names of the interfaces on the switch.
LED (ADM/SPD/DPX/POE)	State of the currently selected port parameter of the Status LED for the interface. The Status LED port parameters are: NOTE: The XRE200 External Routing Engine always displays the **NA** parameter. The QFX Series products do not have any of the port parameters listed below. • **ADM**—Administrative • **SPD**—Speed • **DPX**—Duplex • **NA**—Not applicable. • **POE**—Power over Ethernet
fpc*x*	On standalone EX Series and QFX Series switches, always **0**. On EX Series Virtual Chassis member switches, member ID of the Virtual Chassis member whose LCD menu is displayed.

 Copyright © 2016, Juniper Networks, Inc.

Sample Output

show chassis lcd (Two-Member EX4200 Virtual Chassis)

```
user@switch> show chassis lcd
Front panel contents for slot: 0
---------------------------------
LCD screen:
    00:BK switch1
    LED:SPD ALARM 00
LEDs status:
    Alarms LED: Off
    System LED: Green
    Master LED: Off
Interface       LED(ADM/SPD/DPX/POE)
-------------------------------------
ge-0/0/0        Off
ge-0/0/1        Off
ge-0/0/2        Off
ge-0/0/3        Off
ge-0/0/4        Off
ge-0/0/5        Off
ge-0/0/6        Off
ge-0/0/7        Off
ge-0/0/8        Off
ge-0/0/9        Off
ge-0/0/10       Off
ge-0/0/11       Off
ge-0/0/12       Off
ge-0/0/13       Off
ge-0/0/14       Off
ge-0/0/15       Off
ge-0/0/16       Off
ge-0/0/17       Off
ge-0/0/18       Off
ge-0/0/19       Off
ge-0/0/20       Off
ge-0/0/21       Off
ge-0/0/22       Off
ge-0/0/23       Off
Front panel contents for slot: 1
---------------------------------
LCD screen:
    01:RE switch2
    LED:SPD ALARM 01
LEDs status:
    Alarms LED: Yellow
    System LED: Green
    Master LED: Green
Interface       LED(ADM/SPD/DPX/POE)
-------------------------------------
ge-1/0/0        Off
ge-1/0/1        Off
ge-1/0/2        Off
ge-1/0/3        Off
ge-1/0/4        Off
ge-1/0/5        Off
ge-1/0/6        Off
ge-1/0/7        Off
ge-1/0/8        Off
ge-1/0/9        Off
```

```
ge-1/0/10       Off
ge-1/0/11       Off
ge-1/0/12       Off
ge-1/0/13       Off
ge-1/0/14       Off
ge-1/0/15       Off
ge-1/0/16       Off
ge-1/0/17       Off
ge-1/0/18       Off
ge-1/0/19       Off
ge-1/0/20       Off
ge-1/0/21       Off
ge-1/0/22       Off
ge-1/0/23       Off
```

The output for the **show chassis lcd fpc-slot** command is the same as the output for the **show chassis lcd** command.

show chassis lcd fpc-slot 1 (EX4200 Virtual Chassis)

```
user@switch> show chassis lcd fpc-slot 1
Front panel contents for slot: 1
---------------------------------
LCD screen:
    01:RE switch2
    LED:SPD ALARM 01
LEDs status:
    Alarms LED: Yellow
    System LED: Green
    Master LED: Green
Interface       LED(ADM/SPD/DPX/POE)
-------------------------------------
ge-1/0/0        Off
ge-1/0/1        Off
ge-1/0/2        Off
ge-1/0/3        Off
ge-1/0/4        Off
ge-1/0/5        Off
ge-1/0/6        Off
ge-1/0/7        Off
ge-1/0/8        Off
ge-1/0/9        Off
ge-1/0/10       Off
ge-1/0/11       Off
ge-1/0/12       Off
ge-1/0/13       Off
ge-1/0/14       Off
ge-1/0/15       Off
ge-1/0/16       Off
ge-1/0/17       Off
ge-1/0/18       Off
ge-1/0/19       Off
ge-1/0/20       Off
ge-1/0/21       Off
ge-1/0/22       Off
ge-1/0/23       Off
```

show chassis lcd (EX8200 Switch)

```
user@switch> show chassis lcd
```

 Copyright © 2016, Juniper Networks, Inc.

```
Front panel contents:
---------------------
LCD screen:
    RE st-8200-r
    LED:ADM ALARM 01
LEDs status:
    Alarms LED: Yellow
    System LED: Yellow
    Master LED: Green
Interface       LED(ADM/SPD/DPX)
-----------------------------------------
ge-0/0/0        Off
ge-0/0/1        Off
ge-0/0/2        Off
ge-0/0/3        Off
ge-0/0/4        Off
ge-0/0/5        Off
ge-0/0/6        Off
ge-0/0/7        Off
ge-0/0/8        Off
ge-0/0/9        Off
ge-0/0/10       Off
ge-0/0/11       Off
ge-0/0/12       Off
ge-0/0/13       Off
ge-0/0/14       Off
ge-0/0/15       Off
ge-0/0/16       Off
ge-0/0/17       Off
ge-0/0/18       Off
ge-0/0/19       Off
ge-0/0/20       Off
ge-0/0/21       Off
ge-0/0/22       Off
ge-0/0/23       Off
ge-0/0/24       Off
ge-0/0/25       Off
ge-0/0/26       Off
ge-0/0/27       Off
ge-0/0/28       Off
ge-0/0/29       Off
ge-0/0/30       Off
ge-0/0/31       Off
ge-0/0/32       Off
ge-0/0/33       Off
ge-0/0/34       Off
ge-0/0/35       Off
ge-0/0/36       Off
ge-0/0/37       Off
ge-0/0/38       Off
ge-0/0/39       Off
ge-0/0/40       Off
ge-0/0/41       Off
ge-0/0/42       Off
ge-0/0/43       Off
ge-0/0/44       Off
ge-0/0/45       Off
ge-0/0/46       Off
ge-0/0/47       Off
xe-2/0/0        Off
xe-2/0/1        Off
```

```
xe-2/0/2        Off
xe-2/0/3        Off
xe-2/0/4        Off
xe-2/0/5        Off
xe-2/0/6        Off
xe-2/0/7        Off
xe-3/0/0        Off
xe-3/0/1        Off
xe-3/0/2        Off
xe-3/0/3        Off
xe-3/0/4        Off
xe-3/0/5        Off
xe-3/0/6        Off
xe-3/0/7        Off
xe-5/0/0        Off
xe-5/0/1        Off
xe-5/0/2        Off
xe-5/0/3        Off
xe-5/0/4        Off
xe-5/0/5        Off
xe-5/0/6        On
xe-5/0/7        On
xe-7/0/5        Off
```

show chassis lcd fpc-slot 2 (EX8200 Switch)

show chassis lcd fpc-slot 2

```
Interface       LED(ADM/SPD/DPX)
-----------------------------------------
xe-2/0/0        Off
xe-2/0/1        Off
xe-2/0/2        Off
xe-2/0/3        Off
xe-2/0/4        Off
xe-2/0/5        Off
xe-2/0/6        Off
xe-2/0/7        Off
```

show chassis lcd menu (EX4200 Switch)

```
user@switch> show chassis lcd menu
fpc0:
--------------------------------------------------------------------------
status-menu
status-menu vcp-status
status-menu power-status
status-menu environ-menu
status-menu show-version
maintenance-menu
maintenance-menu halt-menu
maintenance-menu system-reboot
maintenance-menu rescue-config
maintenance-menu vc-uplink-config
maintenance-menu factory-default
```

On an EX4200 switch in a Virtual Chassis, the output for the **show chassis lcd menu all-members** command is the same as the output for the **show chassis lcd menu** command.

Copyright © 2016, Juniper Networks, Inc.

show chassis lcd menu (EX8200 Switch)

```
user@switch> show chassis lcd menu
status-menu
status-menu sf-status1-menu
status-menu sf-status2-menu
status-menu psu-status1-menu
status-menu psu-status2-menu
status-menu environ-menu
status-menu show-version
maintenance-menu
maintenance-menu halt-menu
maintenance-menu system-reboot
maintenance-menu rescue-config
maintenance-menu factory-default
```

show chassis lcd (QFX3500 Switches)

```
user@switch> show chassis lcd
Front panel contents for slot: 0
--------------------------------
LCD screen:
00:RE switch
ALARM 01
LEDs status:
Status/Beacon LED: Yellow Blinking
Interface STATUS LED ACTIVITY LED
-----------------------------------------
fte-0/1/0 Off Off
```

show chassis lcd (XRE200 External Routing Engine in EX8200 Virtual Chassis)

```
user@external-routing-engine> show chassis lcd
member0:
--------------------------------------------------------------------------
Front panel contents:
---------------------
LCD screen:
    RE ex8200-member0
    LED:ADM ALARM 04
LEDs status:
    Alarms LED: Red
    System LED: Yellow
    Master LED: Green

member1:
--------------------------------------------------------------------------

member8:
--------------------------------------------------------------------------
Front panel contents:
---------------------
LCD screen:
    BACKUP

member9:
--------------------------------------------------------------------------
Front panel contents:
---------------------
LCD screen:
    09:RE xre200-member9
```

```
    LED: NA ALARM 01
Interface       LED(ADM/SPD/DPX/POE)
-----------------------------------------
ge-0/0/0        On
ge-0/0/1        On
ge-0/0/2        On
ge-0/0/3        On
ge-0/0/4        Off
ge-0/0/5        Off
ge-0/0/6        Off
ge-0/0/7        Off
ge-0/0/8        Off
ge-0/0/9        Off
ge-0/0/10       On
ge-0/0/11       Off
ge-0/0/12       Off
ge-0/0/13       Off
ge-0/0/14       Off
ge-0/0/15       Off
ge-0/0/16       Off
ge-0/0/17       Off
ge-0/0/18       Off
ge-0/0/19       Off
ge-0/0/20       Off
ge-0/0/21       Off
ge-0/0/22       Off
ge-0/0/23       Off
ge-0/0/24       Off
ge-0/0/25       Off
ge-0/0/26       Off
ge-0/0/27       Off
ge-0/0/28       Off
ge-0/0/29       Off
ge-0/0/30       Off
ge-0/0/31       Off
ge-0/0/32       Off
ge-0/0/33       Off
ge-0/0/34       Off
ge-0/0/35       Off
ge-0/0/36       Off
ge-0/0/37       Off
ge-0/0/38       Off
ge-0/0/39       Off
ge-0/0/40       On
ge-0/0/41       On
ge-0/0/42       On
ge-0/0/43       On
ge-0/0/44       On
ge-0/0/45       On
ge-0/0/46       On
ge-0/0/47       On
ge-16/0/0       On
ge-16/0/1       Off
ge-16/0/2       On
ge-16/0/3       Off
ge-16/0/4       On
ge-16/0/5       Off
ge-16/0/6       On
ge-16/0/7       Off
ge-16/0/8       Off
ge-16/0/9       Off
```

 Copyright © 2016, Juniper Networks, Inc.

```
ge-16/0/10       Off
ge-16/0/11       Off
ge-16/0/12       Off
ge-16/0/13       On
ge-16/0/14       Off
ge-16/0/15       On
ge-16/0/16       Off
ge-16/0/17       On
ge-16/0/18       On
ge-16/0/19       On
ge-16/0/20       On
ge-16/0/21       Off
ge-16/0/22       On
ge-16/0/23       Off
ge-16/0/24       Off
ge-16/0/25       Off
ge-16/0/26       On
ge-16/0/27       Off
ge-16/0/28       Off
ge-16/0/29       Off
ge-16/0/30       On
ge-16/0/31       Off
ge-16/0/32       On
ge-16/0/33       On
ge-16/0/34       On
ge-16/0/35       Off
ge-16/0/36       On
ge-16/0/37       Off
ge-16/0/38       Off
ge-16/0/39       Off
ge-16/0/40       Off
ge-16/0/41       Off
ge-16/0/42       On
ge-16/0/43       Off
ge-16/0/44       Off
ge-16/0/45       Off
ge-16/0/46       Off
ge-16/0/47       Off
xe-19/0/0        Off
xe-19/0/1        On
xe-19/0/2        On
xe-19/0/3        On
xe-19/0/4        On
xe-19/0/5        On
ge-22/0/0        Off
ge-22/0/1        Off
ge-22/0/2        On
ge-22/0/3        Off
ge-22/0/4        On
ge-22/0/5        On
ge-22/0/6        On
ge-22/0/7        On
ge-22/0/8        Off
ge-22/0/9        Off
ge-22/0/10       Off
ge-22/0/11       Off
ge-22/0/12       Off
ge-22/0/13       Off
ge-22/0/14       Off
ge-22/0/15       Off
ge-22/0/16       On
```

```
ge-22/0/17      Off
ge-22/0/18      On
ge-22/0/19      Off
ge-22/0/20      On
ge-22/0/21      Off
ge-22/0/22      On
ge-22/0/23      Off
ge-22/0/24      On
ge-22/0/25      Off
ge-22/0/26      Off
ge-22/0/27      Off
ge-22/0/28      Off
ge-22/0/29      Off
ge-22/0/30      Off
ge-22/0/31      Off
ge-22/0/32      On
ge-22/0/33      Off
ge-22/0/34      On
ge-22/0/35      Off
ge-22/0/36      Off
ge-22/0/37      Off
ge-22/0/38      Off
ge-22/0/39      Off
ge-22/0/40      Off
ge-22/0/41      Off
ge-22/0/42      Off
ge-22/0/43      Off
ge-22/0/44      Off
ge-22/0/45      Off
ge-22/0/46      Off
ge-22/0/47      Off
```

show chassis lcd interconnect-device (QFabric Systems)

show chassis lcd interconnect-device IC-F1012

```
                Front Panel Module Information
                ------------------------------
                LCD screen:
                IC-F1012        3 Alarms active
LEDs status:
    Status LED: Green
    Power LED : Green
    Major Alarm LED: off
    Minor Alarm LED: Yellow
    Fan 0 LED : Green
    Fan 1 LED : Green
    Fan 2 LED : Green
    Fan 3 LED : Green
    Fan 4 LED : Green
    Fan 5 LED : Green
    Fan 6 LED : Green
    Fan 7 LED : Green
    Fan 8 LED : Green
    Fan 9 LED : Green
    PEM 0 LED : Green
    PEM 1 LED : Green
    PEM 2 LED : Green
    PEM 3 LED : off
    PEM 4 LED : off
    PEM 5 LED : off
```


Copyright © 2016, Juniper Networks, Inc.

```
                LED info for: CB - 0
                ---------------------------------
LEDs status:
    Status LED: Green
    Mastership LED: Green

Interface               STATUS LED      LINK/ACTIVITY LED
---------------------------------------------------------
IC-F1012:pme0 :         Green           N/A
IC-F1012:pme1 :         Green           N/A
IC-F1012:pme2 :         off             N/A
IC-F1012:pme3 :         off             N/A

                LED info for: CB - 1
                ---------------------------------
LEDs status:
    Status LED: Green
    Mastership LED: Amber

Interface               STATUS LED      LINK/ACTIVITY LED
---------------------------------------------------------
IC-F1012:pme0 :         Green           N/A
IC-F1012:pme1 :         Green           N/A
IC-F1012:pme2 :         off             N/A
IC-F1012:pme3 :         off             N/A

                LED info for: FC 0 FPC - 0
                ---------------------------------
LEDs status:
    Status LED: Green

Interface               STATUS LED      LINK/ACTIVITY LED
---------------------------------------------------------
IC-F1012:fte-0/0/0      Green           N/A
IC-F1012:fte-0/0/1      Green           N/A
IC-F1012:fte-0/0/2      Green           N/A
IC-F1012:fte-0/0/3      Green           N/A
IC-F1012:fte-0/0/4      Green           N/A

                LED info for: FC 1 FPC - 1
                ---------------------------------
LEDs status:
    Status LED: Green

Interface               STATUS LED      LINK/ACTIVITY LED
---------------------------------------------------------
IC-F1012:fte-1/0/0      Green           N/A
IC-F1012:fte-1/0/1      Green           N/A
IC-F1012:fte-1/0/2      Green           N/A
IC-F1012:fte-1/0/3      Green           N/A
IC-F1012:fte-1/0/4      Green           N/A

                LED info for: RC 0 FPC - 8
                ---------------------------------
LEDs status:
    Status LED: Green

                LED info for: RC 1 FPC - 9
                ---------------------------------
LEDs status:
    Status LED: Green
```

```
                LED info for: RC 2 FPC - 10
                ---------------------------------
LEDs status:
    Status LED: Green

                LED info for: RC 3 FPC - 11
                ---------------------------------
LEDs status:
    Status LED: Green

                LED info for: RC 4 FPC - 12
                ---------------------------------
LEDs status:
    Status LED: Green

                LED info for: RC 5 FPC - 13
                ---------------------------------
LEDs status:
    Status LED: Green

                LED info for: RC 6 FPC - 14
                ---------------------------------
LEDs status:
    Status LED: Green

                LED info for: RC 7 FPC - 15
                ---------------------------------
LEDs status:
    Status LED: Green
```

show chassis lcd node-device (QFabric Systems)

show chassis lcd node-device P3774-C

```
                Front panel contents for: P3774-C
                ----------------------------------
                LCD screen:
                P3774-C
LEDs status:
    Status/Beacon LED: Yellow Blinking

Interface               STATUS LED      LINK/ACTIVITY LED
---------------------------------------------------------
P3774-C:xe-0/0/6        Green           Green
P3774-C:xe-0/0/7        Green           Green
P3774-C:ge-0/0/10       Green           Green
P3774-C:ge-0/0/11       Green           Green Blinking
P3774-C:ge-0/0/12       Green           Off
P3774-C:ge-0/0/13       Green           Green Blinking
P3774-C:ge-0/0/20       Green           Green
P3774-C:ge-0/0/21       Green           Green
P3774-C:ge-0/0/22       Green           Green Blinking
P3774-C:ge-0/0/23       Green           Off
P3774-C:ge-0/0/30       Green           Green
P3774-C:ge-0/0/31       Green           Green
P3774-C:ge-0/0/32       Green           Green Blinking
P3774-C:ge-0/0/33       Green           Green Blinking
P3774-C:fte-0/1/0       Green           Green
P3774-C:fte-0/1/1       Green           Green Blinking
P3774-C:fte-0/1/2       Green           Green Blinking
P3774-C:fte-0/1/3       Green           Green
```

 Copyright © 2016, Juniper Networks, Inc.

show chassis led

List of Syntax

show chassis led (EX Series) on page 852
show chassis led (QFX Series) on page 852
Syntax (OCX Series) on page 852

show chassis led (EX Series)

show chassis led
<fpc-slot <*fpc-slot-number*>>

show chassis led (QFX Series)

show chassis led
<fpc-slot <*fpc-slot-number*>>
interconnect-device *name*
node-device *name*

Syntax (OCX Series)

show chassis led
<fpc-slot <*fpc-slot-number*>>

Release Information

Command introduced in Junos OS Release 10.1 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display the status and colors of the chassis LEDs on the front panel of the switch. A major alarm (red) indicates a critical error condition that requires immediate action. A minor alarm (yellow) indicates a noncritical condition that requires monitoring or maintenance. A minor alarm that is left unchecked might cause interruption in service or performance degradation.

Options

none—Display the status of the chassis status LEDs (for EX4200 switches configured as a Virtual Chassis, display the information for all Virtual Chassis members).

fpc-slot <*fpc-slot-number*>—(Optional) (Not on EX2200 switches) Display the information as follows:

- (EX3200, standalone EX4200, standalone QFX3500,EX4500, and OCX Series switches) Display the status of the chassis status LEDs for either an FPC slot with no ***fpc-slot-number*** value specified or for the FPC slot specified by **fpc-slot 0**. **fpc-slot** refers to the switch itself and **0** is the only valid value for ***fpc-slot-number***. Output for these options is the same as for the **none** option.
- (EX4200 switches in a Virtual Chassis with two or more members) If no ***fpc-slot-number*** value is specified, display the status of the chassis status LEDs for all members of the Virtual Chassis. Output for this option is the same as for the **none** option. If the ***fpc-slot-number*** value is specified (it equals the ***member-id*** value), display the status of the chassis status LEDs for the specified member.
- (EX8200 switches)—Display the status of the chassis status LEDs for the line card in the line-card slot specified by the ***fpc-slot-number*** value.

interconnect-device *name*—

— (QFabric systems only) (Optional) Display the status of the chassis and interface status LEDs for the Interconnect device.

Copyright © 2016, Juniper Networks, Inc.

node-device ***name***— (QFabric systems only) (Optional) Display the status of the chassis and interface status LEDs for the Node device.

Required Privilege Level

view

Related Documentation

- *Chassis Status LEDs in EX2200 Switches*
- *Chassis Status LEDs in EX3200 Switches*
- *Chassis Status LEDs in EX4200 Switches*
- *Chassis Status LEDs in EX4500 Switches*
- *Chassis Status LEDs in an EX8200 Switch*
- *Chassis Status LEDs on a QFX3500 Device*
- *Chassis Status LEDs in the QFX3600 and QFX3600-I Device*
- *Management Port LEDs on a QFX3500 Device*
- *Management Port LEDs in the QFX3600 and QFX3600-I Device*
- *Chassis Status LEDs on a QFX3008-I Interconnect Device*
- *Control Board LEDs on a QFX3008-I Interconnect Device*

List of Sample Output

show chassis led (EX2200 Switch) on page 856
show chassis led on page 857
show chassis led fpc-slot 0 on page 858
show chassis led (EX Series) on page 858
show chassis led node-device (QFabric System Node Device) on page 859
show chassis led interconnect-device (QFabric System - QFX3600-I Interconnect Device) on page 859
show chassis led interconnect-device (QFabric System - QFX3008-I Interconnect Device) on page 860

Output Fields

Table 28 on page 484 lists the output fields for the **show chassis led** command. Output fields are listed in the approximate order in which they appear.

Table 39: show chassis led Output Fields

Field Name	Field Description
Front panel contents for slot **Front panel contents** (EX8200 Switches) **Front Panel Module Information** (QFabric system QFX3008-I Interconnect device) **Front panel contents for** (QFabric system Node devices and QFX3600-I Interconnect devices)	FPC slot number of the device whose content is being displayed. The number is always **0**, except for EX4200 switches in a Virtual Chassis, where it is the member ID value. On EX8200 switches, no slot number is displayed. On QFabric system Node devices, the name of the Node device whose content is being displayed.

Table 39: show chassis led Output Fields *(continued)*

Field Name	Field Description
Alarms LED	(EX Series switches only) Displays status of the ALM LED: • Off—No alarm has been configured. • Green—No alarm has been triggered. • Red—Major alarm. • Yellow—Minor alarm
System LED	(EX Series switches only) Displays status of the SYS LED: • Off—Switch is powered off. • Green—Switch is operating normally. • Yellow—Switch is booting.

Master LED:	Displays status of the MST LED (on EX3200, EX4200, and EX8200 switches):
	• Green—On an EX4200 Virtual Chassis switch, indicates the switch is the master in the Virtual Chassis configuration. On other switches, indicates that the Routing Engine is operational.
	• Off
	  ◦ On an EX4200 Virtual Chassis switch, indicates that this switch is not the master in the Virtual Chassis configuration.
	  ◦ On EX3200, standalone EX4200, and EX8200 switches, indicates that the Routing Engine is not operational.

Mode LED:	(EX Series switches only) On an EX2200 switch only, displays the currently selected port parameter of the Status LED: • **ADM**—Administrative • **SPD**—Speed • **DPX**—Duplex • **POE**—Power over Ethernet
Status/Beacon LED	(QFX Series and OCX Series) Displays the system status as indicated by the Status LED on the chassis. For more information, see: • *Chassis Status LEDs on a QFX3500 Device* • *Chassis Status LEDs in the QFX3600 and QFX3600-I Device*
LINK/SPEED LED	(QFX Series and OCX Series) Displays the link status and speed of a management port. For more information, see: • *Management Port LEDs on a QFX3500 Device* • *Management Port LEDs in the QFX3600 and QFX3600-I Device*
ACTIVITY LED	(QFX Series and OCX Series) Displays the activity status of a management port. For more information, see: • *Management Port LEDs on a QFX3500 Device* • *Management Port LEDs in the QFX3600 and QFX3600-I Device*

Copyright © 2016, Juniper Networks, Inc.

Table 39: show chassis led Output Fields *(continued)*

Field Name	Field Description
STATUS LED	(QFX Series and OCX Series) Displays the link status of an interface as indicated by the ST LED. For more information, see: • *Control Board LEDs on a QFX3008-I Interconnect Device* • *Access Port and Uplink Port LEDs on a QFX3500 Device* • *Access Port and Uplink Port LEDs on a QFX3600 or QFX3600-I Device*
LINK/ACTIVITY LED	(QFX Series and OCX Series) Displays link activity or faults on an interface as indicated by the LA LED. For more information, see: • *Access Port and Uplink Port LEDs on a QFX3500 Device* • *Access Port and Uplink Port LEDs on a QFX3600 or QFX3600-I Device*
Status LED	(QFX3008-I Interconnect device only) • Displays the system status as indicated by the STATUS LED on the front panel of the chassis. For more information, see *Chassis Status LEDs on a QFX3008-I Interconnect Device*. • Displays the status of a Control Board as indicated by the STATUS LED on the Control Board. For more information, see *Control Board LEDs on a QFX3008-I Interconnect Device*.
Power LED	(QFX3008-I Interconnect device only) Displays the status of system power on the device. For more information, see *Chassis Status LEDs on a QFX3008-I Interconnect Device*.
Major Alarm LED	(QFX3008-I Interconnect device only) Displays whether a critical error condition that requires immediate action exists on the device. For more information, see *Chassis Status LEDs on a QFX3008-I Interconnect Device*.
Minor Alarm LED	(QFX3008-I Interconnect device only) Displays whether a noncritical condition that requires monitoring or maintenance exists on the device. For more information, see *Chassis Status LEDs on a QFX3008-I Interconnect Device*.
Fan 0 LED **Fan 1 LED** **Fan 2 LED** **Fan 3 LED** **Fan 4 LED** **Fan 5 LED** **Fan 6 LED** **Fan 7 LED** **Fan 8 LED**	(QFX3008-I Interconnect device only) Displays the status of fan trays on the device. For more information, see *Chassis Status LEDs on a QFX3008-I Interconnect Device*.

Table 39: show chassis led Output Fields *(continued)*

Field Name	Field Description
PEM 0 LED **PEM 1 LED** **PEM 2 LED** **PEM 3 LED** **PEM 4 LED**	(QFX3008-I Interconnect device only) Displays the status of power supplies on the device. For more information, see *Chassis Status LEDs on a QFX3008-I Interconnect Device*.
LED info for	(QFX3008-I Interconnect device only) Displays the LED information for a Control Board.
Mastership LED	(QFX3008-I Interconnect device only) Displays status of the MASTER LED on a Control Board. For more information, see *Control Board LEDs on a QFX3008-I Interconnect Device*.
Interface	Names of the interfaces on the device.
LED (ADM/SPD/DPX/POE)	(EX Series switches only) State of the currently selected port parameter of the Status LED for the interface. The Status LED port parameters are: NOTE: EX4500 and EX8200 switches do not have the POE port parameter. • **ADM**—Administrative • **SPD**—Speed • **DPX**—Duplex • **POE**—Power over Ethernet

Sample Output

show chassis led (EX2200 Switch)

```
user@switch> show chassis led
Front panel contents for slot: 0
--------------------------------
LEDs status:
    Alarms LED: Amber
    System LED: Green
    Mode LED  : Duplex
Interface    LED(ADM/SPD/DPX/POE)
-------------------------------------
ge-0/0/0        Off
ge-0/0/1        Full Duplex
ge-0/0/2        Full Duplex
ge-0/0/3        Off
ge-0/0/4        Off
ge-0/0/5        Full Duplex
ge-0/0/6        Full Duplex
ge-0/0/7        Full Duplex
ge-0/0/8        Full Duplex
ge-0/0/9        Full Duplex
ge-0/0/10       Full Duplex
ge-0/0/11       Full Duplex
```


Copyright © 2016, Juniper Networks, Inc.

```
ge-0/0/12       Full Duplex
ge-0/0/13       Full Duplex
ge-0/0/14       Full Duplex
ge-0/0/15       Full Duplex
ge-0/0/16       Full Duplex
ge-0/0/17       Full Duplex
ge-0/0/18       Full Duplex
ge-0/0/19       Full Duplex
ge-0/0/20       Full Duplex
ge-0/0/21       Full Duplex
ge-0/0/22       Off
ge-0/0/23       Off
ge-0/0/24       Full Duplex
ge-0/0/25       Full Duplex
ge-0/0/26       Off
ge-0/0/27       Off
ge-0/0/28       Full Duplex
ge-0/0/29       Full Duplex
```

show chassis led

```
user@switch> show chassis led

Front panel contents for slot: 0
--------------------------------
LEDs status:
    Alarms LED: Off
    System LED: Green
    Master LED: Green
Interface       LED(ADM/SPD/DPX/POE)
-------------------------------------
ge-0/0/0        Off
ge-0/0/1        Full Duplex
ge-0/0/2        Full Duplex
ge-0/0/3        Off
ge-0/0/4        Off
ge-0/0/5        Full Duplex
ge-0/0/6        Full Duplex
ge-0/0/7        Full Duplex
ge-0/0/8        Full Duplex
ge-0/0/9        Full Duplex
ge-0/0/10       Full Duplex
ge-0/0/11       Full Duplex
ge-0/0/12       Full Duplex
ge-0/0/13       Full Duplex
ge-0/0/14       Full Duplex
ge-0/0/15       Full Duplex
ge-0/0/16       Full Duplex
ge-0/0/17       Full Duplex
ge-0/0/18       Full Duplex
ge-0/0/19       Full Duplex
ge-0/0/20       Full Duplex
ge-0/0/21       Full Duplex
ge-0/0/22       Off
ge-0/0/23       Off
ge-0/0/24       Full Duplex
ge-0/0/25       Full Duplex
ge-0/0/26       Off
ge-0/0/27       Off
ge-0/0/28       Full Duplex
ge-0/0/29       Full Duplex
```

show chassis led fpc-slot 0

```
user@switch> show chassis led fpc-slot 0
Front panel contents for slot: 0
---------------------------------
LEDs status:
    Alarms LED: Red
    System LED: Green
    Master LED: Green
Interface       LED(ADM/SPD/DPX/POE)
-------------------------------------
ge-0/0/0        Off
ge-0/0/1        Off
ge-0/0/2        Off
ge-0/0/3        Off
ge-0/0/4        Off
ge-0/0/5        Off
ge-0/0/6        Off
ge-0/0/7        Off
ge-0/0/8        Off
ge-0/0/9        Off
ge-0/0/10       Off
ge-0/0/11       Off
ge-0/0/12       Off
ge-0/0/13       Off
ge-0/0/14       Off
ge-0/0/15       Off
ge-0/0/16       Off
ge-0/0/17       Off
ge-0/0/18       Off
ge-0/0/19       Off
ge-0/0/20       Off
ge-0/0/21       Off
ge-0/0/22       Off
ge-0/0/23       Off
```

show chassis led (EX Series)

```
user@switch> show chassis led
Front panel contents for slot: 0
---------------------------------
LEDs status:
Alarms LED: Amber
Status LED: Green
Mode LED : Duplex
Interface LED(ADM/SPD/DPX/POE)
-------------------------------------
ge-0/0/0 Off
ge-0/0/1 Full Duplex
ge-0/0/2 Full Duplex
ge-0/0/3 Off
ge-0/0/4 Off
ge-0/0/5 Full Duplex
ge-0/0/6 Full Duplex
ge-0/0/7 Full Duplex
ge-0/0/8 Full Duplex
ge-0/0/9 Full Duplex
ge-0/0/10 Full Duplex
ge-0/0/11 Full Duplex
ge-0/0/12 Full Duplex
ge-0/0/13 Full Duplex
```


Copyright © 2016, Juniper Networks, Inc.

```
ge-0/0/14 Full Duplex
ge-0/0/15 Full Duplex
ge-0/0/16 Full Duplex
ge-0/0/17 Full Duplex
ge-0/0/18 Full Duplex
ge-0/0/19 Full Duplex
ge-0/0/20 Full Duplex
ge-0/0/21 Full Duplex
ge-0/0/22 Off
ge-0/0/23 Off
ge-0/0/24 Full Duplex
ge-0/0/25 Full Duplex
ge-0/0/26 Off
ge-0/0/27 Off
ge-0/0/28 Full Duplex
ge-0/0/29 Full Duplex
```

show chassis led node-device (QFabric System Node Device)

```
user@switch> show chassis led node-device node1
 Front panel contents for: node1
LEDs status:
    Status/Beacon LED: Yellow Blinking

Interface              LINK/SPEED LED      ACTIVITY LED
-------------------------------------------------------
node1:me5              Green               N/A
node1:me6              Green               N/A

Interface              STATUS LED      LINK/ACTIVITY LED
-----------------------------------------------------
node1:xe-0/0/8         Green           Green
node1:ge-0/0/10        Green           Green
node1:ge-0/0/12        Green           Green
node1:ge-0/0/24        Green           Green
node1:ge-0/0/25        Green           Green
node1:ge-0/0/26        Green           Green
node1:ge-0/0/27        Green           Green
node1:ge-0/0/28        Green           Green
node1:ge-0/0/29        Green           Green
node1:ge-0/0/30        Green           Green
node1:ge-0/0/31        Green           Green
node1:ge-0/0/32        Green           Green
node1:ge-0/0/33        Green           Green
node1:ge-0/0/34        Green           Green
node1:ge-0/0/35        Green           Green
node1:ge-0/0/36        Green           Green
node1:ge-0/0/37        Green           Green
node1:ge-0/0/38        Green           Green
node1:ge-0/0/39        Green           Green
node1:fte-0/1/0        Green           Green Blinking
node1:fte-0/1/2        Green           Green Blinking
```

show chassis led interconnect-device (QFabric System - QFX3600-I Interconnect Device)

```
user@switch> show chassis led interconnect-device IC-EG0712
                Front panel contents for: FPC 0
                -----------------------------------
LEDs status:
    Status/Beacon LED: Yellow Blinking
```

```
Interface               LINK/SPEED LED      ACTIVITY LED
-------------------------------------------------------
IC-EG0712:me5           Green               N/A
IC-EG0712:me6           Green               N/A

Interface               STATUS LED      LINK/ACTIVITY LED
---------------------------------------------------------
IC-EG0712:fte-0/1/0     Green           Green
IC-EG0712:fte-0/1/1     Green           Green Blinking
IC-EG0712:fte-0/1/2     Green           Green
IC-EG0712:fte-0/1/3     Green           Green Blinking
IC-EG0712:fte-0/1/4     Green           Green
IC-EG0712:fte-0/1/5     Green           Green Blinking
IC-EG0712:fte-0/1/6     Green           Green
IC-EG0712:fte-0/1/7     Green           Green
IC-EG0712:fte-0/1/8     Green           Green Blinking
IC-EG0712:fte-0/1/9     Green           Green Blinking
IC-EG0712:fte-0/1/10    Green           Green Blinking
```

show chassis led interconnect-device (QFabric System - QFX3008-I Interconnect Device)

```
user@switch> show chassis led interconnect-device IC-EG0712
                Front Panel Module Information
                ---------------------------------
LEDs status:
    Status LED: Green
    Power LED : Yellow Blinking
    Major Alarm LED: Red
    Minor Alarm LED: Yellow
    Fan 0 LED : Green
    Fan 1 LED : Green
    Fan 2 LED : Green
    Fan 3 LED : Green
    Fan 4 LED : Green
    Fan 5 LED : Green
    Fan 6 LED : Green
    Fan 7 LED : Green
    Fan 8 LED : Green
    Fan 9 LED : Green
    PEM 0 LED : Green
    PEM 1 LED : Green
    PEM 2 LED : Green
    PEM 3 LED : off
    PEM 4 LED : Yellow Blinking
    PEM 5 LED : off

                LED info for: CB - 0
                ---------------------------------
LEDs status:
    Status LED: Green
    Mastership LED: Green

Interface               STATUS LED      LINK/ACTIVITY LED
---------------------------------------------------------
IC-F4899:pme0 :         Green           N/A
IC-F4899:pme1 :         off             N/A
IC-F4899:pme2 :         off             N/A
IC-F4899:pme3 :         off             N/A

                LED info for: CB - 1
                ---------------------------------
```

 Copyright © 2016, Juniper Networks, Inc.

```
LEDs status:
    Status LED: Green
    Mastership LED: Amber

Interface               STATUS LED      LINK/ACTIVITY LED
---------------------------------------------------------
IC-F4899:pme0 :         Green           N/A
IC-F4899:pme1 :         off             N/A
IC-F4899:pme2 :         off             N/A
IC-F4899:pme3 :         off             N/A

                LED info for: FC 0 FPC - 0
                ---------------------------------
LEDs status:
    Status LED: Green

Interface               STATUS LED      LINK/ACTIVITY LED
---------------------------------------------------------
IC-F4899:fte-0/0/0      Green           N/A
IC-F4899:fte-0/0/1      Green           N/A
IC-F4899:fte-0/0/2      Green           N/A
IC-F4899:fte-0/0/3      Green           N/A
IC-F4899:fte-0/0/4      Green           N/A
IC-F4899:fte-0/0/5      Green           N/A
IC-F4899:fte-0/0/6      Green           N/A
IC-F4899:fte-0/0/7      Green           N/A
IC-F4899:fte-0/0/8      Green           N/A
IC-F4899:fte-0/0/9      Green           N/A
IC-F4899:fte-0/0/10     Green           N/A
IC-F4899:fte-0/0/11     Green           N/A
IC-F4899:fte-0/0/12     Green           N/A
IC-F4899:fte-0/0/13     Green           N/A
IC-F4899:fte-0/0/14     Green           N/A
IC-F4899:fte-0/0/15     Green           N/A

                LED info for: FC 1 FPC - 1
                ---------------------------------
LEDs status:
    Status LED: Green

Interface               STATUS LED      LINK/ACTIVITY LED
---------------------------------------------------------
IC-F4899:fte-1/0/0      Green           N/A
IC-F4899:fte-1/0/1      Green           N/A

                LED info for: RC 2 FPC - 10
                ---------------------------------
LEDs status:
    Status LED: Green

                LED info for: RC 3 FPC - 11
                ---------------------------------
LEDs status:
    Status LED: Green
```

show chassis location

List of Syntax

Syntax on page 862
Syntax (TX Matrix Router) on page 862
Syntax (TX Matrix Plus Router) on page 862
Syntax (MX Series Router) on page 862
Syntax (QFX Series) on page 862
Syntax (OCX Series) on page 862

Syntax

show chassis location

Syntax (TX Matrix Router)

show chassis location
<fpc | interface (by-name *name* | by-slot fpc *number* lcc *number*) | lcc *number* | scc>

Syntax (TX Matrix Plus Router)

show chassis location
<fpc | interface (by-name *name* | by-slot fpc *number* lcc *number*) | lcc *number* | sfc *number*>

Syntax (MX Series Router)

show chassis location
<all-members>
<local>
<member *member-id*>

Syntax (QFX Series)

show chassis location
<interconnect-device *name*>
<node-device *name*>

Syntax (OCX Series)

show chassis location

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.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display the physical location of the chassis. This command can only be used on the master Routing Engine.

Options

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.

all-members—(MX Series routers only) (Optional) Display the physical location of the chassis for all the member routers in the Virtual Chassis configuration.

fpc—(TX Matrix router and TX Matrix Plus router only) (Optional) Display the physical location of all Flexible PIC Concentrators (FPCs).

interconnect-device *name*—(QFabric systems only) (Optional) Display the physical location of the Interconnect device.

Copyright © 2016, Juniper Networks, Inc.

interface by-name ***name***—(TX Matrix and TX Matrix Plus routers only) (Optional) Display the physical location of a specified interface name. On a TX Matrix router, this option displays the FPC number and T640 router (line-card chassis) number associated with the specified interface. On a TX Matrix Plus router, this option displays the FPC number and router (line-card chassis) number associated with the specified interface.

interface by-slot fpc ***number*** **lcc** ***number***—(TX Matrix and TX Matrix Plus router only) (Optional) On a TX Matrix router, display the global FPC number of an interface by specifying its local FPC number and T640 router (line-card chassis) number. On a TX Matrix Plus router, display the global FPC number of an interface by specifying its local FPC number and router (line-card chassis) number.

- The global FPC number is the FPC slot number when all the FPC slots in the routing matrix are considered: **0** through **31**. On TX Matrix Plus router with 3D SIBs, the value is **0** through **63**. The local FPC number is the FPC slot number on a particular T640 router.
- For **fpc**, replace ***number*** with a value from **0** through **7**.
- For **lcc**, replace ***number*** with a value from **0** through **7**.

lcc ***number***—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display the physical location of a specified T640 router (line-card chassis) that is connected to a TX Matrix router. On a TX Matrix Plus router , display the physical location of a specified router (line-card chassis) that is connected to a TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(MX Series routers only) (Optional) Display the physical location of the chassis for the local Virtual Chassis member.

member ***member-id***—(MX Series routers only) (Optional) Display the physical location of the chassis for the specified member of the Virtual Chassis configuration. Replace ***member-id*** with a value of 0 or 1.

node-device ***name***—(QFabric systems only) (Optional) Display the physical location of the Node device.

scc—(TX Matrix routers only) (Optional) Display the physical location of the TX Matrix router (switch-card chassis).

sfc—(TX Matrix Plus routers only) (Optional) Display the physical location of the TX Matrix Plus router (or switch-fabric chassis).

Required Privilege Level view

Related Documentation
- *Displaying Chassis Physical Locations for a Routing Matrix with a TX Matrix Plus Router*

List of Sample Output

show chassis location on page 864
show chassis location fpc (TX Matrix Router) on page 865
show chassis location interface by-slot (TX Matrix Router) on page 865
show chassis location fpc (TX Matrix Plus Router) on page 865
show chassis location interface by-slot (TX Matrix Plus Router) on page 865
show chassis location (QFX Series and OCX Series) on page 865
show chassis location (QFabric Systems) on page 865

Output Fields Table 40 on page 864 lists the output fields for the **show chassis location** command. Output fields are listed in the approximate order in which they appear.

Table 40: show chassis location Output Fields

Field Name	Field Description
country-code	Country code information.
postal-code	Postal code information.
Building	Building information.
Floor	Floor information.
Global FPC	Global FPC number. The FPC slot number, when all FPC slots in the routing matrix are considered. The range of values is **0** through **31**. On TX Matrix Plus router with 3D SIBs the value is **0** through **63**.
LATA	Local access transport area information.
LCC	Line-card chassis number. On a TX Matrix router, the number of a particular T640 router connected to the TX Matrix router. On a TX Matrix Plus router, the number of a particular router connected to the TX Matrix Plus router.
Local FPC	Local FPC number. On a TX Matrix router, the FPC slot number on a particular T640 router. On a TX Matrix Plus router, the FPC slot number on a particular router.

Sample Output

show chassis location

```
user@host> show chassis location
```

 Copyright © 2016, Juniper Networks, Inc.

```
country-code: US
postal-code: 94404
Building: Building 2, Floor: 2
```

show chassis location fpc (TX Matrix Router)

```
user@host> show chassis location fpc
Global FPC    LCC     Local FPC
    17          2         1
    21          2         5
```

show chassis location interface by-slot (TX Matrix Router)

```
user@host> show chassis location interface by-slot fpc 1 lcc 1
Global FPC: 9
```

show chassis location fpc (TX Matrix Plus Router)

```
user@host> show chassis location fpc
Global FPC    LCC     Local FPC
     0          0         0
     1          0         1
```

show chassis location interface by-slot (TX Matrix Plus Router)

```
user@host> show chassis location interface by-slot fpc 2 lcc 1
Global FPC: 10
```

show chassis location (QFX Series and OCX Series)

```
user@switch> show chassis location
country-code: US
postal-code: 94404
Building: Building 2, Floor: 2
```

show chassis location (QFabric Systems)

```
user@switch> show chassis location interconnect-device interconnect1
country-code: US
postal-code: 94404
Building: Building 2, Floor: 2
```

show chassis mac-addresses

List of Syntax

Syntax on page 866
Syntax (TX Matrix Router) on page 866
Syntax (TX Matrix Plus Router) on page 866
Syntax (MX Series Router) on page 866
Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers) on page 866
Syntax (QFX Series) on page 866
Syntax (OCX Series) on page 866
Syntax (ACX Series Universal Access Routers) on page 866

Syntax

show chassis mac-addresses

Syntax (TX Matrix Router)

show chassis mac-addresses
<lcc *number* | scc>

Syntax (TX Matrix Plus Router)

show chassis mac-addresses
<lcc *number* | sfc *number*>

Syntax (MX Series Router)

show chassis mac-addresses
<all-members>
<local>
<member *member-id*>

Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers)

show chassis mac-addresses

Syntax (QFX Series)

show chassis mac-addresses
<interconnect-device *name*>
<node-group *name*>

Syntax (OCX Series)

show chassis mac-addresses

Syntax (ACX Series Universal Access Routers)

show chassis mac-addresses

Release Information

Command introduced before JUNOS Release 7.4.
Command introduced in JUNOS Release 9.0 for EX Series switches.
sfc option introduced for the TX Matrix Plus router in JUNOS Release 9.6.
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 MX104 3D Universal Edge Routers.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display the media access control (MAC) addresses for the router, switch chassis, or switch.

Copyright © 2016, Juniper Networks, Inc.

Options

none—(TX Matrix, TX Matrix Plus routers, QFX Series, and OCX Series Switches) Display the MAC addresses for the router chassis or switch. On a TX Matrix router, display MAC addresses on the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display MAC addresses on the TX Matrix Plus router and its attached routers.

all-members—(MX Series routers only) (Optional) Display the MAC addresses for all the member routers of the Virtual Chassis configuration.

interconnect-device ***name***—(QFabric systems only) (Optional) Display the MAC addresses for the Interconnect device.

lcc ***number***—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display MAC addresses for a specified T640 router (line-card chassis) that is connected to the TX Matrix Plus router. On a TX Matrix Plus router, display MAC addresses for a specified router (line-card chassis) that is connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(MX Series routers only) (Optional) Display the MAC addresses for the local Virtual Chassis member.

member ***member-id***—(MX Series routers only) (Optional) Display the MAC addresses for the specified member of the Virtual Chassis configuration. Replace ***member-id*** with a value of 0 or 1.

node-group ***name***—(QFabric systems only) (Optional) Display the MAC addresses for the specified Node group.

scc—(TX Matrix routers only) (Optional) Display MAC addresses for the TX Matrix router (switch-card chassis).

sfc ***number***—(TX Matrix Plus routers only) (Optional) Display MAC addresses for the TX Matrix Plus router (or switch-fabric chassis).

Required Privilege Level

view

Related Documentation

- *ACX2000 and ACX2100 Routers Hardware and CLI Terminology Mapping*

List of Sample Output

show chassis mac-addresses on page 868
show chassis mac-addresses (MX104 Router) on page 868
show chassis mac-addresses (MX2010 Router) on page 868
show chassis mac-addresses (MX2020 Router) on page 869
show chassis mac-addresses (TX Matrix Router) on page 869
show chassis mac-addresses (TX Matrix Plus Router) on page 869
show chassis mac-addresses (QFX Series and OCX Series) on page 870
show chassis mac-addresses interconnect-device (QFabric Systems) on page 870
show chassis mac-addresses node-group (QFabric Systems) on page 870
show chassis mac-addresses (ACX2000 Universal Access Router) on page 870

Output Fields

Table 41 on page 868 lists the output fields for the **show chassis mac-addresses** command. Output fields are listed in the approximate order in which they appear.

Table 41: 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
```


Copyright © 2016, Juniper Networks, Inc.

```
  Private base address    64:87:88:04:57:c0
  Private count           64
```

show chassis mac-addresses (MX2020 Router)

```
user@host> show chassis mac-addresses
MAC address information:
  Public base address     2c:21:72:70:20:00
  Public count            4032
  Private base address    2c:21:72:70:2f:c0
  Private count           64
```

show chassis mac-addresses (TX Matrix Router)

```
user@host> show chassis mac-addresses
scc-re0:
--------------------------------------------------------------------------
MAC address information:
  Public base address     00:05:85:9e:cc:00
  Public count            8064
  Private base address    00:05:85:9e:eb:80
  Private count           128
lcc0-re0:
--------------------------------------------------------------------------
MAC address information:
  Public base address     00:05:85:68:98:00
  Public count            2032
  Private base address    00:05:85:68:9f:f0
  Private count           16
lcc2-re0:
--------------------------------------------------------------------------
MAC address information:
  Public base address     00:05:85:68:78:00
  Public count            2032
  Private base address    00:05:85:68:7f:f0
  Private count           16
```

show chassis mac-addresses (TX Matrix Plus Router)

```
user@host> show chassis mac-addresses
sfc0-re0:
--------------------------------------------------------------------------
MAC address information:
  Public base address     00:1d:b5:14:00:00
  Public count            65023
  Private base address    00:1d:b5:14:fd:ff
  Private count           512

lcc0-re0:
--------------------------------------------------------------------------
MAC address information:
  Public base address     00:1f:12:7a:84:00
  Public count            2032
  Private base address    00:1f:12:7a:8b:f0
  Private count           16

lcc1-re0:
--------------------------------------------------------------------------
MAC address information:
  Public base address     00:22:83:42:48:00
  Public count            2032
  Private base address    00:22:83:42:4f:f0
```

```
  Private count           16

lcc2-re0:
--------------------------------------------------------------------------
MAC address information:
  Public base address     00:1f:12:c3:58:00
  Public count            2032
  Private base address    00:1f:12:c3:5f:f0
  Private count           16

lcc3-re0:
--------------------------------------------------------------------------
MAC address information:
  Public base address     00:21:59:ef:b8:00
  Public count            2032
  Private base address    00:21:59:ef:bf:f0
  Private count           16
```

show chassis mac-addresses (QFX Series and OCX Series)

```
user@switch> show chassis mac-addresses
MAC address information:
Public base address 02:00:08:00:00:00
Public count 512
Private base address 02:00:00:00:00:00
Private count 64
```

show chassis mac-addresses interconnect-device (QFabric Systems)

```
user@switch> show chassis mac-addresses interconnect-device interconnect1
MAC address information:
  Public base address     00:1f:12:30:9c:c0
  Public count            58
  Private base address    00:1f:12:30:9c:fa
  Private count           6
```

show chassis mac-addresses node-group (QFabric Systems)

```
user@switch> show chassis mac-addresses node-group NW-NG-0
MAC address information:
------------------------
RE:
  FC MAC base    00:11:00:00:00:00
  FC MAC count   2
  VLAN MAC       00:11:00:00:00:09
EC6007
  Base address   00:00:01:76:00:00
  Count          64
EC6008
  Base address   00:22:83:22:52:ae
  Count          260
```

show chassis mac-addresses (ACX2000 Universal Access Router)

```
user@switch> show chassis mac-addresses
MAC address information:
  Public base address     84:18:88:c0:2b:00
  Public count            112
  Private base address    84:18:88:c0:2b:70
  Private count           16
```


Copyright © 2016, Juniper Networks, Inc.

show chassis pic

List of Syntax

Syntax on page 871
Syntax (TX Matrix and TX Matrix Plus Routers) on page 871
Syntax (MX Series Routers and EX Series Switches) on page 871
Syntax (MX2010 and MX2010 3D Universal Edge Routers) on page 871
Syntax (PTX Series Packet Transport Router) on page 871
Syntax (QFX Series) on page 871
Syntax (OCX Series) on page 871
Syntax (ACX Series Universal Access Routers) on page 871

Syntax

show chassis pic fpc-slot *slot-number* pic-slot *slot-number*

Syntax (TX Matrix and TX Matrix Plus Routers)

show chassis pic fpc-slot *slot-number* pic-slot *slot-number*
<lcc *number*>

Syntax (MX Series Routers and EX Series Switches)

show chassis pic fpc-slot *slot-number* pic-slot *slot-number*
<all-members>
<local>
<member *member-id*>

Syntax (MX2010 and MX2010 3D Universal Edge Routers)

show chassis pic fpc-slot *slot-number* pic-slot *slot-number*

Syntax (PTX Series Packet Transport Router)

show chassis pic transport fpc-slot *slot-number* pic-slot *slot-number*

Syntax (QFX Series)

show chassis pic fpc-slot *slot-number* pic-slot *slot-number*
<interconnect-device *name* (fpc-slot *slot-number* | pic-slot *slot-number*)>
<node-device *name* pic-slot *slot-number*>

Syntax (OCX Series)

show chassis pic fpc-slot *slot-number* pic-slot *slot-number*

Syntax (ACX Series Universal Access Routers)

show chassis pic fpc-slot *slot-number* pic-slot *slot-number*

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.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display status information about the PIC installed in the specified Flexible PIC Concentrator (FPC) and PIC slot.

Options **fpc-slot** ***slot-number***—Display information about the PIC in this particular FPC slot:

- On a TX Matrix router, if you specify the number of the T640 router by using the **lcc** ***number*** option (the recommended method), replace ***slot-number*** with a value from **0** through **7**. Otherwise, replace ***slot-number*** with a value from **0** through **31**.

  Likewise, on a TX Matrix Plus router, if you specify the number of the T1600 router by using the **lcc** ***number*** option (the recommended method), replace ***slot-number*** with a value from **0** through **7**. Otherwise, replace ***slot-number*** with a value from **0** through **31**. For example, the following commands have the same result:

  ```
  user@host> show chassis pic fpc-slot 1 lcc 1 pic-slot 1
  user@host> show chassis pic fpc-slot 9 pic-slot 1
  ```

- M120 routers only—Replace ***slot-number*** with a value from **0** through **5**.
- MX80 routers only—Replace ***slot-number*** with a value from **0** through **1**.
- MX104 routers only—Replace ***slot-number*** with a value from **0** through **2**.
- MX240 routers only—Replace ***slot-number*** with a value from **0** through **2**.
- MX480 routers only—Replace ***slot-number*** with a value from **0** through **5**.
- MX960 routers only—Replace ***slot-number*** with a value from **0** through **11**.
- MX2010 routers only—Replace ***slot-number*** with a value from **0** through **9**.
- MX2020 routers only—Replace ***slot-number*** with a value from **0** through **19**.
- Other routers—Replace ***slot-number*** with a value from **0** through **7**.
- EX Series switches:
  - EX3200 switches and EX4200 standalone switches—Replace ***slot-number*** with 0.
  - EX4200 switches in a Virtual Chassis configuration—Replace ***slot-number*** with a value from 0 through 9 (switch's member ID).
  - EX8208 switches—Replace ***slot-number*** with a value from 0 through 7 (line card).
  - EX8216 switches—Replace ***slot-number*** with a value from 0 through 15 (line card).
- QFX Series:
  - QFX3500, QFX3600, QFX5100, and OCX Series standalone switches—Replace ***slot-number*** with 0. In the command output, FPC refers to a line card. The FPC number equals the slot number for the line card.
  - QFabric systems—Replace ***slot-number*** with any number between 0 and 15. In the command output, FPC refers to a line card. The FPC number equals the slot number for the line card.

all-members—(MX Series routers and EX Series switches only) (Optional) Display PIC information for all member routers in the Virtual Chassis configuration.

 Copyright © 2016, Juniper Networks, Inc.

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 (or 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 350
- show chassis hardware on page 656
- *100-Gigabit Ethernet Type 4 PIC with CFP Overview*

List of Sample Output

show chassis pic fpc-slot pic-slot on page 876
show chassis pic fpc-slot pic-slot (PIC Offline) on page 877

show chassis pic fpc-slot pic-slot (FPC Offline) on page 877
show chassis pic fpc-slot pic-slot (FPC Not Present) on page 877
show chassis pic fpc-slot pic-slot (PIC Not Present) on page 877
show chassis pic fpc-slot 3 pic-slot 0 (M120 Router) on page 877
show chassis pic fpc-slot pic-slot (MX104 Router) on page 877
show chassis pic fpc-slot pic-slot (MX960 Router with Bidirectional Optics) on page 878
show chassis pic fpc-slot pic-slot (MX480 Router with 100-Gigabit Ethernet MIC) on page 878
show chassis pic fpc-slot pic-slot (MX240, MX480, MX960 Routers with Application Services Modular Line Card) on page 878
show chassis pic fpc-slot pic-slot (MX960 Router with MPC5EQ) on page 879
show chassis pic fpc-slot pic-slot (MX960 Router with MPC3E and 100-Gigabit DWDM OTN MIC) on page 879
show chassis pic fpc-slot pic-slot (PTX3000 Router with 5-port 100-Gigabit DWDM OTN PIC on page 879
show chassis pic fpc-slot pic-slot (MX480 Router with MPC4E) on page 880
show chassis pic fpc-slot pic-slot (MX480 Router with OTN Interface) on page 880
show chassis pic fpc-slot pic-slot (MX2010 Router with OTN Interfaces) on page 880
show chassis pic fpc-slot pic-slot (MX2010 Router) on page 880
show chassis pic fpc-slot pic-slot (MX2020 Router) on page 881
show chassis pic fpc-slot pic-slot (MX2020 Router with MPC5EQ and MPC6E) on page 881
show chassis pic fpc-slot pic-slot (MX2020 Router with MPC6E and OTN MIC) on page 881
show chassis pic fpc-slot pic-slot (MX2020 Router with MPC4E) on page 882
show chassis pic fpc-slot pic-slot (T1600 Router with 100-Gigabit Ethernet PIC) on page 882
show chassis pic fpc-slot pic-slot lcc (TX Matrix Router) on page 882
show chassis pic fpc-slot pic-slot lcc (TX Matrix Plus Router) on page 883
show chassis pic fpc-slot pic-slot (Next-Generation SONET/SDH SFP) on page 883
show chassis pic fpc-slot pic-slot (12-Port T1/E1) on page 883
show chassis pic fpc-slot 0 pic-slot 1 (4x CHOC3 SONET CE SFP) on page 883
show chassis pic fpc-slot 0 pic-slot 0 (SONET/SDH OC3/STM1 [Multi-Rate] MIC with SFP) on page 884
show chassis pic fpc-slot 3 pic-slot 0 (8-port Channelized SONET/SDH OC3/STM1 [Multi-Rate] MIC with SFP) on page 884
show chassis pic fpc-slot 5 pic-slot 0 (4-Port Channelized SONET/SDH OC3/STM1 [Multi-Rate] MIC with SFP) on page 884
show chassis pic fpc-slot 1 pic-slot 0 (1-Port OC192/STM64 MIC with XFP) on page 885
show chassis pic fpc-slot 1 pic-slot 2 (8-Port DS3/E3 MIC) on page 885
show chassis pic fpc-slot pic-slot (OTN) on page 885
show chassis pic fpc-slot pic-slot (QFX3500 Switch) on page 885
show chassis pic fpc-slot pic-slot (QFX5100 Switches and OCX Series) on page 885
show chassis pic interconnect-device fpc-slot pic-slot (QFabric Systems) on page 885
show chassis pic node-device fpc-slot pic-slot (QFabric System) on page 886
show chassis pic fpc-slot 0 pic-slot 1 (ACX2000 Universal Access Router) on page 887
show chassis pic FPC-slot 1 PIC-slot 0 (MX Routers with Media Services Blade [MSB]) on page 887

 Copyright © 2016, Juniper Networks, Inc.

show chassis pic FPC slot 1, PIC slot 2 (MX Routers with Media Services Blade [MSB]) on page 887

Output Fields

Table 42 on page 875 lists the output fields for the **show chassis pic** command. Output fields are listed in the approximate order in which they appear.

Table 42: show chassis pic Output Fields

Field Name	Field Description
Type	PIC type. 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**.
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. • **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. • 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 • Xcvr Firmware—Transceiver firmware version.

Copyright © 2016, Juniper Networks, Inc.

Table 42: show chassis pic Output Fields *(continued)*

Field Name	Field Description

PIC Port Information (MX960 Router Bidirectional Optics)	Port-level information for the PIC.
	• 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.
	  ◦ 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.

PIC Port Information (Next-Generation SONET/SDH SFP)	Port-level information for the next-generation SONET/SDH SFP PIC. • 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)	Port-level information for the PIC. • 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-selectabilty 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
```


Copyright © 2016, Juniper Networks, Inc.

```
  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 3 pic-slot 0 (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 with Bidirectional Optics)

```
user@host> show chassis pic fpc-slot 4 pic-slot 1
FPC slot 4, PIC slot 1 information:
  Type                              10x 1GE(LAN)
  State                             Online
  PIC version                  0.0
  Uptime                         18 days, 5 hours, 41 minutes, 54 seconds

PIC port information:
                          Fiber                     Xcvr vendor
  Port  Cable type        type  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:
        Fiber                    Xcvr vendor
  Port  Cable type        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 Application Services Modular Line Card)

```
user@host>show chassis pic fpc-slot 1 pic-slot 2
FPC slot 1, PIC slot 2 information:
  Type                              AS-MXC
  State                             Online
  PIC version                  1.0
  Uptime                         11 hours, 18 minutes, 3 seconds
```


Copyright © 2016, Juniper Networks, Inc.

show chassis pic fpc-slot pic-slot (MX960 Router with MPC5EQ)

```
user@host> show chassis pic fpc-slot 0 pic-slot 3
FPC slot 0, PIC slot 3 information:
  Type                              1X100GE CFP2 OTN
  State                             Online
  PIC version                  0.0
  Uptime                         1 hour, 22 minutes, 42 seconds

PIC port information:
                         Fiber                    Xcvr vendor       Wave-    Xcvr

  Port Cable type        type  Xcvr vendor        part number       length
Firmware
  0    100GBASE LR4      n/a   Oclaro Inc.        TRB5E20FNF-LF150  1309 nm  1.0
```

show chassis pic fpc-slot pic-slot (MX960 Router with MPC3E and 100-Gigabit DWDM OTN MIC)

```
user@host> show chassis pic fpc-slot 3 pic-slot 0
FPC slot 3, PIC slot 0 information:
  Type                              1X100GE DWDM CFP2-ACO
  State                             Online
  PIC version                  1.3
  Uptime                         9 hours, 4 minutes, 43 seconds

PIC port information:
                         Fiber                    Xcvr vendor       Wave-    Xcvr

  Port Cable type        type  Xcvr vendor        part number       length
Firmware
  0    100G LH           SM    OCLARO             TRB100AJ-01       1528.77 nm -
 1568.36 nm 20.10
```

show chassis pic fpc-slot pic-slot (PTX3000 Router with 5-port 100-Gigabit DWDM OTN PIC

```
user@host > show chassis pic fpc-slot 4 pic-slot 0
FPC slot 4, PIC slot 0 information:
  Type                              5X100GE DWDM CFP2-ACO
  State                             Online
  PIC version                 1.17
  Uptime                         1 day, 5 hours, 15 minutes, 17 seconds

PIC port information:
                         Fiber                    Xcvr vendor       Wave-    Xcvr

  Port Cable type        type  Xcvr vendor        part number       length
Firmware
  0    100G LH           SM    MULTILANE SAL      ML4030-ACO-2      1528.77 nm -
 1568.36 nm 1.0
  1    100G LH           SM    MULTILANE SAL      ML4030-ACO-2      1528.77 nm -
 1568.36 nm 1.0
  2    100G LH           SM    JUNIPER-FUJITSU    FIM38500/222      1528.77 nm -
 1568.36 nm 1.16
  3    100G LH           SM    FUJITSU            FIM38500/222      1528.77 nm -
 1568.36 nm 1.16
  4    100G LH           SM    FUJITSU            FIM38500/222      1528.77 nm -
 1568.36 nm 1.16
```

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 (MX480 Router with OTN Interface)

```
user@host> show chassis pci fpc-slot 4 pic-slot 0
FPC slot 4, PIC slot 0 information:
  Type                            12X10GE SFPP OTN
  State                           Online
  PIC version                 0.0
  Uptime                        5 hours, 28 minutes, 23 seconds

PIC port information:
                        Fiber                   Xcvr vendor       Wave-    Xcvr

  Port Cable type        type  Xcvr vendor        part number       length
Firmware
  0    10GBASE SR        MM    FINISAR CORP.      FTLX8571D3BNL-J1  850 nm   0.0

  1    10GBASE SR        MM    FINISAR CORP.      FTLX8571D3BCL-J1  850 nm   0.0

  2    10GBASE SR        MM    OPNEXT, INC.       TRS2001EM-0014    850 nm   0.0
```

show chassis pic fpc-slot pic-slot (MX2010 Router with OTN Interfaces)

```
user@host> show chassis pic fpc-slot 9 pic-slot 0
FPC slot 9, PIC slot 0 information:
  Type                            2X100GE CFP2 OTN
  State                           Online
  PIC version                 1.9
  Uptime                        3 hours, 56 minutes, 16 seconds

PIC port information:
                        Fiber                   Xcvr vendor       Wave-    Xcvr

  Port Cable type        type  Xcvr vendor        part number       length
Firmware
  0    100GBASE LR4-D    SM    FUJITSU            FIM37300/222      1310 nm  1.3

  1    100GBASE SR10     MM    AVAGO              AFBR-8420Z        n/a      1.0
```

show chassis pic fpc-slot pic-slot (MX2010 Router)

```
user@host>show chassis pic fpc-slot 9 pic-slot 3
```

 Copyright © 2016, Juniper Networks, Inc.

```
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 (MX2020 Router with MPC5EQ and MPC6E)

```
user@host> show chassis pic fpc-slot 18 pic-slot 2
FPC slot 18, PIC slot 2 information:
  Type                              3X40GE QSFPP
  State                             Online
  PIC version                  0.0
  Uptime                         6 minutes, 31 seconds

PIC port information:
                        Fiber                    Xcvr vendor       Wave-    Xcvr

  Port Cable type        type  Xcvr vendor        part number       length
Firmware
  0    40GBASE SR4       MM    AVAGO              AFBR-79E4Z-D-JU2  850 nm   0.0

  1    40GBASE SR4       MM    AVAGO              AFBR-79E4Z-D-JU2  850 nm   0.0

  2    40GBASE SR4       MM    AVAGO              AFBR-79E4Z-D-JU2  850 nm   0.0
```

show chassis pic fpc-slot pic-slot (MX2020 Router with MPC6E and OTN MIC)

```
user@host> show chassis pic fpc-slot 3 pic-slot 0
FPC slot 0, PIC slot 1 information:
  Type                              24X10GE SFPP OTN
  State                             Online
  PIC version                  1.1
  Uptime                         1 hour, 33 minutes, 59 seconds

PIC port information:
```

```
                          Fiber                    Xcvr vendor       Wave-    Xcvr

  Port Cable type         type  Xcvr vendor        part number       length
Firmware
  7    10GBASE SR         MM    SumitomoElectric   SPP5200SR-J6-M    850 nm   0.0

  9    10GBASE SR         MM    FINISAR CORP.      FTLX8571D3BNL-J1  850 nm   0.0

  12   10GBASE LR         SM    FINISAR CORP.      FTLX1472M3BNL-J3  1310 nm  0.0

  20   10GBASE ZR         SM    FINISAR CORP.      FTLX1871M3BNL-J3  1550 nm  0.0

  21   10GBASE ER         SM    FINISAR CORP.      FTLX1671D3BTL-J4  1550 nm  0.0

  22   10GBASE LR         SM    SOURCEPHOTONICS    SPP10SLREDFCJNP   1310 nm  0.0

  23   10GBASE LR         SM    FINISAR CORP.      FTLX1471D3BNL-J1  1310 nm  0.0
```

show chassis pic fpc-slot pic-slot (MX2020 Router with MPC4E)

```
user@host> show chassis pic fpc-slot 14 pic-slot 0
FPC slot 14, PIC slot 1 information:
  Type                            1X100GE CFP
  State                           Online
  PIC version                 0.0
  Uptime                        1 day, 2 hours, 19 minutes, 18 seconds

PIC port information:
                          Fiber                    Xcvr vendor       Wave-    Xcvr

  Port Cable type         type  Xcvr vendor        part number       length
Firmware
  0    100GBASE SR10      MM    Reflex Photonics   CF-X12-C11801-50  860 nm   4.7
```

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:
                           Fiber                    Xcvr vendor
  Port  Cable type         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
```


Copyright © 2016, Juniper Networks, Inc.

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:
                           Fiber
  Port  Cable type         type  Xcvr vendor         part number       Wavelength

  0     10GBASE ZR         SM    Opnext Inc.         TRF7061BN-LF150   1550 nm
  0     10GBASE ZR         SM    FINISAR CORP.       FTRX-1811-3-J2    1550 nm
```

show chassis pic fpc-slot pic-slot (Next-Generation SONET/SDH SFP)

```
user@host> show chassis pic fpc-slot 4 pic-slot 0
FPC slot 4, PIC slot 0 information:
   Type                              4x OC-3 1x OC-12 SFP
   ASIC type                         D FPGA
   State                             Online
   PIC version                  1.3
   Uptime                        1 day, 50 minutes, 4 seconds

 PIC port information:
                            Fiber                    Xcvr vendor
   Port  Cable type         type  Xcvr vendor        part number       Wavelength

   0     OC48 short reach   SM    FINISAR CORP.      FTRJ1321P1BTL-J2  1310 nm
   1     OC3 short reach    MM    OCP                TRPA03MM3BAS-JE   1310 nm
   2     OC3 short reach    MM    OCP                TRXA03MM3BAS-JW   1310 nm
   3     OC12 inter reach   SM    FINISAR CORP.      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 0 pic-slot 1 (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:
                           Fiber                    Xcvr vendor
  Port  Cable type         type  Xcvr vendor        part number       Wavelength
  0     OC3 short reach    MM    AVAGO              HFBR-57E0P-JU2    n/a
  1     OC3 short reach    MM    AVAGO              HFBR-57E0P-JU2    n/a
  3     OC3 long reach     SM    OPNEXT INC         TRF5456AVLB314    1310 nm
```

show chassis pic fpc-slot 0 pic-slot 0 (SONET/SDH OC3/STM1 [Multi-Rate] MIC with SFP)

```
user@host> show chassis pic fpc-slot 0 pic-slot 0
FPC slot 0, PIC slot 0 information:
  Type                              MIC-3D-8OC3OC12-4OC48
  State                             Online
  PIC version                   1.8
  Uptime                          3 days, 22 hours, 3 minutes, 50 seconds

PIC port information:
                           Fiber                    Xcvr vendor
  Port  Cable type         type  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 3 pic-slot 0 (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:
                           Fiber                    Xcvr vendor
  Port  Cable type         type  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 5 pic-slot 0 (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:
                           Fiber                    Xcvr vendor
  Port  Cable type         type  Xcvr vendor        part number       Wavelength
  1     OC12 inter reach   SM    FINISAR CORP.      FTRJ1322P1BTR-J3  1310 nm
```


Copyright © 2016, Juniper Networks, Inc.

```
  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 1 pic-slot 0 (1-Port OC192/STM64 MIC with XFP)

```
user@host> show chassis pic fpc-slot 1 pic-slot 0
FPC slot 1, PIC slot 0 information:
  Type                            MIC-3D-1OC192-XFP
  State                           Online
  PIC version                     1.2
  Uptime                          1 day, 11 hours, 4 minutes, 6 seconds

PIC port information:
                          Fiber                     Xcvr vendor
  Port  Cable type        type  Xcvr vendor        part number       Wavelength
  0     OC192 short reach n/a   FINISAR CORP.      FTLX1412M3BCL-J3  1310 nm
```

show chassis pic fpc-slot 1 pic-slot 2 (8-Port DS3/E3 MIC)

```
user@host> show chassis pic fpc-slot 1 pic-slot 2
FPC slot 1, PIC slot 2 information:
  Type                            MIC-3D-8DS3-E3
  State                           Online
  PIC version                     1.10
  Uptime                          4 days, 1 hour, 29 minutes, 19 seconds
  Channelization Mode             Disabled
```

show chassis pic fpc-slot pic-slot (OTN)

```
user@host> show chassis pic fpc-slot 5 pic-slot 0
PIC fpc slot 5 pic slot 0 information:
     Type                            1x10GE(LAN),OTN
     ASIC type                       H chip
     State                           Online
     PIC version                  1.0
     Uptime                       5 minutes, 50 seconds
```

show chassis pic fpc-slot pic-slot (QFX3500 Switch)

```
user@switch> show chassis pic fpc-slot 0 pic-slot 0
FPC slot 0, PIC slot 0 information:
Type 48x 10G-SFP+ Builtin
State Online
Uptime 3 days, 3 hours, 5 minutes, 20 seconds
```

show chassis pic fpc-slot pic-slot (QFX5100 Switches and OCX Series)

```
user@switch> show chassis pic fpc-slot 0 pic-slot 0
FPC slot 0, PIC slot 0 information:
  Type                            Unknown Builtin
  State                           Online
  Uptime                        1 day, 17 hours, 5 minutes, 9 seconds
```

show chassis pic interconnect-device fpc-slot pic-slot (QFabric Systems)

```
user@switch> show chassis pic interconnect-device interconnect1 fpc-slot 9 pic-slot 0
FPC slot 9, PIC slot 0 information:
  Type                            16x 40G-GEBuiltin
  State                           Online
  Uptime                        2 hours, 47 minutes, 40 seconds
```

show chassis pic node-device fpc-slot pic-slot (QFabric System)

```
user@switch> show chassis pic node-device node1 pic-slot 0
FPC slot node1, PIC slot 0 information:
  Type                              48x 10G-SFP+Builtin
  State                             Online
  Uptime                          2 hours, 52 minutes, 37 seconds

PIC port information:
                            Fiber                     Xcvr vendor
  Port  Cable type          type  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
```


Copyright © 2016, Juniper Networks, Inc.

show chassis pic fpc-slot 0 pic-slot 1 (ACX2000 Universal Access Router)

```
user@host> show chassis pic fpc-slot 0 pic-slot 1
FPC slot 0, PIC slot 1 information:
  Type                              8x 1GE(LAN) RJ45 Builtin
  State                             Online
  Uptime                          6 days, 2 hours, 51 minutes, 11 seconds
```

show chassis pic FPC-slot 1 PIC-slot 0 (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 1, PIC slot 2 (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 routing-engine

List of Syntax

Syntax on page 888
Syntax (ACX Series Universal Access Routers) on page 888
Syntax (EX Series Switches) on page 888
Syntax (QFX Series) on page 888
Syntax (MX Series Routers) on page 888
Syntax (MX2010 3D Universal Edge Routers) on page 888
Syntax (MX2020 3D Universal Edge Routers) on page 888
Syntax (MX104 3D Universal Edge Routers) on page 888
Syntax (PTX Series Packet Transport Routers) on page 888
Syntax (T Series Routers) on page 889
Syntax (TX Matrix Routers) on page 889
Syntax (TX Matrix Plus Routers) on page 889

Syntax

show chassis routing-engine
<bios | *slot*>

Syntax (ACX Series Universal Access Routers)

show chassis routing-engine

Syntax (EX Series Switches)

show chassis routing-engine
<*slot*>
<satellite [slot-id *slot-id* |device-alias *alias-name*>

Syntax (QFX Series)

show chassis routing-engine
<interconnect-device *name*>
<node-device *name*>

Syntax (MX Series Routers)

show chassis routing-engine
<all-members>
<bios | *slot*>
<local>
<member *member-id*>
<satellite [slot-id *slot-id* |device-alias *alias-name*>

Syntax (MX2010 3D Universal Edge Routers)

show chassis routing-engine
<bios | *slot*>

Syntax (MX2020 3D Universal Edge Routers)

show chassis routing-engine
<bios | *slot*>

Syntax (MX104 3D Universal Edge Routers)

show chassis routing-engine

Syntax (PTX Series Packet Transport Routers)

show chassis routing-engine

Copyright © 2016, Juniper Networks, Inc.

Syntax (T Series Routers)

show chassis routing-engine
<bios | *slot*>

Syntax (TX Matrix Routers)

show chassis routing-engine
<bios | *slot*>
<lcc *number* | scc>

Syntax (TX Matrix Plus Routers)

show chassis routing-engine
<bios | *slot*>
<lcc *number* | sfc *number*>

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 in 9.6.
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 MX104 3D Univesral Edge Routers.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
satellite option introduced in Junos OS Release 14.2R3.

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.

satellite [slot-id ***slot-id*** **|device-alias** ***alias-name*****]**—(Junos Fusion only) (Optional) Display Routing Engine information for the specified satellite device in a Junos Fusion, or for all satellite devices in the Junos Fusion if no satellite devices are specified.

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 355
- *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 893
show chassis routing-engine (M10 Router) on page 894
show chassis routing-engine (M20 Router) on page 894
show chassis routing-engine (M40 Router) on page 895
show chassis routing-engine (M120 Router) on page 895
show chassis routing-engine (M160 Router) on page 896
show chassis routing-engine (MX104 Router) on page 897
show chassis routing-engine (MX240 Router) on page 897
show chassis routing-engine (MX480 Router) on page 898
show chassis routing-engine (MX960 Router) on page 899
show chassis routing-engine (MX2010 Router) on page 901
show chassis routing-engine (MX2020 Router) on page 901
show chassis routing-engine (T320 Router) on page 902

Copyright © 2016, Juniper Networks, Inc.

show chassis routing-engine (T640 Router) on page 903
show chassis routing-engine (T1600 Router) on page 904
show chassis routing-engine (T4000 Router) on page 904
show chassis routing-engine (TX Matrix Router) on page 905
show chassis routing-engine lcc (TX Matrix Router) on page 906
show chassis routing-engine bios (TX Matrix Router) on page 907
show chassis routing-engine (TX Matrix Plus Router) on page 907
show chassis routing-engine lcc (TX Matrix Plus Router) on page 908
show chassis routing-engine bios (TX Matrix Plus Router) on page 909
show chassis routing-engine (QFX Series) on page 909
show chassis routing-engine (OCX Series) on page 910
show chassis routing engine interconnect-device (QFabric Systems) on page 910
show chassis routing-engine (PTX Series Packet Transport Router) on page 911
show chassis routing-engine (EX9200 Switch) on page 911
show chassis routing-engine (ACX2000 Universal Access Router) on page 912
show chassis routing-engine (ACX1000 Universal Access Router) on page 912

Output Fields Table 43 on page 891 lists the output fields for the **show chassis routing-engine** command. Output fields are listed in the approximate order in which they appear.

Table 43: 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.
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. NOTE: For platforms running Junos OS with upgraded FreeBSD, the way memory utilization is calculated has changed. Starting in Junos OS Release 15.1R1, inactive memory is no longer included in the calculation for memory utilization. For platforms that run Junos OS with upgraded FreeBSD, see *Understanding Junos OS with Upgraded FreeBSD*.

Table 43: show chassis routing-engine Output Fields *(continued)*

Field Name	Field Description
CPU utilization	Information about the Routing Engine's CPU utilization: • **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.
5 sec CPU Utilization NOTE: Supported only on MX240, MX480, MX960, MX2010, and MX2020.	Information about the Routing Engine's CPU utilization in the past 5 seconds: • **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.
1 min CPU Utilization NOTE: Supported only on MX240, MX480, MX960, MX2010, and MX2020.	Information about the Routing Engine's CPU utilization in the past 1 minute: • **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.
5 min CPU Utilization NOTE: Supported only on MX240, MX480, MX960, MX2010, and MX2020.	Information about the Routing Engine's CPU utilization in the past 5 minutes: • **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.
15 min CPU Utilization NOTE: Supported only on MX240, MX480, MX960, MX2010, and MX2020.	Information about the Routing Engine's CPU utilization in the past 15 minutes: • **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.

Copyright © 2016, Juniper Networks, Inc.

Table 43: show chassis routing-engine Output Fields *(continued)*

Field Name	Field Description
Routing Engine BIOS Version	BIOS version being run by the Routing Engine.
Last reboot reason	Reason for last reboot, including: • **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 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)
```


Copyright © 2016, Juniper Networks, Inc.

```
    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
```


Copyright © 2016, Juniper Networks, Inc.

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                  Master
    Election priority              Master (default)
    Temperature                 36 degrees C / 96 degrees F
    CPU temperature             35 degrees C / 95 degrees F
    DRAM                      3314 MB (8192 MB installed)
    Memory utilization          37 percent
    5 sec CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     1 percent
```

```
      Interrupt                  0 percent
      Idle                      99 percent
    1 min CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     1 percent
      Interrupt                  0 percent
      Idle                      99 percent
    5 min CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     1 percent
      Interrupt                  0 percent
      Idle                      99 percent
    15 min CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     1 percent
      Interrupt                  0 percent
      Idle                      99 percent
    Model                          RE-S-1800x4
    Serial ID                      9009074155
    Start time                     2014-10-13 00:35:41 PDT
    Uptime                         98 days, 2 hours, 6 minutes, 35 seconds
    Last reboot reason             Router rebooted after a normal shutdown.
    Load averages:                 1 minute   5 minute  15 minute
                                       0.12       0.12       0.13
Routing Engine status:
  Slot 1:
    Current state                  Present
```

show chassis routing-engine (MX480 Router)

```
user@host> show chassis routing-engine
Routing Engine status:
  Slot 0:
    Current state                  Backup
    Election priority              Master (default)
    Temperature                 30 degrees C / 86 degrees F
    CPU temperature             32 degrees C / 89 degrees F
    DRAM                      3314 MB (8192 MB installed)
    Memory utilization          51 percent
    5 sec CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     0 percent
      Interrupt                  0 percent
      Idle                     100 percent
    1 min CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     0 percent
      Interrupt                  0 percent
      Idle                       0 percent
    5 min CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     0 percent
      Interrupt                  0 percent
      Idle                       0 percent
    15 min CPU utilization:
```

 Copyright © 2016, Juniper Networks, Inc.

```
      User                        0 percent
      Background                  0 percent
      Kernel                      0 percent
      Interrupt                   0 percent
      Idle                        0 percent
    Model                           RE-S-1800x4
    Serial ID                       9009079817
    Start time                      2015-01-19 01:45:58 PST
    Uptime                          7 minutes, 23 seconds
    Last reboot reason              Router rebooted after a normal shutdown.
    Load averages:                  1 minute   5 minute  15 minute
                                        0.16       0.16       0.09
Routing Engine status:
  Slot 1:
    Current state                   Master
    Election priority               Backup (default)
    Temperature                  31 degrees C / 87 degrees F
    CPU temperature              32 degrees C / 89 degrees F
    DRAM                       8144 MB (8192 MB installed)
    Memory utilization           23 percent
    5 sec CPU utilization:
      User                        0 percent
      Background                  0 percent
      Kernel                      1 percent
      Interrupt                   0 percent
      Idle                       99 percent
    1 min CPU utilization:
      User                        0 percent
      Background                  0 percent
      Kernel                      1 percent
      Interrupt                   0 percent
      Idle                       98 percent
    5 min CPU utilization:
      User                        0 percent
      Background                  0 percent
      Kernel                      1 percent
      Interrupt                   0 percent
      Idle                       98 percent
    15 min CPU utilization:
      User                        0 percent
      Background                  0 percent
      Kernel                      1 percent
      Interrupt                   0 percent
      Idle                       98 percent
    Model                           RE-S-1800x4
    Serial ID                       9009079838
    Start time                      2015-01-09 10:52:20 PST
    Uptime                          9 days, 15 hours, 1 minute, 4 seconds
    Last reboot reason              Router rebooted after a normal shutdown.
    Load averages:                  1 minute   5 minute  15 minute
                                        0.10       0.16       0.16
```

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              34 degrees C / 93 degrees F
```

```
    DRAM                      3313 MB (16384 MB installed)
    Memory utilization          31 percent
    5 sec CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     3 percent
      Interrupt                  1 percent
      Idle                      96 percent
    1 min CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     4 percent
      Interrupt                  1 percent
      Idle                      96 percent
    5 min CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     4 percent
      Interrupt                  1 percent
      Idle                      95 percent
    15 min CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     4 percent
      Interrupt                  1 percent
      Idle                      95 percent
    Model                        RE-S-1800x4
    Serial ID                    9013043785
    Start time                   2015-01-12 23:37:53 PST
    Uptime                       6 days, 2 hours, 17 minutes, 3 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                 37 degrees C / 98 degrees F
    CPU temperature             34 degrees C / 93 degrees F
    DRAM                      3313 MB (16384 MB installed)
    Memory utilization          26 percent
    5 sec CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     0 percent
      Interrupt                  0 percent
      Idle                      99 percent
    1 min CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     0 percent
      Interrupt                  0 percent
      Idle                       0 percent
    5 min CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     0 percent
      Interrupt                  0 percent
      Idle                       0 percent
    15 min CPU utilization:
      User                       0 percent
```

 Copyright © 2016, Juniper Networks, Inc.

```
      Background                 0 percent
      Kernel                     0 percent
      Interrupt                  0 percent
      Idle                       0 percent
    Model                          RE-S-1800x4
    Serial ID                      9013037303
    Start time                     2015-01-12 23:25:29 PST
    Uptime                         6 days, 2 hours, 29 minutes, 21 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 (MX2010 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                      3313 MB (16384 MB installed)
    Memory utilization          37 percent
    5 sec CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     2 percent
      Interrupt                  2 percent
      Idle                      96 percent
    1 min CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     2 percent
      Interrupt                  2 percent
      Idle                      97 percent
    5 min CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     2 percent
      Interrupt                  2 percent
      Idle                      97 percent
    15 min CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     2 percent
      Interrupt                  2 percent
      Idle                      97 percent
    Model                          RE-S-1800x4
    Serial ID                      9009146890
    Start time                     2015-01-18 21:35:12 PST
    Uptime                         4 hours, 21 minutes, 34 seconds
    Last reboot reason             Router rebooted after a normal shutdown.
    Load averages:                 1 minute   5 minute  15 minute
                                       0.11       0.14       0.14
```

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                  2 degrees C / 35 degrees F
    CPU temperature              32 degrees C / 89 degrees F
    DRAM                       32735 MB (32768 MB installed)
    Memory utilization           10 percent
    5 sec CPU utilization:
      User                        0 percent
      Background                  0 percent
      Kernel                      1 percent
      Interrupt                   1 percent
      Idle                       98 percent
    1 min CPU utilization:
      User                        0 percent
      Background                  0 percent
      Kernel                      1 percent
      Interrupt                   1 percent
      Idle                       99 percent
    5 min CPU utilization:
      User                        0 percent
      Background                  0 percent
      Kernel                      1 percent
      Interrupt                   1 percent
      Idle                       99 percent
    15 min CPU utilization:
      User                        0 percent
      Background                  0 percent
      Kernel                      1 percent
      Interrupt                   1 percent
      Idle                       99 percent
    Model                         RE-S-2X00x8
    Serial ID                     CADN0309
    Start time                    2015-01-08 16:31:15 PST
    Uptime                        4 days, 22 hours, 59 minutes, 3 seconds
    Last reboot reason            Router rebooted after a normal shutdown.
    Load averages:                1 minute   5 minute  15 minute
                                      0.39       0.41       0.34
```

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:
```


Copyright © 2016, Juniper Networks, Inc.

```
  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
```


Copyright © 2016, Juniper Networks, Inc.

```
      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
```

 Copyright © 2016, Juniper Networks, Inc.

```
      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
```

 Copyright © 2016, Juniper Networks, Inc.

```
    CPU temperature             43 degrees C / 109 degrees F
    DRAM                      3327 MB
    Memory utilization           9 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     2 percent
      Interrupt                  0 percent
      Idle                      98 percent
    Model                           RE-TXP-LCC
    Serial ID                       737F-1024
    Start time                      2009-05-11 17:40:32 PDT
    Uptime                          3 hours, 45 minutes, 26 seconds
    Last reboot reason              Router rebooted after a normal shutdown.
    Load averages:                  1 minute   5 minute  15 minute
                                        0.00       0.00       0.00
Routing Engine status:
  Slot 1:
    Current state                   Backup
    Election priority               Backup (default)
    Temperature                 30 degrees C / 86 degrees F
    CPU temperature             43 degrees C / 109 degrees F
    DRAM                      3327 MB
    Memory utilization           9 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     0 percent
      Interrupt                  0 percent
      Idle                     100 percent
    Model                           RE-TXP-LCC
    Serial ID                       737F-1024
    Start time                      2009-05-06 17:31:32 PDT
    Uptime                          5 days, 3 hours, 54 minutes, 59 seconds
    Last reboot reason              Router rebooted after a normal shutdown.
```

show chassis routing-engine bios (TX Matrix Plus Router)

```
user@host> show chassis routing-engine bios
sfc0-re0:
--------------------------------------------------------------------------
    Routing Engine BIOS Version: V0.0.Z

lcc0-re0:
--------------------------------------------------------------------------
    Routing Engine BIOS Version: V0.0.N
```

show chassis routing-engine (QFX Series)

```
user@switch> show chassis routing-engine
Routing Engine status:
Slot 0:
Current state Master
Election priority Master (default)
DRAM 2820 MB
Memory utilization 49 percent
CPU utilization:
User 1 percent
Background 0 percent
Kernel 1 percent
Interrupt 0 percent
```

```
Idle 97 percent
Model QFX3500-48S4Q
Serial ID S/N ED3709
Uptime 3 days, 4 hours, 29 minutes, 42 seconds
Last reboot reason 0x200:chassis control reset
Load averages: 1 minute 5 minute 15 minute
0.37 0.26 0.19
```

show chassis routing-engine (OCX Series)

```
user@switch> show chassis routing-engine
Routing Engine status:
Slot 0:
Current state Master
Election priority Master (default)
DRAM 2820 MB
Memory utilization 49 percent
CPU utilization:
User 1 percent
Background 0 percent
Kernel 1 percent
Interrupt 0 percent
Idle 97 percent
Model OCX-1100-48SX-AFI
Serial ID S/N ED3709
Uptime 3 days, 4 hours, 29 minutes, 42 seconds
Last reboot reason 0x200:chassis control reset
Load averages: 1 minute 5 minute 15 minute
0.37 0.26 0.19
```

show chassis routing engine interconnect-device (QFabric Systems)

```
user@switch> show chassis routing-engine
Routing Engine status:
  Slot 0:
    Current state                  Master
    Election priority              Master (default)
    Temperature                 48 degrees C / 118 degrees F
    DRAM                      3312 MB
    Memory utilization          63 percent
    CPU utilization:
      User                      14 percent
      Background                 0 percent
      Kernel                     5 percent
      Interrupt                  0 percent
      Idle                      81 percent
    Model                          RE-QFXC08-CB4S
    Serial ID                      BUILTIN
    Start time                     2011-07-06 13:26:15 UTC
    Uptime                         11 hours, 24 minutes, 57 seconds
    Last reboot reason             0x4:reset-button reset
    Load averages:                 1 minute   5 minute  15 minute
                                       2.62       2.31       2.28
Routing Engine status:
  Slot 1:
    Current state                  Backup
    Election priority              Backup (default)
    Temperature                 39 degrees C / 102 degrees F
    DRAM                      3312 MB
    Memory utilization          59 percent
    CPU utilization:
```

 Copyright © 2016, Juniper Networks, Inc.

```
      User                        9 percent
      Background                  0 percent
      Kernel                      1 percent
      Interrupt                   0 percent
      Idle                       91 percent
    Model                           RE-QFXC08-CB4S
    Serial ID                       BUILTIN
    Start time                      2011-07-06 13:24:58 UTC
    Uptime                          11 hours, 26 minutes, 18 seconds
    Last reboot reason              0x4:reset-button reset
```

show chassis routing-engine (PTX Series Packet Transport Router)

```
user@switch> show chassis routing-engine
Routing Engine status:
  Slot 0:
    Current state                   Master
    Election priority               Master (default)
    Temperature                    60 degrees C / 140 degrees F
    CPU temperature                76 degrees C / 168 degrees F
    DRAM                        17152 MB
    Memory utilization             11 percent
    CPU utilization:
      User                          0 percent
      Background                    0 percent
      Kernel                        4 percent
      Interrupt                     0 percent
      Idle                         95 percent
    Model                           RE-DUO-2600
    Serial ID                       P737A-002231
    Start time                      2011-12-21 16:54:37 PST
    Uptime                          25 minutes, 44 seconds
    Last reboot reason              Router rebooted after a normal shutdown.
    Load averages:                  1 minute   5 minute  15 minute
                                        0.01       0.02       0.06
Routing Engine status:
  Slot 1:
    Current state                   Backup
    Election priority               Backup (default)
    Temperature                    50 degrees C / 122 degrees F
    CPU temperature                64 degrees C / 147 degrees F
    DRAM                        17152 MB
    Memory utilization             10 percent
    CPU utilization:
      User                          0 percent
      Background                    0 percent
      Kernel                        0 percent
      Interrupt                     0 percent
      Idle                         99 percent
    Model                           RE-DUO-2600
    Serial ID                       P737A-002438
    Start time                      2011-12-21 16:52:26 PST
    Uptime                          27 minutes, 49 seconds
    Last reboot reason              Router rebooted after a normal shutdown.
```

show chassis routing-engine (EX9200 Switch)

```
user@switch> show chassis routing-engine
Routing Engine status:
Slot 0:
```

```
  Current state                  Master
  Election priority              Master (default)
  Temperature                 35 degrees C / 95 degrees F
  CPU temperature             33 degrees C / 91 degrees F
  DRAM                      8157 MB
    Installed Memory        8192 MB
  Memory utilization          18 percent
CPU utilization:
  User                       1 percent
  Background                 0 percent
  Kernel                     4 percent
  Interrupt                  1 percent
  Idle                      94 percent
Model                          RE-S-EX9200-1800X4
Serial ID                      9009119555
Start time                     2014-03-12 14:58:05 UTC
Uptime                         1 hour, 41 minutes, 51 seconds
Last reboot reason             Router rebooted after a normal shutdown.
Load averages:                 1 minute   5 minute  15 minute
                               0.02       0.02       0.00
Routing Engine status:
Slot 1:
  Current state                  Backup
  Election priority              Backup (default)

[...Output truncasted...]
```

show chassis routing-engine (ACX2000 Universal Access Router)

```
user@host> show chassis routing-engine
Routing Engine status:
    Temperature                 53 degrees C / 127 degrees F
    DRAM                      1536 MB
    Memory utilization          25 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     0 percent
      Interrupt                  1 percent
      Idle                      99 percent
    Model                           RE-ACX-2000
    Start time                      2012-05-09 00:57:07 PDT
    Uptime                          5 days, 3 hours, 16 minutes, 15 seconds
    Last reboot reason              Router rebooted after a normal shutdown.
    Load averages:                  1 minute   5 minute  15 minute
                                        0.00       0.03       0.05
```

show chassis routing-engine (ACX1000 Universal Access Router)

```
user@host> show chassis routing-engine
Routing Engine status:
    Temperature                 36 degrees C / 96 degrees F
    DRAM                       768 MB
    Memory utilization          50 percent
    CPU utilization:
      User                       3 percent
      Background                 0 percent
      Kernel                     6 percent
      Interrupt                  0 percent
      Idle                      91 percent
    Model                           RE-ACX-1000
```


Copyright © 2016, Juniper Networks, Inc.

```
Start time                     2012-05-10 07:12:23 PDT
Uptime                         4 days, 10 hours, 46 minutes, 53 seconds
Last reboot reason             Router rebooted after a normal shutdown.
Load averages:                 1 minute   5 minute  15 minute
                                   0.00       0.00       0.00
```

show chassis temperature-thresholds

List of Syntax

Syntax on page 914
Syntax (TX Matrix Routers) on page 914
Syntax (TX Matrix Plus Routers) on page 914
Syntax (MX Series Routers) on page 914
Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers) on page 914
Syntax (QFX Series) on page 914
Syntax (PTX Series) on page 914

Syntax

show chassis temperature-thresholds

Syntax (TX Matrix Routers)

show chassis temperature-thresholds
<lcc *number* | scc>

Syntax (TX Matrix Plus Routers)

show chassis temperature-thresholds
<lcc *number* | sfc *number*>

Syntax (MX Series Routers)

show chassis temperature-thresholds
<all-members>
<local>
<member *member-id*>
<satellite [slot-id *slot-ID* |device-alias *alias-name*]>

Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers)

show chassis temperature-thresholds

Syntax (QFX Series)

show chassis temperature-thresholds
<interconnect-device *name*>
<node-device *name*>

Syntax (PTX Series)

show chassis temperature-thresholds

Release Information

Command introduced in Junos OS Release 8.0.
Command introduced in Junos OS Release 9.0 for EX Series switches.
sfc command 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 12.1 for T4000 Core Routers.
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.
Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.
satellite option introduced in Junos OS Release 14.2R3.

Description

Display chassis temperature threshold settings, in degrees Celsius.

Options

none—Display the temperature threshold details.

Copyright © 2016, Juniper Networks, Inc.

all-members—(MX Series routers only) (Optional) Display the chassis temperature threshold settings of all member routers in the Virtual Chassis configuration.

interconnect-device ***name***—(QFabric systems only) (Optional) Display the chassis temperature threshold settings of the Interconnect device.

lcc ***number***—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display the temperature threshold details of a specified T640 router (line-card chassis) that is connected to a TX Matrix router. On a TX Matrix Plus router, display the temperature threshold details of a specified router (line-card chassis) that is connected to a TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(MX Series routers only) (Optional) Display the chassis temperature threshold settings of the local Virtual Chassis member.

member ***member-id***—(MX Series routers only) (Optional) Display the chassis temperature threshold settings of the specified member of the Virtual Chassis configuration. Replace ***member-id*** with a value of 0 or 1.

node-device ***name***—(QFabric systems only) (Optional) Display the chassis temperature threshold settings of the Node device.

satellite [slot-id ***slot-ID*** **| device-alias** ***alias-name*** **]**—(Junos Fusion only) (Optional) Display the chassis temperature threshold settings for the specified satellite device or devices in a Junos Fusion, or for all satellite devices if no satellite devices are specified.

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 917

show chassis temperature-thresholds (MX104 Router) on page 917
show chassis temperature-thresholds (MX240, MX480, MX960 Routers with Application Services Modular Line Card) on page 918
show chassis temperature-thresholds (MX480 Router with MPC4E) on page 918
show chassis temperature-thresholds (MX2010 Router) on page 918
show chassis temperature-thresholds (MX2020 Router) on page 921
show chassis temperature-thresholds (MX2020 Router with MPC4E) on page 924
show chassis temperature-thresholds (T4000 Core Routers) on page 925
show chassis temperature-thresholds (TX Matrix Plus Router) on page 926
show chassis temperature-thresholds lcc (TX Matrix Plus Router) on page 927
show chassis temperature-thresholds sfc (TX Matrix Plus Router) on page 927
show chassis temperature-thresholds (TX Matrix Plus routers with 3D SIBs) on page 928
show chassis temperature-thresholds (QFX3500 Switch and QFX3600) on page 929
show chassis temperature-thresholds interconnect-device (QFabric System) on page 930
show chassis temperature-thresholds (PTX5000 Packet Transport Router) on page 930
show chassis temperature-thresholds (PTX1000 Packet Transport Router) on page 932
show chassis temperature-thresholds (MX Routers with Media Services Blade [MSB]) on page 932

Output Fields Table 44 on page 916 lists the output fields for the **show chassis temperature-thresholds** command. Output fields are listed in the approximate order in which they appear.

Table 44: 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	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. Temperature threshold settings, in degrees Celsius, for the fans to operate at normal and high speeds. • **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. 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. • **High**—The fans operate at high speed if the component has exceeded this temperature or a fan has failed or is missing. 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. NOTE: For MX480 Routers, there are three fan speeds: **Low**, **Medium**, and **High**. An alarm is not triggered until the temperature exceeds the threshold settings for a yellow alarm or a red alarm.

 Copyright © 2016, Juniper Networks, Inc.

Table 44: show chassis temperature-thresholds Output Fields *(continued)*

Field name	Field Description
Yellow alarm	Temperature threshold settings, in degrees Celsius, that trigger a yellow alarm. • **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	Temperature threshold settings, in degrees Celsius, that trigger a red alarm. • **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

                          Fan speed        Yellow alarm        Red alarm
                         (degrees C)        (degrees C)        (degrees C)
Item                    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
       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    80       95       95      105      100
108
```

show chassis temperature-thresholds (MX240, MX480, MX960 Routers with Application Services Modular Line Card)

```
user@host> show chassis temperature-thresholds
Fan speed      Yellow alarm      Red alarm      Fire Shutdown
                         (degrees C)      (degrees C)     (degrees C)
(degrees C)
Item                   Normal  High   Normal  Bad fan   Normal  Bad fan
Normal
Chassis default            48    54       65       55       75       65
100
Routing Engine 0           70    80       95       95      110      110
112
Routing Engine 1           70    80       95       95      110      110
112
FPC 0                      55    60       75       65       90       80
95
FPC 1                      55    60       75       65       90       80
95
FPC 2                      55    60       75       65       90       80
95
FPC 4                      55    60       75       65       90       80
95
FPC 5                      55    60       75       65       90       80
95
```

show chassis temperature-thresholds (MX480 Router with MPC4E)

```
user@ host> show chassis temperature-thresholds
       Fan speed      Yellow alarm      Red alarm      Fire Shutdown
                         (degrees C)      (degrees C)     (degrees C)
(degrees C)
Item                   Normal  High   Normal  Bad fan   Normal  Bad fan
Normal
Chassis default            48    54       65       55       75       65
100
Routing Engine 0           70    80       95       95      110      110
112
Routing Engine 1           70    80       95       95      110      110
112
FPC 2                      55    60       75       65       95       80
100
FPC 3                      55    60       75       65       95       80
100
FPC 4                      55    60       75       65       90       80
95
```

show chassis temperature-thresholds (MX2010 Router)

```
user@host> show chassis temperature-thresholds
                  Fan speed       Yellow alarm      Red alarm     Fire Shutdown
                  (degrees C)     (degrees C)      (degrees C)    (degrees C)
Item                Normal  High   Normal  Bad fan   Normal  Bad fan  Normal
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
```


Copyright © 2016, Juniper Networks, Inc.

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

Copyright © 2016, Juniper Networks, Inc.

show chassis temperature-thresholds (MX2020 Router)

```
user@host> show chassis temperature-thresholds
                    Fan speed        Yellow alarm      Red alarm    Fire Shutdown

                   (degrees C)     (degrees C)      (degrees C)     (degrees C)
Item                Normal  High   Normal  Bad fan   Normal  Bad fan  Normal
Routing Engine 0      70    80      95       95      110      110      112
Routing Engine 1      70    80      95       95      110      110      112
CB 0 IntakeA-Zone0    60    65      78       75       85       80       95
CB 0 IntakeB-Zone1    60    65      78       75       85       80       95
CB 0 IntakeC-Zone0    60    65      78       75       85       80       95
CB 0 ExhaustA-Zone0   60    65      78       75       85       80       95
CB 0 ExhaustB-Zone1   60    65      78       75       85       80       95
CB 0 TCBC-Zone0       60    65      78       75       85       80       95
CB 1 IntakeA-Zone0    60    65      78       75       85       80       95
CB 1 IntakeB-Zone1    60    65      78       75       85       80       95
CB 1 IntakeC-Zone0    60    65      78       75       85       80       95
CB 1 ExhaustA-Zone0   60    65      78       75       85       80       95
CB 1 ExhaustB-Zone1   60    65      78       75       85       80       95
CB 1 TCBC-Zone0       60    65      78       75       85       80       95
SPMB 0 Intake         56    62      75       63       83       76       95
SPMB 1 Intake         56    62      75       63       83       76       95
SFB 0 Intake-Zone0    56    62      75       63       82       70       87
SFB 0 Exhaust-Zone1   56    62      75       63       82       70       87
SFB 0 IntakeA-Zone0   56    62      75       63       82       70       87
SFB 0 IntakeB-Zone1   56    62      75       63       82       70       87
SFB 0 Exhaust-Zone0   56    62      75       63       82       70       87
SFB 0 SFB-XF2-Zone1   70    80      90       90      107      107      115
SFB 0 SFB-XF1-Zone0   70    80      90       90      107      107      115
SFB 0 SFB-XF0-Zone0   70    80      90       90      107      107      115
SFB 1 Intake-Zone0    56    62      75       63       82       70       87
SFB 1 Exhaust-Zone1   56    62      75       63       82       70       87
SFB 1 IntakeA-Zone0   56    62      75       63       82       70       87
SFB 1 IntakeB-Zone1   56    62      75       63       82       70       87
SFB 1 Exhaust-Zone0   56    62      75       63       82       70       87
SFB 1 SFB-XF2-Zone1   70    80      90       90      107      107      115
SFB 1 SFB-XF1-Zone0   70    80      90       90      107      107      115
SFB 1 SFB-XF0-Zone0   70    80      90       90      107      107      115
SFB 2 Intake-Zone0    56    62      75       63       82       70       87
SFB 2 Exhaust-Zone1   56    62      75       63       82       70       87
SFB 2 IntakeA-Zone0   56    62      75       63       82       70       87
SFB 2 IntakeB-Zone1   56    62      75       63       82       70       87
SFB 2 Exhaust-Zone0   56    62      75       63       82       70       87
SFB 2 SFB-XF2-Zone1   70    80      90       90      107      107      115
SFB 2 SFB-XF1-Zone0   70    80      90       90      107      107      115
SFB 2 SFB-XF0-Zone0   70    80      90       90      107      107      115
SFB 3 Intake-Zone0    56    62      75       63       82       70       87
SFB 3 Exhaust-Zone1   56    62      75       63       82       70       87
SFB 3 IntakeA-Zone0   56    62      75       63       82       70       87
SFB 3 IntakeB-Zone1   56    62      75       63       82       70       87
SFB 3 Exhaust-Zone0   56    62      75       63       82       70       87
SFB 3 SFB-XF2-Zone1   70    80      90       90      107      107      115
SFB 3 SFB-XF1-Zone0   70    80      90       90      107      107      115
SFB 3 SFB-XF0-Zone0   70    80      90       90      107      107      115
SFB 4 Intake-Zone0    56    62      75       63       82       70       87
SFB 4 Exhaust-Zone1   56    62      75       63       82       70       87
SFB 4 IntakeA-Zone0   56    62      75       63       82       70       87
SFB 4 IntakeB-Zone1   56    62      75       63       82       70       87
SFB 4 Exhaust-Zone0   56    62      75       63       82       70       87
SFB 4 SFB-XF2-Zone1   70    80      90       90      107      107      115
```

SFB 4 SFB-XF1-Zone0	70	80	90	90	107	107	115
SFB 4 SFB-XF0-Zone0	70	80	90	90	107	107	115
SFB 5 Intake-Zone0	56	62	75	63	82	70	87
SFB 5 Exhaust-Zone1	56	62	75	63	82	70	87
SFB 5 IntakeA-Zone0	56	62	75	63	82	70	87
SFB 5 IntakeB-Zone1	56	62	75	63	82	70	87
SFB 5 Exhaust-Zone0	56	62	75	63	82	70	87
SFB 5 SFB-XF2-Zone1	70	80	90	90	107	107	115
SFB 5 SFB-XF1-Zone0	70	80	90	90	107	107	115
SFB 5 SFB-XF0-Zone0	70	80	90	90	107	107	115
SFB 6 Intake-Zone0	56	62	75	63	82	70	87
SFB 6 Exhaust-Zone1	56	62	75	63	82	70	87
SFB 6 IntakeA-Zone0	56	62	75	63	82	70	87
SFB 6 IntakeB-Zone1	56	62	75	63	82	70	87
SFB 6 Exhaust-Zone0	56	62	75	63	82	70	87
SFB 6 SFB-XF2-Zone1	70	80	90	90	107	107	115
SFB 6 SFB-XF1-Zone0	70	80	90	90	107	107	115
SFB 6 SFB-XF0-Zone0	70	80	90	90	107	107	115
SFB 7 Intake-Zone0	56	62	75	63	82	70	87
SFB 7 Exhaust-Zone1	56	62	75	63	82	70	87
SFB 7 IntakeA-Zone0	56	62	75	63	82	70	87
SFB 7 IntakeB-Zone1	56	62	75	63	82	70	87
SFB 7 Exhaust-Zone0	56	62	75	63	82	70	87
SFB 7 SFB-XF2-Zone1	70	80	90	90	107	107	115
SFB 7 SFB-XF1-Zone0	70	80	90	90	107	107	115
SFB 7 SFB-XF0-Zone0	70	80	90	90	107	107	115
FPC 0	55	60	75	65	90	80	95
FPC 1	55	60	75	65	90	80	95
FPC 2	55	60	75	65	90	80	95
FPC 3	55	60	75	65	90	80	95
FPC 4	55	60	75	65	90	80	95
FPC 5	55	60	75	65	90	80	95
FPC 6	55	60	75	65	90	80	95
FPC 7	55	60	75	65	90	80	95
FPC 8	55	60	75	65	90	80	95
FPC 9	55	60	75	65	90	80	95
FPC 10	55	60	75	65	90	80	95
FPC 11	55	60	75	65	90	80	95
FPC 12	55	60	75	65	90	80	95
FPC 13	55	60	75	65	90	80	95
FPC 14	55	60	75	65	90	80	95
FPC 15	55	60	75	65	90	80	95
FPC 16	55	60	75	65	90	80	95
FPC 17	55	60	75	65	90	80	95
FPC 18	55	60	75	65	90	80	95
FPC 19	55	60	75	65	90	80	95
ADC 0 Intake	56	62	75	63	83	76	95
ADC 0 Exhaust	56	62	75	63	83	76	95
ADC 0 ADC-XF1	70	80	90	90	107	107	115
ADC 0 ADC-XF0	70	80	90	90	107	107	115
ADC 1 Intake	56	62	75	63	83	76	95
ADC 1 Exhaust	56	62	75	63	83	76	95
ADC 1 ADC-XF1	70	80	90	90	107	107	115
ADC 1 ADC-XF0	70	80	90	90	107	107	115
ADC 2 Intake	56	62	75	63	83	76	95
ADC 2 Exhaust	56	62	75	63	83	76	95
ADC 2 ADC-XF1	70	80	90	90	107	107	115
ADC 2 ADC-XF0	70	80	90	90	107	107	115
ADC 3 Intake	56	62	75	63	83	76	95
ADC 3 Exhaust	56	62	75	63	83	76	95
ADC 3 ADC-XF1	70	80	90	90	107	107	115

Copyright © 2016, Juniper Networks, Inc.

ADC 3 ADC-XF0	70	80	90	90	107	107	115
ADC 4 Intake	56	62	75	63	83	76	95
ADC 4 Exhaust	56	62	75	63	83	76	95
ADC 4 ADC-XF1	70	80	90	90	107	107	115
ADC 4 ADC-XF0	70	80	90	90	107	107	115
ADC 5 Intake	56	62	75	63	83	76	95
ADC 5 Exhaust	56	62	75	63	83	76	95
ADC 5 ADC-XF1	70	80	90	90	107	107	115
ADC 5 ADC-XF0	70	80	90	90	107	107	115
ADC 6 Intake	56	62	75	63	83	76	95
ADC 6 Exhaust	56	62	75	63	83	76	95
ADC 6 ADC-XF1	70	80	90	90	107	107	115
ADC 6 ADC-XF0	70	80	90	90	107	107	115
ADC 7 Intake	56	62	75	63	83	76	95
ADC 7 Exhaust	56	62	75	63	83	76	95
ADC 7 ADC-XF1	70	80	90	90	107	107	115
ADC 7 ADC-XF0	70	80	90	90	107	107	115
ADC 8 Intake	56	62	75	63	83	76	95
ADC 8 Exhaust	56	62	75	63	83	76	95
ADC 8 ADC-XF1	70	80	90	90	107	107	115
ADC 8 ADC-XF0	70	80	90	90	107	107	115
ADC 9 Intake	56	62	75	63	83	76	95
ADC 9 Exhaust	56	62	75	63	83	76	95
ADC 9 ADC-XF1	70	80	90	90	107	107	115
ADC 9 ADC-XF0	70	80	90	90	107	107	115
ADC 10 Intake	56	62	75	63	83	76	95
ADC 10 Exhaust	56	62	75	63	83	76	95
ADC 10 ADC-XF1	70	80	90	90	107	107	115
ADC 10 ADC-XF0	70	80	90	90	107	107	115
ADC 11 Intake	56	62	75	63	83	76	95
ADC 11 Exhaust	56	62	75	63	83	76	95
ADC 11 ADC-XF1	70	80	90	90	107	107	115
ADC 11 ADC-XF0	70	80	90	90	107	107	115
ADC 12 Intake	56	62	75	63	83	76	95
ADC 12 Exhaust	56	62	75	63	83	76	95
ADC 12 ADC-XF1	70	80	90	90	107	107	115
ADC 12 ADC-XF0	70	80	90	90	107	107	115
ADC 13 Intake	56	62	75	63	83	76	95
ADC 13 Exhaust	56	62	75	63	83	76	95
ADC 13 ADC-XF1	70	80	90	90	107	107	115
ADC 13 ADC-XF0	70	80	90	90	107	107	115
ADC 14 Intake	56	62	75	63	83	76	95
ADC 14 Exhaust	56	62	75	63	83	76	95
ADC 14 ADC-XF1	70	80	90	90	107	107	115
ADC 14 ADC-XF0	70	80	90	90	107	107	115
ADC 15 Intake	56	62	75	63	83	76	95
ADC 15 Exhaust	56	62	75	63	83	76	95
ADC 15 ADC-XF1	70	80	90	90	107	107	115
ADC 15 ADC-XF0	70	80	90	90	107	107	115
ADC 16 Intake	56	62	75	63	83	76	95
ADC 16 Exhaust	56	62	75	63	83	76	95
ADC 16 ADC-XF1	70	80	90	90	107	107	115
ADC 16 ADC-XF0	70	80	90	90	107	107	115
ADC 17 Intake	56	62	75	63	83	76	95
ADC 17 Exhaust	56	62	75	63	83	76	95
ADC 17 ADC-XF1	70	80	90	90	107	107	115
ADC 17 ADC-XF0	70	80	90	90	107	107	115
ADC 18 Intake	56	62	75	63	83	76	95
ADC 18 Exhaust	56	62	75	63	83	76	95
ADC 18 ADC-XF1	70	80	90	90	107	107	115
ADC 18 ADC-XF0	70	80	90	90	107	107	115

```
ADC 19 Intake          56    62       75       63       83       76       95
ADC 19 Exhaust         56    62       75       63       83       76       95
ADC 19 ADC-XF1         70    80       90       90      107      107      115
ADC 19 ADC-XF0         70    80       90       90      107      107      115
```

show chassis temperature-thresholds (MX2020 Router with MPC4E)

```
user@host> show chassis temperature-thresholds
     Fan speed      Yellow alarm      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       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
```


Copyright © 2016, Juniper Networks, Inc.

```
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 (TX Matrix Plus Router)

```
user@host> show chassis temperature-thresholds
sfc0-re0:
--------------------------------------------------------------------------
                          Fan speed        Yellow alarm         Red alarm
                         (degrees C)        (degrees C)        (degrees C)
Item                    Normal   High    Normal   Bad fan    Normal   Bad fan
Chassis default             48     54       65        55        75        65
Routing Engine 0            55     65       85        85       100       100
Routing Engine 1            55     65       85        85       100       100
SIB F13 0                   64     70       76        72        90        84
SIB F13 3                   64     70       76        72        90        84
SIB F13 6                   64     70       76        72        90        84
SIB F13 8                   64     70       76        72        90        84
SIB F13 11                  64     70       76        72        90        84
SIB F13 12                  64     70       76        72        90        84
SIB F2S 16                  64     70       76        72        90        84
SIB F2S 17                  64     70       76        72        90        84
SIB F2S 18                  64     70       76        72        90        84
SIB F2S 19                  64     70       76        72        90        84
SIB F2S 20                  64     70       76        72        90        84
SIB F2S 21                  64     70       76        72        90        84
SIB F2S 22                  64     70       76        72        90        84
SIB F2S 23                  64     70       76        72        90        84
SIB F2S 24                  64     70       76        72        90        84
SIB F2S 25                  64     70       76        72        90        84
SIB F2S 26                  64     70       76        72        90        84
SIB F2S 27                  64     70       76        72        90        84
SIB F2S 28                  64     70       76        72        90        84
SIB F2S 29                  64     70       76        72        90        84
SIB F2S 30                  64     70       76        72        90        84
SIB F2S 31                  64     70       76        72        90        84
SIB F2S 32                  64     70       76        72        90        84
SIB F2S 33                  64     70       76        72        90        84
SIB F2S 34                  64     70       76        72        90        84
SIB F2S 35                  64     70       76        72        90        84

lcc0-re0:
--------------------------------------------------------------------------
                          Fan speed        Yellow alarm         Red alarm
                         (degrees C)        (degrees C)        (degrees C)
Item                    Normal   High    Normal   Bad fan    Normal   Bad fan
```


Copyright © 2016, Juniper Networks, Inc.

```
Chassis default              48     54        65        55        75        65
Routing Engine 0             55     65        85        85       100       100
Routing Engine 1             55     65        85        85       100       100
FPC 1                        56     62        75        63        83        76
FPC 3                        56     62        75        63        83        76
FPC 4                        56     62        75        63        83        76
FPC 6                        56     62        75        63        83        76
FPC 7                        56     62        75        63        83        76
SIB 0                        48     54        65        60        80        75
SIB 1                        48     54        65        60        80        75
SIB 2                        48     54        65        60        80        75
SIB 3                        48     54        65        60        80        75
SIB 4                        48     54        65        60        80        75

lcc1-re0:
--------------------------------------------------------------------------
                          Fan speed        Yellow alarm         Red alarm
                         (degrees C)        (degrees C)        (degrees C)
Item                    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:
--------------------------------------------------------------------------
                          Fan speed        Yellow alarm         Red alarm
                         (degrees C)        (degrees C)        (degrees C)
Item                    Normal   High    Normal   Bad fan    Normal   Bad fan
Chassis default              48     54        65        55        75        65
Routing Engine 0             55     65        85        85       100       100
Routing Engine 1             55     65        85        85       100       100
FPC 1                        56     62        75        63        83        76
FPC 3                        56     62        75        63        83        76
FPC 4                        56     62        75        63        83        76
FPC 6                        56     62        75        63        83        76
SIB 0                        48     54        65        60        80        75
SIB 1                        48     54        65        60        80        75
SIB 2                        48     54        65        60        80        75
SIB 3                        48     54        65        60        80        75
SIB 4                        48     54        65        60        80        75
```

show chassis temperature-thresholds sfc (TX Matrix Plus Router)

```
user@host> show chassis temperature-thresholds sfc 0
sfc0-re0:
--------------------------------------------------------------------------
                          Fan speed        Yellow alarm         Red alarm
                         (degrees C)        (degrees C)        (degrees C)
Item                    Normal   High    Normal   Bad fan    Normal   Bad fan
Chassis default              48     54        65        55        75        65
Routing Engine 0             55     65        85        85       100       100
Routing Engine 1             55     65        85        85       100       100
SIB F13 0                    64     70        76        72        90        84
```

```
SIB F13 3                    64     70        76        72        90        84
SIB F13 6                    64     70        76        72        90        84
SIB F13 8                    64     70        76        72        90        84
SIB F13 11                   64     70        76        72        90        84
SIB F13 12                   64     70        76        72        90        84
SIB F2S 16                   64     70        76        72        90        84
SIB F2S 17                   64     70        76        72        90        84
SIB F2S 18                   64     70        76        72        90        84
SIB F2S 19                   64     70        76        72        90        84
SIB F2S 20                   64     70        76        72        90        84
SIB F2S 21                   64     70        76        72        90        84
SIB F2S 22                   64     70        76        72        90        84
SIB F2S 23                   64     70        76        72        90        84
SIB F2S 24                   64     70        76        72        90        84
SIB F2S 25                   64     70        76        72        90        84
SIB F2S 26                   64     70        76        72        90        84
SIB F2S 27                   64     70        76        72        90        84
SIB F2S 28                   64     70        76        72        90        84
SIB F2S 29                   64     70        76        72        90        84
SIB F2S 30                   64     70        76        72        90        84
SIB F2S 31                   64     70        76        72        90        84
SIB F2S 32                   64     70        76        72        90        84
SIB F2S 33                   64     70        76        72        90        84
SIB F2S 34                   64     70        76        72        90        84
SIB F2S 35                   64     70        76        72        90        84
```

show chassis temperature-thresholds (TX Matrix Plus routers with 3D SIBs)

```
user@host> show chassis temperature-thresholds
sfc0-re0:
--------------------------------------------------------------------------
                          Fan speed      Yellow alarm      Red alarm      Fire
Shutdown
                         (degrees C)      (degrees C)     (degrees C)
(degrees C)
Item                    Normal  High   Normal  Bad fan   Normal  Bad fan
Normal
Chassis default             48    54       65       55       75       65
100
Routing Engine 0            70    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
```


Copyright © 2016, Juniper Networks, Inc.

```
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)      (degrees C)     (degrees C)
(degrees C)
Item                     Normal  High   Normal  Bad fan   Normal  Bad fan
Normal
Chassis default              48     54       65       55       75       65
100
Routing Engine 0             55     65       85       85      100      100
102
FPC 0                        63     68       75       70       90       83
95
FPC 1                        56     62       75       63       83       76
95
FPC 7                        56     62       75       63       83       76
95
SIB 0                        64     70       76       72       87       84
95
SIB 0 ASIC Junction          63     68       75       70      105      100
107
SIB 2                        64     70       76       72       87       84
95
SIB 2 ASIC Junction          63     68       75       70      105      100
107
SIB 3                        64     70       76       72       87       84
95
SIB 3 ASIC Junction          63     68       75       70      105      100
107
```

show chassis temperature-thresholds (QFX3500 Switch and QFX3600)

```
user@switch> show chassis temperature-thresholds
```

```
                            Fan speed      Yellow alarm      Red alarm
                           (degrees C)      (degrees C)     (degrees C)
Item                      Normal  High   Normal  Bad fan   Normal  Bad fan
rmal
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 Mgmnt 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
                            Fan speed        Yellow alarm         Red alarm
Item                      Normal   High    Normal   Bad fan    Normal   Bad fan
Chassis default               48     54        65        55        75        65
```

show chassis temperature-thresholds (PTX5000 Packet Transport Router)

```
user@switch> show chassis temperature-thresholds
user@switch> show chassis temperature-thresholds

                            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             80    90       95       85      105       95
115
CB 0 Exhaust A               60    65       78       75       85       80
95
CB 0 Exhaust B               60    65       78       75       85       80
95
CB 1 Exhaust A               60    65       78       75       85       80
95
CB 1 Exhaust B               60    65       78       75       85       80
95
FPC 3 Exhaust A              80    90       95       85      105       95
115
FPC 3 Exhaust B              80    90       95       85      105       95
115
FPC 3 TL5                    80    90       95       85      105       95
115
FPC 3 TQ5                    80    90       95       85      105       95
115
FPC 3 TL6                    80    90       95       85      105       95
115
FPC 3 TQ6                    80    90       95       85      105       95
115
FPC 3 TL1                    80    90       95       85      105       95
115
FPC 3 TQ1                    80    90       95       85      105       95
115
```


Copyright © 2016, Juniper Networks, Inc.

```
FPC 3 TL2                    80    90       95       85      105       95
115
FPC 3 TQ2                    80    90       95       85      105       95
115
FPC 3 TL4                    80    90       95       85      105       95
115
FPC 3 TQ4                    80    90       95       85      105       95
115
FPC 3 TL7                    80    90       95       85      105       95
115
FPC 3 TQ7                    80    90       95       85      105       95
115
FPC 3 TL0                    80    90       95       85      105       95
115
FPC 3 TQ0                    80    90       95       85      105       95
115
FPC 3 TL3                    80    90       95       85      105       95
115
FPC 3 TQ3                    80    90       95       85      105       95
115
SIB 0 Exhaust                60    65       78       75       85       80
95
SIB 0 Junction               75    80       90       85      105       95
115
SIB 1 Exhaust                60    65       78       75       85       80
95
SIB 1 Junction               75    80       90       85      105       95
115
SIB 2 Exhaust                60    65       78       75       85       80
95
SIB 2 Junction               75    80       90       85      105       95
115
SIB 3 Exhaust                60    65       78       75       85       80
95
SIB 3 Junction               75    80       90       85      105       95
115
SIB 4 Exhaust                60    65       78       75       85       80
95
SIB 4 Junction               75    80       90       85      105       95
115
SIB 5 Exhaust                60    65       78       75       85       80
95
SIB 5 Junction               75    80       90       85      105       95
115
SIB 6 Exhaust                60    65       78       75       85       80
95
SIB 6 Junction               75    80       90       85      105       95
115
SIB 7 Exhaust                60    65       78       75       85       80
95
SIB 7 Junction               75    80       90       85      105       95
115
SIB 8 Exhaust                60    65       78       75       85       80
95
SIB 8 Junction               75    80       90       85      105       95
115
```

show chassis temperature-thresholds (PTX1000 Packet Transport Router)

```
user@host> show chassis temperature-thresholds

                           Fan speed      Yellow alarm      Red alarm      Fire
Shutdown
                          (degrees C)      (degrees C)     (degrees C)
(degrees C)
Item                     Normal  High   Normal  Bad fan   Normal  Bad fan
Normal
FPC 0 Intake Temp Sensor     30    65       65       65       70       70
75
FPC 0 Exhaust Temp Sensor    30    65       65       65       70       70
75
FPC 0 Mezz Temp Sensor 0     30    65       65       65       70       70
75
FPC 0 Mezz Temp Sensor 1     30    65       65       65       70       70
75
FPC 0 PE2 Temp Sensor        50    90       90       90      100      100
103
FPC 0 PE1 Temp Sensor        50    90       90       90      100      100
103
FPC 0 PF0 Temp Sensor        50    90       90       90      100      100
103
FPC 0 PE0 Temp Sensor        50    90       90       90      100      100
103
FPC 0 PE5 Temp Sensor        50    90       90       90      100      100
103
FPC 0 PE4 Temp Sensor        50    90       90       90      100      100
103
FPC 0 PF1 Temp Sensor        50    90       90       90      100      100
103
FPC 0 PE3 Temp Sensor        50    90       90       90      100      100
103
FPC 0 CPU Die Temp Sensor    50    90       90       90      100      100
103
FPC 0 OCXO Temp Sensor       50    90       90       90      100      100
103
```

show chassis temperature-thresholds (MX Routers with Media Services Blade [MSB])

```
user@switch> show chassis temperature-thresholds
  Fan speed      Yellow alarm      Red alarm      Fire Shutdown
                          (degrees C)      (degrees C)     (degrees C)
(degrees C)
Item                     Normal  High   Normal  Bad fan   Normal  Bad fan
Normal
Chassis default              48    54       65       55       75       65
100
Routing Engine 0             70    80       95       95      110      110
112
Routing Engine 1             70    80       95       95      110      110
112
FPC 0                        55    60       75       65       90       80
95
FPC 1                        55    60       75       65       90       80
95
FPC 2                        55    60       75       65       90       80
95
FPC 4                        55    60       75       65       90       80
```


Copyright © 2016, Juniper Networks, Inc.

95
FPC 5 55 60 75 65 90 80
95

show chassis zones

List of Syntax

Syntax on page 934
Syntax (MX Series Routers) on page 934
Syntax (QFX Series) on page 934

Syntax

show chassis zones
<detail>

Syntax (MX Series Routers)

show chassis zones
<detail>
<all-members>
<local>
<member *member-id*>

Syntax (QFX Series)

show chassis zones
<detail>
<interconnect-device *name*>

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.
all-members, **local**, and **member *member-id*** options introduced in Junos OS Release 15.1 for MX2020 and MX2010 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.

(MX2010 and MX2020 routers only) 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

all-members—(MX2010 and MX2020 routers only) (Optional) Display the status of the cooling system zones in all members of the Virtual Chassis configuration.

detail—(MX2010 and MX2020 routers only) (Optional) Display detailed status of the cooling system zones.

detail *device-name*— (QFabric systems only) (Optional) Display detailed status of the two cooling systems on the Interconnect device.

interconnect-device *name*— (QFabric systems only) (Optional) Display the status of the cooling zones on the Interconnect device.

local—(MX2010 and MX2020 routers only) (Optional) Display the status of the cooling system zones in the local member of the Virtual Chassis.

Copyright © 2016, Juniper Networks, Inc.

member ***member-id***—(MX2010 and MX2020 routers only) (Optional) Display the status of the cooling system zones in the specified member of the Virtual Chassis. Replace ***member-id*** with the value 0 or 1.

Required Privilege Level view

Related Documentation

- show chassis fan on page 591
- show chassis temperature-thresholds on page 914

List of Sample Output

show chassis zones interconnect-device (QFabric System) on page 936
show chassis zones (MX2010 Router) on page 936
show chassis zones detail (MX2010 Router) on page 936
show chassis zones (MX2020 Router) on page 937
show chassis zones detail (MX2020 Router) on page 937
show chassis beacon interconnect-device (QFabric System) on page 939
show chassis beacon interconnect-device fpc (QFabric System) on page 939
show chassis beacon node-device (QFabric System) on page 939
show chassis beacon node-device fpc (QFabric System) on page 939

Output Fields Table 28 on page 484 lists the output fields for the **show chassis zones** command. Output fields are listed in the approximate order in which they appear.

Table 45: 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: • 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:	

Table 45: show chassis zones Output Fields *(continued)*

Field Name	Field Description
Item	Chassis component: • 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
```


Copyright © 2016, Juniper Networks, Inc.

```
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
```


Copyright © 2016, Juniper Networks, Inc.

```
SFB 0                   OK
SFB 1                   OK
SFB 2                   OK
SFB 3                   OK
SFB 4                   OK
SFB 5                   OK
SFB 6                   OK
SFB 7                   OK
SPMB 0                  OK
SPMB 1                  OK
Fan Tray 2              OK                    Spinning at 38% fan tray speed
Fan Tray 3              OK                    Spinning at 38% fan tray speed
```

show chassis beacon interconnect-device (QFabric System)

```
user@switch> show chassis beacon interconnect-device interconnect1
Chassis                 OFF
CB 0                    OFF
CB 1                    OFF
FC 0 FPC 0              OFF
FC 1 FPC 1              OFF
RC 0 FPC 8              OFF
RC 1 FPC 9              OFF
```

show chassis beacon interconnect-device fpc (QFabric System)

```
user@switch> show chassis beacon interconnect-device interconnect1 fpc 0
FPC 0                   ON
```

show chassis beacon node-device (QFabric System)

```
user@switch> show chassis beacon node-device node1
node1                  ON
```

show chassis beacon node-device fpc (QFabric System)

```
user@switch> show chassis beacon node-device node1 fpc 0
FPC 0                 ON
```

show host

Syntax show host *hostname*

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Display Domain Name System (DNS) hostname information.

Options *hostname*—Hostname or address.

Additional Information The **show host** command displays the raw data received from the DNS server.

Required Privilege Level view

List of Sample Output show host on page 940

Sample Output

show host

```
user@host> show host snark
snark.boojum.net has address 192.168.1.254

user@host> show host 192.168.1.254
Name: snark.boojum.net
Address: 192.168.1.254
Aliases:
```

 Copyright © 2016, Juniper Networks, Inc.

show log

List of Syntax

Syntax on page 941
Syntax (QFX Series and OCX Series) on page 941
Syntax (TX Matrix Router) on page 941

Syntax

show log
<*filename* | user <*username*>>

Syntax (QFX Series and OCX Series)

show log *filename*
<*device-type (device-id* | *device-alias*)>

Syntax (TX Matrix Router)

show log
<all-lcc | lcc *number* | scc>
<*filename* | user <*username*>>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Option *device-type (device-id* | *device-alias*) is introduced in Junos OS Release 13.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

List log files, display log file contents, or display information about users who have logged in to the router or switch.

NOTE: On MX Series routers, modifying a configuration to replace a service interface with another service interface is treated as a catastrophic event. When you modify a configuration, the entire configuration associated with the service interface—including NAT pools, rules, and service sets—is deleted and then re-created for the newly specified service interface. If there are active sessions associated with the service interface that is being replaced, these sessions are deleted and the NAT pools are then released, which leads to the generation of the NAT_POOL_RELEASE system log messages. However, because NAT pools are already deleted as a result of the catastrophic configuration change and no longer exist, the NAT_POOL_RELEASE system log messages are not generated for the changed configuration.

Options

none—List all log files.

<all-lcc | lcc *number* | scc>—(Routing matrix only)(Optional) Display logging information about all T640 routers (or line-card chassis) or a specific T640 router (replace ***number*** with a value from 0 through 3) connected to a TX Matrix router. Or, display logging information about the TX Matrix router (or switch-card chassis).

device-type—(QFabric system only) (Optional) Display log messages for only one of the following device types:

- **director-device**—Display logs for Director devices.
- **infrastructure-device**—Display logs for the logical components of the QFabric system infrastructure, including the diagnostic Routing Engine, fabric control Routing Engine, fabric manager Routing Engine, and the default network Node group and its backup (NW-NG-0 and NW-NG-0-backup).
- **interconnect-device**—Display logs for Interconnect devices.
- **node-device**—Display logs for Node devices.

NOTE: **If you specify the device-type optional parameter, you must also specify either the device-id or device-alias optional parameter.**

(***device-id*** **|** ***device-alias***)—If a device type is specified, display logs for a device of that type. Specify either the device ID or the device alias (if configured).

filename—(Optional) Display the log messages in the specified log file. For the routing matrix, the filename must include the chassis information.

user <*username*>—(Optional) Display logging information about users who have recently logged in to the router or switch. If you include ***username***, display logging information about the specified user.

Required Privilege Level trace

Related Documentation
- *syslog (System)*

List of Sample Output

show log on page 942
show log filename on page 943
show log filename (QFabric System) on page 943
show log user on page 944

Sample Output

show log

```
user@host> show log
total 57518
-rw-r--r--  1 root  bin      211663 Oct  1 19:44 dcd
-rw-r--r--  1 root  bin      999947 Oct  1 19:41 dcd.0
-rw-r--r--  1 root  bin      999994 Oct  1 17:48 dcd.1
-rw-r--r--  1 root  bin      238815 Oct  1 19:44 rpd
-rw-r--r--  1 root  bin     1049098 Oct  1 18:00 rpd.0
-rw-r--r--  1 root  bin     1061095 Oct  1 12:13 rpd.1
-rw-r--r--  1 root  bin     1052026 Oct  1 06:08 rpd.2
-rw-r--r--  1 root  bin     1056309 Sep 30 18:21 rpd.3
-rw-r--r--  1 root  bin     1056371 Sep 30 14:36 rpd.4
-rw-r--r--  1 root  bin     1056301 Sep 30 10:50 rpd.5
-rw-r--r--  1 root  bin     1056350 Sep 30 07:04 rpd.6
```

 Copyright © 2016, Juniper Networks, Inc.

```
-rw-r--r--  1 root  bin     1048876 Sep 30 03:21 rpd.7
-rw-rw-r--  1 root  bin       19656 Oct  1 19:37 wtmp
```

show log filename

```
user@host> show log rpd
Oct  1 18:00:18 trace_on: Tracing to ?/var/log/rpd? started
Oct  1 18:00:18 EVENT <MTU> ds-5/2/0.0 index 24 <Broadcast PointToPoint Multicast
Oct  1 18:00:18
Oct  1 18:00:19 KRT recv len 56 V9 seq 148 op add Type route/if af 2 addr
192.0.2.21 nhop type local nhop 192.0.2.21
Oct  1 18:00:19 KRT recv len 56 V9 seq 149 op add Type route/if af 2 addr
192.0.2.22 nhop type unicast nhop 192.0.2.22
Oct  1 18:00:19 KRT recv len 48 V9 seq 150 op add Type ifaddr index 24 devindex
43
Oct  1 18:00:19 KRT recv len 144 V9 seq 151 op chnge Type ifdev devindex 44
Oct  1 18:00:19 KRT recv len 144 V9 seq 152 op chnge Type ifdev devindex 45
Oct  1 18:00:19 KRT recv len 144 V9 seq 153 op chnge Type ifdev devindex 46
Oct  1 18:00:19 KRT recv len 1272 V9 seq 154 op chnge Type ifdev devindex 47
...
```

show log filename (QFabric System)

```
user@qfabric> show log messages
Mar 28 18:00:06 qfabric chassisd: QFABRIC_INTERNAL_SYSLOG: Mar 28 18:00:06 ED1486
 chassisd: CHASSISD_SNMP_TRAP10: SNMP trap generated: FRU power on
(jnxFruContentsIndex 8, jnxFruL1Index 1, jnxFruL2Index 1, jnxFruL3Index 0,
jnxFruName PIC: 48x 10G-SFP+ @ 0/0/*, jnxFruType 11, jnxFruSlot 0,
jnxFruOfflineReason 2, jnxFruLastPowerOff 0, jnxFruLastPowerOn 2159)
Mar 28 18:00:07 qfabric chassisd: QFABRIC_INTERNAL_SYSLOG: Mar 28 18:00:07 ED1486
 chassisd: CHASSISD_SNMP_TRAP10: SNMP trap generated: FRU power on
(jnxFruContentsIndex 8, jnxFruL1Index 1, jnxFruL2Index 2, jnxFruL3Index 0,
jnxFruName PIC:  @ 0/1/*, jnxFruType 11, jnxFruSlot 0, jnxFruOfflineReason 2,
jnxFruLastPowerOff 0, jnxFruLastPowerOn 2191)
Mar 28 18:00:07 qfabric chassisd: QFABRIC_INTERNAL_SYSLOG: Mar 28 18:00:07 ED1492
 chassisd: CHASSISD_SNMP_TRAP10: SNMP trap generated: FRU power on
(jnxFruContentsIndex 8, jnxFruL1Index 1, jnxFruL2Index 1, jnxFruL3Index 0,
jnxFruName PIC: 48x 10G-SFP+ @ 0/0/*, jnxFruType 11, jnxFruSlot 0,
jnxFruOfflineReason 2, jnxFruLastPowerOff 0, jnxFruLastPowerOn 242726)
Mar 28 18:00:07 qfabric chassisd: QFABRIC_INTERNAL_SYSLOG: Mar 28 18:00:07 ED1492
 chassisd: CHASSISD_SNMP_TRAP10: SNMP trap generated: FRU power on
(jnxFruContentsIndex 8, jnxFruL1Index 1, jnxFruL2Index 2, jnxFruL3Index 0,
jnxFruName PIC:  @ 0/1/*, jnxFruType 11, jnxFruSlot 0, jnxFruOfflineReason 2,
jnxFruLastPowerOff 0, jnxFruLastPowerOn 242757)
Mar 28 18:00:16 qfabric file: QFABRIC_INTERNAL_SYSLOG: Mar 28 18:00:16 ED1486
file: UI_COMMIT: User 'root' requested 'commit' operation (comment: none)
Mar 28 18:00:27 qfabric file: QFABRIC_INTERNAL_SYSLOG: Mar 28 18:00:27 ED1486
file: UI_COMMIT: User 'root' requested 'commit' operation (comment: none)
Mar 28 18:00:50 qfabric file: QFABRIC_INTERNAL_SYSLOG: Mar 28 18:00:50
_DCF_default___NW-INE-0_RE0_ file: UI_COMMIT: User 'root' requested 'commit'
operation (comment: none)
Mar 28 18:00:50 qfabric file: QFABRIC_INTERNAL_SYSLOG: Mar 28 18:00:50
_DCF_default___NW-INE-0_RE0_ file: UI_COMMIT: User 'root' requested 'commit'
operation (comment: none)
Mar 28 18:00:55 qfabric file: QFABRIC_INTERNAL_SYSLOG: Mar 28 18:00:55 ED1492
file: UI_COMMIT: User 'root' requested 'commit' operation (comment: none)
Mar 28 18:01:10 qfabric file: QFABRIC_INTERNAL_SYSLOG: Mar 28 18:01:10 ED1492
file: UI_COMMIT: User 'root' requested 'commit' operation (comment: none)
Mar 28 18:02:37 qfabric chassisd: QFABRIC_INTERNAL_SYSLOG: Mar 28 18:02:37 ED1491
 chassisd: CHASSISD_SNMP_TRAP10: SNMP trap generated: FRU power on
(jnxFruContentsIndex 8, jnxFruL1Index 1, jnxFruL2Index 1, jnxFruL3Index 0,
```

```
jnxFruName PIC: 48x 10G-SFP+ @ 0/0/*, jnxFruType 11, jnxFruSlot 0,
jnxFruOfflineReason 2, jnxFruLastPowerOff 0, jnxFruLastPowerOn 33809)
```

show log user

```
user@host> show log user
usera    mg2546                  Thu Oct  1 19:37   still logged in
usera    mg2529                  Thu Oct  1 19:08 - 19:36  (00:28)
usera    mg2518                  Thu Oct  1 18:53 - 18:58  (00:04)
root     mg1575                  Wed Sep 30 18:39 - 18:41  (00:02)
root     ttyp2    aaa.bbbb.com   Wed Sep 30 18:39 - 18:41  (00:02)
userb    ttyp1    192.0.2.0      Wed Sep 30 01:03 - 01:22  (00:19)
```


Copyright © 2016, Juniper Networks, Inc.

show subscribers

Syntax

show subscribers
<detail | extensive | terse>
<aci-interface-set-name *aci-interface-set-name*>
<address *address*>
<agent-circuit-identifier *agent-circuit-identifier-substring*>
<client-type *client-type*>
<count>
<id>
<interface *interface*>
<logical-system *logical-system*>
<mac-address *mac-address*>
<physical-interface *physical-interface-name*>
<profile-name *profile-name*>
<routing-instance *routing-instance*>
<stacked-vlan-id *stacked-vlan-id*>
<subscriber-state *subscriber-state*>
<user-name *user-name*>
<vci *vci-identifier*>
<vpi *vpi-identifier*>
<vlan-id *vlan-id*>

Release Information

Command introduced in Junos OS Release 9.3.
Command introduced in Junos OS Release 9.3 for EX Series switches.
client-type, **mac-address**, **subscriber-state**, and **extensive** options introduced in Junos OS Release 10.2.
count option usage with other options introduced in Junos OS Release 10.2.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Options **aci-interface-set-name** and **agent-circuit-identifier** introduced in Junos OS Release 12.2.
The **physical-interface** and **user-name** options introduced in Junos OS Release 12.3.
Options **vci** and **vpi** introduced in Junos OS Release 12.3R3 and supported in later 12.3R*x* releases.
Options **vci** and **vpi** supported in Junos OS Release 13.2 and later releases. (Not supported in Junos OS Release 13.1.)
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
Command introduced in Junos OS Release 15.1R3 on MX Series routers for enhanced subscriber management.

Description

Display information for active subscribers.

Options

detail | extensive | terse—(Optional) Display the specified level of output.

aci-interface-set-name—(Optional) Display all dynamic subscriber sessions that use the specified agent circuit identifier (ACI) interface set. Use the ACI interface set name generated by the router, such as aci-1003-ge-1/0/0.4001, and not the actual ACI value found in the DHCP or PPPoE control packets.

address—(Optional) Display subscribers whose IP address matches the specified address. You must specify the IPv4 or IPv6 address prefix without a netmask (for example,

192.168.17.1). If you specify the IP address as a prefix with a netmask (for example, 192.168.17.1/32), the router displays a message that the IP address is invalid, and rejects the command.

agent-circuit-identifier-substring—(Optional) Display all dynamic subscriber sessions whose ACI value matches the specified substring.

client-type—(Optional) Display subscribers whose client type matches one of the following client types:

- **dhcp**—DHCP clients only.
- **dotlx**—Dotlx clients only.
- **essm**—ESSM clients only.
- **fwauth**—FwAuth (authenticated across a firewall) clients only.
- **l2tp**—L2TP clients only.
- **mlppp**—MLPPP clients only.
- **ppp**—PPP clients only.
- **pppoe**—PPPoE clients only.
- **static**—Static clients only.
- **vlan**—VLAN clients only.
- **vlan-oob**—VLAN out-of-band (ANCP-triggered) clients only.
- **vpls-pw**—VPLS pseudowire clients only.
- **xauth**—Xauth clients only.

count—(Optional) Display the count of total subscribers and active subscribers for any specified option. You can use the **count** option alone or with the **address**, **client-type**, **interface**, **logical-system**, **mac-address**, **profile-name**, **routing-instance**, **stacked-vlan-id**, **subscriber-state**, or **vlan-id** options.

id—(Optional) Display a specific subscriber session whose session id matches the specified subscriber ID. You can display subscriber IDs by using the **show subscribers extensive** or the **show subscribers interface extensive** commands.

interface—(Optional) Display subscribers whose interface matches the specified interface.

logical-system—(Optional) Display subscribers whose logical system matches the specified logical system.

mac-address—(Optional) Display subscribers whose MAC address matches the specified MAC address.

physical-interface-name—(M120, M320, and MX Series routers only) (Optional) Display subscribers whose physical interface matches the specified physical interface.

profile-name—(Optional) Display subscribers whose dynamic profile matches the specified profile name.

 Copyright © 2016, Juniper Networks, Inc.

routing-instance—(Optional) Display subscribers whose routing instance matches the specified routing instance.

stacked-vlan-id—(Optional) Display subscribers whose stacked VLAN ID matches the specified stacked VLAN ID.

subscriber-state—(Optional) Display subscribers whose subscriber state matches the specified subscriber state (ACTIVE, CONFIGURED, INIT, TERMINATED, or TERMINATING).

user-name—(M120, M320, and MX Series routers only) (Optional) Display subscribers whose username matches the specified subscriber name.

vci-identifier—(MX Series routers with MPCs and ATM MICs with SFP only) (Optional) Display active ATM subscribers whose ATM virtual circuit identifier (VCI) matches the specified VCI identifier. The range of values is **0** through **255**.

vpi-identifier—(MX Series routers with MPCs and ATM MICs with SFP only) (Optional) Display active ATM subscribers whose ATM virtual path identifier (VPI) matches the specified VPI identifier. The range of values is **0** through **65535**.

vlan-id—(Optional) Display subscribers whose VLAN ID matches the specified VLAN ID, regardless of whether the subscriber uses a single-tagged or double-tagged VLAN. For subscribers using a double-tagged VLAN, this option displays subscribers where the inner VLAN tag matches the specified VLAN ID. To display only subscribers where the specified value matches only double-tagged VLANs, use the **stacked-vlan-id** ***stacked-vlan-id*** option to match the outer VLAN tag.

NOTE: Due to display limitations, logical system and routing instance output values are truncated when necessary.

Required Privilege Level

view

Related Documentation

- *show subscribers summary*
- *Verifying and Managing Agent Circuit Identifier-Based Dynamic VLAN Configuration*
- *Verifying and Managing Junos OS Enhanced Subscriber Management*

List of Sample Output

show subscribers (IPv4) on page 952
show subscribers (IPv6) on page 952
show subscribers (IPv4 and IPv6 Dual Stack) on page 952
show subscribers (LNS on MX Series Routers) on page 953
show subscribers (L2TP Switched Tunnels) on page 953
show subscribers client-type dhcp detail on page 953
show subscribers client-type vlan-oob detail on page 953
show subscribers count on page 954
show subscribers address detail (IPv6) on page 954

show subscribers detail (IPv4) on page 954
show subscribers detail (IPv6) on page 955
show subscribers detail (IPv6 Static Demux Interface) on page 955
show subscribers detail (L2TP LNS Subscribers on MX Series Routers) on page 955
show subscribers detail (L2TP Switched Tunnels) on page 955
show subscribers detail (Tunneled Subscriber) on page 956
show subscribers detail (IPv4 and IPv6 Dual Stack) on page 956
show subscribers detail (ACI Interface Set Session) on page 957
show subscribers detail (PPPoE Subscriber Session with ACI Interface Set) on page 957
show subscribers extensive on page 958
show subscribers extensive (RPF Check Fail Filter) on page 958
show subscribers extensive (L2TP LNS Subscribers on MX Series Routers) on page 958
show subscribers extensive (IPv4 and IPv6 Dual Stack) on page 959
show subscribers extensive (ADF Rules) on page 960
show subscribers extensive (Effective Shaping-Rate) on page 960
show subscribers aci-interface-set-name detail (Subscriber Sessions Using Specified ACI Interface Set) on page 960
show subscribers agent-circuit-identifier detail (Subscriber Sessions Using Specified ACI Substring) on page 961
show subscribers interface extensive on page 961
show subscribers logical-system terse on page 962
show subscribers physical-interface count on page 962
show subscribers routing-instance inst1 count on page 962
show subscribers stacked-vlan-id detail on page 962
show subscribers stacked-vlan-id vlan-id detail (Combined Output) on page 962
show subscribers stacked-vlan-id vlan-id interface detail (Combined Output for a Specific Interface) on page 963
show subscribers user-name detail on page 963
show subscribers vlan-id on page 963
show subscribers vlan-id detail on page 963
show subscribers vpi vci extensive (PPPoE-over-ATM Subscriber Session) on page 964
show subscribers address detail (Enhanced Subscriber Management) on page 964

Output Fields Table 46 on page 948 lists the output fields for the **show subscribers** command. Output fields are listed in the approximate order in which they appear.

Table 46: show subscribers Output Fields

Field Name	Field Description
Interface	Interface associated with the subscriber. The router or switch displays subscribers whose interface matches or begins with the specified interface. The * character indicates a continuation of addresses for the same session.
IP Address/VLAN ID	Subscriber IP address or VLAN ID associated with the subscriber in the form *tpid.vlan-id* No IP address or VLAN ID is assigned to an L2TP tunnel-switched session. For these subscriber sessions the value is **Tunnel-switched**.
User Name	Name of subscriber.

 Copyright © 2016, Juniper Networks, Inc.

Table 46: show subscribers Output Fields *(continued)*

Field Name	Field Description
LS:RI	Logical system and routing instance associated with the subscriber.
Type	Subscriber client type (DHCP, L2TP, PPP, PPPoE, STATIC-INTERFACE, VLAN).
IP Address	Subscriber IPv4 address.
IP Netmask	Subscriber IP netmask.
Primary DNS Address	IP address of primary DNS server.
Secondary DNS Address	IP address of secondary DNS server.
Primary WINS Address	IP address of primary WINS server.
Secondary WINS Address	IP address of secondary WINS server.
IPv6 Address	Subscriber IPv6 address, or multiple addresses.
IPv6 Prefix	Subscriber IPv6 prefix. If you are using DHCPv6 prefix delegation, this is the delegated prefix.
IPv6 User Prefix	IPv6 prefix obtained through ND/RA.
IPv6 Address Pool	Subscriber IPv6 address pool. The IPv6 address pool is used to allocate IPv6 prefixes to the DHCPv6 clients.
IPv6 Network Prefix Length	Length of the network portion of the IPv6 address.
IPv6 Prefix Length	Length of the subscriber IPv6 prefix.
Logical System	Logical system associated with the subscriber.
Routing Instance	Routing instance associated with the subscriber.
Interface	(Enhanced subscriber management for MX Series routers) Name of the enhanced subscriber management logical interface, in the form **demux0.*nnnn*** (for example, **demux0.3221225472**), to which access-internal and framed subscriber routes are mapped.
Interface Type	Whether the subscriber interface is **Static** or **Dynamic**.
Interface Set	Internally generated name of the dynamic ACI interface set used by the subscriber session.
Interface Set Type	Interface type of the ACI interface set: **Dynamic**. This is the only ACI interface set type currently supported.
Interface Set Session ID	Identifier of the dynamic ACI interface set entry in the session database.

Copyright © 2016, Juniper Networks, Inc.

Table 46: show subscribers Output Fields *(continued)*

Field Name	Field Description
Underlying Interface	Name of the underlying interface for the subscriber session.
Dynamic Profile Name	Dynamic profile used for the subscriber.
Dynamic Profile Version	Version number of the dynamic profile used for the subscriber.
MAC Address	MAC address associated with the subscriber.
State	Current state of the subscriber session (**Init**, **Configured**, **Active**, **Terminating**, **Tunneled**).
L2TP State	Current state of the L2TP session, **Tunneled** or **Tunnel-switched**. When the value is **Tunnel-switched**, two entries are displayed for the subscriber; the first entry is at the LNS interface on the LTS and the second entry is at the LAC interface on the LTS.
Tunnel switch Profile Name	Name of the L2TP tunnel switch profile that initiates tunnel switching.
Local IP Address	IP address of the local gateway (LAC).
Remote IP Address	IP address of the remote peer (LNS).
VLAN Id	VLAN ID associated with the subscriber in the form *tpid.vlan-id*.
Stacked VLAN Id	Stacked VLAN ID associated with the subscriber in the form *tpid.vlan-id*.
RADIUS Accounting ID	RADIUS accounting ID associated with the subscriber.
Agent Circuit ID	For the **dhcp** client type, option 82 agent circuit ID associated with the subscriber. The ID is displayed as an ASCII string unless the value has nonprintable characters, in which case it is displayed in hexadecimal format. For the **vlan-oob** client type, the agent circuit ID or access-loop circuit identifier that identifies the subscriber line based on the subscriber-facing DSLAM interface on which the subscriber request originates.
Agent Remote ID	For the **dhcp** client type, option 82 agent remote ID associated with the subscriber. The ID is displayed as an ASCII string unless the value has nonprintable characters, in which case it is displayed in hexadecimal format. For the **vlan-oob** client type, the agent remote ID or access-loop remote identifier that identifies the subscriber line based on the NAS-facing DSLAM interface on which the subscriber request originates.
DHCP Relay IP Address	IP address used by the DHCP relay agent.
ATM VPI	(MX Series routers with MPCs and ATM MICs with SFP only) ATM virtual path identifier (VPI) on the subscriber's physical interface.
ATM VCI	(MX Series routers with MPCs and ATM MICs with SFP only) ATM virtual circuit identifier (VCI) for each VPI configured on the subscriber interface.

Copyright © 2016, Juniper Networks, Inc.

Table 46: show subscribers Output Fields *(continued)*

Field Name	Field Description
Login Time	Date and time at which the subscriber logged in.
Effective shaping-rate	Actual downstream traffic shaping rate for the subscriber, in kilobits per second.
IPv4 rpf-check Fail Filter Name	Name of the filter applied by the dynamic profile to IPv4 packets that fail the RPF check.
IPv6 rpf-check Fail Filter Name	Name of the filter applied by the dynamic profile to IPv6 packets that fail the RPF check.
DHCP Options	**len** = number of hex values in the message. The hex values specify the type, length, value (TLV) for DHCP options, as defined in RFC 2132.
Session ID	ID number for a subscriber service session.
Underlying Session ID	For DHCPv6 subscribers on a PPPoE network, displays the session ID of the underlying PPPoE interface.
Service Sessions	Number of service sessions (that is, a service activated using RADIUS CoA) associated with the subscribers.
Service Session Name	Service session profile name.
Session Timeout (seconds)	Number of seconds of access provided to the subscriber before the session is automatically terminated.
Idle Timeout (seconds)	Number of seconds subscriber can be idle before the session is automatically terminated.
IPv6 Delegated Address Pool	Name of the pool used for DHCPv6 prefix delegation.
IPv6 Delegated Network Prefix Length	Length of the prefix configured for the IPv6 delegated address pool.
IPv6 Interface Address	Address assigned by the Framed-Ipv6-Prefix AAA attribute.
IPv6 Framed Interface Id	Interface ID assigned by the Framed-Interface-Id AAA attribute.
ADF IPv4 Input Filter Name	Name assigned to the Ascend-Data-Filter (ADF) interface IPv4 input filter (client or service session). The filter name is followed by the rules (in hexadecimal format) associated with the ADF filter and the decoded rule in Junos OS filter style.
ADF IPv4 Output Filter Name	Name assigned to the Ascend-Data-Filter (ADF) interface IPv4 output filter (client or service session). The filter name is followed by the rules (in hexadecimal format) associated with the ADF filter and the decoded rule in Junos OS filter style.
ADF IPv6 Input Filter Name	Name assigned to the Ascend-Data-Filter (ADF) interface IPv6 input filter (client or service session). The filter name is followed by the rules (in hexadecimal format) associated with the ADF filter and the decoded rule in Junos OS filter style.

Copyright © 2016, Juniper Networks, Inc.

Table 46: show subscribers Output Fields *(continued)*

Field Name	Field Description
ADF IPv6 Output Filter Name	Name assigned to the Ascend-Data-Filter (ADF) interface IPv6 output filter (client or service session). The filter name is followed by the rules (in hexadecimal format) associated with the ADF filter and the decoded rule in Junos OS filter style.
IPv4 Input Filter Name	Name assigned to the IPv4 input filter (client or service session).
IPv4 Output Filter Name	Name assigned to the IPv4 output filter (client or service session).
IPv6 Input Filter Name	Name assigned to the IPv6 input filter (client or service session).
IPv6 Output Filter Name	Name assigned to the IPv6 output filter (client or service session).
IFL Input Filter Name	Name assigned to the logical interface input filter (client or service session).
IFL Output Filter Name	Name assigned to the logical interface output filter (client or service session).

Sample Output

show subscribers (IPv4)

```
user@host> show subscribers
Interface                IP Address/VLAN ID   User Name         LS:RI
ge-1/3/0.1073741824      100                                    default:default
demux0.1073741824        10.0.0.10           WHOLESALER-CLIENT default:default
demux0.1073741825        192.3.0.3            RETAILER1-CLIENT  test1:retailer1
demux0.1073741826       198.53.102.3            RETAILER2-CLIENT  test1:retailer2
```

show subscribers (IPv6)

```
user@host> show subscribers
Interface           IP Address/VLAN ID   User Name           LS:RI
ge-1/0/0.0          2001:db8::c0:0:0:0/74    WHOLESALER-CLIENT   default:default
     *              2001:db8::1/128          subscriber-25       default:default
```

show subscribers (IPv4 and IPv6 Dual Stack)

```
user@host> show subscribers
Interface            IP Address/VLAN ID         User Name
LS:RI
demux0.1073741834    0x8100.1002 0x8100.1
default:default
demux0.1073741835    0x8100.1001 0x8100.1
default:default
pp0.1073741836       192.168.1.1                 dualstackuser1@EXAMPLE1.com
default:ASP-1
*                    2001:db8:1::/48
*                    2001:db8:1:1::/64
pp0.1073741837       192.168.1.3                 dualstackuser2@EXAMPLE1.com
default:ASP-1
*                    2001:db8:1:2:5::/64
```


Copyright © 2016, Juniper Networks, Inc.

show subscribers (LNS on MX Series Routers)

```
user@host> show subscribers
Interface          IP Address/VLAN ID   User Name         LS:RI
si-4/0/0.1         192.168.4.1          xyz@example.com   default:default
```

show subscribers (L2TP Switched Tunnels)

```
user@host> show subscribers
Interface           IP Address/VLAN ID    User Name              LS:RI
si-2/1/0.1073741842 Tunnel-switched       ap@example.com        default:default

si-2/1/0.1073741843 Tunnel-switched       ap@example.com        default:default
```

show subscribers client-type dhcp detail

```
user@host> show subscribers client-type dhcp detail
Type: DHCP
IP Address: 192.20.9.7
IP Netmask: 255.255.0.0
Logical System: default
Routing Instance: default
Interface: demux0.1073744127
Interface type: Dynamic
Dynamic Profile Name: dhcp-demux-prof
MAC Address: 00:10:95:00:00:98
State: Active
Radius Accounting ID: jnpr :2304
Login Time: 2009-08-25 14:43:52 PDT

Type: DHCP
IP Address: 10.20.10.7
IP Netmask: 255.255.0.0
Logical System: default
Routing Instance: default
Interface: demux0.1073744383
Interface type: Dynamic
Dynamic Profile Name: dhcp-demux-prof
MAC Address: 00:10:94:00:01:f3
State: Active
Radius Accounting ID: jnpr :2560
Login Time: 2009-08-25 14:43:56 PDT
```

show subscribers client-type vlan-oob detail

```
user@host> show subscribers client-type vlan-oob detail
Type: VLAN-OOB
User Name: L2WS.line-aci-1.line-ari-1
Logical System: default
Routing Instance: ISP1
Interface: demux0.1073744127
Interface type: Dynamic
Underlying Interface: ge-1/0/0
Dynamic Profile Name: Prof_L2WS
Dynamic Profile Version: 1
State: Active
Radius Accounting ID: 2304
Session ID: 77
VLAN Id: 126
```

```
Core-Facing Interface: ge-2/1/1
VLAN Map Id: 6
Inner VLAN Map Id: 2001
Agent Circuit ID: line-aci-1
Agent Remote ID: line-ari-1
Login Time: 2013-10-29 14:43:52 EDT
```

show subscribers count

```
user@host> show subscribers count
Total Subscribers: 188, Active Subscribers: 188
```

show subscribers address detail (IPv6)

```
user@host> show subscribers address 10.16.12.137 detail
Type: PPPoE
User Name: pppoeTerV6User1Svc
IP Address: 10.16.12.137
IP Netmask: 255.0.0.0
IPv6 User Prefix: 2001:db8:0:c88::/32
Logical System: default
Routing Instance: default
Interface: pp0.1073745151
Interface type: Dynamic
Underlying Interface: demux0.8201
Dynamic Profile Name: pppoe-client-profile
MAC Address: 00:0d:02:01:00:01
Session Timeout (seconds): 31622400
Idle Timeout (seconds): 86400
State: Active
Radius Accounting ID: jnpr demux0.8201:6544
Session ID: 6544
Agent Circuit ID: ifl3720
Agent Remote ID: ifl3720
Login Time: 2012-05-21 13:37:27 PDT
Service Sessions: 1
```

show subscribers detail (IPv4)

```
user@host> show subscribers detail
Type: DHCP
IP Address: 10.20.9.7
IP Netmask: 255.255.0.0
Primary DNS Address: 192.168.17.1
Secondary DNS Address: 192.168.17.2
Primary WINS Address: 192.168.22.1
Secondary WINS Address: 192.168.22.2
Logical System: default
Routing Instance: default
Interface: demux0.1073744127
Interface type: Dynamic
Dynamic Profile Name: dhcp-demux-prof
MAC Address: 00:10:95:00:00:98
State: Active
Radius Accounting ID: jnpr :2304
Idle Timeout (seconds): 600
Login Time: 2009-08-25 14:43:52 PDT
DHCP Options: len 52
35 01 01 39 02 02 40 3d 07 01 00 10 94 00 00 08 33 04 00 00
00 3c 0c 15 63 6c 69 65 6e 74 5f 50 6f 72 74 20 2f 2f 36 2f
```


Copyright © 2016, Juniper Networks, Inc.

```
33 2d 37 2d 30 37 05 01 06 0f 21 2c
Service Sessions: 2
```

show subscribers detail (IPv6)

```
user@host> show subscribers detail
Type: DHCP
User Name: pd-user1
IPv6 Prefix: 2001:db8:db2:ffff:1::/64
Logical System: default
Routing Instance: default
Interface: ge-3/1/3.2
Interface type: Static
MAC Address: 00:51:ff:ff:00:03
State: Active
Radius Accounting ID: 1
Session ID: 1
Login Time: 2011-08-25 12:12:26 PDT
DHCP Options: len 42
00 08 00 02 00 00 00 01 00 0a 00 03 00 01 00 51 ff ff 00 03
00 06 00 02 00 19 00 19 00 0c 00 00 00 00 00 00 00 00 00 00
00 00
```

show subscribers detail (IPv6 Static Demux Interface)

```
user@host> show subscribers detail
Type: STATIC-INTERFACE
User Name: demux0.1@example.net
IPv6 Prefix: 2001:db8:3:4:5:6:7:aa/32
Logical System: default
Routing Instance: default
Interface: demux0.1
Interface type: Static
Dynamic Profile Name: junos-default-profile
State: Active
Radius Accounting ID: 185
Login Time: 2010-05-18 14:33:56 EDT
```

show subscribers detail (L2TP LNS Subscribers on MX Series Routers)

```
user@host> show subscribers detail
Type: L2TP
User Name: user1@example.net
IP Address: 10.1.32.58
IP Netmask: 255.255.0.0
Logical System: default
Routing Instance: default
Interface: si-5/2/0.1073749824
Interface type: Dynamic
Dynamic Profile Name: dyn-lns-profile2
Dynamic Profile Version: 1
State: Active
Radius Accounting ID: 8001
Session ID: 8001
Login Time: 2011-04-25 20:27:50 IST
```

show subscribers detail (L2TP Switched Tunnels)

```
user@host> show subscribers detail
Type: L2TP
User Name: ap@example.com
Logical System: default
```

```
Routing Instance: default
Interface: si-2/1/0.1073741842
Interface type: Dynamic
Dynamic Profile Name: dyn-lts-profile
State: Active
L2TP State: Tunnel-switched
Tunnel switch Profile Name: ce-lts-profile
Local IP Address: 10.50.1.1
Remote IP Address: 192.168.20.3
Radius Accounting ID: 21
Session ID: 21
Login Time: 2013-01-18 03:01:11 PST

Type: L2TP
User Name: ap@example.com
Logical System: default
Routing Instance: default
Interface: si-2/1/0.1073741843
Interface type: Dynamic
Dynamic Profile Name: dyn-lts-profile
State: Active
L2TP State: Tunnel-switched
Tunnel switch Profile Name: ce-lts-profile
Local IP Address: 10.30.1.1
Remote IP Address: 192.20.1.10
Session ID: 22
Login Time: 2013-01-18 03:01:14 PST
```

show subscribers detail (Tunneled Subscriber)

```
user@host> show subscribers detail
Type: PPPoE
User Name: user1@example.com
Logical System: default
Routing Instance: default
Interface: pp0.1
State: Active, Tunneled
Radius Accounting ID: 512
```

show subscribers detail (IPv4 and IPv6 Dual Stack)

```
user@host> show subscribers detail
Type: VLAN
Logical System: default
Routing Instance: default
Interface: demux0.1073741824
Interface type: Dynamic
Dynamic Profile Name: svlanProfile
State: Active
Session ID: 1
Stacked VLAN Id: 0x8100.1001
VLAN Id: 0x8100.1
Login Time: 2011-11-30 00:18:04 PST

Type: PPPoE
User Name: dualstackuser1@EXAMPLE1.com
IP Address: 10.1.1.1
IPv6 Prefix: 2001:db8:1::/32
IPv6 User Prefix: 2001:db8:1:1::/32
Logical System: default
Routing Instance: ASP-1
```

 Copyright © 2016, Juniper Networks, Inc.

```
Interface: pp0.1073741825
Interface type: Dynamic
Dynamic Profile Name: dualStack-Profile1
MAC Address: 00:00:64:03:01:02
State: Active
Radius Accounting ID: 2
Session ID: 2
Login Time: 2011-11-30 00:18:05 PST

Type: DHCP
IPv6 Prefix: 2001:db8:1::/32
Logical System: default
Routing Instance: ASP-1
Interface: pp0.1073741825
Interface type: Static
MAC Address: 00:00:64:03:01:02
State: Active
Radius Accounting ID: jnpr :3
Session ID: 3
Underlying Session ID: 2
Login Time: 2011-11-30 00:18:35 PST
DHCP Options: len 42
00 08 00 02 0b b8 00 01 00 0a 00 03 00 01 00 00 64 03 01 02
00 06 00 02 00 19 00 19 00 0c 00 00 00 00 00 00 00 00 00 00
00 00
```

show subscribers detail (ACI Interface Set Session)

```
user@host> show subscribers detail
Type: VLAN
Logical System: default
Routing Instance: default
Interface: ge-1/0/0
Interface Set: aci-1001-ge-1/0/0.2800
Interface Set Session ID: 0
Underlying Interface: ge-1/0/0.2800
Dynamic Profile Name: aci-vlan-set-profile-2
Dynamic Profile Version: 1
State: Active
Session ID: 1
Agent Circuit ID: aci-ppp-dhcp-20
Login Time: 2012-05-26 01:54:08 PDT
```

show subscribers detail (PPPoE Subscriber Session with ACI Interface Set)

```
user@host> show subscribers detail
Type: PPPoE
User Name: ppphint2
IP Address: 10.10.1.5
Logical System: default
Routing Instance: default
Interface: pp0.1073741825
Interface type: Dynamic
Interface Set: aci-1001-demux0.1073741824
Interface Set Type: Dynamic
Interface Set Session ID: 2
Underlying Interface: demux0.1073741824
Dynamic Profile Name: aci-vlan-pppoe-profile
Dynamic Profile Version: 1
MAC Address: 00:00:64:39:01:02
```

```
State: Active
Radius Accounting ID: 3
Session ID: 3
Agent Circuit ID: aci-ppp-dhcp-dvlan-50
Login Time: 2012-03-07 13:46:53 PST
```

show subscribers extensive

```
user@host> show subscribers extensive
Type: DHCP
User Name: pd-user1
IPv6 Prefix: 2001:db8:db2:ffff:1::/32
Logical System: default
Routing Instance: default
Interface: ge-3/1/3.2
Interface type: Static
MAC Address: 00:51:ff:ff:00:03
State: Active
Radius Accounting ID: 1
Session ID: 1
Login Time: 2011-08-25 12:12:26 PDT
DHCP Options: len 42
00 08 00 02 00 00 00 01 00 0a 00 03 00 01 00 51 ff ff 00 03
00 06 00 02 00 19 00 19 00 0c 00 00 00 00 00 00 00 00 00 00
00 00
IPv6 Address Pool: pd_pool
IPv6 Network Prefix Length: 48
```

show subscribers extensive (RPF Check Fail Filter)

```
user@host> show subscribers extensive
...
Type: VLAN
  Logical System: default
  Routing Instance: default
  Interface: ae0.1073741824
  Interface type: Dynamic
  Dynamic Profile Name: vlan-prof
  State: Active
  Session ID: 9
  VLAN Id: 100
  Login Time: 2011-08-26 08:17:00 PDT
  IPv4 rpf-check Fail Filter Name: rpf-allow-dhcp
  IPv6 rpf-check Fail Filter Name: rpf-allow-dhcpv6
...
```

show subscribers extensive (L2TP LNS Subscribers on MX Series Routers)

```
user@host> show subscribers extensive
Type: L2TP
User Name: user1@example.net
IP Address: 10.1.32.58
IP Netmask: 255.255.0.0
Logical System: default
Routing Instance: default
Interface: si-5/2/0.1073749824
Interface type: Dynamic
Dynamic Profile Name: dyn-lns-profile2
Dynamic Profile Version: 1
State: Active
Radius Accounting ID: 8001
Session ID: 8001
```

 Copyright © 2016, Juniper Networks, Inc.

```
Login Time: 2011-04-25 20:27:50 IST
IPv4 Input Filter Name: classify-si-5/2/0.1073749824-in
IPv4 Output Filter Name: classify-si-5/2/0.1073749824-out
```

show subscribers extensive (IPv4 and IPv6 Dual Stack)

```
user@host> show subscribers extensive
Type: VLAN
Logical System: default
Routing Instance: default
Interface: demux0.1073741824
Interface type: Dynamic
Dynamic Profile Name: svlanProfile
State: Active
Session ID: 1
Stacked VLAN Id: 0x8100.1001
VLAN Id: 0x8100.1
Login Time: 2011-11-30 00:18:04 PST

Type: PPPoE
User Name: dualstackuser1@EXAMPLE1.com
IP Address: 192.1.1.1
IPv6 Prefix: 2001:db8:1::/32
IPv6 User Prefix: 2001:db8:1:1::/32
Logical System: default
Routing Instance: ASP-1
Interface: pp0.1073741825
Interface type: Dynamic
Dynamic Profile Name: dualStack-Profile1
MAC Address: 00:00:64:03:01:02
State: Active
Radius Accounting ID: 2
Session ID: 2
Login Time: 2011-11-30 00:18:05 PST
IPv6 Delegated Network Prefix Length: 48
IPv6 Interface Address: 2001:db8:1:1::1/32
IPv6 Framed Interface Id: 10:1:2:2
IPv4 Input Filter Name: FILTER-IN-pp0.1073741825-in
IPv4 Output Filter Name: FILTER-OUT-pp0.1073741825-out
IPv6 Input Filter Name: FILTER-IN6-pp0.1073741825-in
IPv6 Output Filter Name: FILTER-OUT6-pp0.1073741825-out

Type: DHCP
IPv6 Prefix:2001:db81:1::/32
Logical System: default
Routing Instance: ASP-1
Interface: pp0.1073741825
Interface type: Static
MAC Address: 00:00:64:03:01:02
State: Active
Radius Accounting ID: jnpr :3
Session ID: 3
Underlying Session ID: 2
Login Time: 2011-11-30 00:18:35 PST
DHCP Options: len 42
00 08 00 02 0b b8 00 01 00 0a 00 03 00 01 00 00 64 03 01 02
00 06 00 02 00 19 00 19 00 0c 00 00 00 00 00 00 00 00 00 00
00 00
IPv6 Delegated Network Prefix Length: 48
```

show subscribers extensive (ADF Rules)

```
user@host> show subscribers extensive
...
   Service Session ID: 12
   Service Session Name: SERVICE-PROFILE
   State: Active
   Family: inet
     ADF IPv4 Input Filter Name: __junos_adf_12-demux0.3221225474-inet-in
                        Rule 0: 010101000b0101020b020200201811
                                from {
                                    source-address 10.1.1.2/32;
                                    destination-address 10.2.2.0/24;
                                    protocol 17;
                                }
                                then {
                                    accept;
                                }
```

show subscribers extensive (Effective Shaping-Rate)

```
user@host> show subscribers extensive
Type: VLAN
Logical System: default
Routing Instance: default
Interface: demux0.1073741837
Interface type: Dynamic
Interface Set: ifset-1
Underlying Interface: ae1
Dynamic Profile Name: svlan-dhcp-test
State: Active
Session ID: 1
Stacked VLAN Id: 0x8100.201
VLAN Id: 0x8100.201
Login Time: 2011-11-30 00:18:04 PST
Effective shaping-rate: 31000000k
...
```

show subscribers aci-interface-set-name detail (Subscriber Sessions Using Specified ACI Interface Set)

```
user@host> show subscribers aci-interface-set-name aci-1003-ge-1/0/0.4001 detail
Type: VLAN
Logical System: default
Routing Instance: default
Interface: ge-1/0/0.
Underlying Interface: ge-1/0/0.4001
Dynamic Profile Name: aci-vlan-set-profile
Dynamic Profile Version: 1
State: Active
Session ID: 13
Agent Circuit ID: aci-ppp-vlan-10
Login Time: 2012-03-12 10:41:56 PDT

Type: PPPoE
User Name: ppphint2
IP Address: 10.10.1.7
Logical System: default
Routing Instance: default
Interface: pp0.1073741834
Interface type: Dynamic
Interface Set: aci-1003-ge-1/0/0.4001
```

 Copyright © 2016, Juniper Networks, Inc.

```
Interface Set Type: Dynamic
Interface Set Session ID: 13
Underlying Interface: ge-1/0/0.4001
Dynamic Profile Name: aci-vlan-pppoe-profile
Dynamic Profile Version: 1
MAC Address: 00:00:65:26:01:02
State: Active
Radius Accounting ID: 14
Session ID: 14
Agent Circuit ID: aci-ppp-vlan-10
Login Time: 2012-03-12 10:41:57 PDT
```

show subscribers agent-circuit-identifier detail (Subscriber Sessions Using Specified ACI Substring)

```
user@host> show subscribers agent-circuit-identifier aci-ppp-vlan detail
Type: VLAN
Logical System: default
Routing Instance: default
Interface: ge-1/0/0.
Underlying Interface: ge-1/0/0.4001
Dynamic Profile Name: aci-vlan-set-profile
Dynamic Profile Version: 1
State: Active
Session ID: 13
Agent Circuit ID: aci-ppp-vlan-10
Login Time: 2012-03-12 10:41:56 PDT

Type: PPPoE
User Name: ppphint2
IP Address: 10.10.1.7
Logical System: default
Routing Instance: default
Interface: pp0.1073741834
Interface type: Dynamic
Interface Set: aci-1003-ge-1/0/0.4001
Interface Set Type: Dynamic
Interface Set Session ID: 13
Underlying Interface: ge-1/0/0.4001
Dynamic Profile Name: aci-vlan-pppoe-profile
Dynamic Profile Version: 1
MAC Address: 00:00:65:26:01:02
State: Active
Radius Accounting ID: 14
Session ID: 14
Agent Circuit ID: aci-ppp-vlan-10
Login Time: 2012-03-12 10:41:57 PDT
```

show subscribers interface extensive

```
user@host> show subscribers interface demux0.1073741826 extensive
Type: VLAN
User Name: test1@test.com
Logical System: default
Routing Instance: testnet
Interface: demux0.1073741826
Interface type: Dynamic
Dynamic Profile Name: profile-vdemux-relay-23qos
MAC Address: 00:00:6e:56:01:04
State: Active
Radius Accounting ID: 12
Session ID: 12
```

```
Stacked VLAN Id: 0x8100.1500
VLAN Id: 0x8100.2902
Login Time: 2011-10-20 16:21:59 EST

Type: DHCP
User Name: test1@test.com
IP Address: 192.168.200.6
IP Netmask: 255.255.255.0
Logical System: default
Routing Instance: testnet
Interface: demux0.1073741826
Interface type: Static
MAC Address: 00:00:6e:56:01:04
State: Active
Radius Accounting ID: 21
Session ID: 21
Login Time: 2011-10-20 16:24:33 EST
Service Sessions: 2

Service Session ID: 25
Service Session Name: SUB-QOS
State: Active

Service Session ID: 26
Service Session Name: service-cb-content
State: Active
IPv4 Input Filter Name: content-cb-in-demux0.1073741826-in
IPv4 Output Filter Name: content-cb-out-demux0.1073741826-out
```

show subscribers logical-system terse

```
user@host> show subscribers logical-system test1 terse
Interface           IP Address/VLAN ID   User Name         LS:RI
demux0.1073741825     10.0.0.3            RETAILER1-CLIENT  test1:retailer1
demux0.1073741826     10.0.0.6            RETAILER2-CLIENT  test1:retailer2
```

show subscribers physical-interface count

```
user@host> show subscribers physical-interface ge-1/0/0 count
Total subscribers: 3998, Active Subscribers: 3998
```

show subscribers routing-instance inst1 count

```
user@host> show subscribers routing-instance inst1 count
Total Subscribers: 188, Active Subscribers: 183
```

show subscribers stacked-vlan-id detail

```
user@host> show subscribers stacked-vlan-id 101 detail
Type: VLAN
Interface: ge-1/2/0.1073741824
Interface type: Dynamic
Dynamic Profile Name: svlan-prof
State: Active
Stacked VLAN Id: 0x8100.101
VLAN Id: 0x8100.100
Login Time: 2009-03-27 11:57:19 PDT
```

show subscribers stacked-vlan-id vlan-id detail (Combined Output)

```
user@host> show subscribers stacked-vlan-id 101 vlan-id 100 detail
```


Copyright © 2016, Juniper Networks, Inc.

```
Type: VLAN
Interface: ge-1/2/0.1073741824
Interface type: Dynamic
Dynamic Profile Name: svlan-prof
State: Active
Stacked VLAN Id: 0x8100.101
VLAN Id: 0x8100.100
Login Time: 2009-03-27 11:57:19 PDT
```

show subscribers stacked-vlan-id vlan-id interface detail (Combined Output for a Specific Interface)

```
user@host> show subscribers stacked-vlan-id 101 vlan-id 100 interface ge-1/2/0.* detail
Type: VLAN
Interface: ge-1/2/0.1073741824
Interface type: Dynamic
Dynamic Profile Name: svlan-prof
State: Active
Stacked VLAN Id: 0x8100.101
VLAN Id: 0x8100.100
Login Time: 2009-03-27 11:57:19 PDT
```

show subscribers user-name detail

```
user@host> show subscribers user-name larry1 detail
Type: DHCP
User Name: larry1
IP Address: 10.0.0.37
IP Netmask: 255.255.0.0
Logical System: default
Routing Instance: default
Interface: ge-1/0/0.1
Interface type: Static
Dynamic Profile Name: foo
MAC Address: 00:10:94:00:00:01
State: Active
Radius Accounting ID: 1
Session ID: 1
Login Time: 2011-11-07 08:25:59 PST
DHCP Options: len 52
35 01 01 39 02 02 40 3d 07 01 00 10 94 00 00 01 33 04 00 00
00 3c 0c 15 63 6c 69 65 6e 74 5f 50 6f 72 74 20 2f 2f 32 2f
37 2d 30 2d 30 37 05 01 06 0f 21 2c
```

show subscribers vlan-id

```
user@host> show subscribers vlan-id 100
Interface           IP Address                              User Name
ge-1/0/0.1073741824
ge-1/2/0.1073741825
```

show subscribers vlan-id detail

```
user@host> show subscribers vlan-id 100 detail
Type: VLAN
Interface: ge-1/0/0.1073741824
Interface type: Dynamic
Dynamic Profile Name: vlan-prof-tpid
State: Active
VLAN Id: 100
Login Time: 2009-03-11 06:48:54 PDT

Type: VLAN
```

```
Interface: ge-1/2/0.1073741825
Interface type: Dynamic
Dynamic Profile Name: vlan-prof-tpid
State: Active
VLAN Id: 100
Login Time: 2009-03-11 06:48:54 PDT
```

show subscribers vpi vci extensive (PPPoE-over-ATM Subscriber Session)

```
user@host> show subscribers vpi 40 vci 50 extensive
Type: PPPoE
User Name: testuser
IP Address: 10.0.0.2
IP Netmask: 255.255.0.0
Logical System: default
Routing Instance: default
Interface: pp0.0
Interface type: Static
MAC Address: 00:00:65:23:01:02
State: Active
Radius Accounting ID: 2
Session ID: 2
ATM VPI: 40
ATM VCI: 50
Login Time: 2012-12-03 07:49:26 PST
IP Address Pool: pool_1
IPv6 Framed Interface Id: 200:65ff:fe23:102
```

show subscribers address detail (Enhanced Subscriber Management)

```
user@host> show subscribers address 100.20.0.111 detail
Type: DHCP
User Name: simple_filters_service
IP Address: 10.0.0.2
IP Netmask: 255.0.0.0
Logical System: default
Routing Instance: default
Interface: demux0.3221225482
Interface type: Dynamic
Underlying Interface: demux0.3221225472
Dynamic Profile Name: dhcp-demux-prof
MAC Address: 00:01:02:03:04:0f
State: Active
Radius Accounting ID: 11
Session ID: 11
PFE Flow ID: 15
Stacked VLAN Id: 210
VLAN Id: 209
Login Time: 2014-03-24 12:53:48 PDT
Service Sessions: 1
DHCP Options: len 3
35 01 01
```


Copyright © 2016, Juniper Networks, Inc.

show system alarms

Syntax show system alarms

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Display active system alarms.

Options This command has no options.

Additional Information System alarms are preset. They include a *configuration* alarm that appears when no rescue configuration alarm is set and a *license* alarm that appears when a software feature is configured and no valid license is configured for the feature. On EX6200 switches, an alarm can be triggered by an internal link error. For more information about system alarms, see the *Junos OS Administration Library for Routing Devices*.

In Junos OS release 11.1 and later, alarms for fans also show the slot number of the malfunctioning fans in the CLI output.

Starting with Junos OS Release 13.2, you can view degraded fabric alarms on a routing matrix based on TX Matrix Plus router with 3D SIBs. The alarm indicates that the source FPC is running with a degraded fabric condition. This alarm is an early warning of a possible fabric black-hole condition. When the degraded fabric alarm is raised on the source FPC, you can take remedial action to avoid a fabric black-hole condition. The degraded fabric alarm is raised on the source FPC if both the following conditions are met:

- The active Packet Forwarding Engine destinations are reachable on one or no active switching planes.
- At least one of the inactive switching planes has a fault that causes the destination Packet Forwarding Engine to become unreachable.

Required Privilege Level view

Related Documentation
- show chassis alarms on page 469

List of Sample Output
show system alarms on page 966
show system alarms (Fan Tray) on page 966
show system alarms (QFX Series and OCX Series) on page 966
show system alarms (EX6200) on page 966
show system alarms (TX Matrix Plus router with 3D SIBs) on page 966

Output Fields Table 47 on page 966 lists the output fields for the **show system alarms** command. Output fields are listed in the approximate order in which they appear.

Table 47: show system alarms Output Fields

Field Name	Field Description
Alarm time	Date and time the alarm was first recorded.
Class	Severity class for this alarm: **Minor** or **Major**.
Description	Information about the alarm.

Sample Output

show system alarms

```
user@host> show system alarms
2 alarms currently active
Alarm time                    Class     Description
2005-02-24 17:29:34 UTC       Minor     IPsec VPN tunneling usage requires a
license
2005-02-24 17:29:34 UTC       Minor     Rescue configuration is not sent
```

show system alarms (Fan Tray)

```
user@host> show system alarms
4 alarms currently active
Alarm time               Class  Description
2010-11-11 20:27:38 UTC  Major  Side Fan Tray 7 Failure
2010-11-11 20:27:13 UTC  Minor  Side Fan Tray 7 Overspeed
2010-11-11 20:27:13 UTC  Major  Side Fan Tray 5 Failure
2010-11-11 20:27:13 UTC  Major  Side Fan Tray 0 Failure
```

show system alarms (QFX Series and OCX Series)

```
user@switch> show system alarms
2 alarms currently active
Alarm time Class Description
2005-02-24 17:29:34 UTC Minor Rescue configuration is not sent
```

show system alarms (EX6200)

```
user@switch> show system alarms
2 alarms currently active
Alarm time               Class  Description
2013-04-05 16:51:41 PDT  Major  FPC 8 internal link errors detected
2013-04-04 18:05:35 PDT  Minor  Rescue configuration is not set
```

show system alarms (TX Matrix Plus router with 3D SIBs)

```
user@router> show system alarms

sfc0-re0:
--------------------------------------------------------------------------
2 alarms currently active
Alarm time               Class  Description
2013-05-08 18:13:58 UTC  Major  LCC 0 Major Errors
2013-05-08 17:48:46 UTC  Major  LCC 7 Major Errors

lcc0-re1:
--------------------------------------------------------------------------
```


Copyright © 2016, Juniper Networks, Inc.

```
1 alarm currently active
Alarm time               Class  Description
2013-05-08 18:19:24 UTC  Major  FPC 1 degraded fabric condition detected

lcc7-re0:
--------------------------------------------------------------------------
1 alarm currently active
Alarm time               Class  Description
2013-05-08 18:19:24 UTC  Major  FPC 7 degraded fabric condition detected
```

show system audit

List of Syntax

Syntax on page 968
Syntax (EX Series Switch and MX Series Router) on page 968
Syntax (TX Matrix Router) on page 968
Syntax (TX Matrix Plus Router) on page 968
Syntax (QFX Series) on page 968
Syntax (OCX Series) on page 968

Syntax

show system audit
<root-only>

Syntax (EX Series Switch and MX Series Router)

show system audit
<all-members>
<local>
<member *member-id*>
<root-only>

Syntax (TX Matrix Router)

show system audit
<all-lcc | lcc *number* | scc>
<root-only>

Syntax (TX Matrix Plus Router)

show system audit
<all-chassis | all-lcc | lcc *number* | sfc *number*>
<root-only>

Syntax (QFX Series)

show system audit
<infrastructure *name* | interconnect-device *name* | node-group *name* | root-only>

Syntax (OCX Series)

show system audit
<root-only>

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.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display the state and checksum values for file systems.

Options

none—Display the state and checksum values for all file systems.

all-chassis—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Display file system MD5 hash and permissions information for all of the chassis.

all-lcc—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display file system MD5 hash and permissions information for all T640 routers connected to the TX Matrix router. On a TX Matrix Plus router, display file system MD5 hash and permissions information for all T1600 or T4000 routers connected to the TX Matrix Plus router.

Copyright © 2016, Juniper Networks, Inc.

all-members—(EX4200 switch, QFX Series, and MX Series routers only) (Optional) Display file system MD5 hash and permissions information on all members of the Virtual Chassis configuration.

lcc ***number***—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display file system MD5 hash and permissions information for a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, display file system MD5 hash and permissions information for a specific router that is connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

infrastructure ***name***—(QFabric systems only) (Optional) Display file system MD5 hash and permissions information for a fabric control Routing Engine or a fabric control Routing Engine.

interconnect-device ***name***—(QFabric systems only) (Optional) Display file system MD5 hash and permissions information for the Interconnect device.

local—(EX4200 switch, QFX Series, and MX Series routers only) (Optional) Display file system MD5 hash and permissions information on the local Virtual Chassis member.

member ***member-id***—(EX4200 switch, QFX Series, and MX Series routers only) (Optional) Display file system MD5 hash and permissions information on the specified member of the Virtual Chassis configuration. For EX4200 switches, replace ***member-id*** with a value from 0 through 9. For an MX Series Virtual Chassis, replace ***member-id*** with a value of 0 or 1.

node-group ***name***—(QFabric systems only) (Optional) Display file system MD5 hash and permissions information for the Node group

root-only—(Optional) Check only the root (/) file system. On a QFabric system, you can check the root (/) file system on the infrastructure (fabric manager Routing Engine and fabric control Routing Engine), Interconnect device, or Node group.

scc—(TX Matrix routers only) (Optional) Display file system MD5 hash and permissions information for the TX Matrix router (or switch-card chassis).

sfc ***number***—(TX Matrix Plus routers only) (Optional) Display file system MD5 hash and permissions information for the TX Matrix Plus router (or switch-fabric chassis). Replace *number* with **0**.

Additional Information

To redirect the output to a file, issue the following command:

ssh *device-name* 'show system audit root-only' > *output-file*

If you save the output of the **show system audit root-only** command to a file, you can compare it to subsequent output from the command to determine whether anything has changed.

By default, when you issue the **show system audit** command on the master Routing Engine of a TX Matrix router or a TX Matrix Plus router, the command is broadcast to all the master Routing Engines of the LCCs connected to it in the routing matrix. Likewise, if you issue the same command on the backup Routing Engine of a TX Matrix or a TX Matrix Plus router, the command is broadcast to all backup Routing Engines of the LCCs that are connected to it in the routing matrix.

Required Privilege Level

admin

List of Sample Output

show system audit root-only on page 970
show system audit lcc (TX Matrix Router) on page 971
show system audit lcc (TX Matrix Plus Router) on page 973
show system audit root-only (QFX3500 Switch) on page 974

Sample Output

show system audit root-only

```
user@host> show system audit root-only
#          user: root
#       machine: my-host
#          tree: /
date: Fri Feb 11 21:21:46 2000

# .
/set type=file uid=0 gid=0 mode=0755 nlink=1
.               type=dir nlink=23 size=1024 time=950252640.0
  .cshrc      uid=3 gid=7 mode=0644 size=177 time=939182975.0 \
                md5digest=f414e06fea6bd646244b98e13d6e6226
  .kernel.jkernel.backup \
                mode=0744 size=1934552 time=944688902.0 \
                md5digest=2c343cf0bd9fea8f04f78604feed7aa4
  .profile    uid=3 gid=7 mode=0644 nlink=2 size=173 time=939182975.0 \
                md5digest=55a1e3c6c67789c9d3a1cce1ea39f670
    COPYRIGHT   uid=3 gid=7 mode=0444 size=3425 time=939182975.0 \
                md5digest=7df8bc77dcee71382ea73eb0ec6a9243
    boot.config mode=0644 size=3 time=945902618.0 \
                md5digest=93d722493ed38477338a1405d7dcbb40
    boot.help   uid=3 gid=7 mode=0444 size=411 time=939182876.0 \
                md5digest=9b7126385734bcae753f4179ab59d8e5
    compat      type=link mode=0777 size=11 time=915149058.0 \
                link=/usr/compat
    kernel      mode=0444 size=1947607 time=950230892.0 \
                md5digest=1a2a8aff2fec678a918ba0d6bf063980
    kernel.avr  uid=1112 size=1947642 time=950252597.0 \
                md5digest=82e1637682d58ec28964dfee7fccb62e
    kernel.config \
                mode=0644 size=0 time=915149058.0 \
                md5digest=d41d8cd98f00b204e9800998ecf8427e
```


Copyright © 2016, Juniper Networks, Inc.

```
    sys         type=link mode=0777 size=11 time=915149029.0 \
                link=usr/src/sys
```

show system audit lcc (TX Matrix Router)

```
user@host> show system audit lcc 2
lcc2-re0:
--------------------------------------------------------------------------
#          user: root
#       machine: rodin-lcc2
#          tree: /
#          date: Mon Sep 13 11:55:33 2004

# .
/set type=file uid=0 gid=0 mode=0555 nlink=1 flags=none
.               type=dir nlink=20 size=512 time=1094982121.0
    COPYRIGHT   mode=0644 size=4735 time=986012708.0 \
                md5digest=78396df1404ad742e6eb1be28f0cd63b
    kernel      type=link mode=0700 size=17 time=1090266262.0 \
                link=/packages/jkernel

# ./altconfig
altconfig       type=dir nlink=2 size=512 time=1089801320.0
# ./altconfig
..


# ./altroot
altroot         type=dir nlink=2 size=512 time=1089801320.0
# ./altroot
..

# ./b
b               type=dir mode=0755 nlink=2 size=512 time=1093961429.0
# ./b
..


# ./bin
/set type=file uid=0 gid=0 mode=0700 nlink=1 flags=none
bin             type=dir mode=0755 nlink=2 size=512 time=1089843059.0
    [           type=link size=28 time=1090266270.0 \
                link=/packages/mnt/jbase/bin/test
    cat         type=link size=27 time=1090266270.0 \
                link=/packages/mnt/jbase/bin/cat
    chmod       type=link size=29 time=1090266270.0 \
                link=/packages/mnt/jbase/bin/chmod
    cp          type=link size=26 time=1090266270.0 \
                link=/packages/mnt/jbase/bin/cp
    csh         type=link size=27 time=1090266270.0 \
                link=/packages/mnt/jbase/bin/csh
    date        type=link size=28 time=1090266270.0 \
                link=/packages/mnt/jbase/bin/date
    dd          type=link size=26 time=1090266270.0 \
                link=/packages/mnt/jbase/bin/dd
    df          type=link size=26 time=1090266270.0 \
                link=/packages/mnt/jbase/bin/df
    echo        type=link size=28 time=1090266270.0 \
                link=/packages/mnt/jbase/bin/echo
    ed          type=link size=26 time=1090266270.0 \
                link=/packages/mnt/jbase/bin/ed
```

```
    expr        type=link size=28 time=1090266270.0 \
                link=/packages/mnt/jbase/bin/expr
    hostname    type=link size=32 time=1090266270.0 \
                link=/packages/mnt/jbase/bin/hostname
    kill        type=link size=28 time=1090266270.0 \
                link=/packages/mnt/jbase/bin/kill
    ln          type=link size=26 time=1090266270.0 \
                link=/packages/mnt/jbase/bin/ln
    ls          type=link size=26 time=1090266270.0 \
                link=/packages/mnt/jbase/bin/ls
    mkdir       type=link size=29 time=1090266270.0 \
                link=/packages/mnt/jbase/bin/mkdir
    mv          type=link size=26 time=1090266270.0 \
                link=/packages/mnt/jbase/bin/mv
    ps          type=link size=26 time=1090266270.0 \
                link=/packages/mnt/jbase/bin/ps
    pwd         type=link size=27 time=1090266270.0 \
                link=/packages/mnt/jbase/bin/pwd
    rcp         type=link size=27 time=1090266270.0 \
                link=/packages/mnt/jbase/bin/rcp
    red         type=link size=26 time=1090266270.0 \
                link=/packages/mnt/jbase/bin/ed
    rm          type=link size=26 time=1090266270.0 \
                link=/packages/mnt/jbase/bin/rm
    rmdir       type=link size=29 time=1090266270.0 \
                link=/packages/mnt/jbase/bin/rmdir
    sh          type=link size=26 time=1090266270.0 \
                link=/packages/mnt/jbase/bin/sh
    sleep       type=link size=29 time=1090266270.0 \
                link=/packages/mnt/jbase/bin/sleep
    stty        type=link size=28 time=1090266270.0 \
                link=/packages/mnt/jbase/bin/stty
    sync        type=link size=28 time=1090266270.0 \
                link=/packages/mnt/jbase/bin/sync
    tcsh        type=link size=27 time=1090266270.0 \
                link=/packages/mnt/jbase/bin/csh
    test        type=link size=28 time=1090266270.0 \
                link=/packages/mnt/jbase/bin/test
# ./bin
..


# ./boot
/set type=file uid=0 gid=0 mode=0444 nlink=1 flags=none
boot            type=dir mode=0555 nlink=3 size=512 time=1095069935.0
    boot0       size=512 time=1094978286.0 \
                md5digest=6f780822dd4ae482a20462b66e542cca
    boot1       mode=0555 size=512 time=1094978294.0 \
                md5digest=8d112b09df342cd0b60fdb9bdcde8e07
    boot2       mode=0555 size=7680 time=1094978294.0 \
                md5digest=28eb58c4068c6b85717e1484f9e028e4
    cdboot      mode=0555 size=165888 time=1094978298.0 \
                md5digest=1474c6b800dfc82ba552d7c36116d07d
    kgzldr.o    size=5996 time=1094982121.0 \
                md5digest=c53dc948eb07e2ea4eb0413e4c4634a3
    loader      mode=0555 size=163840 time=1094978298.0 \
                md5digest=82d9dc2d31033476bfb61bb7264c4fed
    loader.4th  size=9237 time=986013631.0 \
                md5digest=43144391465ad50267d31e0a320be1de
...
```


Copyright © 2016, Juniper Networks, Inc.

show system audit lcc (TX Matrix Plus Router)

```
user@host> show system audit all-chassis

sfc0-re0:
--------------------------------------------------------------------------
#          user: root
#       machine: finalfive
#          tree: /
#          date: Mon May 18 00:13:16 2009

# .
/set type=file uid=0 gid=0 mode=0755 nlink=1 flags=none
.               type=dir nlink=23 size=512 time=1242347096.0
    COPYRIGHT   mode=0644 size=6196 time=1168587741.0 \
                md5digest=bbad415e1c29bbedd9b383537100412c
    kernel      type=link size=17 time=1242347011.0 link=/packages/jkernel
    staging     type=link mode=0777 size=8 time=1242346935.0 link=/var/tmp

# ./.snap
.snap           type=dir mode=0775 nlink=2 size=512 time=1242346922.0
# ./.snap
..


# ./altconfig
altconfig       type=dir mode=0500 nlink=2 size=512 time=1242319843.0
# ./altconfig
..


# ./altroot
altroot         type=dir mode=0500 nlink=2 size=512 time=1242319843.0
# ./altroot
..


# ./bin
bin             type=dir nlink=2 size=512 time=1242346944.0
    \133        type=link size=28 time=1242346942.0 \
                link=/packages/mnt/jbase/bin/test
    cat         type=link size=27 time=1242346941.0 \
                link=/packages/mnt/jbase/bin/cat
    chflags     type=link size=31 time=1242346941.0 \
                link=/packages/mnt/jbase/bin/chflags
    chmod       type=link size=29 time=1242346941.0 \
                link=/packages/mnt/jbase/bin/chmod
    cp          type=link size=26 time=1242346941.0 \
                link=/packages/mnt/jbase/bin/cp
    csh         type=link size=27 time=1242346941.0 \
                link=/packages/mnt/jbase/bin/csh
    date        type=link size=28 time=1242346941.0 \
                link=/packages/mnt/jbase/bin/date
    dd          type=link size=26 time=1242346941.0 \
                link=/packages/mnt/jbase/bin/dd
    df          type=link size=26 time=1242346941.0 \
                link=/packages/mnt/jbase/bin/df
    echo        type=link size=28 time=1242346941.0 \
                link=/packages/mnt/jbase/bin/echo
    ed          type=link size=26 time=1242346941.0 \
                link=/packages/mnt/jbase/bin/ed
```

```
    expr        type=link size=28 time=1242346941.0 \
                link=/packages/mnt/jbase/bin/expr
    hostname    type=link size=32 time=1242346941.0 \
                link=/packages/mnt/jbase/bin/hostname
    kill        type=link size=28 time=1242346941.0 \
                link=/packages/mnt/jbase/bin/kill
    ln          type=link size=26 time=1242346941.0 \
                link=/packages/mnt/jbase/bin/ln
    ls          type=link size=26 time=1242346941.0 \
                link=/packages/mnt/jbase/bin/ls
    mkdir       type=link size=29 time=1242346941.0 \
                link=/packages/mnt/jbase/bin/mkdir
    mv          type=link size=26 time=1242346941.0 \
                link=/packages/mnt/jbase/bin/mv
    pax         type=link size=27 time=1242346944.0 \
                link=/packages/mnt/jbase/bin/pax
    ps          type=link size=26 time=1242346941.0 \
                link=/packages/mnt/jbase/bin/ps
    pwd         type=link size=27 time=1242346941.0 \
                link=/packages/mnt/jbase/bin/pwd
    rcp         type=link size=27 time=1242346942.0 \
                link=/packages/mnt/jbase/bin/rcp
    red         type=link size=26 time=1242346941.0 \
                link=/packages/mnt/jbase/bin/ed
    rm          type=link size=26 time=1242346942.0 \
                link=/packages/mnt/jbase/bin/rm
    rmdir       type=link size=29 time=1242346942.0 \
                link=/packages/mnt/jbase/bin/rmdir
    sh          type=link size=26 time=1242346942.0 \
                link=/packages/mnt/jbase/bin/sh
    sleep       type=link size=29 time=1242346942.0 \
                link=/packages/mnt/jbase/bin/sleep
    stty        type=link size=28 time=1242346942.0 \
                link=/packages/mnt/jbase/bin/stty
    sync        type=link size=28 time=1242346942.0 \
                link=/packages/mnt/jbase/bin/sync
    tcsh        type=link size=27 time=1242346941.0 \
                link=/packages/mnt/jbase/bin/csh
    test        type=link size=28 time=1242346942.0 \
                link=/packages/mnt/jbase/bin/test
# ./bin
...
```

show system audit root-only (QFX3500 Switch)

```
user@switch> show system audit root-only
#          user: root
#       machine: my-host
#          tree: /
date: Fri Feb 11 21:21:46 2000

# .
/set type=file uid=0 gid=0 mode=0755 nlink=1
.               type=dir nlink=23 size=1024 time=950252640.0
  .cshrc      uid=3 gid=7 mode=0644 size=177 time=939182975.0 \
                md5digest=f414e06fea6bd646244b98e13d6e6226
  .kernel.jkernel.backup \
                mode=0744 size=1934552 time=944688902.0 \
                md5digest=2c343cf0bd9fea8f04f78604feed7aa4
  .profile    uid=3 gid=7 mode=0644 nlink=2 size=173 time=939182975.0 \
                md5digest=55a1e3c6c67789c9d3a1cce1ea39f670
```


Copyright © 2016, Juniper Networks, Inc.

```
COPYRIGHT   uid=3 gid=7 mode=0444 size=3425 time=939182975.0 \
            md5digest=7df8bc77dcee71382ea73eb0ec6a9243
boot.config mode=0644 size=3 time=945902618.0 \
            md5digest=93d722493ed38477338a1405d7dcbb40
boot.help   uid=3 gid=7 mode=0444 size=411 time=939182876.0 \
            md5digest=9b7126385734bcae753f4179ab59d8e5
compat      type=link mode=0777 size=11 time=915149058.0 \
            link=/usr/compat
kernel      mode=0444 size=1947607 time=950230892.0 \
            md5digest=1a2a8aff2fec678a918ba0d6bf063980
kernel.avr  uid=1112 size=1947642 time=950252597.0 \
            md5digest=82e1637682d58ec28964dfee7fccb62e
kernel.config \
            mode=0644 size=0 time=915149058.0 \
            md5digest=d41d8cd98f00b204e9800998ecf8427e
sys         type=link mode=0777 size=11 time=915149029.0 \
            link=usr/src/sys
```

show system boot-messages

List of Syntax

Syntax on page 976
Syntax (EX Series Switches) on page 976
Syntax (TX Matrix Router) on page 976
Syntax (TX Matrix Plus Router) on page 976
Syntax (MX Series Router) on page 976
Syntax (QFX Series) on page 976

Syntax

show system boot-messages

Syntax (EX Series Switches)

show system boot-messages
<all-members>
<local>
<member *member-id*>

Syntax (TX Matrix Router)

show system boot-messages
<all-chassis | all-lcc | lcc *number* | scc>

Syntax (TX Matrix Plus Router)

show system boot-messages
<all-chassis | all-lcc | lcc *number* | sfc *number*>

Syntax (MX Series Router)

show system boot-messages
<all-members>
<local>
<member *member-id*>

Syntax (QFX Series)

show system boot-messages
infrastructure *name* | interconnect-device *name* | node-group *name*

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.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display initial messages generated by the system kernel upon startup. These messages are the contents of **/var/run/dmesg.boot**.

Options

none—Display all boot time messages.

all-chassis—(TX Matrix routers andTX Matrix Plus routers only) (Optional) Display boot time messages for all of the chassis.

all-lcc—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display boot time messages for all T640 routers connected to a TX Matrix router. On a TX Matrix Plus router, display boot time messages for all connected T1600 or T4000 LCCs.

all-members—(EX4200 switches and MX Series routers only) (Optional) Display boot time messages on all members of the Virtual Chassis configuration.

Copyright © 2016, Juniper Networks, Inc.

infrastructure ***name***—(QFabric systems only) (Optional) Display boot time messages on the fabric control Routing Engine or fabric manager Routing engines.

interconnect-device ***name***—(QFabric systems only) (Optional) Display boot time messages on the Interconnect device.

lcc ***number***—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display boot time messages for a specific T640 router connected to a TX Matrix router. On a TX Matrix Plus router, display boot time messages for a specific router connected to a TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(EX4200 switches and MX Series routers only) (Optional) Display boot time messages on the local Virtual Chassis member.

member ***member-id***—(EX4200 switches and MX Series routers only) (Optional) Display boot time messages on the specified member of the Virtual Chassis configuration. For EX4200 switches, replace ***member-id*** with a value from 0 through 9. For an MX Series Virtual Chassis, replace ***member-id*** with a value of 0 or 1.

node-group ***name***—(QFabric systems only) (Optional) Display boot time messages on the Node group.

scc—(TX Matrix routers only) (Optional) Display boot time messages for the TX Matrix router (or switch-card chassis).

sfc ***number***—(TX Matrix Plus routers only) (Optional) Display boot time messages for the TX Matrix Plus router. Replace *number* with **0**.

Additional Information

By default, when you issue the **show system boot-messages** command on the master Routing Engine of a TX Matrix router or a TX Matrix Plus router, the command is broadcast to all the master Routing Engines of the LCCs connected to it in the routing matrix. Likewise, if you issue the same command on the backup Routing Engine of a TX Matrix or a TX Matrix Plus router, the command is broadcast to all backup Routing Engines of the LCCs that are connected to it in the routing matrix.

Required Privilege Level

view

Related Documentation

- *Routing Matrix with a TX Matrix Plus Router Solutions Page*

List of Sample Output

show system boot-messages (TX Matrix Router) on page 978
show system boot-messages lcc (TX Matrix Router) on page 979
show system boot-messages (TX Matrix Plus Router) on page 980
show system boot-messages (QFX3500 Switch) on page 980

Sample Output

show system boot-messages (TX Matrix Router)

```
user@host> show system boot-messages
Copyright (c) 1992-1998 FreeBSD Inc.
Copyright (c) 1996-2000 Juniper Networks, Inc.
All rights reserved.
Copyright (c) 1982, 1986, 1989, 1991, 1993
        The Regents of the University of California.  All rights reserved.

JUNOS 4.1-20000216-Zf8469 #0: 2000-02-16 12:57:28 UTC
    tlim@device1.example.com:/p/build/20000216-0905/4.1/release_kernel/sys/compil
e/GENERIC
CPU: Pentium Pro (332.55-MHz 686-class CPU)
  Origin = "GenuineIntel"  Id = 0x66a  Stepping=10
  Features=0x183f9ff<FPU,VME,DE,PSE,TSC,MSR,PAE,MCE,CX8,SEP,MTRR,PGE,MCA,CMOV,<b
16>,<b17>,MMX,<b24>>
Teknor CPU Card Recognized
real memory  = 805306368 (786432K bytes)
avail memory = 786280448 (767852K bytes)
Probing for devices on PCI bus 0:
chip0 <generic PCI bridge (vendor=8086 device=7192 subclass=0)> rev 3 class 6000
0 on pci0:0:0
chip1 <Intel 82371AB PCI-ISA bridge> rev 1 class 60100 on pci0:7:0
chip2 <Intel 82371AB IDE interface> rev 1 class 10180 on pci0:7:1
chip3 <Intel 82371AB USB interface> rev 1 class c0300 int d irq 11 on pci0:7:2
smb0 <Intel 82371AB SMB controller> rev 1 class 68000 on pci0:7:3
pcic0 <TI PCI-1131 PCI-CardBus Bridge> rev 1 class 60700 int a irq 15 on pci0:13
:0
TI1131 PCI Config Reg: [pci only][FUNC0 pci int]
pcic1 <TI PCI-1131 PCI-CardBus Bridge> rev 1 class 60700 int b irq 12 on pci0:13
:1
TI1131 PCI Config Reg: [pci only][FUNC1 pci int]
fxp0 <Intel EtherExpress Pro 10/100B Ethernet> rev 8 class 20000 int a irq 12 on

 pci0:16:0
chip4 <generic PCI bridge (vendor=1011 device=0022 subclass=4)> rev 4 class 6040
0 on pci0:17:0
fxp1 <Intel EtherExpress Pro 10/100B Ethernet> rev 8 class 20000 int a irq 10 on

 pci0:19:0
Probing for devices on PCI bus 1:
mcs0 <Miscellaneous Control Subsystem> rev 12 class ff0000 int a irq 12 on pci1:
13:0
fxp2 <Intel EtherExpress Pro 10/100B Ethernet> rev 8 class 20000 int a irq 10 on

 pci1:14:0
Probing for devices on the ISA bus:
sc0 at 0x60-0x6f irq 1 on motherboard
sc0: EGA color <16 virtual consoles, flags=0x0>
ed0 not found at 0x300
```


Copyright © 2016, Juniper Networks, Inc.

```
ed1 not found at 0x280
ed2 not found at 0x340
psm0 not found at 0x60
sio0 at 0x3f8-0x3ff irq 4 flags 0x20010 on isa
sio0: type 16550A, console
sio1 at 0x3e8-0x3ef irq 5 flags 0x20000 on isa
sio1: type 16550A
sio2 at 0x2f8-0x2ff irq 3 flags 0x20000 on isa
sio2: type 16550A
pcic0 at 0x3e0-0x3e1 on isa
PC-Card ctlr(0) TI PCI-1131 [CardBus bridge mode] (5 mem & 2 I/O windows)
pcic0: slot 0 controller I/O address 0x3e0
npx0 flags 0x1 on motherboard
npx0: INT 16 interface
fdc0: direction bit not set
fdc0: cmd 3 failed at out byte 1 of 3
fdc0 not found at 0x3f0
wdc0 at 0x1f0-0x1f7 irq 14 on isa
wdc0: unit 0 (wd0): <SunDisk SQFXB-80>, single-sector-i/o
wd0: 76MB (156672 sectors), 612 cyls, 8 heads, 32 S/T, 512 B/S
wdc0: unit 1 (wd1): <IBM-DCXA-210000>
wd1: 8063MB (16514064 sectors), 16383 cyls, 16 heads, 63 S/T, 512 B/S
wdc1 not found at 0x170
wdc2 not found at 0x180
ep0 not found at 0x300
fxp0: Ethernet address 00:a0:a5:12:05:5a
fxp1: Ethernet address 00:a0:a5:12:05:59
fxp2: Ethernet address 02:00:00:00:00:01
swapon: adding /dev/wd1s1b as swap device
Automatic reboot in progress...
/dev/rwd0s1a: clean, 16599 free (95 frags, 2063 blocks, 0.1% fragmentation)
/dev/rwd0s1e: clean, 9233 free (9 frags, 1153 blocks, 0.1% fragmentation)
/dev/rwd0s1a: clean, 16599 free (95 frags, 2063 blocks, 0.1% fragmentation)
/dev/rwd1s1f: clean, 4301055 free (335 frags, 537590 blocks, 0.0% fragmentation)
```

show system boot-messages lcc (TX Matrix Router)

```
user@host> show system boot-messages lcc 2
lcc2-re0:
--------------------------------------------------------------------------
Copyright (c) 1996-2001, Juniper Networks, Inc.
All rights reserved.
Copyright (c) 1992-2001 The FreeBSD Project.
Copyright (c) 1979, 1980, 1983, 1986, 1988, 1989, 1991, 1992, 1993, 1994
        The Regents of the University of California. All rights reserved.
JUNOS 7.0-20040912.0 #0: 2004-09-12 09:16:32 UTC

builder@device1.example.com:/build/benten-b/7.0/20040912.0/obj-i386/sys/compile/JUNIPER
Timecounter "i8254"  frequency 1193182 Hz
Timecounter "TSC"  frequency 601368936 Hz
CPU: Pentium III/Pentium III Xeon/Celeron (601.37-MHz 686-class CPU)
  Origin = "GenuineIntel"  Id = 0x68a  Stepping = 10

Features=0x387f9ff<FPU,VME,DE,PSE,TSC,MSR,PAE,MCE,CX8,SEP,MTRR,PGE,MCA,CMOV,PAT,PSE36,PN,MMX,FXSR,SSE>
real memory  = 2147467264 (2097136K bytes)
sio0: gdb debugging port
avail memory = 2084040704 (2035196K bytes)
Preloaded elf kernel "kernel" at 0xc06d9000.
DEVFS: ready for devices
Pentium Pro MTRR support enabled
md0: Malloc disk
```

```
DRAM Data Integrity Mode: ECC Mode with h/w scrubbing
npx0: <math processor> on motherboard
npx0: INT 16 interface
pcib0: <ServerWorks NB6635 3.0LE host to PCI bridge> on motherboard
pci0: <PCI bus> on pcib0
pcic-pci0: <TI PCI-1410 PCI-CardBus Bridge> irq 15 at device 1.0 on pci0
pcic-pci0: TI12XX PCI Config Reg: [pwr save][pci only]
fxp0: <Intel Embedded 10/100 Ethernet> port 0x1000-0x103f mem
0xfb800000-0xfb81ffff,0xfb820000-0xfb820fff irq 9 at device 3.0 on pci0
fxp1: <Intel Embedded 10/100 Ethernet> port 0x1040-0x107f mem
0xfb840000-0xfb85ffff,0xfb821000-0xfb821fff irq 11 at device 4.0 on pci0
...
```

show system boot-messages (TX Matrix Plus Router)

```
user@host> show system boot-messages
sfc0-re0:
--------------------------------------------------------------------------
Copyright (c) 1996-2009, Juniper Networks, Inc.
All rights reserved.
Copyright (c) 1992-2006 The FreeBSD Project.
Copyright (c) 1979, 1980, 1983, 1986, 1988, 1989, 1991, 1992, 1993, 1994
        The Regents of the University of California. All rights reserved.
JUNOS 9.6B3.3 #0: 2009-06-17 19:52:08 UTC

builder@ldevice1.example.com:/volume/build/junos/9.6/release/9.6B3.3/obj-i386/bsd/sys/compile/JUNIPER
MPTable:  Timecounter "i8254" frequency 1193182 Hz quality 0 CPU: Intel(R) Xeon(R)
 CPU           L5238  @ 2.66GHz (2660.01-MHz 686-class CPU)   Origin =
"GenuineIntel"  Id = 0x1067a  Stepping = 10   Features=0xbfebfbff
...
lcc1-re0:
--------------------------------------------------------------------------
Copyright (c) 1996-2009, Juniper Networks, Inc.
All rights reserved.
Copyright (c) 1992-2006 The FreeBSD Project.
Copyright (c) 1979, 1980, 1983, 1986, 1988, 1989, 1991, 1992, 1993, 1994
        The Regents of the University of California. All rights reserved.
JUNOS 9.6-20090617.0 #0: 2009-06-17 04:15:14 UTC

builder@ldevice1.example.com:/volume/build/junos/9.6/production/20090617.0/obj-i386/bsd/sys/compile/JUNIPER
Timecounter "i8254" frequency 1193182 Hz quality 0
CPU: Intel(R) Xeon(R) CPU                 @ 1.86GHz (1862.01-MHz 686-class CPU)

  Origin = "GenuineIntel"  Id = 0x1067a  Stepping = 10
  Features=0xbfebfbff
...
```

show system boot-messages (QFX3500 Switch)

```
user@switch> show sytem boot-messages
getmemsize: msgbufp[size=32768] = 0x81d07fe4

System physical memory distribution:
--------------------------------------------------------------------------------
Total physical memory: 4160749568 (3968 MB)
Physical memory used: 3472883712 (3312 MB)
Physical memory allocated to kernel: 2130706432 (2032 MB)
Physical memory allocated to user BTLB: 1342177280 (1280 MB)
--------------------------------------------------------------------------------

Copyright (c) 1996-2010, Juniper Networks, Inc.
```


Copyright © 2016, Juniper Networks, Inc.

```
All rights reserved.
Copyright (c) 1992-2006 The FreeBSD Project.
Copyright (c) 1979, 1980, 1983, 1986, 1988, 1989, 1991, 1992, 1993, 1994
        The Regents of the University of California. All rights reserved.
JUNOS 11.1I #0: 2010-09-17 19:18:07 UTC
    user@device1.example.com:/c/user/DEV_BRANCH/03/20100917.399988/
obj-xlr/bsd/sys/compile/JUNIPER-DCTOR
WARNING: debug.mpsafenet forced to 0 as ipsec requires Giant
JUNOS 11.1I #0: 2010-09-17 19:18:07 UTC
    user@device.net:/c/test/DEV_BRANCH/03/20100917.399988/
obj-xlr/bsd/sys/compile/JUNIPER-DCTOR
real memory  = 3472883712 (3312MB)
avail memory = 1708171264 (1629MB)
cpuid: 0, btlb_cpumap:0xffffffff8
FreeBSD/SMP: Multiprocessor System Detected: 12 CPUs
ETHERNET SOCKET BRIDGE initialising
Initializing QFX platform properties ..
cpu0 on motherboard
: RMI's XLR CPU Rev. 0.3 with no FPU implemented
        L1 Cache: I size 32kb(32 line), D size 32kb(32 line), eight way.
        L2 Cache: Size 1024kb, eight way
pic_lbus0: <XLR Local Bus>
pic_lbus0: <XLR Local Bus> on motherboard
Enter qfx control ethernet probe addr:0xc5eeec00
gmac4: <XLR GMAC GE Ethernet> on pic_lbus0
me0: Ethernet address 00:1d:b5:f7:68:40
Enter qfx control ethernet probe addr:0xc5eeeb40
gmac5: <XLR GMAC GE Ethernet> on pic_lbus0
me1: Ethernet address 00:1d:b5:f7:68:41
Enter qfx control ethernet probe addr:0xc5eeea80
gmac6: <XLR GMAC GE Ethernet> on pic_lbus0
me1: Ethernet address 00:1d:b5:f7:68:42
sio0 on pic_lbus0
Entering sioattach
sio0: type 16550A, console
xls_setup_intr: skip irq 3, xlr regs are set up somewhere else.
gblmem0 on pic_lbus0
ehci0: <RMI XLS USB 2.0 controller> on pic_lbus0
ehci_bus_attach: allocated resource.  tag=1, base=bef24000
xls_ehci_init: endian hardware swapping NOT enabled.
usb0: EHCI version 1.0
usb0 on ehci0
usb0: USB revision 2.0
uhub0: vendor 0x0000 EHCI root hub, class 9/0, rev 2.00/1.00, addr 1
uhub0: 2 ports with 2 removable, self powered
umass0: USB USBFlashDrive, rev 2.00/11.00, addr 2
pcib0: PCIe link 0 up
pcib0: PCIe link 2 up
pcib0: PCIe link 3 up
pcib0: <XLS PCI Host Controller> on pic_lbus0
pci0: <PCI bus> on pcib0
pcib1: <PCI-PCI bridge> at device 0.0 on pci0
pci1: <PCI bus> on pcib1
pci1: <network, ethernet> at device 0.0 (no driver attached)
pcib2: <PCI-PCI bridge> at device 1.0 on pci0
pcib3: <PCI-PCI bridge> at device 2.0 on pci0
pci2: <PCI bus> on pcib3
pci2: <network, ethernet> at device 0.0 (no driver attached)
pcib4: <PCI-PCI bridge> at device 3.0 on pci0
pci3: <PCI bus> on pcib4
pci3: <network, ethernet> at device 0.0 (no driver attached)
```

```
cfi device address space at 0xbc000000
cfi0: <AMD/Fujitsu - 8MB> on pic_lbus0
cfi device address space at 0xbc000000
i2c0: <I2C bus controller> on pic_lbus0
i2c1: <I2C bus controller> on pic_lbus0
qfx_fmn0 on pic_lbus0
pool offset 1503776768
xlr_lbus0: <XLR Local Bus Controller> on motherboard
qfx_bcpld_probe[124]
qfx_bcpld_probe[138]: dev_type=0x0
qfx_bcpld_probe[124]
qfx_bcpld0: QFX BCPLD probe success
qfx_bcpld0qfx_bcpld_attach[174]
qfx_bcpld_attach[207] : bus_space_tag=0x0, bus_space_handle=0xbd900000
qfx_bcpld_probe[124]
qfx_bcpld1: QFX BCPLD probe success
qfx_bcpld1qfx_bcpld_attach[174]
tor_bcpld_slave_attach[1245] : bus_space_tag=0x0, bus_space_handle=0xbda00000
Initializing product: 96 ..
bmeb: bmeb_lib_init done 0xc60a5000, addr 0x809c99a0
bme0:Virtual BME driver initializing
Timecounter "mips" frequency 1200000000 Hz quality 0
Timecounter "xlr_pic_timer" frequency 66666666 Hz quality 1
Timecounters tick every 1.000 msec
Loading the NETPFE fc module
IPsec: Initialized Security Association Processing.
SMP: AP CPU #3 Launched!
SMP: AP CPU #1 Launched!
SMP: AP CPU #2 Launched!
SMP: AP CPU #4 Launched!
SMP: AP CPU #5 Launched!
SMP: AP CPU #7 Launched!
SMP: AP CPU #6 Launched!
SMP: AP CPU #11 Launched!
SMP: AP CPU #10 Launched!
SMP: AP CPU #9 Launched!
SMP: AP CPU #8 Launched!
da0 at umass-sim0 bus 0 target 0 lun 0
da0: <USB USBFlashDrive 1100> Removable Direct Access SCSI-0 device
da0: 40.000MB/s transfers
da0: 3920MB (8028160 512 byte sectors: 255H 63S/T 499C)
Trying to mount root from ufs:/dev/da0s1a
```


Copyright © 2016, Juniper Networks, Inc.

show system buffers

List of Syntax

Syntax on page 983
Syntax (EX Series) on page 983
Syntax (TX Matrix Router) on page 983
Syntax (TX Matrix Plus Router) on page 983
Syntax (MX Series Router) on page 983
Syntax (QFX Series) on page 983

Syntax

show system buffers

Syntax (EX Series)

show system buffers
<all-members>
<local>
<member *member-id*>

Syntax (TX Matrix Router)

show system buffers
<all-chassis | all-lcc | lcc *number* | scc>

Syntax (TX Matrix Plus Router)

show system buffers
<all-chassis | all-lcc | lcc *number* | sfc *number*>

Syntax (MX Series Router)

show system buffers
<all-members>
<local>
<member *member-id*>

Syntax (QFX Series)

show system buffers
<infrastructure *name* | interconnect-device *name* | node-group *name* | root-only (infrastructure *name* | interconnect-device *name* | node-group *name*)>

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.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display information about the buffer pool that the Routing Engine uses for local traffic. Local traffic is the routing and management traffic that is exchanged between the Routing Engine and the Packet Forwarding Engine within the router or switch, as well as the routing and management traffic from IP (that is, from OSPF, BGP, SNMP, ping operations, and so on).

Options

none—Show all buffer statistics.

all-lcc—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, show buffer statistics for all T640 routers connected to the TX Matrix router. On a TX Matrix Plus router, show buffer statistics for all routers connected to the TX Matrix Plus router.

all-chassis—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Show buffer statistics for all of the chassis.

all-members—(EX4200 switches and MX Series routers only) (Optional) Show buffer statistics for all members of the Virtual Chassis configuration.

infrastructure ***name***—(QFabric systems only) (Optional) Show buffer statistics for a fabric control Routing Engine or a fabric control Routing Engine.

interconnect-device ***name***—(QFabric systems only) (Optional) Show buffer statistics for the Interconnect device.

lcc ***number***—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, show buffer statistics for a specific T640 router (or line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, show buffer statistics for a specific router (line-card chassis) that is connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(EX4200 switches and MX Series routers only) (Optional) Show buffer statistics for the local Virtual Chassis member.

member ***member-id***—(EX4200 switches and MX Series routers only) (Optional) Show buffer statistics for the specified member of the Virtual Chassis configuration. For EX4200 switches, replace ***member-id*** with a value from 0 through 9. For an MX Series Virtual Chassis, replace ***member-id*** with a value of 0 or 1.

node-group ***name***—(QFabric systems only) (Optional) Show buffer statistics for the Node group

sfc—(TX Matrix Plus routers only) (Optional) Show buffer statistics for the TX Matrix Plus router. Replace ***number*** with **0**.

Additional Information

By default, when you issue the **show system buffers** command on the master Routing Engine of a TX Matrix router or a TX Matrix Plus router, the command is broadcast to all the master Routing Engines of the LCCs connected to it in the routing matrix. Likewise, if you issue the same command on the backup Routing Engine of a TX Matrix or a TX Matrix Plus router, the command is broadcast to all backup Routing Engines of the LCCs that are connected to it in the routing matrix.

Copyright © 2016, Juniper Networks, Inc.

A special type of memory buffer called a *cluster* is 2 KB in size. For more information, see *The Design and Implementation of the 4.4BSD Operation System* by McKusic, Bostic, Karels, and Quarterman.

Required Privilege Level

view

Related Documentation

- *Routing Matrix with a TX Matrix Plus Router Solutions Page*

List of Sample Output

show system buffers on page 986
show system buffers scc (TX Matrix Router) on page 987
show system buffers sfc (TX Matrix Plus Router) on page 987
show system buffers all-chassis (TX Matrix Plus Router) on page 987
show system buffers node-group (QFabric System) on page 988

Output Fields

Table 48 on page 986 describes the output fields for the **show system buffers** command. Output fields are listed in the approximate order in which they appear.

Table 48: show system buffers Output Fields

Field Name	Field Description
mbufs in use	Memory buffers (mbufs) are 128-byte buffers that are used for various purposes inside the kernel. Each memory buffer has a type, and the output itemizes the amount allocated for each type. Types with no memory buffers allocated are not displayed.
mbufs allocated to packet headers	Number of memory buffers currently holding packet headers
mbufs allocated to control blocks	Number of memory buffers currently holding the state for sockets.
mbufs allocated to send data	Number of memory buffers currently holding socket send data.
mbufs allocated to pfe refill data	Number of memory buffers currently holding Packet Forwarding Engine refill data.
mbufs allocated to fxp data	Number of memory buffers currently holding fxp data.
mbufs allocated to socket names and addresses	Number of memory buffers currently holding addresses for sockets.
mbuf clusters in use	Allocation statistics for memory buffer clusters.
allocated to network	Total amount of memory in use by the networking and interprocess communication (IPC) code.
requests for memory denied	Number of times a memory allocation request within the IPC and networking code failed.
requests for memory delayed	Number of times a memory allocation request within the IPC and networking code was postponed.
calls to protocol drain routines	Number of times a memory allocation request within the IPC and networking code triggered a memory reclamation attempt.

Sample Output

show system buffers

```
user@host> show system buffers
397/893/1290 mbufs in use (current/cache/total)
395/331/726/30000 mbuf clusters in use (current/cache/total/max)
384/256 mbuf+clusters out of packet secondary zone in use (current/cache)
0/0/0/0 4k (page size) jumbo clusters in use (current/cache/total/max)
0/0/0/0 9k jumbo clusters in use (current/cache/total/max)
0/0/0/0 16k jumbo clusters in use (current/cache/total/max)
889K/885K/1774K bytes allocated to network (current/cache/total)
0/0/0 requests for mbufs denied (mbufs/clusters/mbuf+clusters)
0/0/0 requests for jumbo clusters denied (4k/9k/16k)
0/5/1024 sfbufs in use (current/peak/max)
```


Copyright © 2016, Juniper Networks, Inc.

```
0 requests for sfbufs denied
0 requests for sfbufs delayed
0 requests for I/O initiated by sendfile
0 calls to protocol drain routines
```

show system buffers scc (TX Matrix Router)

```
user@host> show system buffers scc
213 mbufs in use:
        11 mbufs allocated to packet headers
        26 mbufs allocated to socket names and addresses
        2 mbufs allocated to socket options
        17 mbufs allocated to socket send data
        2 mbufs allocated to pfe data
        155 mbufs allocated to fxp data (rx)
        511 mbufs allocated to <mbuf type 86>
        256 mbufs allocated to <mbuf type 92>
924/1162 mbuf clusters in use
2788 Kbytes allocated to network (75% in use)
0 requests for memory denied
0 requests for memory delayed
0 calls to protocol drain routines
```

show system buffers sfc (TX Matrix Plus Router)

```
user@host> show system buffers sfc 0

sfc0-re0:
--------------------------------------------------------------------------
4363/2807/7170 mbufs in use (current/cache/total)
4358/1968/6326/30000 mbuf clusters in use (current/cache/total/max)
256/128 mbuf+clusters out of packet secondary zone in use (current/cache)
0/0/0/0 4k (page size) jumbo clusters in use (current/cache/total/max)
0/0/0/0 9k jumbo clusters in use (current/cache/total/max)
0/0/0/0 16k jumbo clusters in use (current/cache/total/max)
9806K/4637K/14444K bytes allocated to network (current/cache/total)
0/0/0 requests for mbufs denied (mbufs/clusters/mbuf+clusters)
0/0/0 requests for jumbo clusters denied (4k/9k/16k)
0/10/1024 sfbufs in use (current/peak/max)
0 requests for sfbufs denied
0 requests for sfbufs delayed
0 requests for I/O initiated by sendfile
0 calls to protocol drain routines
```

show system buffers all-chassis (TX Matrix Plus Router)

```
user@host> show system buffers all-chassis

sfc0-re0:
--------------------------------------------------------------------------
4363/2807/7170 mbufs in use (current/cache/total)
4358/1968/6326/30000 mbuf clusters in use (current/cache/total/max)
256/128 mbuf+clusters out of packet secondary zone in use (current/cache)
0/0/0/0 4k (page size) jumbo clusters in use (current/cache/total/max)
0/0/0/0 9k jumbo clusters in use (current/cache/total/max)
0/0/0/0 16k jumbo clusters in use (current/cache/total/max)
9806K/4637K/14444K bytes allocated to network (current/cache/total)
0/0/0 requests for mbufs denied (mbufs/clusters/mbuf+clusters)
0/0/0 requests for jumbo clusters denied (4k/9k/16k)
0/10/1024 sfbufs in use (current/peak/max)
0 requests for sfbufs denied
0 requests for sfbufs delayed
```

```
0 requests for I/O initiated by sendfile
0 calls to protocol drain routines

lcc0-re0:
--------------------------------------------------------------------------
772/2558/3330 mbufs in use (current/cache/total)
772/598/1370/30000 mbuf clusters in use (current/cache/total/max)
768/512 mbuf+clusters out of packet secondary zone in use (current/cache)
0/0/0/0 4k (page size) jumbo clusters in use (current/cache/total/max)
0/0/0/0 9k jumbo clusters in use (current/cache/total/max)
0/0/0/0 16k jumbo clusters in use (current/cache/total/max)
1737K/1835K/3572K bytes allocated to network (current/cache/total)
0/0/0 requests for mbufs denied (mbufs/clusters/mbuf+clusters)
0/0/0 requests for jumbo clusters denied (4k/9k/16k)
0/4/1024 sfbufs in use (current/peak/max)
0 requests for sfbufs denied
0 requests for sfbufs delayed
0 requests for I/O initiated by sendfile
0 calls to protocol drain routines

lcc1-re0:
--------------------------------------------------------------------------
773/2437/3210 mbufs in use (current/cache/total)
773/453/1226/30000 mbuf clusters in use (current/cache/total/max)
768/384 mbuf+clusters out of packet secondary zone in use (current/cache)
0/0/0/0 4k (page size) jumbo clusters in use (current/cache/total/max)
0/0/0/0 9k jumbo clusters in use (current/cache/total/max)
0/0/0/0 16k jumbo clusters in use (current/cache/total/max)
1739K/1515K/3254K bytes allocated to network (current/cache/total)
0/0/0 requests for mbufs denied (mbufs/clusters/mbuf+clusters)
0/0/0 requests for jumbo clusters denied (4k/9k/16k)
0/7/1024 sfbufs in use (current/peak/max)
0 requests for sfbufs denied
0 requests for sfbufs delayed
0 requests for I/O initiated by sendfile
0 calls to protocol drain routines

lcc2-re0:
--------------------------------------------------------------------------
816/2514/3330 mbufs in use (current/cache/total)
816/554/1370/30000 mbuf clusters in use (current/cache/total/max)
768/512 mbuf+clusters out of packet secondary zone in use (current/cache)
0/0/0/0 4k (page size) jumbo clusters in use (current/cache/total/max)
0/0/0/0 9k jumbo clusters in use (current/cache/total/max)
0/0/0/0 16k jumbo clusters in use (current/cache/total/max)
1836K/1736K/3572K bytes allocated to network (current/cache/total)
0/0/0 requests for mbufs denied (mbufs/clusters/mbuf+clusters)
0/0/0 requests for jumbo clusters denied (4k/9k/16k)
0/4/1024 sfbufs in use (current/peak/max)
0 requests for sfbufs denied
0 requests for sfbufs delayed
0 requests for I/O initiated by sendfile
```

show system buffers node-group (QFabric System)

```
user@switch> show system buffers node-group node1
node-group node1:
--------------------------------------------------------------------------
2/2698/2700 mbufs in use (current/cache/total)
2/1520/1522/30000 mbuf clusters in use (current/cache/total/max)
0/1280 mbuf+clusters out of packet secondary zone in use (current/cache)
```

 Copyright © 2016, Juniper Networks, Inc.

```
0/0/0/0 4k (page size) jumbo clusters in use (current/cache/total/max)
0/0/0/0 9k jumbo clusters in use (current/cache/total/max)
0/0/0/0 16k jumbo clusters in use (current/cache/total/max)
4K/3714K/3719K bytes allocated to network (current/cache/total)
0/0/0 requests for mbufs denied (mbufs/clusters/mbuf+clusters)
0/0/0 requests for jumbo clusters denied (4k/9k/16k)
0/6/6656 sfbufs in use (current/peak/max)
0 requests for sfbufs denied
0 requests for sfbufs delayed
0 requests for I/O initiated by sendfile
0 calls to protocol drain routines

re0:
--------------------------------------------------------------------------
516/639/1155 mbufs in use (current/cache/total)
515/147/662/30000 mbuf clusters in use (current/cache/total/max)
512/128 mbuf+clusters out of packet secondary zone in use (current/cache)
0/0/0/0 4k (page size) jumbo clusters in use (current/cache/total/max)
0/0/0/0 9k jumbo clusters in use (current/cache/total/max)
0/0/0/0 16k jumbo clusters in use (current/cache/total/max)
1159K/453K/1612K bytes allocated to network (current/cache/total)
0/0/0 requests for mbufs denied (mbufs/clusters/mbuf+clusters)
0/0/0 requests for jumbo clusters denied (4k/9k/16k)
0/4/1024 sfbufs in use (current/peak/max)
0 requests for sfbufs denied
0 requests for sfbufs delayed
0 requests for I/O initiated by sendfile
0 calls to protocol drain routines

re1:
--------------------------------------------------------------------------
519/771/1290 mbufs in use (current/cache/total)
518/176/694/30000 mbuf clusters in use (current/cache/total/max)
512/128 mbuf+clusters out of packet secondary zone in use (current/cache)
0/0/0/0 4k (page size) jumbo clusters in use (current/cache/total/max)
0/0/0/0 9k jumbo clusters in use (current/cache/total/max)
0/0/0/0 16k jumbo clusters in use (current/cache/total/max)
1165K/544K/1710K bytes allocated to network (current/cache/total)
0/0/0 requests for mbufs denied (mbufs/clusters/mbuf+clusters)
0/0/0 requests for jumbo clusters denied (4k/9k/16k)
0/4/1024 sfbufs in use (current/peak/max)
0 requests for sfbufs denied
0 requests for sfbufs delayed
0 requests for I/O initiated by sendfile
0 calls to protocol drain routines
```

show system certificate

Syntax

show system certificate
<certificate-id>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

(Encryption interface on M Series, T Series routers, QFX Series, and OCX Series switches only) Display installed certificates signed by the Juniper Networks certificate authority.

Options

none—Display all installed certificates signed by the Juniper Networks certificate authority.

certificate-id—(Optional) Display the details of a particular certificate.

Required Privilege Level

maintenance

List of Sample Output

show system certificate on page 991
show system certificate (QFX Series) on page 991

Output Fields

Table 49 on page 990 lists the output fields for the **show system certificate** command. Output fields are listed in the approximate order in which they appear.

Table 49: show system certificate Output Fields

Field Name	Field Description
Certificate identifier	Unique identifier associated with a certificate. The certificate identifier is the common name of the subject.
Issuer **Subject**	Information about the certificate issuer and the distinguished name (**DN**) of the issuer, respectively: • **Organization**—Name of the owner's organization. • **Organizational unit**—Name of the owner's department. • **Country**—Two-character country code in which the owner's system is located. • **State**—State in the USA in which the owner is using the certificate. • **Locality**—City in which the owner's system is located. • **Common name**—Name of the owner of the certificate. • **E-mail address**—E-mail address of the owner of the certificate.
Validity	When a certificate is valid.
Signature algorithm	Encryption algorithm applied to the installed certificate.
Public key algorithm	Encryption algorithm applied to the public key.

Copyright © 2016, Juniper Networks, Inc.

Sample Output

show system certificate

```
user@host> show system certificate
Certificate identifier: Dallas-v3
  Issuer:
Organization: Juniper Networks, Organizational unit: Juniper CA,
Country:  US, State: CA, Locality: Sunnyvale, Common name: Dallas CA,
E-mail address:ca@device.net
  Subject:
  Organization: Juniper Networks, Organizational unit: Juniper CA,
Country: US, State: CA, Locality: Sunnyvale, Common name: Dallas-v3,
E-mail address:ca@device.net
Validity:
 Not before: Mar 13 03:23:25 2004 GMT
  Not after: Mar 24 03:23:25 2014 GMT
Signature algorithm: sha1WithRSAEncryption
Public key algorithm: dsaEncryption
```

show system certificate (QFX Series)

```
user@host> show system certificate
Certificate identifier: Dallas-v3
  Issuer:
Organization: Juniper Networks, Organizational unit: Juniper CA,
Country:  US, State: CA, Locality: Sunnyvale, Common name: Dallas CA,
E-mail address:ca@device.net
  Subject:
  Organization: Juniper Networks, Organizational unit: Juniper CA,
Country: US, State: CA, Locality: Sunnyvale, Common name: Dallas-v3,
E-mail address:ca@device.net
Validity:
 Not before: Mar 13 03:23:25 2004 GMT
  Not after: Mar 24 03:23:25 2014 GMT
Signature algorithm: sha1WithRSAEncryption
Public key algorithm: dsaEncryption
```

show system commit

Syntax

show system commit
<revision>
<server>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Option **server** introduced in Junos OS Release 12.1 for the PTX Series router.
Option **revision** introduced in Junos OS Release 14.1.
Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description

Display the system commit history and any pending commit operation.

Options

none—Display the last 50 commit operations listed, most recent to first.

revision—(Optional) Display the revision number of the active configuration of the Routing Engine(s).

server— (Optional) Display commit server status.

NOTE: By default, the status of the commit server is “Not running”. The commit server starts running only when a commit job is added to the batch.

Required Privilege Level

view

Related Documentation

- clear system commit on page 315
- *show system commit revision*

List of Sample Output

show system commit on page 994
show system commit (At a Particular Time) on page 994
show system commit (At the Next Reboot) on page 994
show system commit (Rollback Pending) on page 994
show system commit (QFX Series) on page 994

Output Fields

Table 50 on page 992 describes the output fields for the **show system commit** command. Output fields are listed in the approximate order in which they appear.

Table 50: show system commit Output Fields

Field Name	Field Description	Level of Output
<number>	Displays the last 50 commit operations listed, most recent to first. The identifier *<number>* designates a configuration created for recovery using the **request system configuration rescue save** command.	**none**

Copyright © 2016, Juniper Networks, Inc.

Table 50: show system commit Output Fields *(continued)*

Field Name	Field Description	Level of Output
<time-stamp>	Date and time of the commit operation.	**none**
<root>/<username>	User who executed the commit operation.	**none**
<method>	Method used to execute the commit operation: • **CLI**—CLI interactive user performed the commit operation. • **Junos XML protocol**—Junos XML protocol client performed the commit operation. • **synchronize**—The **commit synchronize** command was performed on the other Routing Engine. • **snmp**—An SNMP **set** request caused the commit operation. • **button**—A button on the router or switch was pressed to commit a rescue configuration for recovery. • **autoinstall**—A configuration obtained through autoinstallation was committed. • **other**—When there is no login name associated with the session, the values for user and client default to root and other. For example, during a reboot after package installation, mgd commits the configuration as a system commit, and there is no login associated with the commit.	**none**

Sample Output

show system commit

```
user@host> show system commit
0   2003-07-28 19:14:04 PDT by root via other
1   2003-07-25 22:01:36 PDT by user via cli
2   2003-07-25 22:01:32 PDT by user via cli
3   2003-07-25 21:30:13 PDT by root via button
4   2003-07-25 13:46:48 PDT by user via cli
5   2003-07-25 05:33:21 PDT by root via autoinstall
...
rescue  2002-05-10 15:32:03 PDT by root via other
```

show system commit (At a Particular Time)

```
user@host> show system commit
commit requested by root via cli at Tue May  7 15:59:00 2002
```

show system commit (At the Next Reboot)

```
user@host> show system commit
commit requested by root via cli at reboot
```

show system commit (Rollback Pending)

```
user@host> show system commit
0 2005-01-05 15:00:37 PST by root via cli commit confirmed, rollback in 3mins
```

show system commit (QFX Series)

```
user@switch> show system commit
0   2011-11-25 19:17:49 PST by root via cli
```


Copyright © 2016, Juniper Networks, Inc.

show system configuration archival

Syntax show system configuration archival

Release Information Introduced in Junos OS Release 7.6.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Display directory and number of files queued for archival transfer.

NOTE: The **[edit system configuration]** hierarchy is not available on QFabric systems.

Options This command has no options.

Required Privilege Level maintenance

List of Sample Output show system configuration archival on page 995

Sample Output

show system configuration archival

```
user@host> show system configuration archival

/var/transfer/config/:
total 8
```

show system configuration rescue

Syntax show system configuration rescue

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description Display a rescue configuration, if one exists.

NOTE: The **[edit system configuration]** hierarchy is not available on QFabric systems.

Options This command has no options.

Required Privilege Level maintenance

Related Documentation
- show system configuration archival on page 995

List of Sample Output show system configuration rescue on page 996

Sample Output

show system configuration rescue

```
user@switch> show system configuration rescue
version "7.3"; groups {
    global {
        system {
            host-name router1;
            domain-name customer.net;
            domain-search [ customer.net ];
            backup-router 192.168.124.254;
            name-server {
                192.168.28.11;
                192.168.28.101;
                192.168.28.100;
                192.168.28.10;
            }
            login {
                user user1 {
                    uid 928;
                    class ;
                    shell csh;
                    authentication {
                        encrypted-password "$ABC123"; ## SECRET-DATA
                    }
                }
            }
            services {
```

 Copyright © 2016, Juniper Networks, Inc.

```
                ftp;
                rlogin;
                rsh;
                telnet;
            }
        }
    }
....
```

show system connections

List of Syntax

Syntax on page 998
Syntax (EX Series) on page 998
Syntax (TX Matrix Router) on page 998
Syntax (TX Matrix Plus Router) on page 998
Syntax (MX Series Router) on page 998
Syntax (QFX Series) on page 998
Syntax (OCX Series) on page 998

Syntax

show system connections
<extensive>
<all-chassis | all-lcc | lcc *number* | scc>
<inet | inet6>
<show-routing-instances>

Syntax (EX Series)

show system connections
<extensive>
<all-members>
<inet | inet6>
<local>
<member *member-id*>
<show-routing-instances>

Syntax (TX Matrix Router)

show system connections
<extensive>
<all-chassis | all-lcc | lcc *number* | scc>
<inet | inet6>
<show-routing-instances>

Syntax (TX Matrix Plus Router)

show system connections
<extensive>
<all-chassis | all-lcc | lcc *number* | sfc *number*>
<inet | inet6>
<show-routing-instances>

Syntax (MX Series Router)

show system connections
<extensive>
<all-members>
<inet | inet6>
<local>
<member *member-id*>
<show-routing-instances>

Syntax (QFX Series)

show system connections
<extensive>
<inet>
<infrastructure *name*>
<interconnect-device *name*>
<node-group *name*>
<show-routing-instances>

Syntax (OCX Series)

show system connections

Copyright © 2016, Juniper Networks, Inc.

<extensive>
<inet>
<show-routing-instances>

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.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Display information about the active IP sockets on the Routing Engine. Use this command to verify which servers are active on a system and what connections are currently in progress.

Options **none**—Display information about all active IP sockets on the Routing Engine.

extensive—(Optional) Display exhaustive system process information, which, for TCP connections, includes the TCP control block. This option is useful for debugging TCP connections.

all-chassis—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Display system connection activity for all the routers in the chassis.

all-lcc—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display system connection activity for all T640 routers connected to the TX Matrix router. On a TX Matrix Plus router, display system connection activity for all connected T1600 or T4000 LCCs

all-members—(EX4200 switches and MX Series routers only) (Optional) Display system connection activity for all members of the Virtual Chassis configuration.

inet | inet6—(Optional) Display IPv4 connections or IPv6 connections, respectively.

infrastructure *name*—(QFabric systems only) (Optional) Display system connection activity for the fabric control Routing Engines or fabric manager Routing Engines.

interconnect-device *name*—(QFabric systems only) (Optional) Display system connection activity for the Interconnect device.

lcc *number*—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display system connection activity for a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, display system connection activity for a specific router that is connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.

- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(EX4200 switches and MX Series routers only) (Optional) Display system connection activity for the local Virtual Chassis member.

member *member-id*—(EX4200 switches and MX Series routers only) (Optional) Display system connection activity for the specified member of the Virtual Chassis configuration. For EX4200 switches, replace ***member-id*** with a value from 0 through 9. For an MX Series Virtual Chassis, replace ***member-id*** with a value of 0 or 1.

node-group *name*—(QFabric systems only) (Optional) Display system connection activity for the Node group.

scc—(TX Matrix routers only) (Optional) Display system connection activity for the TX Matrix router (or switch-card chassis).

sfc—(TX Matrix routers only) (Optional) Display system connection activity for the TX Matrix Plus router.

show-routing-instances—(Optional) Display routing instances.

Additional Information

By default, when you issue the **show system connections** command on the master Routing Engine of a TX Matrix router or a TX Matrix Plus router, the command is broadcast to all the master Routing Engines of the LCCs connected to it in the routing matrix. Likewise, if you issue the same command on the backup Routing Engine of a TX Matrix or a TX Matrix Plus router, the command is broadcast to all backup Routing Engines of the LCCs that are connected to it in the routing matrix.

Required Privilege Level

view

Related Documentation

- *Routing Matrix with a TX Matrix Plus Router Solutions Page*

List of Sample Output

show system connections on page 1001
show system connections extensive on page 1002
show system connections lcc (TX Matrix Router) on page 1003
show system connections show-routing-instances on page 1003
show system connections (TX Matrix Plus Router) on page 1004
show system connections sfc (TX Matrix Plus Router) on page 1007
show system connections show-routing-instances (TX Matrix Plus Router) on page 1009
show system connections (QFX3500 Switch) on page 1014

Output Fields

Table 51 on page 1001 describes the output fields for the **show system connections** command. Output fields are listed in the approximate order in which they appear.

Copyright © 2016, Juniper Networks, Inc.

Table 51: show system connections Output Fields

Field Name	Field Description
Proto	Protocol of the socket: **IP**, **TCP**, or **UDP** for IPv4 or IPv6.
Recv-Q	Number of input packets received by the protocol and waiting to be processed by the application.
Send-Q	Number of output packets sent by the application and waiting to be processed by the protocol.
Local Address	Local address and port of the socket, separated by a period. An asterisk (*) indicates that the bound address is the wildcard address. Server sockets typically have the wildcard address and a well-known port bound to them.
Foreign Address	Foreign address and port of the socket, separated by a period. An asterisk (*) indicates that the address or port is a wildcard.
Routing Instance	(Displayed only when the **show-routing-instance** option is used.) Routing instances associated with active IP sockets on the Routing Engine.
(state)	For TCP, the protocol state of the socket.

Sample Output

show system connections

```
user@host> show system connections
Active Internet connections (including servers)
Proto Recv-Q Send-Q  Local Address          Foreign Address        (state)
tcp        0      2  192.168.4.16.513       208.197.169.254.894    ESTABLISHED
tcp        0      0  192.168.4.16.513       208.197.169.195.945    ESTABLISHED
tcp        0      0  *.23                   *.*                    LISTEN
tcp        0      0  *.22                   *.*                    LISTEN
tcp        0      0  *.513                  *.*                    LISTEN
tcp00 *.514      *.*                    LISTEN
tcp 0 0*.21      *.*                    LISTEN
tcp00 *.79     *.*                    LISTEN
tcp 00 *.1023     *.*                    LISTEN
tcp 00 *.111     *.*                    LISTEN
udp00192.168.4.16.1634     208.197.169.249.2049
udp00192.168.4.16.1627     208.197.169.254.2049
udp00192.168.4.16.1371     208.197.169.195.2049
udp00*.*      *.*
udp00*.9999     *.*
udp00 *.161     *.*
udp00192.168.4.16.1039     192.168.4.16.1023
udp00192.168.4.16.1038     192.168.4.16.1023
udp 00 192.168.4.16.1037     192.168.4.16.1023
udp00192.168.4.16.1036     192.168.4.16.1023
udp00*.1022     *.*
udp00*.1023     *.*
udp00*.111     *.*
udp00*.*      *.*
```

show system connections extensive

```
user@host> show system connections extensive

Active Internet connections (including servers)
Proto Recv-Q Send-Q  Local Address                              Foreign Address
                                (state)
tcp4       0      6  192.168.187.15.23
172.27.133.138.3013                          ESTABLISHED
   sndsbcc:          6 sndsbmbcnt:        256  sndsbmbmax:     272000
sndsblowat:       2048 sndsbhiwat:      34000
   rcvsbcc:          0 rcvsbmbcnt:          0  rcvsbmbmax:     533120
rcvsblowat:          1 rcvsbhiwat:      66640
   proc id:          0  proc name:
       iss: 2566994072      sndup: 2566994491
    snduna: 2566994491     sndnxt: 2566994494      sndwnd:      64094
    sndmax: 2566994494    sndcwnd:       6589 sndssthresh:       2720
       irs:  236981199      rcvup:  236981325
    rcvnxt:  236981327     rcvadv:  237046862      rcvwnd:      66640
       rtt:  140058623       srtt:      15519        rttv:        908
    rxtcur:       1200   rxtshift:          0       rtseq: 2566994491
    rttmin:       1000  mss:       1360
     flags: SACK_PERMIT [0x2000200]
tcp4       0      0  10.255.165.93.179
10.255.165.203.65141                         ESTABLISHED
   sndsbcc:          0 sndsbmbcnt:          0  sndsbmbmax:     131072
sndsblowat:       2048 sndsbhiwat:      16384
   rcvsbcc:          0 rcvsbmbcnt:          0  rcvsbmbmax:     131072
rcvsblowat:          1 rcvsbhiwat:      16384
   proc id:          0  proc name:
       iss: 2555961065      sndup: 2555995917
    snduna: 2555995917     sndnxt: 2555995917      sndwnd:      16384
    sndmax: 2555995917    sndcwnd:       1000 sndssthresh: 1073725440
       irs: 2123825753      rcvup: 2123860681
    rcvnxt: 2123860681     rcvadv: 2123877065      rcvwnd:      16384
       rtt:          0       srtt:       3309        rttv:         72
    rxtcur:       1200   rxtshift:          0       rtseq: 2555995898
    rttmin:       1000  mss:        500
     flags: REQ_SCALE RCVD_SCALE REQ_TSTMP RCVD_TSTMP SACK_PERMIT [0x3e0]
tcp4       0      0  10.255.165.203.65141
10.255.165.93.179                            ESTABLISHED
   sndsbcc:          0 sndsbmbcnt:          0  sndsbmbmax:     131072
sndsblowat:       2048 sndsbhiwat:      16384
   rcvsbcc:          0 rcvsbmbcnt:          0  rcvsbmbmax:     131072
rcvsblowat:          1 rcvsbhiwat:      16384
   proc id:       5022  proc name:        rpd
       iss: 2123825753      sndup: 2123860662
    snduna: 2123860681     sndnxt: 2123860681      sndwnd:      16384
    sndmax: 2123860681    sndcwnd:       1000 sndssthresh: 1073725440
       irs: 2555961065      rcvup: 2555995917
    rcvnxt: 2555995917     rcvadv: 2556012301      rcvwnd:      16384
       rtt:          0       srtt:       3279        rttv:         22
    rxtcur:       1200   rxtshift:          0       rtseq: 2123860662
    rttmin:       1000  mss:        500
     flags: REQ_SCALE RCVD_SCALE REQ_TSTMP RCVD_TSTMP SACK_PERMIT [0x100003e0]
tcp4       0      0  10.255.165.203.179
10.255.165.113.52404                         ESTABLISHED
   sndsbcc:          0 sndsbmbcnt:          0  sndsbmbmax:     131072
sndsblowat:       2048 sndsbhiwat:      16384
   rcvsbcc:          0 rcvsbmbcnt:          0  rcvsbmbmax:     131072
rcvsblowat:          1 rcvsbhiwat:      16384
```


Copyright © 2016, Juniper Networks, Inc.

```
   proc id:          0  proc name:
       iss: 1109297190      sndup: 1109332099
    snduna: 1109332118     sndnxt: 1109332118      sndwnd:      16384
    sndmax: 1109332118    sndcwnd:       1000 sndssthresh: 1073725440
       irs: 1476831634      rcvup: 1476866449
    rcvnxt: 1476866449     rcvadv: 1476882833      rcvwnd:      16384
       rtt:          0       srtt:       3235        rttv:         18
    rxtcur:       1200   rxtshift:          0       rtseq: 1109332099
    rttmin:       1000  mss:        500
     flags: REQ_SCALE RCVD_SCALE REQ_TSTMP RCVD_TSTMP SACK_PERMIT [0x3e0]
```

show system connections lcc (TX Matrix Router)

```
user@host> show system connections lcc 2

lcc2-re0:
--------------------------------------------------------------------------
Active Internet connections (including servers)
Proto Recv-Q Send-Q  Local Address          Foreign Address        (state)
tcp4       0      0  192.168.66.131.1342    192.168.66.130.23      ESTABLISHED
tcp4       0      0  192.168.66.131.2059    192.168.66.130.23      ESTABLISHED
tcp4       0      0  192.168.66.131.4571    192.168.66.130.23      ESTABLISHED
tcp4       0      0  192.168.66.131.2496    192.168.66.130.23      ESTABLISHED
tcp4       0      0  *.3221                 *.*                    LISTEN
tcp4       0      0  *.23                   *.*                    LISTEN
tcp4       0      0  *.22                   *.*                    LISTEN
tcp4       0      0  *.514                  *.*                    LISTEN
tcp4       0      0  *.513                  *.*                    LISTEN
tcp4       0      0  *.21                   *.*                    LISTEN
tcp4       0      0  *.79                   *.*                    LISTEN
tcp4       0      0  *.6234                 *.*                    LISTEN
udp4       0      0  *.514                  *.*
udp4       0      0  *.6333                 *.*
```

show system connections show-routing-instances

```
user@host> show system connections show-routing-instances
Active Internet connections (including servers) (including routing-instances)
Proto Recv-Q Send-Q  Local Address         Foreign Address       Routing Instance
       (state)
tcp4       0      0  192.168.69.204.23      172.17.28.19.4267      default
          ESTABLISHED
tcp4       0      0  192.168.69.204.58540   10.209.7.138.23        default
          ESTABLISHED
tcp4       0      0  192.168.69.204.23      172.17.28.19.1098      default
          ESTABLISHED
tcp4       0      0  192.168.7.1.57668      192.168.9.1.179        default
          ESTABLISHED
tcp4       0      0  192.168.7.1.179        192.168.8.1.49209      default
          ESTABLISHED
tcp4       0      0  128.0.0.1.6234         128.0.3.17.1024
__juniper_private1__   ESTABLISHED
tcp4       0      0  128.0.0.4.9000         128.0.0.4.59103
__juniper_private1__   ESTABLISHED
tcp4       0      0  128.0.0.4.59103        128.0.0.4.9000
__juniper_private1__   ESTABLISHED
tcp4       0      0  *.32012                *.*
__juniper_private1__   LISTEN
tcp4       0      0  *.9000                 *.*
__juniper_private1__   LISTEN
tcp4       0      0  *.33007                *.*
```

```
__juniper_private2__   LISTEN
tcp46      0      0  *.179                  *.*                    default
          LISTEN
tcp4       0      0  *.179                  *.*                    default
          LISTEN
tcp4       0      0  *.6154                 *.*
__juniper_private1__   LISTEN
tcp4       0      0  *.6153                 *.*
__juniper_private1__   LISTEN
tcp4       0      0  *.7000                 *.*
__juniper_private1__   LISTEN
tcp4       0      0  *.6152                 *.*
__juniper_private1__   LISTEN
tcp4       0      0  *.6156                 *.*
__juniper_private1__   LISTEN
tcp4       0      0  *.33005                *.*
__juniper_private2__   LISTEN
tcp4       0      0  *.31343                *.*
__juniper_private1__   LISTEN
tcp4       0      0  *.31341                *.*
__juniper_private1__   LISTEN
tcp4       0      0  *.32003                *.*
__juniper_private2__   LISTEN
tcp4       0      0  *.666                  *.*
__juniper_private1__   LISTEN
tcp4       0      0  *.38                   *.*
__juniper_private1__   LISTEN
tcp4       0      0  *.3221                 *.*                    default
          LISTEN
```

show system connections (TX Matrix Plus Router)

```
user@host> show system connections
sfc0-re0:
--------------------------------------------------------------------------
Active Internet connections (including servers)
Proto Recv-Q Send-Q  Local Address                              Foreign Address
                                (state)
tcp4       0      3  192.168.178.11.23
172.17.28.19.3565                          ESTABLISHED
tcp4       0      0  192.168.178.11.23
172.17.28.204.62719                        ESTABLISHED
tcp4       0      0  192.168.178.11.23
192.168.69.199.51255                       ESTABLISHED
tcp4       0      0  192.168.178.11.23
172.24.26.227.42860                        ESTABLISHED
tcp4       0      0  *.6156                                        *.*
                                LISTEN
tcp4       0      0  162.0.0.4.32012                             162.0.0.5.58935
                               ESTABLISHED
tcp4       0      0  *.32012                                       *.*
                                LISTEN
tcp4       0      0  *.33007                                       *.*
                                LISTEN
tcp4       0      0  *.666                                         *.*
                                LISTEN
tcp4       0      0  162.0.0.4.6161                              162.0.0.5.62026
                               ESTABLISHED
tcp4       0      0  *.33005                                       *.*
                                LISTEN
tcp4       0      0  162.0.0.4.9000                              162.0.0.4.51611
```


Copyright © 2016, Juniper Networks, Inc.

```
                                ESTABLISHED
tcp4       0      0  162.0.0.4.51611                          162.0.0.4.9000
                                 ESTABLISHED
tcp4       0      0  *.6151                                    *.*
                                  LISTEN
tcp4       0      0  *.6154                                    *.*
                                  LISTEN
tcp4       0      0  *.6153                                    *.*
                                  LISTEN
tcp4       0      0  *.31343                                   *.*
                                  LISTEN
tcp4       0      0  *.31341                                   *.*
                                  LISTEN
tcp4       0      0  *.9000                                    *.*
                                  LISTEN
tcp4       0      0  *.6152                                    *.*
                                  LISTEN
tcp4       0      0  *.32003                                   *.*
                                  LISTEN
tcp4       0      0  *.33009                                   *.*
                                  LISTEN
tcp4       0      0  *.3221                                    *.*
                                  LISTEN
tcp4       0      0  *.23                                      *.*
                                  LISTEN
tcp4       0      0  *.22                                      *.*
                                  LISTEN
tcp4       0      0  *.514                                     *.*
                                  LISTEN
tcp4       0      0  *.513                                     *.*
                                  LISTEN
tcp4       0      0  *.21                                      *.*
                                  LISTEN
tcp4       0      0  *.79                                      *.*
                                  LISTEN
tcp4       0      0  *.514                                     *.*
                                  LISTEN
tcp4       0      0  *.513                                     *.*
                                  LISTEN
tcp4       0      0  *.6234                                    *.*
                                  LISTEN
udp4       0      0  127.0.0.1.123                             *.*
udp4       0      0  10.255.178.11.123                         *.*
udp4       0      0  *.123                                     *.*
udp46      0      0  *.514                                     *.*
udp4       0      0  *.514                                     *.*
udp46      0      0  *.62027                                   *.*
udp4       0      0  *.59363                                   *.*
udp4       0      0  *.31342                                   *.*
udp46      0      0  *.161                                     *.*
udp4       0      0  *.161                                     *.*
udp4       0      0  *.31340                                   *.*
udp4       0      0  *.31340                                   *.*
udp46      0      0  *.49152                                   *.*
udp46      0      0  *.4784                                    *.*
udp46      0      0  *.3784                                    *.*
udp4       0      0  *.49152                                   *.*
udp4       0      0  *.4784                                    *.*
udp4       0      0  *.3784                                    *.*
udp4       0      0  *.6333                                    *.*
ip4        0      0  *.*                                       *.*
```

```
ip4        0      0  *.*                                        *.*

lcc0-re0:
--------------------------------------------------------------------------
Active Internet connections (including servers)
Proto Recv-Q Send-Q  Local Address                             Foreign Address
                               (state)
tcp4       0      0  192.168.178.3.23
172.24.26.227.50399                           ESTABLISHED
tcp4       0      0  *.6234                                     *.*
                                 LISTEN
tcp4       0      0  *.7000                                     *.*
                                 LISTEN
tcp4       0      0  *.9000                                     *.*
                                 LISTEN
tcp4       0      0  *.33009                                    *.*
                                 LISTEN
tcp4       0      0  *.3221                                     *.*
                                 LISTEN
tcp4       0      0  *.23                                       *.*
                                 LISTEN
tcp4       0      0  *.22                                       *.*
                                 LISTEN
tcp4       0      0  *.514                                      *.*
                                 LISTEN
tcp4       0      0  *.513                                      *.*
                                 LISTEN
tcp4       0      0  *.21                                       *.*
                                 LISTEN
tcp4       0      0  *.79                                       *.*
                                 LISTEN
tcp4       0      0  *.514                                      *.*
                                 LISTEN
tcp4       0      0  *.513                                      *.*
                                 LISTEN
udp46      0      0  *.514                                      *.*
udp4       0      0  *.514                                      *.*
udp46      0      0  *.59924                                    *.*
udp4       0      0  *.59412                                    *.*
udp46      0      0  *.161                                      *.*
udp4       0      0  *.161                                      *.*
udp4       0      0  *.31342                                    *.*
udp4       0      0  *.6333                                     *.*

lcc1-re0:
--------------------------------------------------------------------------
Active Internet connections (including servers)
Proto Recv-Q Send-Q  Local Address                             Foreign Address
                               (state)
tcp4       0      0  *.6234                                     *.*
                                 LISTEN
tcp4       0      0  *.7000                                     *.*
                                 LISTEN
tcp4       0      0  *.9000                                     *.*
                                 LISTEN
tcp4       0      0  *.3221                                     *.*
                                 LISTEN
tcp4       0      0  *.23                                       *.*
                                 LISTEN
tcp4       0      0  *.22                                       *.*
                                 LISTEN
```

 Copyright © 2016, Juniper Networks, Inc.

```
tcp4       0      0  *.514                                    *.*
                                LISTEN
tcp4       0      0  *.513                                    *.*
                                LISTEN
tcp4       0      0  *.21                                     *.*
                                LISTEN
tcp4       0      0  *.79                                     *.*
                                LISTEN
tcp4       0      0  *.514                                    *.*
                                LISTEN
tcp4       0      0  *.513                                    *.*
                                LISTEN
tcp4       0      0  *.33009                                  *.*
                                LISTEN
udp46      0      0  *.514                                    *.*
udp4       0      0  *.514                                    *.*
udp46      0      0  *.59924                                  *.*
udp4       0      0  *.59412                                  *.*
udp4       0      0  *.31342                                  *.*
udp46      0      0  *.161                                    *.*
udp4       0      0  *.161                                    *.*
udp4       0      0  *.6333                                   *.*

lcc2-re0:
--------------------------------------------------------------------------
Active Internet connections (including servers)
Proto Recv-Q Send-Q  Local Address                          Foreign Address
                              (state)
tcp4       0      0  *.6234                                   *.*
                                LISTEN
tcp4       0      0  *.7000                                   *.*
                                LISTEN
tcp4       0      0  *.9000                                   *.*
                                LISTEN
tcp4       0      0  *.33009                                  *.*
                                LISTEN
tcp4       0      0  *.3221                                   *.*
                                LISTEN
tcp4       0      0  *.23                                     *.*
                                LISTEN
tcp4       0      0  *.22                                     *.*
                                LISTEN
tcp4       0      0  *.514                                    *.*
...
```

show system connections sfc (TX Matrix Plus Router)

```
user@host> show system connections sfc 0
sfc0-re0:
--------------------------------------------------------------------------
Active Internet connections (including servers)
Proto Recv-Q Send-Q  Local Address                          Foreign Address
                              (state)
tcp4       0      0  162.0.0.4.514                           132.0.0.4.952
                                TIME_WAIT
tcp4       0      0  162.0.0.4.514                           131.0.0.4.694
                                TIME_WAIT
tcp4       0      0  162.0.0.4.514                           130.0.0.4.860
                                TIME_WAIT
tcp4       0      0  162.0.0.4.514                           129.0.0.4.716
                                TIME_WAIT
```

```
tcp4       0      0  162.0.0.4.996                                  132.0.0.4.514
                                TIME_WAIT
tcp4       0      0  162.0.0.4.798                                  131.0.0.4.514
                                TIME_WAIT
tcp4       0      0  162.0.0.4.995                                  130.0.0.4.514
                                TIME_WAIT
tcp4       0      0  162.0.0.4.895                                  129.0.0.4.514
                                TIME_WAIT
tcp4       0      0  192.168.178.11.21
172.17.28.204.64662                          TIME_WAIT
tcp4       0      0  192.168.178.11.21
172.17.28.204.51612                          TIME_WAIT
tcp4       0      0  *.6156                                         *.*
                                LISTEN
tcp4       0      0  *.9000                                         *.*
                                LISTEN
tcp4       0      0  *.666                                          *.*
                                LISTEN
tcp4       0      2  192.168.178.11.23
172.17.28.19.3565                            ESTABLISHED
tcp4       0      0  192.168.178.11.23
172.17.28.204.62719                          ESTABLISHED
tcp4       0      0  192.168.178.11.23
192.168.69.199.51255                         ESTABLISHED
tcp4       0      0  192.168.178.11.23
172.24.26.227.42860                          ESTABLISHED
tcp4       0      0  162.0.0.4.32012                              162.0.0.5.58935
                             ESTABLISHED
tcp4       0      0  *.32012                                        *.*
                                LISTEN
tcp4       0      0  *.33007                                        *.*
                                LISTEN
tcp4       0   1432  162.0.0.4.6161                               162.0.0.5.62026
                             ESTABLISHED
tcp4       0      0  *.33005                                        *.*
                                LISTEN
tcp4       0      0  162.0.0.4.9000                               162.0.0.4.51611
                             FIN_WAIT_2
tcp4       0      0  162.0.0.4.51611                               162.0.0.4.9000
                              CLOSE_WAIT
tcp4       0      0  *.6151                                         *.*
                                LISTEN
tcp4       0      0  *.6154                                         *.*
                                LISTEN
tcp4       0      0  *.6153                                         *.*
                                LISTEN
tcp4       0      0  *.31343                                        *.*
                                LISTEN
tcp4       0      0  *.31341                                        *.*
                                LISTEN
tcp4       0      0  *.6152                                         *.*
                                LISTEN
tcp4       0      0  *.32003                                        *.*
                                LISTEN
tcp4       0      0  *.33009                                        *.*
                                LISTEN
tcp4       0      0  *.3221                                         *.*
                                LISTEN
tcp4       0      0  *.23                                           *.*
                                LISTEN
tcp4       0      0  *.22                                           *.*
```

 Copyright © 2016, Juniper Networks, Inc.

```
                                    LISTEN
tcp4       0      0  *.514                                    *.*
                                    LISTEN
tcp4       0      0  *.513                                    *.*
                                    LISTEN
tcp4       0      0  *.21                                     *.*
                                    LISTEN
tcp4       0      0  *.79                                     *.*
                                    LISTEN
tcp4       0      0  *.514                                    *.*
                                    LISTEN
tcp4       0      0  *.513                                    *.*
                                    LISTEN
tcp4       0      0  *.6234                                   *.*
                                    LISTEN
udp4       0      0  127.0.0.1.123                            *.*
udp4       0      0  10.255.178.11.123                        *.*
udp4       0      0  *.123                                    *.*
udp46      0      0  *.514                                    *.*
udp4       0      0  *.514                                    *.*
udp46      0      0  *.50895                                  *.*
udp4       0      0  *.50794                                  *.*
udp4       0      0  *.31342                                  *.*
udp46      0      0  *.161                                    *.*
udp4       0      0  *.161                                    *.*
udp4       0      0  *.31340                                  *.*
udp4       0      0  *.31340                                  *.*
udp46      0      0  *.49152                                  *.*
udp46      0      0  *.4784                                   *.*
udp46      0      0  *.3784                                   *.*
udp4       0      0  *.49152                                  *.*
udp4       0      0  *.4784                                   *.*
udp4       0      0  *.3784                                   *.*
udp4       0      0  *.6333                                   *.*
ip4      104      0  *.*                                      *.*
ip4        0      0  *.*                                      *.*
ip4        0      0  *.*                                      *.*
```

show system connections show-routing-instances (TX Matrix Plus Router)

```
user@host> show system connections show-routing-instances
sfc0-re0:
--------------------------------------------------------------------------
Active Internet connections (including servers) (including routing-instances)
Proto Recv-Q Send-Q  Local Address                             Foreign Address
                              Routing Instance       (state)
tcp4       0      0  *.6156                                    *.*
                                __juniper_private1__   LISTEN
tcp4       0      0  *.9000                                    *.*
                                __juniper_private1__   LISTEN
tcp4       0      0  *.666                                     *.*
                                __juniper_private1__   LISTEN
tcp4       0      2  192.168.178.11.23
172.17.28.19.3565                           default                ESTABLISHED
tcp4       0      0  192.168.178.11.23
172.17.28.204.62719                         default                ESTABLISHED
tcp4       0      0  192.168.178.11.23
192.168.69.199.51255                        default                ESTABLISHED
tcp4       0      0  192.168.178.11.23
172.24.26.227.42860                         default                ESTABLISHED
tcp4       0      0  162.0.0.4.32012                            162.0.0.5.58935
```

```
                                __juniper_private1__   ESTABLISHED
tcp4       0      0  *.32012                                    *.*
                                __juniper_private1__   LISTEN
tcp4       0      0  *.33007                                    *.*
                                __juniper_private2__   LISTEN
tcp4       0      0  162.0.0.4.6161                          162.0.0.5.62026
                                __juniper_private1__   ESTABLISHED
tcp4       0      0  *.33005                                    *.*
                                __juniper_private2__   LISTEN
tcp4       0      0  162.0.0.4.9000                          162.0.0.4.51611
                                __juniper_private1__   FIN_WAIT_2
tcp4       0      0  162.0.0.4.51611                          162.0.0.4.9000
                                __juniper_private1__   CLOSE_WAIT
tcp4       0      0  *.6151                                     *.*
                                __juniper_private1__   LISTEN
tcp4       0      0  *.6154                                     *.*
                                __juniper_private1__   LISTEN
tcp4       0      0  *.6153                                     *.*
                                __juniper_private1__   LISTEN
tcp4       0      0  *.31343                                    *.*
                                __juniper_private1__   LISTEN
tcp4       0      0  *.31341                                    *.*
                                __juniper_private1__   LISTEN
tcp4       0      0  *.6152                                     *.*
                                __juniper_private1__   LISTEN
tcp4       0      0  *.32003                                    *.*
                                __juniper_private2__   LISTEN
tcp4       0      0  *.33009                                    *.*
                                __juniper_private2__   LISTEN
tcp4       0      0  *.3221                                     *.*
                                default                LISTEN
tcp4       0      0  *.23                                       *.*
                                default                LISTEN
tcp4       0      0  *.22                                       *.*
                                default                LISTEN
tcp4       0      0  *.514                                      *.*
                                default                LISTEN
tcp4       0      0  *.513                                      *.*
                                default                LISTEN
tcp4       0      0  *.21                                       *.*
                                default                LISTEN
tcp4       0      0  *.79                                       *.*
                                default                LISTEN
tcp4       0      0  *.514                                      *.*
                                __juniper_private1__   LISTEN
tcp4       0      0  *.513                                      *.*
                                __juniper_private1__   LISTEN
tcp4       0      0  *.6234                                     *.*
                                __juniper_private1__   LISTEN
udp4       0      0  127.0.0.1.123                              *.*
                                default
udp4       0      0  10.255.178.11.123                           *.*
                                default
udp4       0      0  *.123                                       *.*
                                default
udp46      0      0  *.514                                       *.*
                                default
udp4       0      0  *.514                                       *.*
                                default
udp46      0      0  *.50895                                     *.*
                                default
```


Copyright © 2016, Juniper Networks, Inc.

```
udp4       0      0  *.50794                                    *.*
                                  default
udp4       0      0  *.31342                                    *.*
                                  __juniper_private1__
udp46      0      0  *.161                                      *.*
                                  default
udp4       0      0  *.161                                      *.*
                                  default
udp4       0      0  *.31340                                    *.*
                                  __juniper_private2__
udp4       0      0  *.31340                                    *.*
                                  __juniper_private1__
udp46      0      0  *.49152                                    *.*
                                  default
udp46      0      0  *.4784                                     *.*
                                  default
udp46      0      0  *.3784                                     *.*
                                  default
udp4       0      0  *.49152                                    *.*
                                  default
udp4       0      0  *.4784                                     *.*
                                  default
udp4       0      0  *.3784                                     *.*
                                  default
udp4       0      0  *.6333                                     *.*
                                  __juniper_private1__
ip4        0      0  *.*                                        *.*
                                  default
ip4        0      0  *.*                                        *.*
                                  default
ip4        0      0  *.*                                        *.*
                                  default

lcc0-re0:
--------------------------------------------------------------------------
Active Internet connections (including servers) (including routing-instances)
Proto Recv-Q Send-Q  Local Address                              Foreign Address
                              Routing Instance       (state)
tcp4       0      0  *.7000                                     *.*
                                  __juniper_private1__   LISTEN
tcp4       0      0  192.168.178.3.23
172.24.26.227.50399                          default                ESTABLISHED
tcp4       0      0  *.6234                                     *.*
                                  __juniper_private1__   LISTEN
tcp4       0      0  *.9000                                     *.*
                                  __juniper_private1__   LISTEN
tcp4       0      0  *.33009                                    *.*
                                  __juniper_private2__   LISTEN
tcp4       0      0  *.3221                                     *.*
                                  default                LISTEN
tcp4       0      0  *.23                                       *.*
                                  default                LISTEN
tcp4       0      0  *.22                                       *.*
                                  default                LISTEN
tcp4       0      0  *.514                                      *.*
                                  default                LISTEN
tcp4       0      0  *.513                                      *.*
                                  default                LISTEN
tcp4       0      0  *.21                                       *.*
                                  default                LISTEN
tcp4       0      0  *.79                                       *.*
```

```
                                 default                LISTEN
tcp4       0      0  *.514                                        *.*
                                 __juniper_private1__   LISTEN
tcp4       0      0  *.513                                        *.*
                                 __juniper_private1__   LISTEN
udp46      0      0  *.514                                        *.*
                                 default
udp4       0      0  *.514                                        *.*
                                 default
udp46      0      0  *.59924                                      *.*
                                 default
udp4       0      0  *.59412                                      *.*
                                 default
udp46      0      0  *.161                                        *.*
                                 default
udp4       0      0  *.161                                        *.*
                                 default
udp4       0      0  *.31342                                      *.*
                                 __juniper_private1__
udp4       0      0  *.6333                                       *.*
                                 __juniper_private1__

lcc1-re0:
--------------------------------------------------------------------------
Active Internet connections (including servers) (including routing-instances)
Proto Recv-Q Send-Q  Local Address                              Foreign Address
                                Routing Instance       (state)
tcp4       0      0  *.7000                                       *.*
                                 __juniper_private1__   LISTEN
tcp4       0      0  *.6234                                       *.*
                                 __juniper_private1__   LISTEN
tcp4       0      0  *.9000                                       *.*
                                 __juniper_private1__   LISTEN
tcp4       0      0  *.3221                                       *.*
                                 default                LISTEN
tcp4       0      0  *.23                                         *.*
                                 default                LISTEN
tcp4       0      0  *.22                                         *.*
                                 default                LISTEN
tcp4       0      0  *.514                                        *.*
                                 default                LISTEN
tcp4       0      0  *.513                                        *.*
                                 default                LISTEN
tcp4       0      0  *.21                                         *.*
                                 default                LISTEN
tcp4       0      0  *.79                                         *.*
                                 default                LISTEN
tcp4       0      0  *.514                                        *.*
                                 __juniper_private1__   LISTEN
tcp4       0      0  *.513                                        *.*
                                 __juniper_private1__   LISTEN
tcp4       0      0  *.33009                                      *.*
                                 __juniper_private2__   LISTEN
udp46      0      0  *.514                                        *.*
                                 default
udp4       0      0  *.514                                        *.*
                                 default
udp46      0      0  *.59924                                      *.*
                                 default
udp4       0      0  *.59412                                      *.*
                                 default
```


Copyright © 2016, Juniper Networks, Inc.

```
udp4       0      0  *.31342                                    *.*
                                  __juniper_private1__
udp46      0      0  *.161                                      *.*
                                  default
udp4       0      0  *.161                                      *.*
                                  default
udp4       0      0  *.6333                                     *.*
                                  __juniper_private1__

lcc2-re0:
--------------------------------------------------------------------------
Active Internet connections (including servers) (including routing-instances)
Proto Recv-Q Send-Q  Local Address                              Foreign Address
                                Routing Instance       (state)
tcp4       0      0  *.7000                                     *.*
                                  __juniper_private1__   LISTEN
tcp4       0      0  *.6234                                     *.*
                                  __juniper_private1__   LISTEN
tcp4       0      0  *.9000                                     *.*
                                  __juniper_private1__   LISTEN
tcp4       0      0  *.33009                                    *.*
                                  __juniper_private2__   LISTEN
tcp4       0      0  *.3221                                     *.*
                                  default                LISTEN
tcp4       0      0  *.23                                       *.*
                                  default                LISTEN
tcp4       0      0  *.22                                       *.*
                                  default                LISTEN
tcp4       0      0  *.514                                      *.*
                                  default                LISTEN
tcp4       0      0  *.513                                      *.*
                                  default                LISTEN
tcp4       0      0  *.21                                       *.*
                                  default                LISTEN
tcp4       0      0  *.79                                       *.*
                                  default                LISTEN
tcp4       0      0  *.514                                      *.*
                                  __juniper_private1__   LISTEN
tcp4       0      0  *.513                                      *.*
                                  __juniper_private1__   LISTEN
udp46      0      0  *.514                                      *.*
                                  default
udp4       0      0  *.514                                      *.*
                                  default
udp4       0      0  *.31342                                    *.*
                                  __juniper_private1__
udp46      0      0  *.62103                                    *.*
                                  default
udp4       0      0  *.59924                                    *.*
                                  default
udp46      0      0  *.161                                      *.*
                                  default
udp4       0      0  *.161                                      *.*
                                  default
udp4       0      0  *.6333                                     *.*
                                  __juniper_private1__

lcc3-re0:
--------------------------------------------------------------------------
Active Internet connections (including servers) (including routing-instances)
Proto Recv-Q Send-Q  Local Address                              Foreign Address
```

```
                                Routing Instance       (state)
tcp4       0      0  *.7000                                        *.*
                                  __juniper_private1__   LISTEN
tcp4       0      0  *.6234                                        *.*
                                  __juniper_private1__   LISTEN
tcp4       0      0  *.9000                                        *.*
                                  __juniper_private1__   LISTEN
tcp4       0      0  *.33009                                       *.*
                                  __juniper_private2__   LISTEN
tcp4       0      0  *.3221                                        *.*
                                  default                LISTEN
tcp4       0      0  *.23                                          *.*
                                  default                LISTEN
tcp4       0      0  *.22                                          *.*
                                  default                LISTEN
tcp4       0      0  *.514                                         *.*
                                  default                LISTEN
tcp4       0      0  *.513                                         *.*
                                  default                LISTEN
tcp4       0      0  *.21                                          *.*
                                  default                LISTEN
tcp4       0      0  *.79                                          *.*
                                  default                LISTEN
tcp4       0      0  *.514                                         *.*
                                  __juniper_private1__   LISTEN
tcp4       0      0  *.513                                         *.*
                                  __juniper_private1__   LISTEN
udp46      0      0  *.514                                         *.*
                                  default
udp4       0      0  *.514                                         *.*
                                  default
udp46      0      0  *.62103                                       *.*
                                  default
udp4       0      0  *.59924                                       *.*
                                  default
udp4       0      0  *.31342                                       *.*
                                  __juniper_private1__
udp46      0      0  *.161                                         *.*
                                  default
udp4       0      0  *.161                                         *.*
                                  default
udp4       0      0  *.6333                                        *.*
                                  __juniper_private1__
```

show system connections (QFX3500 Switch)

```
user@switch> show system connections
Active Internet connections (including servers)
Proto Recv-Q Send-Q  Local Address                              Foreign Address
                                (state)
tcp4       0      0  10.94.204.110.23
172.17.28.19.1308                           ESTABLISHED
tcp4       0      0  128.0.0.1.6234                             128.0.0.1.65142
                                ESTABLISHED
tcp4       0      0  128.0.0.1.65142                             128.0.0.1.6234
                                 ESTABLISHED
tcp4       0      0  128.0.0.1.33003                            128.0.0.1.61441
                                ESTABLISHED
tcp4       0      0  128.0.0.1.61441                            128.0.0.1.33003
                                ESTABLISHED
tcp46      0      0  *.179                                        *.*
```


Copyright © 2016, Juniper Networks, Inc.

```
                                        LISTEN
tcp4       0      0  *.179                                        *.*
                                        LISTEN
tcp4       0      0  128.0.0.16.9000                          128.0.0.16.50970
                                    ESTABLISHED
tcp4       0      0  128.0.0.16.50970                          128.0.0.16.9000
                                    ESTABLISHED
tcp4       0      0  *.38                                         *.*
                                        LISTEN
tcp4       0      0  *.3491                                       *.*
                                        LISTEN
tcp4       0      0  *.6156                                       *.*
                                        LISTEN
tcp4       0      0  128.0.0.1.33001                           128.0.0.1.59437
                                    ESTABLISHED
tcp4       0      0  128.0.0.1.59437                           128.0.0.1.33001
                                    ESTABLISHED
tcp4       0      0  128.0.0.1.33023                           128.0.0.1.63605
                                    ESTABLISHED
tcp4       0      0  128.0.0.1.63605                           128.0.0.1.33023
                                    ESTABLISHED
tcp4       0      0  128.0.0.1.33001                           128.0.0.1.63830
                                    ESTABLISHED
tcp4       0      0  128.0.0.1.63830                           128.0.0.1.33001
                                    ESTABLISHED
tcp4       0      0  *.667                                        *.*
                                        LISTEN
tcp4       0      0  *.6156                                       *.*
                                        LISTEN
tcp4       0      0  128.0.0.1.7000                            128.0.0.1.51580
                                    ESTABLISHED
tcp4       0      0  128.0.0.1.51580                            128.0.0.1.7000
                                     ESTABLISHED
tcp4       0      0  128.0.0.1.6234                            128.0.0.1.53646
                                    ESTABLISHED
tcp4       0      0  *.33001                                      *.*
                                        LISTEN
tcp4       0      0  *.33003                                      *.*
                                        LISTEN
tcp4       0      0  128.0.0.1.53646                            128.0.0.1.6234
                                     ESTABLISHED
tcp4       0      0  128.0.0.16.9000                          128.0.0.16.63454
                                    ESTABLISHED
tcp4       0      0  128.0.0.16.63454                          128.0.0.16.9000
                                    ESTABLISHED
tcp4       0      0  *.666                                        *.*
                                        LISTEN
tcp4       0      0  *.7000                                       *.*
                                        LISTEN
tcp4       0      0  *.51627                                      *.*
                                        LISTEN
tcp4       0      0  *.3492                                       *.*
                                        LISTEN
tcp4       0      0  *.33023                                      *.*
                                        LISTEN
tcp4       0      0  *.33013                                      *.*
                                        LISTEN
tcp4       0      0  *.7202                                       *.*
                                        LISTEN
tcp4       0      0  *.6151                                       *.*
                                        LISTEN
```

```
tcp4       0      0  *.9000                                    *.*
                                  LISTEN
tcp4       0      0  *.6161                                    *.*
                                  LISTEN
tcp4       0      0  *.6011                                    *.*
                                  LISTEN
tcp4       0      0  *.3221                                    *.*
                                  LISTEN
tcp4       0      0  *.23                                      *.*
                                  LISTEN
tcp4       0      0  *.22                                      *.*
                                  LISTEN
tcp4       0      0  *.514                                     *.*
                                  LISTEN
tcp4       0      0  *.513                                     *.*
                                  LISTEN
tcp4       0      0  *.21                                      *.*
                                  LISTEN
tcp4       0      0  *.79                                      *.*
                                  LISTEN
tcp4       0      0  *.514                                     *.*
                                  LISTEN
tcp4       0      0  *.513                                     *.*
                                  LISTEN
tcp4       0      0  *.1127                                    *.*
                                  LISTEN
tcp4       0      0  *.1129                                    *.*
                                  LISTEN
tcp4       0      0  *.1128                                    *.*
                                  LISTEN
tcp4       0      0  *.6234                                    *.*
                                  LISTEN
udp46      0      0  *.514                                     *.*
udp4       0      0  *.514                                     *.*
udp4       0      0  128.0.0.1.123                             *.*
udp46      0      0  *.53344                                   *.*
udp4       0      0  *.54261                                   *.*
udp46      0      0  *.161                                     *.*
udp4       0      0  *.161                                     *.*
udp4       0      0  *.31342                                   *.*
udp4       0      0  *.59137                                   *.*
udp4       0      0  *.*                                       *.*
udp46      0      0  *.49152                                   *.*
udp46      0      0  *.4784                                    *.*
udp46      0      0  *.3784                                    *.*
udp4       0      0  *.49152                                   *.*
udp4       0      0  *.4784                                    *.*
udp4       0      0  *.3784                                    *.*
udp4       0      0  10.255.204.110.123                        *.*
udp4       0      0  *.123                                     *.*
udp4       0      0  *.67                                      *.*
udp4       0      0  *.6333                                    *.*
udp4       0      0  *.2293                                    *.*
ip4        0      0  *.*                                       *.*
ip4        0      0  *.*                                       *.*
ip4        0      0  *.*                                       *.*
```


Copyright © 2016, Juniper Networks, Inc.

show system core-dumps

List of Syntax

Syntax on page 1017
Syntax (EX Series Switches) on page 1017
Syntax (TX Matrix Router) on page 1017
Syntax (TX Matrix Plus Router) on page 1017
Syntax (QFX Series and OCX Series) on page 1017

Syntax

show system core-dumps
<brief | detail>
<*core-filename*>
<core-file-info>
<re0>
<re1>
<routing-engine>
<satellite [*fpc-slot-id* |device-alias *alias-name*]>

Syntax (EX Series Switches)

show system core-dumps
<all-members>
<brief | detail>
<*core-filename*>
<core-file-info>
<local>
<member *member-id*>

Syntax (TX Matrix Router)

show system core-dumps
<all-chassis | all-lcc | lcc *number* | scc>
<brief | detail>
<*core-filename*>
<core-file-info>

Syntax (TX Matrix Plus Router)

show system core-dumps
<all-chassis | all-lcc | lcc *number* | sfc *number*>
<brief | detail>
<*core-filename*>
<core-file-info>

Syntax (QFX Series and OCX Series)

show system core-dumps
<brief | detail>
<component (*UUID* | *serial number* | all)>
<core-file-info component (*UUID* | *serial number*) *core-file-name*>
<display-period (*hours* | *minutes* | *seconds*)>
<display-order>
<kernel-crashinfo component (*UUID* | *serial number*)>
<repository (core | log)>

Release Information

Command introduced before Junos OS Release 8.5.
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.
re0, **re1**, and **routing-engine** options introduced for dual Routing Engines in Junos OS Release 13.1.

Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
satellite option introduced in Junos OS Release 14.2R3.

Description Show core files on all routers or switches running Junos OS. You can use the **show system core-dumps** command to show a list of system core files created when the router or switch has failed. This command can be useful for diagnostic purposes. Each list item includes the file permissions, number of links, owner, group, size, modification date, and path and filename. If dual Routing Engines are present, you can view core-dump files for either routing engine or both routing engines together. On a QFabric system, you can view core-dump files on individual QFabric system devices as well as on the entire QFabric system.

You can use the option ***core-filename*** and its options **core-file-info**, **brief**, and **detail** to display more information about the specified core-dump files.

Options **none**—Display a list of all existing core-dump files.

NOTE: **If dual Routing Engines are present, then only the core-dump files for the active Routing Engine are listed.**

all-chassis—(TX Matrix and TX Matrix Plus routers only) (Optional) On a routing matrix based on a TX Matrix router, display system core files for the TX Matrix router switch-card chassis [SCC] and all the T640 routers [LCCs] connected to the TX Matrix router.

On a routing matrix based on a TX Matrix Plus router, display system core files for the TX Matrix Plus router (switch-fabric chassis [SFC]) and all the T1600 routers [LCCs] connected to the TX Matrix Plus router.

<all-lcc | lcc *number*>—(TX Matrix and TX Matrix Plus routers only) (Optional) On a routing matrix based on the TX Matrix router, display core dump files for all T640 routers (line-card chassis [LCCs]) or a specific T640 router [LCC] connected to the TX Matrix router.

On a routing matrix based on the TX Matrix Plus router, display logging information for all T1600 routers (line-card chassis [LCCs]) or a specific T1600 router (LCC) connected to the TX Matrix Plus router. When using the **lcc *number*** option, replace ***number*** with a value from **0** through **3**.

NOTE: **The all-chassis option displays system core files for the SCC or SFC and the LCCs connected to the SCC or SFC in the routing matrix while the all-lcc option only displays system core files for the LCCs in the routing matrix.**

all-members—(EX4200 switches) (Optional) Display system core files on all members of the Virtual Chassis configuration.

 Copyright © 2016, Juniper Networks, Inc.

brief—(Optional) View details of a binary file.

component (*UUID* | *serial number* | *all*)—(QFabric systems only) (Optional) Display a list of core-dump files located on individual QFabric system device or on the entire QFabric system.

core-file-info—(Optional) Display the stack trace of a core file.

core-filename—(Optional) Name of a specific core file to display.

detail—(Optional) View stack trace with details of the binary file.

display-order (timestamp-sort | alphanumeric-sort)—(QFabric systems only) (Optional) Display list of debug artifacts generated within the specified period—for example, within the last hour, within the last 20 minutes, or within the last 32 seconds—or according to their filename.

display-period (*hours* | *minutes* | *seconds*)—(QFabric systems only) (Optional) Display core-dump files generated within the specified period—for example, within the last hour, within the last 20 minutes, or within the last 32 seconds.

kernel-crashinfo component (*UUID* | *serial number*)—(QFabric systems only) (Optional) Display kernel crash information from the EEPROM on a QFabric system device.

local—(EX4200 switches only) (Optional) Display system core files on the local Virtual Chassis member.

member *member-id*—(EX4200 switches only) (Optional) Display system core files on the specified member of the Virtual Chassis configuration. Replace ***member-id*** with a value from 0 through 9.

re0—(Dual Routing Engines only) Display the core-dump files on re0.

re1—(Dual Routing Engines only) Display the coredump files on re1.

repository (core | log)—(QFabric systems only) (Optional) Specify either the core or log repository in which to view core-dump files.

routing-engine (backup | both | local | master | other)—(Dual routing engines only) Display a list of core-dump files for either the backup, local, master, or other routing engine or both routing engines.

satellite [*fpc-slot-id* | device-alias *alias-name*]—(Junos Fusion only)(Optional) Display hardware information for the specified satellite device in a Junos Fusion, or for all satellite devices in the Junos Fusion if no satellite devices are specified.

scc—(TX Matrix routers only) (Optional) Display system core files on the TX Matrix router (or switch-card chassis).

sfc—(TX Matrix Plus routers only) (Optional) Display system core files on the TX Matrix Plus router (or switch-fabric chassis).

Required Privilege Level view

List of Sample Output

show system core-dumps on page 1022
show system core-dumps on page 1022
show system core-dumps routing-engine both on page 1022
show system core-dumps (TX Matrix Plus Router) on page 1022
show system core-dumps (QFX3500 Switch) on page 1024
show system core-dumps (QFabric Systems) on page 1024
show system core-dumps core-file-info component serial number core-file-name (QFabric Systems) on page 1025
show system core-dumps component serial number display-order alphanumeric-sort repository core (QFabric Systems) on page 1025
show system core-dumps display-period (QFabric Systems) on page 1026
show system core-dumps kernel-crashinfo component serial number (QFabric Systems) on page 1028
show system core-dumps repository core (QFabric Systems) on page 1029
show system core-dumps repository log (QFabric Systems) on page 1029

Output Fields Table 52 on page 1020 describes the output fields for the **show system core-dumps** command. Output fields are listed in the approximate order in which they appear.

Table 52: show system core-dumps Output Fields

Field Name	Field Description
Permissions	Read/write permissions for the file named.
Links	Number of links to the file.
Owner	Name of the file owner.
Group	Name of the group with file access.
File size	File size in bytes.
Modified	Last file modification date and time.
Path/filename	File path where the file resides and the filename. (MX Series routers only) When you display the core files for an MX Series Virtual Chassis, the **show system core-dumps** command does not display information about files pertaining to the relayd process.
Repository scope:	Repository where core-dump files and log files are stored. The core-dump files are located in the **core** repository, and the log files are located in the **log** repository. The default **Repository scope** is shared since both the **core** and **log** repositories are shared by all of the QFabric system devices.
Repository head:	Path to the top-level repository location.

 Copyright © 2016, Juniper Networks, Inc.

Table 52: show system core-dumps Output Fields *(continued)*

Field Name	Field Description
Repository name:	Name of the repository: **core** or **log**.
List of nodes for core repository:	List of core-dump files associated with a particular QFabric system device located in the core repository.
Node Group	Name of the QFabric system device.
Node Identifier	UUID or serial number of the QFabric system device.
Num	Number of core-dump and log files.
Model	Model number of the QFabric system device.
Usage	Usage of the repository in megabytes.
Total usage of core repository:	Total usage of core-dump files associated with a particular QFabric system device located in the core repository. Usage is specified in megabytes and as a percentage.
Total usage of log repository:	Total usage of log files associated with a particular QFabric system device located in the log repository. Usage is specified in megabytes and as a percentage.
List of nodes for core repository:	List of core-dump files associated with a particular QFabric system device located in the core repository.
List of nodes for log repository:	List of log files associated with a particular QFabric system device located in the log repository.
Filename	Name of the core-dump file.
Date	Last core-dump file modification date and time.
Size	Size of the core-dump file.
Core filename	Filename of the core-dump file.
Process name	Name of the process that is generating a core-dump file or log file.
Release	Junos OS release.
Build server	Junos OS build server.
Build date	Junos OS build date.
Stack trace	Stack trace of the core-dump file.

Copyright © 2016, Juniper Networks, Inc.

Sample Output

show system core-dumps

This example shows the command output if core files exist.

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

show system core-dumps

This example shows the command output if core files do not exist.

```
user@host> show system core-dumps
/var/crash/*core*: No such file or directory
/var/tmp/*core*: No such file or directory
/var/crash/kernel.*: No such file or directory
```

show system core-dumps routing-engine both

This example shows the command output if dual Routing Engines are present.

```
user@host> show system core-dumps routing-engine both
re0:
--------------------------------------------------------------------------
/var/crash/*core*: No such file or directory
/var/tmp/pics/*core*: No such file or directory
/var/crash/kernel.*: No such file or directory

/var/tmp/cores:
total blocks: 496776
-rw-rw----  1 root  field   11910589 Nov 8  13:20 chassisd.core.0.201311081320
...

-rw-rw----  1 root  field   11737227 Oct 28 14:21
rpd.core-tarball.4.tgz.201310281421.3458162
total files: 10

re1:
--------------------------------------------------------------------------
/var/crash/*core*: No such file or directory
/var/tmp/pics/*core*: No such file or directory
/var/crash/kernel.*: No such file or directory

/var/tmp/cores:
total blocks: 3178420
-rw-rw----  1 root  field   19039721 Nov 8  14:29
chassisd.core.0.201311081429.3485600.gz
-rw-rw----  1 root  field   19039793 Nov 8  14:37
chassisd.core.1.201311081437.3485599.gz
..

-rw-rw----  1 root  field   11710113 Oct 17 15:26
rpd.core-tarball.1.tgz.201310171526.3430028
```

show system core-dumps (TX Matrix Plus Router)

```
user@host> show system core-dumps
```


Copyright © 2016, Juniper Networks, Inc.

```
sfc0-re0:
--------------------------------------------------------------------------
/var/crash/kernel.*: No such file or directory
/tftpboot/corefiles/*core*: No such file or directory

/var/crash/cores:
total 8

/var/tmp/cores:
total 1627592
-rw-r--r--  1 root  field  535346090 May 15 07:36
rpd.core-tarball.0.090515.0736.tgz
-rw-r--r--  1 root  field  105632057 May 15 07:37
rpd.core-tarball.1.090515.0737.tgz
-rw-r--r--  1 root  field  101981681 May 15 07:38
rpd.core-tarball.2.090515.0738.tgz
-rw-r--r--  1 root  field   85854573 May 15 07:40
rpd.core-tarball.3.090515.0740.tgz
-rw-r--r--  1 root  field    4157845 May 15 08:18
rpd.core-tarball.4.090515.0818.tgz

lcc0-re0:
--------------------------------------------------------------------------
/var/crash/kernel.*: No such file or directory
/tftpboot/corefiles/*core*: No such file or directory

/var/crash/cores:
total 8

/var/tmp/cores:
total 12

lcc1-re0:
--------------------------------------------------------------------------
/var/crash/kernel.*: No such file or directory
/tftpboot/corefiles/*core*: No such file or directory

/var/crash/cores:
total 8

/var/tmp/cores:
total 10024
-rw-r--r--  1 root  field    1875794 Apr 22 15:47
chassisd.core-tarball.0.090422.1547.tgz
-rw-r--r--  1 root  field    1894183 Apr 22 19:02
chassisd.core-tarball.0.090422.1902.tgz
-rw-r--r--  1 root  field    1290240 Apr 26 16:01 ksyncd_1558.core.0.090426.1601

lcc2-re0:
--------------------------------------------------------------------------
/var/crash/kernel.*: No such file or directory
/tftpboot/corefiles/*core*: No such file or directory

/var/crash/cores:
total 21124008
-rw-r--r--  1 root  wheel  1022376528 May 2  06:43
core-LCC2-EGFPC7.core.0.090502.0643
-rw-r--r--  1 root  wheel  1022376528 May 2  08:13
core-LCC2-EGFPC7.core.0.090502.0813
-rw-r--r--  1 root  wheel  1022376544 May 5  06:15
core-LCC2-EGFPC7.core.0.090505.0615
```

```
-rw-r--r--  1 root  wheel  1022376544 May 6  10:59
core-LCC2-EGFPC7.core.0.090506.1059
-rw-r--r--  1 root  wheel  1022376528 May 2  06:58
core-LCC2-EGFPC7.core.1.090502.0658
-rw-r--r--  1 root  wheel  754271232 May 5  06:33
core-LCC2-EGFPC7.core.1.090505.0633
-rw-r--r--  1 root  wheel  264897536 May 6  11:12
core-LCC2-EGFPC7.core.1.090506.1112
-rw-r--r--  1 root  wheel  1022376528 May 2  07:22
core-LCC2-EGFPC7.core.2.090502.0722
-rw-r--r--  1 root  wheel  163633152 May 5  06:52
core-LCC2-EGFPC7.core.2.090505.0652
-rw-r--r--  1 root  wheel  171312128 May 6  12:13
core-LCC2-EGFPC7.core.2.090506.1213
-rw-r--r--  1 root  wheel  1022376528 May 2  07:39
core-LCC2-EGFPC7.core.3.090502.0739
-rw-r--r--  1 root  wheel  1022376528 May 2  07:55
core-LCC2-EGFPC7.core.4.090502.0755
-rw-r--r--  1 root  wheel  427277312 May 7  04:47
core-LCC2-STFPC4.core.0.090507.0447
-rw-r--r--  1 root  wheel  419609600 May 7  04:47
core-LCC2-STFPC5.core.0.090507.0447
-rw-r--r--  1 root  wheel  432356352 May 7  04:47
core-LCC2-STFPC6.core.0.090507.0447

/var/tmp/cores:
total 2568
-rw-r--r--  1 root  field    1290240 May 14 14:26 ksyncd_1540.core.0.090514.1426
...
```

show system core-dumps (QFX3500 Switch)

```
user@switch> show system core-dumps
/var/crash/*core*: No such file or directory
-rw-rw----  1 root  field    1545143 Jun 4   2012 /var/tmp/pafxpc.core.0.gz
-rw-rw----  1 root  field    1545146 Jun 4   2012 /var/tmp/pafxpc.core.1.gz
-rw-rw----  1 root  field    1545141 Jun 4   2012 /var/tmp/pafxpc.core.2.gz
-rw-rw----  1 root  field    1545146 Jun 4   2012 /var/tmp/pafxpc.core.3.gz
-rw-rw----  1 root  field    1545142 Jun 5   2012 /var/tmp/pafxpc.core.4.gz
/var/tmp/pics/*core*: No such file or directory
/var/crash/kernel.*: No such file or directory
/tftpboot/corefiles/*core*: No such file or directory
total 5
```

show system core-dumps (QFabric Systems)

```
user@switch> show system core-dumps
Repository scope: shared
Repository head: /pbdata/export
List of nodes for core repository: /pbdata/export/rdumps/
Node Group      Node Identifier                          Num  Model        Usage

DG-0            BCF7208D-E44F-E011-802F-4171BAAC781D     0    qfx3100      OM
FM-0            73747cd8-0710-11e1-b6a4-00e081c5297e     0    fx-jvre      OM
DRE-0           77116f18-0710-11e1-a2a0-00e081c5297e     0    fx-jvre      OM
NW-NG-0         BBAK0394                                 0    qfx3500      OM
NW-NG-0         cd78871a-0710-11e1-878e-00e081c5297e     0    fx-jvre      OM
NW-NG-0         d0afda1e-0710-11e1-a1d0-00e081c5297e     0    fx-jvre      OM
FC-0            d31ab7a6-0710-11e1-ad1b-00e081c5297e     0    fx-jvre      OM
FC-1            d4d0f254-0710-11e1-90c3-00e081c5297e     0    fx-jvre      OM
IC-WS001        WS001                                    0    -            -
```


Copyright © 2016, Juniper Networks, Inc.

```
IC-WS001        WS001/YW3803                            0    qfxc08-3008  0M
IC-WS001        WS001/YN5999                            0    qfxc08-3008  0M
node-device1    BBAK0372                                0    qfx3500      0M
node-device1    EE3093                                  0    qfx3500      0M
Total usage of core repository:0M of 70000M (0.0%)

List of nodes for log repository: /pbdata/export/rlogs/
Node Group      Node Identifier                         Num  Model        Usage

DG-0            BCF7208D-E44F-E011-802F-4171BAAC781D    0    qfx3100      0M
FM-0            73747cd8-0710-11e1-b6a4-00e081c5297e    1    fx-jvre      0M
DRE-0           77116f18-0710-11e1-a2a0-00e081c5297e    1    fx-jvre      0M
NW-NG-0         BBAK0394                                1    qfx3500      0M
NW-NG-0         cd78871a-0710-11e1-878e-00e081c5297e    1    fx-jvre      0M
NW-NG-0         d0afda1e-0710-11e1-a1d0-00e081c5297e    3    fx-jvre      0M
FC-0            d31ab7a6-0710-11e1-ad1b-00e081c5297e    1    fx-jvre      0M
FC-1            d4d0f254-0710-11e1-90c3-00e081c5297e    1    fx-jvre      0M
IC-WS001        WS001                                   0    -            -
IC-WS001        WS001/YN5999                            1    qfxc08-3008  0M
IC-WS001        WS001/YW3803                            1    qfxc08-3008  0M
node-device1    BBAK0372                                1    qfx3500      0M
node-device1    EE3093                                  1    qfx3500      0M
Total usage of log repository:0M of 70000M (0.0%)
```

show system core-dumps core-file-info component serial number core-file-name (QFabric Systems)

```
user@switch> show system core-dumps core-file-info component
e8ff4b3e-7d92-11e0-be5d-00e081c1fe0e cosd.core.0.1519.05162011131846.gz
Repository scope: shared
Repository head: /pbstorage
Repository name: core
Core filename: /pbstorage/rdumps/e8ff4b3e-7d92-11e0-be5d-
00e081c1fe0e/5658.cosd.core.0.1519.05162011131846
Process name: cosd
Release: 11.3I0
Build server: /c/ssengupta/dfx_ha_v1/obj-i386-dcp/dcp/usr.sbin/cosd
Build date: 2011-05-14 01:11:44 UTC
Stack trace:
#0 0x8885d183 in select () from /usr/lib/libc.so.6
#0 0x8885d183 in select () from /usr/lib/libc.so.6
#1 0x887d4a45 in pselect () from /usr/lib/libc.so.6
#2 0x88774719 in pselect () from /usr/lib/libthr.so.2
#3 0x885de5db in __evGetNext () from /usr/lib/libisc.so.2
#4 0x885debf0 in __evMainLoop () from /usr/lib/libisc.so.2
#5 0x081125b2 in cosd_loop ()
#6 0x0812e19a in main ()
```

show system core-dumps component serial number display-order alphanumeric-sort repository core (QFabric Systems)

```
user@switch> show system core-dumps component BBAK8891 display-order alphanumeric-sort
repository core
Repository scope: shared
Repository head: /pbdata/export
Repository name: core
List of core dumps for component BBAK8891
Repository location: /pbdata/export/rdumps/BBAK8891
Filename                                  Date                      Size

eswd.core.0.1361.11172011214257.gz        Nov 17 21:43:10 2011      4779553
eswd.core.1.80267.11172011214514.gz       Nov 17 21:45:19 2011      3541648
```

```
eswd.core.2.80682.11172011214535.gz        Nov 17 21:45:43 2011      2156683
vccpd.core.0.1195.11182011151131.gz        Nov 18 15:11:35 2011      375617
Number of core dumps in repository:4
```

show system core-dumps display-period (QFabric Systems)

```
user@switch> show system core-dumps display-period 24h
 show system core-dumps display-period 24h
Repository scope: shared
Repository head: /pbdata/export
List of core dumps at repository: /pbdata/export/rdumps
Delta timespec: Last 24h
Component: BBAK8273
Filename                                   Size                      Date

vccpd.core.0.1195.11182011151131.gz        Nov 18 15:11:35 2011      375794
Component: cedb7b0e-0025-11e1-9a5f-00e081c52990
Filename                                   Size                      Date

vccpd.core.0.1461.11182011151131.gz        Nov 18 15:11:31 2011      120951
Component: ee19c4f8-0025-11e1-aef6-00e081c52990
Filename                                   Size                      Date

vccpd.core.0.1462.11182011151131.gz        Nov 18 15:11:31 2011      109420
Component: BBAK8281
Filename                                   Size                      Date

vccpd.core.0.1196.11182011151131.gz        Nov 18 15:11:36 2011      375373
Component: BBAK8891
Filename                                   Size                      Date

vccpd.core.0.1195.11182011151131.gz        Nov 18 15:11:35 2011      375617
Component: BBAK8276
Filename                                   Size                      Date

vccpd.core.0.1196.11182011151131.gz        Nov 18 15:11:35 2011      375350
Component: BBAK8868
Filename                                   Size                      Date

vccpd.core.0.1196.11182011151130.gz        Nov 18 15:11:34 2011      376211
Component: BBAK8835
Filename                                   Size                      Date

vccpd.core.0.1195.11182011151130.gz        Nov 18 15:11:35 2011      375700
Component: BBAK8283
Filename                                   Size                      Date

vccpd.core.0.1195.11182011151131.gz        Nov 18 15:11:36 2011      368298
Component: YW3781/YW3781
Filename                                   Size                      Date

vccpd.core.0.1220.11182011151131.gz        Nov 18 15:11:38 2011      380002
Component: 09726be2-0026-11e1-82d9-00e081c52990
Filename                                   Size                      Date

vccpd.core.0.1461.11182011151130.gz        Nov 18 15:11:31 2011      119965
Component: BBAK8309
Filename                                   Size                      Date

vccpd.core.0.1196.11182011151131.gz        Nov 18 15:11:36 2011      378930
Component: 303d476a-0026-11e1-abf4-00e081c52990
```

 Copyright © 2016, Juniper Networks, Inc.

```
Filename                                    Size                      Date

vccpd.core.0.1460.11182011151131.gz         Nov 18 15:11:31 2011      118385
Component: YW3798/YW3798
Filename                                    Size                      Date

vccpd.core.0.1219.11182011151131.gz         Nov 18 15:11:36 2011      380455
List of log dumps at repository: /pbdata/export/rlogs
Delta timespec: Last 24h
Component: BBAK8273
Filename                                    Size                      Date

vccpd.tarball.0.1195.11182011151138.tgz     Nov 18 15:11:39 2011      20415
Component: cedb7b0e-0025-11e1-9a5f-00e081c52990
Filename                                    Size                      Date

vccpd.tarball.0.1461.11182011151131.tgz     Nov 18 15:11:33 2011      19651
Component: ee19c4f8-0025-11e1-aef6-00e081c52990
Filename                                    Size                      Date

vccpd.tarball.0.1462.11182011151133.tgz     Nov 18 15:11:36 2011      24650
Component: BBAK8281
Filename                                    Size                      Date

vccpd.tarball.0.1196.11182011151137.tgz     Nov 18 15:11:41 2011      19445
Component: BBAK8891
Filename                                    Size                      Date

vccpd.tarball.0.1195.11182011151138.tgz     Nov 18 15:11:41 2011      21916
Component: BBAK8276
Filename                                    Size                      Date

vccpd.tarball.0.1196.11182011151137.tgz     Nov 18 15:11:39 2011      20461
Component: BBAK8868
Filename                                    Size                      Date

vccpd.tarball.0.1196.11182011151137.tgz     Nov 18 15:11:41 2011      21924
Component: BBAK8835
Filename                                    Size                      Date

vccpd.tarball.0.1195.11182011151137.tgz     Nov 18 15:11:39 2011      19424
Component: BBAK8283
Filename                                    Size                      Date

vccpd.tarball.0.1195.11182011151138.tgz     Nov 18 15:11:42 2011      31186
Component: YW3781/YW3781
Filename                                    Size                      Date

vccpd.tarball.0.1220.11182011151141.tgz     Nov 18 15:11:45 2011      27565
Component: 09726be2-0026-11e1-82d9-00e081c52990
Filename                                    Size                      Date

vccpd.tarball.0.1461.11182011151130.tgz     Nov 18 15:11:34 2011      19613
Component: BBAK8309
Filename                                    Size                      Date

vccpd.tarball.0.1196.11182011151138.tgz     Nov 18 15:11:46 2011      50362
Component: 303d476a-0026-11e1-abf4-00e081c52990
Filename                                    Size                      Date

vccpd.tarball.0.1460.11182011151133.tgz     Nov 18 15:11:33 2011      19360
```

```
Component: YW3798/YW3798
Filename                                    Size                      Date

vccpd.tarball.0.1219.11182011151140.tgz     Nov 18 15:11:49 2011      24473
```

show system core-dumps kernel-crashinfo component serial number (QFabric Systems)

```
user@switch> show system core-dumps kernel-crashinfo component A0001/YA0197
Node: A0001/YA0197

Information about previous kernel crash:

-- Kernel panic data --

Panic string: kdb_sysctl_panic
System uptime: 3 day 20 hr 59 min 40 sec Kernel crash time: 2011-11-15 Wed 15:25:17
 Kernel build linkstamp: JUNOS 11.3I #0: 2011-11-10 20:42:27 UTC

-- Stacktrace of panicing context --
Processor 1 (crash monarch):
savectx+0x0 (c9552800,80214efc,802a7fbc,c88ad05c) ra 801b93a8 sz 0
kdm_kcore_save_crashinfo+0x254 (c9552800,0,802a7fbc,c88ad05c) ra 801b9f44 sz 784
 kdm_kcore_kern_panic_event_handler+0x4b0 (c9552800,0,802a7fbc,c88ad05c) ra
8022a9b8 sz 88
panic+0x1d0 (c9552800,0,4,77fed534) ra 802540c0 sz 56
kdb_sysctl_panic+0x70 (c9552800,0,4,77fed534) ra 80237e58 sz 40 sysctl_root+0x12c
 (c9552800,0,4,e8bc5cf8) ra 80238e50 sz 48
userland_sysctl+0x164 (c9552800,0,4,e8bc5cf8) ra 8023956c sz 104
__sysctl+0xe4 (c9552800,0,4,e8bc5cf8) ra 806d62e8 sz 160
trap+0xe1c (c9552800,0,4,e8bc5cf8) ra 80896e68 sz 128
MipsUserGenException+0x1a4 (c9552800,0,4,405cd12c) ra 0 sz 0
pid 82340, process: sysctl

Processor 0:
restoreintr+0x14 (1,81bca820,3,0) ra 806cdc3c sz 0
spinlock_exit+0x30 (1,81bca820,3,0) ra 8025d354 sz 24
sleepq_release+0x64 (1,81bca820,3,0) ra 8025e670 sz 24
sleepq_timeout+0x224 (1,81bca820,3,0) ra 80240294 sz 48
softclock+0x434 (1,81bca820,3,0) ra 802067f8 sz 80
ithread_loop+0x244 (1,81bca820,3,0) ra 80200e28 sz 64 fork_exit+0xc0
(1,81bca820,3,0) ra 80897c28 sz 48
MipsNMIException+0x34 (1,81bca820,3,0) ra 0 sz 0
pid 82340, process: sysctl

Processor 2:
cpu_idle+0x20 (80960000,51bbc,2031df,81bca1b8) ra 80204948 sz 24 idle_proc+0x130
 (80960000,51bbc,2031df,81bca1b8) ra 80200e28 sz 56 fork_exit+0xc0
(80960000,51bbc,2031df,81bca1b8) ra 80897c28 sz 48
MipsNMIException+0x34 (80960000,51bbc,2031df,81bca1b8) ra 0 sz 0
pid 82340, process: sysctl

Processor 3:
cpu_idle+0x20 (80960000,51bbc,2038df,81bca300) ra 80204948 sz 24 idle_proc+0x130
 (80960000,51bbc,2038df,81bca300) ra 80200e28 sz 56 fork_exit+0xc0
(80960000,51bbc,2038df,81bca300) ra 80897c28 sz 48
MipsNMIException+0x34 (80960000,51bbc,2038df,81bca300) ra 0 sz 0
pid 82340, process: sysctl

Processor 4:
cpu_idle+0x20 (80960000,51bbc,2037df,81bca448) ra 80204948 sz 24 idle_proc+0x130
 (80960000,51bbc,2037df,81bca448) ra 80200e28 sz 56 fork_exit+0xc0
```

 Copyright © 2016, Juniper Networks, Inc.

```
(80960000,51bbc,2037df,81bca448) ra 80897c28 sz 48
MipsNMIException+0x34 (80960000,51bbc,2037df,81bca448) ra 0 sz 0
pid 82340, process: sysctl

Processor 5:
restoreintr+0x14 (1,51bbc,203edf,81bca590) ra 806cdc3c sz 0
spinlock_exit+0x30 (1,51bbc,203edf,81bca590) ra 80204a34 sz 24 idle_proc+0x21c
(1,51bbc,203edf,81bca590) ra 80200e28 sz 56 fork_exit+0xc0
(1,51bbc,203edf,81bca590) ra 80897c28 sz 48
MipsNMIException+0x34 (1,51bbc,203edf,81bca590) ra 0 sz 0
pid 82340, process: sysctl

Processor 6:
cpu_idle+0x20 (80960000,51bbc,205cdf,81bca6d8) ra 80204948 sz 24 idle_proc+0x130
 (80960000,51bbc,205cdf,81bca6d8) ra 80200e28 sz 56 fork_exit+0xc0
(80960000,51bbc,205cdf,81bca6d8) ra 80897c28 sz 48
MipsNMIException+0x34 (80960000,51bbc,205cdf,81bca6d8) ra 0 sz 0
pid 82340, process: sysctl

Processor 7:
lockmgr+0x5ac (c97e8484,c8dd9800,0,c8dd9800) ra 8c11c81c sz 48
sal_sem_take+0x134 (c97e8484,c8dd9800,0,c8dd9800) ra 8c351108 sz 56
_bcm_esw_linkscan_thread+0x45c (c97e8484,c8dd9800,0,c8dd9800) ra 8c11cdb4 sz 104
sal_thread_start_wrap+0x74 (c97e8484,c8dd9800,0,c8dd9800) ra 80200e28 sz 32
fork_exit+0xc0 (c97e8484,c8dd9800,0,c8dd9800) ra 80897c28 sz 48
MipsNMIException+0x34 (c97e8484,c8dd9800,0,c8dd9800) ra 0 sz 0
pid 82340, process: sysctl
-- End of stacktrace --
```

show system core-dumps repository core (QFabric Systems)

```
user@switch> show system core-dumps repository core
Repository scope: shared
Repository head: /pbdata/export
Repository name: core
List of nodes for core repository: /pbdata/export/rdumps/
Node Group      Node Identifier                         Num  Model        Usage

DG-0            BCF7208D-E44F-E011-802F-4171BAAC781D    0    qfx3100      0M
FM-0            73747cd8-0710-11e1-b6a4-00e081c5297e    0    fx-jvre      0M
DRE-0           77116f18-0710-11e1-a2a0-00e081c5297e    0    fx-jvre      0M
NW-NG-0         BBAK0394                                0    qfx3500      0M
NW-NG-0         cd78871a-0710-11e1-878e-00e081c5297e    0    fx-jvre      0M
NW-NG-0         d0afda1e-0710-11e1-a1d0-00e081c5297e    0    fx-jvre      0M
FC-0            d31ab7a6-0710-11e1-ad1b-00e081c5297e    0    fx-jvre      0M
FC-1            d4d0f254-0710-11e1-90c3-00e081c5297e    0    fx-jvre      0M
IC-WS001        WS001                                   0    -            -
IC-WS001        WS001/YW3803                            0    qfxc08-3008  0M
IC-WS001        WS001/YN5999                            0    qfxc08-3008  0M
node-device1    BBAK0372                                0    qfx3500      0M
node-device1    EE3093                                  0    qfx3500      0M
Total usage of core repository:0M of 70000M (0.0%)
```

show system core-dumps repository log (QFabric Systems)

```
user@switch> show system core-dumps repository log
Repository scope: shared
Repository head: /pbdata/export
Repository name: log
List of nodes for log repository: /pbdata/export/rlogs/
Node Group      Node Identifier                         Num  Model        Usage
```

```
DG-0            BCF7208D-E44F-E011-802F-4171BAAC781D    0    qfx3100      0M
FM-0            73747cd8-0710-11e1-b6a4-00e081c5297e    1    fx-jvre      0M
DRE-0           77116f18-0710-11e1-a2a0-00e081c5297e    1    fx-jvre      0M
NW-NG-0         BBAK0394                                1    qfx3500      0M
NW-NG-0         cd78871a-0710-11e1-878e-00e081c5297e    1    fx-jvre      0M
NW-NG-0         d0afda1e-0710-11e1-a1d0-00e081c5297e    3    fx-jvre      0M
FC-0            d31ab7a6-0710-11e1-ad1b-00e081c5297e    1    fx-jvre      0M
FC-1            d4d0f254-0710-11e1-90c3-00e081c5297e    1    fx-jvre      0M
IC-WS001        WS001                                   0    -            -
IC-WS001        WS001/YN5999                            1    qfxc08-3008  0M
IC-WS001        WS001/YW3803                            1    qfxc08-3008  0M
node-device1    BBAK0372                                1    qfx3500      0M
node-device1    EE3093                                  1    qfx3500      0M
Total usage of log repository:0M of 70000M (0.0%)
```


Copyright © 2016, Juniper Networks, Inc.

show system directory-usage

List of Syntax

Syntax on page 1031
Syntax (EX Series) on page 1031
Syntax (TX Matrix Router) on page 1031
Syntax (TX Matrix Plus Router) on page 1031
Syntax (MX Series Router) on page 1031
Syntax (QFX Series and OCX Series) on page 1031

Syntax

show system directory-usage
<depth *number*>
<*path*>

Syntax (EX Series)

show system directory-usage
<all-members>
<depth *number*>
<local>
<member *member-id*>
<*path*>

Syntax (TX Matrix Router)

show system directory-usage
<all-chassis | all-lcc | lcc *number* | scc>
<depth *number*>
<*path*>

Syntax (TX Matrix Plus Router)

show system directory-usage
<all-chassis | all-lcc | lcc *number* | sfc *number*>
<depth *number*>
<*path*>

Syntax (MX Series Router)

show system directory-usage
<all-members>
<depth *number*>
<local>
<member *member-id*>
<*path*>

Syntax (QFX Series and OCX Series)

show system directory-usage
<depth *number*>
<*path*>
<infrastructure *name*>
<interconnect-device *name*>
<node-group *name*>

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.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display directory usage information.

Options **none**—Display all directory usage information.

all-chassis—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Display directory usage information about all the T640 routers (in a routing matrix based on a TX Matrix router). Display directory usage information about all the T1600 or T4000 routers (in a routing matrix based on a TX Matrix Plus router) in the chassis.

all-lcc—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display directory information for all T640 routers (or line-card chassis) connected to the TX Matrix router. On a TX Matrix Plus router, display directory information for all connected T1600 or T4000 LCCs.

all-members—(EX4200 switches and MX Series routers only) (Optional) Display directory information for all members of the Virtual Chassis configuration.

depth ***number***—(Optional) Depth of the directory to traverse. This option is useful when you want to limit the output shown for a large file system.

infrastructure ***name***— (QFabric systems only) (Optional) Display directory information for the fabric control Routing Engines and fabric manager Routing Engines.

interconnect-device ***name***— (QFabric systems only) (Optional) Display directory information for the Interconnect device.

node-group ***name***— (QFabric systems only) (Optional) Display directory information for the Node group.

lcc ***number***—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display directory information for a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, display directory information for a specific router that is connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(EX4200 switches and MX Series routers only) (Optional) Display directory information for the local Virtual Chassis member.

member ***member-id***—(EX4200 switches and MX Series routers only) (Optional) Display directory information for the specified member of the Virtual Chassis configuration. For EX4200 switches, replace ***member-id*** with a value from 0 through 9. For an MX Series Virtual Chassis, replace ***member-id*** with a value of 0 or 1.

 Copyright © 2016, Juniper Networks, Inc.

path—(Optional) Path or root directory to traverse.

scc—(TX Matrix router only) (Optional) Display directory information for the TX Matrix router (or switch-card chassis).

sfc *number*—(TX Matrix Plus routers only) (Optional) Display directory information for the TX Matrix Plus router. Replace *number* with **0**.

Required Privilege Level

view

Related Documentation

- *Routing Matrix with a TX Matrix Plus Router Solutions Page*

List of Sample Output

show system directory-usage scc (TX Matrix Router) on page 1034
show system directory-usage sfc (TX Matrix Plus Router) on page 1034
show system directory-usage (QFX Series and OCX Series) on page 1034

Output Fields

Table 53 on page 1033 describes the output fields for the **show system directory-usage** command. Output fields are listed in the approximate order in which they appear.

Table 53: show system directory-usage Output Fields

Field Name	Field Description
bytes	Number of bytes used by files in a directory.
directory-name	Name of the directory.

Sample Output

show system directory-usage scc (TX Matrix Router)

```
user@host> show system directory-usage /var/tmp scc
          /var/tmp
1.0K      /var/tmp/vi.recover
2.0K      /var/tmp/instmp.tPMk8u
1.0K      /var/tmp/install
          /var/tmp/instmp.GUMpur
4.8M      /var/tmp/instmp.GUMpur/packages
6.4M      /var/tmp/troy1
297M      /var/tmp/dsw
          /var/tmp/pkg_tmp.2073
83K       /var/tmp/pkg_tmp.2073/bin
          /var/tmp/instmp.oMIDbl
89K       /var/tmp/instmp.oMIDbl/bin
          /var/tmp/instmp.byhMjR
4.6M      /var/tmp/instmp.byhMjR/packages
          /var/tmp/instmp.6fqHf3
1.7M      /var/tmp/instmp.6fqHf3/packages
          /var/tmp/instmp.mljECe
4.6M      /var/tmp/instmp.mljECe/packages
```

show system directory-usage sfc (TX Matrix Plus Router)

```
user@switch> show system directory-usage /var/tmp sfc 0
sfc0-re0:
--------------------------------------------------------------------------
          /var/tmp
46K       /var/tmp/gres-tp
          /var/tmp/sec-download
2.0K      /var/tmp/sec-download/sub-download
2.0K      /var/tmp/vi.recover
2.0K      /var/tmp/install
795M      /var/tmp/cores
766K      /var/tmp/pr440594
```

show system directory-usage (QFX Series and OCX Series)

```
user@switch> show system directory-usage
          /var/tmp
30K       /var/tmp/gres-tp
2.0K      /var/tmp/rtsdb
2.0K      /var/tmp/vi.recover
2.0K      /var/tmp/install
2.0K      /var/tmp/pics
```


Copyright © 2016, Juniper Networks, Inc.

show system processes

List of Syntax

Syntax on page 1035
Syntax (EX Series Switches) on page 1035
Syntax (QFX Series Switches) on page 1035
Syntax (MX Series Routers) on page 1035
Syntax (OCX Series) on page 1035
Syntax (TX Matrix Routers) on page 1036
Syntax (TX Matrix Plus Router) on page 1036

Syntax

show system processes
<brief | detail | extensive | summary>
<health (pid *process-identifer* | process-name *process-name*)>
<providers>
<resource-limits (brief | detail) *process-name*>
<wide>

Syntax (EX Series Switches)

show system processes
<all-members>
<brief | detail | extensive | summary>
<health (pid *process-identifer* | process-name *process-name*)>
<local>
<member *member-id*>
<providers>
<resource-limits (brief | detail) *process-name*>
<wide>

Syntax (QFX Series Switches)

show system processes
<all-members>
<brief | detail | extensive | summary>
<health (pid *process-identifer* | process-name *process-name*)>
host-processes (brief|detail)
<local>
<member *member-id*>
<providers>
<resource-limits (brief | detail) *process-name*>
<wide>

Syntax (MX Series Routers)

show system processes
<all-members>
<brief | detail | extensive | summary>
<health (pid *process-identifer* | process-name *process-name*)>
<local>
<member *member-id*>
<providers>
<resource-limits (brief | detail) *process-name*>
<wide>

Syntax (OCX Series)

show system processes
<brief | detail | extensive | summary >
<health (pid *process-identifer* | process-name *process-name*)>
host-processes (brief|detail)
<providers>

<resource-limits>
<wide>

Syntax (TX Matrix Routers)

show system processes
<brief | detail | extensive | summary>
<all-chassis| all-lcc | lcc *number* | scc>
<wide>

Syntax (TX Matrix Plus Router)

show system processes
<brief | detail | extensive | summary>
<all-chassis| all-lcc | lcc *number* | sfc *number*>
<wide>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Option **sfc** 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.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display information about software processes that are running on the router or switch and that have controlling terminals.

Options

none—Display standard information about system processes.

brief | detail | extensive | summary—(Optional) Display the specified level of detail.

adaptive-services—(Optional) Display the configuration management process that manages the configuration for stateful firewall, Network Address Translation (NAT), intrusion detection services (IDS), and IP Security (IPsec) services on the Adaptive Services PIC.

alarm-control—(Optional) Display the process to configure the system alarm.

all-chassis—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Display standard system process information about all the T640 routers (in a routing matrix based on the TX Matrix router) or all the T1600 or T4000 routers (in a routing matrix based on the TX Matrix Plus router) in the chassis.

all-lcc—(TX Matrix routers and TX Matrix Plus router only) (Optional) Display standard system process information for all T640 routers (or line-card chassis) connected to the TX Matrix router. Display standard system process information for all connected T1600 or T4000 LCCs.

all-members—(EX4200 switches, QFX Series Virtual Chassis, and MX Series routers) (Optional) Display standard system process information for all members of the Virtual Chassis configuration.

ancpd-service—Display the Access Node Control Protocol (ANCP) process, which works with a special Internet Group Management Protocol (IGMP) session to collect outgoing interface mapping events in a scalable manner.

Copyright © 2016, Juniper Networks, Inc.

application-identification—Display the process that identifies an application using intrusion detection and prevention (IDP) to allow or deny traffic based on applications running on standard or nonstandard ports.

audit-process—(Optional) Display the RADIUS accounting process.

auto-configuration—Display the Interface Auto-Configuration process.

bootp—Display the process that enables a router, switch, or interface to act as a Dynamic Host Configuration Protocol (DHCP) or bootstrap protocol (BOOTP) relay agent. DHCP relaying is disabled.

captive-portal-content-delivery—Display the HTTP redirect service by specifying the location to which a subscriber's initial Web browser session is redirected, enabling initial provisioning and service selection for the subscriber.

ce-l2tp-service—(Optional) (M10, M10i, M7i, and MX Series routers only) Display the Universal Edge Layer 2 Tunneling Protocol (L2TP) process, which establishes L2TP tunnels and Point-to-Point Protocol (PPP) sessions through L2TP tunnels.

cfm—Display Ethernet Operations, Administration, and Maintenance (OAM) connectivity fault management (CFM) process, which can be used to monitor the physical link between two switches.

chassis-control—(Optional) Display the chassis management process.

class-of-service—(Optional) Display the class-of-service (CoS) process, which controls the router's or switch’s CoS configuration.

clksyncd-service—Display the external clock synchronization process, which uses synchronous Ethernet (SyncE).

craft-control—Display the process for the I/O of the craft interface.

database-replication—(EX Series switches and MX Series routers only) (Optional) Display the database replication process.

datapath-trace-service—Display the packet path tracing process.

dhcp-service—(EX Series switches and MX Series routers only) (Optional) Display the Dynamic Host Configuration Protocol process, which enables a DHCP server to allocate network IP addresses and deliver configuration settings to client hosts without user intervention.

diameter-service—(Optional) Display the diameter process.

disk-monitoring—(Optional) Display the disk monitoring process, which checks the health of the hard disk drive on the Routing Engine.

dynamic-flow-capture—(Optional) Display the dynamic flow capture (DFC) process, which controls DFC configurations on Monitoring Services III PICs.

Copyright © 2016, Juniper Networks, Inc.

ecc-error-logging—(Optional) Display the error checking and correction (ECC) process, which logs ECC parity errors in memory on the Routing Engine.

ethernet-connectivity-fault-management— Display the process that provides IEEE 802.1ag OAM connectivity fault management (CFM) database information for CFM maintenance association end points (MEPs) in a CFM session.

ethernet-link-fault-management—(EX Series switches and MX Series routers only) (Optional) Display the process that provides the OAM link fault management (LFM) information for Ethernet interfaces.

event-processing—(Optional) Display the event process (eventd).

firewall—(Optional) Display the firewall management process, which manages the firewall configuration and enables accepting or rejecting packets that are transiting an interface on a router or switch.

general-authentication-service—(EX Series switches and MX Series routers only) (Optional) Display the general authentication process.

health (pid ***process-identifer*** **| process-name** ***process-name*****)**—(Optional) Display process health information, either by process id (PID) or by process name.

host-processes—Display process information of processes running on the host system. (On OCX Series only) The following options are available:

- brief | detail—(Optional) Display the specified level of detail.

iccp-service—Display the Inter-Chassis Communication Protocol (ICCP) process.

idp-policy—Display the intrusion detection and prevention (IDP) protocol process.

ilmi—Display the Integrated Local Management Interface (ILMI) protocol process, which provides bidirectional exchange of management information between two ATM interfaces across a physical connection.

inet-process—Display the IP multicast family process.

init—Display the process that initializes the USB modem.

interface-control—(Optional) Display the interface process, which controls the router's or switch's physical interface devices and logical interfaces.

kernel-replication—(Optional) Display the kernel replication process, which replicates the state of the backup Routing Engine when graceful Routing Engine switchover (GRES) is configured.

l2-learning—(Optional) Display the Layer 2 address flooding and learning process.

l2cpd-service—Display the Layer 2 Control Protocol process, which enables features such as Layer 2 protocol tunneling and nonstop bridging.

 Copyright © 2016, Juniper Networks, Inc.

lacp—(Optional) Display the Link Aggregation Control Protocol (LACP)process. LACP provides a standardized means for exchanging information between partner systems on a link to allow their link aggregation control instances to reach agreement on the identity of the LAG to which the link belongs, and then to move the link to that LAG, and to enable the transmission and reception processes for the link to function in an orderly manner.

lcc ***number***—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display standard system process information for a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, display standard system process information for a specific router that is connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(EX4200 switches, QFX Series Virtual Chassis, and MX Series routers) (Optional) Display standard system process information for the local Virtual Chassis member.

local-policy-decision-function—Display the process for the Local Policy Decision Function, which regulates collection of statistics related to applications and application groups and tracking of information about dynamic subscribers and static interfaces.

logical-system-mux—Display the logical router multiplexer process (lrmuxd), which manages the multiple instances of the routing protocols process (rpd) on a machine running logical routers.

mac-validation—Display the MAC validation process, which configures MAC address validation for subscriber interfaces created on demux interfaces in dynamic profiles on MX Series routers.

member ***member-id***—(EX4200 switches, QFX Series Virtual Chassis, and MX Series routers) (Optional) Display standard system process information for the specified member of the Virtual Chassis configuration. For EX4200 switches, replace ***member-id*** with a value from 0 through 9. For an MX Series Virtual Chassis, replace ***member-id*** with a value of 0 or 1.

mib-process—(Optional) Display the MIB II process, which provides the router's MIB II agent.

mobile-ip—(Optional) Display the Mobile IP process, which configures Junos OS Mobile IP features.

mountd-service—(EX Series switches and MX Series routers only) (Optional) Display the service for NFS mounts requests.

mpls-traceroute—(Optional) Display the MPLS Periodic Traceroute process.

mspd—(Optional) Display the Multiservice process.

multicast-snooping—(EX Series switches and MX Series routers only) (Optional) Display the multicast snooping process, which makes Layer 2 devices such as VLAN switches aware of Layer 3 information, such as the media access control (MAC) addresses of members of a multicast group.

named-service—(Optional) Display the DNS Server process, which is used by a router or a switch to resolve hostnames into addresses.

neighbor-liveness—Display the process, which specifies the maximum length of time that the router waits for its neighbor to re-establish an LDP session.

nfsd-service—(Optional) Display the Remote NFS Server process, which provides remote file access for applications that need NFS-based transport.

ntp—Display the Network Time Protocol (NTP) process, which provides the mechanisms to synchronize time and coordinate time distribution in a large, diverse network.

packet-triggered-subscribers—Display the packet-triggered subcribers and policy control (PTSP) process, which allows the application of policies to dynamic subscribers that are controlled by a subscriber termination device.

peer-selection-service—(Optional) Display the Peer Selection Service process.

periodic-packet-services—Display the Periodic packet management process, which is responsible for processing a variety of time-sensitive periodic tasks so that other processes can more optimally direct their resources.

pfe—Display the Packet Forwarding Engine management process.

pgcp-service—(Optional) Display the pgcpd service process running on the Routing Engine.

pgm—Display the Pragmatic General Multicast (PGM) protocol process, which enables a reliable transport layer for multicast applications.

pic-services-logging—(Optional) Display the logging process for some PICs. With this process, also known as fsad (the file system access daemon), PICs send special logging information to the Routing Engine for archiving on the hard disk.

ppp—(Optional) Display the Point-to-Point Protocol (PPP) process, which is the encapsulation protocol process for transporting IP traffic across point-to-point links.

ppp-service—Display the Universal edge PPP process, which is the encapsulation protocol process for transporting IP traffic across universal edge routers.

Copyright © 2016, Juniper Networks, Inc.

pppoe—(Optional) Display the Point-to-Point Protocol over Ethernet (PPPoE) process, which combines PPP that typically runs over broadband connections with the Ethernet link-layer protocol that allows users to connect to a network of hosts over a bridge or access concentrator.

process-monitor—Display the process health monitor process (pmond).

providers—(Optional) Display provider processes.

redundancy-interface-process—(Optional) Display the ASP redundancy process.

remote-operations—(Optional) Display the remote operations process, which provides the ping and traceroute MIBs.

resource-cleanup—Display the resource cleanup process.

resource-limits (brief | detail) ***process-name***—(Optional) Display process resource limits.

routing—(Optional) Display the routing protocol process.

sampling—(Optional) Display the sampling process, which performs packet sampling based on particular input interfaces and various fields in the packet header.

sbc-configuration-process—Display the session border controller (SBC) process of the border signaling gateway (BSG).

scc—(TX Matrix routers only) (Optional) Display standard system process information for the TX Matrix router (or switch-card chassis).

sdk-service—Display the SDK Service process, which runs on the Routing Engine and is responsible for communications between the SDK application and Junos OS. Although the SDK Service process is present on the router, it is turned off by default.

secure-neighbor-discovery—(EX Series switches and MX Series routers only) (Optional) Display the secure Neighbor Discovery Protocol (NDP) process, which provides support for protecting NDP messages.

send—(Optional) Display the Secure Neighbor Discovery Protocol (SEND) process, which provides support for protecting Neighbor Discovery Protocol (NDP) messages.

service-deployment—(Optional) Display the service deployment process, which enables Junos OS to work with the Session and Resource Control (SRC) software.

sfc ***number***—(TX Matrix Plus routers only) (Optional) Display system process information for the TX Matrix Plus router. Replace ***number*** with 0.

snmp—Display the SNMP process, which enables the monitoring of network devices from a central location and provides the router's or switch's SNMP master agent.

sonet-aps—Display the SONET Automatic Protection Switching (APS) process, which monitors any SONET interface that participates in APS.

Copyright © 2016, Juniper Networks, Inc.

static-subscribers—(Optional) Display the Static subscribers process, which associates subscribers with statically configured interfaces and provides dynamic service activation and activation for these subscribers.

tunnel-oamd—(Optional) Display the Tunnel OAM process, which enables the Operations, Administration, and Maintenance of Layer 2 tunneled networks. Layer 2 protocol tunneling (L2PT) allows service providers to send Layer 2 protocol data units (PDUs) across the provider's cloud and deliver them to Juniper Networks EX Series Ethernet Switches that are not part of the local broadcast domain.

vrrp—(EX Series switches and MX Series routers only) (Optional) Display the Virtual Router Redundancy Protocol (VRRP) process, which enables hosts on a LAN to make use of redundant routing platforms on that LAN without requiring more than the static configuration of a single default route on the hosts.

watchdog—Display the watchdog timer process, which enables the watchdog timer when Junos OS encounters a problem.

wide—(Optional) Display process information that might be wider than 80 columns.

Additional Information

By default, when you issue the **show system processes** command on the master Routing Engine of a TX Matrix router or a TX Matrix Plus router, the command is broadcast to all the master Routing Engines of the LCCs connected to it in the routing matrix. Likewise, if you issue the same command on the backup Routing Engine of a TX Matrix or a TX Matrix Plus router, the command is broadcast to all backup Routing Engines of the LCCs that are connected to it in the routing matrix.

Required Privilege Level

view

Related Documentation

- *List of Junos OS Processes*
- *Routing Matrix with a TX Matrix Plus Router Solutions Page*

List of Sample Output

show system processes on page 1045
show system processes brief on page 1046
show system processes detail on page 1046
show system processes extensive on page 1047
show system processes extensive (EX9200 Switch) on page 1047
show system processes host processes (OCX1100 Switch) on page 1048
show system processes lcc wide (TX Matrix Routing Matrix) on page 1048
show system processes summary on page 1049
show system processes (TX Matrix Plus Router) on page 1049
show system processes sfc (TX Matrix Plus Router) on page 1056
show system processes lcc wide (TX Matrix Plus Routing Matrix) on page 1059
show system processes (QFX Series and OCX Series) on page 1061

Output Fields

Table 54 on page 1043 describes the output fields for the **show system processes** command. Output fields are listed in the approximate order in which they appear.

Copyright © 2016, Juniper Networks, Inc.

Table 54: show system processes Output Fields

Field Name	Field Description	Level of Output
last pid	Last process identifier assigned to the process.	**brief extensive summary**
load averages	Three load averages followed by the current time.	**brief extensive summary**
processes	Number of existing processes and the number of processes in each state (**sleeping, running, starting, zombies**, and **stopped**).	**brief extensive summary**
Mem	Information about physical and virtual memory allocation.	**brief extensive summary**
Active	Memory allocated and actively used by the program. When the system is under memory pressure, the pageout process reuses memory from the free, cache, inact and, if necessary, active pages. When the pageout process runs, it scans memory to see which pages are good candidates to be unmapped and freed up. Thus, the distinction between **Active** and **Inact** memory is only used by the pageout process to determine which pool of pages to free first at the time of a memory shortage. The pageout process first scans the **Inact** list, and checks whether the pages on this list have been accessed since the time they have been listed here. The pages that have been accessed are moved from the **Inact** list to the **Active** list. On the other hand, pages that have not been accessed become prime candidates to be freed by the pageout process. If the pageout process cannot produce enough free pages from the **Inact** list, pages from the **Active** list get freed up. Because the pageout process runs only when the system is under memory pressure, the pages on the **Inact** list remain untouched – even if they have not been accessed recently – when the amount of **Free** memory is adequate.	**brief extensive summary**
Inact	Memory allocated but not recently used or memory freed by the programs. Inactive memory remains mapped in the address space of one or more processes and, therefore, counts toward the RSS value of those processes. Any amount of memory freed by the routing protocol process might still be considered part of the **RES** value. Generally, the kernel delays the migrating of memory out of the **Inact** queue into the **Cache** or **Free** list unless there is a memory shortage.	**brief extensive summary**
Wired	Memory that is not eligible to be swapped, usually used for in-kernel memory structures and/or memory physically locked by a process.	**brief extensive summary**
Cache	Memory that is not associated with any program and does not need to be swapped before being reused.	**brief extensive summary**
Buf	Size of memory buffer used to hold data recently called from the disk.	**brief extensive summary**
Free	Memory that is not associated with any programs. Memory freed by a process can become **Inactive**, **Cache**, or **Free**, depending on the method used by the process to free the memory.	**brief extensive summary**

Copyright © 2016, Juniper Networks, Inc.

Table 54: show system processes Output Fields *(continued)*

Field Name	Field Description	Level of Output
Swap	Information about physical and virtual memory allocation. NOTE: Memory can remain swapped out indefinitely if it is not accessed again. Therefore, the show system process extensive command shows that memory is swapped to disk even though there is plenty of free memory, and such a situation is not unusual.	**brief extensive summary**
PID	Process identifier.	**detail extensive summary**
TT	Control terminal name.	none **detail**
STAT	Symbolic process state. The state is given by a sequence of letters. The first letter indicates the run state of the process: • **D**—In disk or other short-term, uninterruptible wait • **I**—Idle (sleeping longer than about 20 seconds) • **R**—Runnable • **S**—Sleeping for less than 20 seconds • **T**—Stopped • **Z**—Dead (zombie) • **+** —The process is in the foreground process group of its control terminal. • **<**—The process has raised CPU scheduling priority. • **>**—The process has specified a soft limit on memory requirements and is currently exceeding that limit; such a process is not swapped. • **A**—The process requested random page replacement. • **E**—The process is trying to exit. • **L**—The process has pages locked in core. • **N**—The process has reduced CPU scheduling priority. • **S**—The process requested first-in, first-out (FIFO) page replacement. • **s**—The process is a session leader. • **V**—The process is temporarily suspended. • **W**—The process is swapped out. • **X**—The process is being traced or debugged.	none **detail**
UID	User identifier.	**detail**
USERNAME	Process owner.	**extensive summary**
PPID	Parent process identifier.	**detail**
CPU	(D)—Short-term CPU usage. (E and S)—Raw (unweighted) CPU usage. The value of this field is used to sort the processes in the output.	**detail extensive summary**
RSS	Resident set size.	**detail**

Copyright © 2016, Juniper Networks, Inc.

Table 54: show system processes Output Fields *(continued)*

Field Name	Field Description	Level of Output
WCHAN	Symbolic name of the wait channel.	**detail**
STARTED	Local time when the process started running.	**detail**
PRI	Current priority of the process. A lower number indicates a higher priority.	**detail extensive summary**
NI or NICE	UNIX "niceness" value. A lower number indicates a higher priority.	**detail extensive summary**
SIZE	Total size of the process (text, data, and stack), in kilobytes.	**extensive summary**
RES	Current amount of program resident memory, in kilobytes. This is also known as RSS or Resident Set Size. The **RES** value includes shared library pages used by the process. Any amount of memory freed by the process might still be considered part of the **RES** value. Generally, the kernel delays the migrating of memory out of the **Inact** queue into the **Cache** or **Free** list unless there is a memory shortage. This can lead to large discrepancies between the values reported by the routing protocol process and the kernel, even after the routing protocol process has freed a large amount of memory.	**extensive summary**
STATE	Current state of the process (for example, **sleep**, **wait**, **run**, **idle**, **zombie**, or **stop**).	**extensive summary**
TIME	(S)—Number of system and user CPU seconds that the process has used. (None, D, and E)—Total amount of time that the command has been running.	**detail extensive summary**
WCPU	Weighted CPU usage.	**extensive summary**
COMMAND	Command that is currently running. (MX Series routers only) When you display the software processes for an MX Series Virtual Chassis, the **show system processes** command does not display information about the relayd process.	**detail extensive summary**
THR	Number of threads in the process	extensive

Sample Output

show system processes

```
user@host> show system processes
PID  TT  STAT      TIME COMMAND
    0  ??  DLs    0:00.70  (swapper)
    1  ??  Is     0:00.35 /sbin/init --
    2  ??  DL     0:00.00  (pagedaemon)
    3  ??  DL     0:00.00  (vmdaemon)
    4  ??  DL     0:42.37  (update)
    5  ??  DL     0:00.00  (if_jnx)
   80  ??  Ss     0:14.66 syslogd -s
```

```
   96  ??  Is     0:00.01 portmap
  128  ??  Is     0:02.70 cron
  173  ??  Is     0:02.24 /usr/local/sbin/sshd (sshd1)
  189  ??  S      0:03.80 /sbin/watchdog -t180
  190  ??  I      0:00.03 /usr/sbin/tnetd -N
  191  ??  S      2:24.76 /sbin/ifd -N
  192  ??  S<     0:55.44 /usr/sbin/xntpd -N
  195  ??  S      0:53.11 /usr/sbin/snmpd -N
  196  ??  S      1:15.73 /usr/sbin/mib2d -N
  198  ??  I      0:00.75 /usr/sbin/inetd -N
 2677  ??  I      0:00.01 /usr/sbin/mgd -N
 2712  ??  Ss     0:00.24 rlogind
 2735  ??  R      0:00.00 /bin/ps -ax
 1985  p0- S      0:07.41 ./rpd -N
 2713  p0  Is     0:00.24 -tcsh (tcsh)
 2726  p0  S+     0:00.07 cli
```

show system processes brief

```
user@host> show system processes brief
last pid:   543;  load averages:  0.00,  0.00,  0.00    18:29:47
37 processes:  1 running, 36 sleeping

Mem: 25M Active, 3976K Inact, 19M Wired, 8346K Buf, 202M Free
Swap: 528M Total, 64K Used, 528M Free
```

show system processes detail

```
user@host> show system processes detail
PID   UID  PPID CPU PRI NI  RSS WCHAN  STARTED   TT  STAT      TIME COMMAND
 3151  1049  3129   2  28  0  672 -       1:13PM   p0  R+     0:00.00 ps -ax -r
    1     0     0   0  10  0  376 wait    1:51PM   ??  Is     0:00.29 /sbin/ini
    2     0     0   0 -18  0   12 psleep  1:51PM   ??  DL     0:00.00  (pagedae
    3     0     0   0  28  0   12 psleep  1:51PM   ??  DL     0:00.00  (vmdaemo
    4     0     0   0  28  0   12 update  1:51PM   ??  DL     0:07.15  (update)
    5     0     0   0   2  0   12 pfesel  1:51PM   ??  IL     0:02.90  (if_pfe)
   27     0     1   0  10  0 17936 mfsidl  1:51PM  ??  Is     0:00.46 mfs /dev/
   81     0     1   0   2  0  496 select  1:52PM   ??  Ss     0:31.21 syslogd -
  119     1     1   0   2  0  492 select  1:52PM   ??  Is     0:00.00 portmap
  134     0     1   0   2  0  580 select  1:52PM   ??  S      0:02.95 amd -p -a
  151     0     1   0  18  0  532 pause   1:52PM   ??  Is     0:00.34 cron
  183     0     1   0   2  0  420 select  1:52PM   ??  Ss     0:00.07 /usr/loca
  206     0     1   0  18  0   72 pause   1:52PM   ??  S      0:00.51 /sbin/wat
  207     0     1   0   2  0  520 select  1:52PM   ??  I      0:00.16 /usr/sbin
  208     0     1   0   2  0  536 select  1:52PM   ??  S      0:08.21 /sbin/dcd
  210     0     1 255   2 -12  740 select  1:52PM  ??  S<     0:05.83 /usr/sbin
  211     0     1   0   2  0  376 select  1:52PM   ??  S      0:00.03 /usr/sbin
  215     0     1   0   2  0  548 select  1:52PM   ??  I      0:00.50 /usr/sbin
  219     0     1   0   3  0  540 ttyin   1:52PM   v0  Is+    0:00.02 /usr/libe
  220     0     1   0   3  0  540 ttyin   1:52PM   v1  Is+    0:00.01 /usr/libe
  221     0     1   0   3  0  540 ttyin   1:52PM   v2  Is+    0:00.01 /usr/libe
  222     0     1   0   3  0  540 ttyin   1:52PM   v3  Is+    0:00.01 /usr/libe
  735     0     1   0   2  0  468 select  2:47PM   ??  S      0:19.14 /usr/sbin
  736     0     1   0   2  0  212 select  2:47PM   ??  S      0:14.13 /usr/sbin
 1380     0     1   0   3  0  888 ttyin   7:32PM   d0  Is+    0:00.46 bash
 3019     0   207   0   2  0  636 select 10:49AM   ??  Ss     0:02.93 tnp.chass
 3122     0  1380   0   2  0 1764 select 12:33PM   d0  S      0:00.77 ./rpd -N
 3128     0   215   0   2  0  580 select 12:45PM   ??  Ss     0:00.12 rlogind
 3129  1049  3128   0  18  0  944 pause  12:45PM   p0  Ss     0:00.14 -tcsh (tc
    0     0     0   0 -18  0    0 sched   1:51PM   ??  DLs    0:00.10  (swapper
```


Copyright © 2016, Juniper Networks, Inc.

show system processes extensive

```
user@host> show system processes extensive
Mem: 241M Active, 99M Inact, 78M Wired, 325M Cache, 69M Buf, 1251M Free
Swap: 2048M Total, 2048M Free


  PID USERNAME  THR PRI NICE   SIZE    RES STATE    TIME   WCPU COMMAND
   11 root        1 171   52     0K    12K RUN    807.5H 98.73% idle
   13 root        1 -20 -139     0K    12K WAIT    36:17  0.00% swi7: clock sio
 1499 root        1  96    0  7212K  3040K select  34:01  0.00% license-check
 1621 root        1  96    0 20968K 11216K select  20:25  0.00% mib2d
 1465 root        2   8  -88   115M 11748K nanslp  14:32  0.00% chassisd
 1478 root        1  96    0  6336K  3816K select  11:28  0.00% ppmd
   20 root        1 -68 -187     0K    12K WAIT    10:28  0.00% irq10: em0 em1+++*

 1490 root        1  96    0 11792K  4336K select   9:44  0.00% shm-rtsdbd
 1618 root        1  96    0 39584K  7464K select   8:47  0.00% pfed
 1622 root        1  96    0 15268K 10988K select   6:16  0.00% snmpd
 1466 root        1  96    0  7408K  2896K select   5:44  0.00% alarmd
    7 root        1 -16    0     0K    12K client   5:09  0.00% ifstate notify
 1480 root        1  96    0  5388K  2660K select   4:29  0.00% ksyncd
   12 root        1 -40 -159     0K    12K WAIT     4:15  0.00% swi2: netisr 0
 1462 root        1  96    0  1836K  1240K select   3:57  0.00% bslockd
   55 root        1 -16    0     0K    12K -        3:44  0.00% schedcpu
 1392 root        1  16    0     0K    12K bcmsem   3:37  0.00% bcmLINK.0
   47 root        1 -16    0     0K    12K psleep   3:25  0.00% vmkmemdaemon
   36 root        1  20    0     0K    12K syncer   2:46  0.00% syncer
 1484 root        1  96    0  7484K  3428K select   2:38  0.00% clksyncd
 1616 root        1  96    0  4848K  2848K select   2:18  0.00% irsd
 1487 root        1  96    0 32800K  6992K select   2:10  0.00% smid
 1623 root        1  96    0 34616K  5464K select   2:01  0.00% dcd
   15 root        1 -16    0     0K    12K -        1:59  0.00% yarrow
   49 root        1 -16    0     0K    12K .        1:51  0.00% ddostasks
```

show system processes extensive (EX9200 Switch)

```
user@switch> show system processes extensive
last pid:  3372;  load averages:  0.02,  0.02,  0.00  up 0+01:42:22    16:39:57
151 processes: 4 running, 131 sleeping, 1 zombie, 15 waiting

Mem: 935M Active, 122M Inact, 108M Wired, 838M Cache, 214M Buf, 5872M Free
Swap: 8192M Total, 8192M Free

 PID USERNAME  THR PRI NICE   SIZE    RES STATE    TIME   WCPU COMMAND
  10 root        1 171   52     0K    16K RUN     96:34 92.19% idle
3317 root        1  97    0 40412K 30944K select   0:00  5.13% mgd
3316 root        1  96    0 26672K 20516K select   0:00  3.08% cli
1626 root        2   8  -88   124M 20332K nanslp   3:19  2.39% chassisd
 260 root        1  -8    0     0K    16K mdwait   0:16  0.00% md16
  19 root        1 -68 -187     0K    16K WAIT     0:12  0.00% irq11: em0 em1
em2*
1642 root        1  96    0  8052K  3936K RUN      0:10  0.00% clksyncd
  11 root        1 -20 -139     0K    16K WAIT     0:07  0.00% swi7: clock sio
 154 root        1  -8    0     0K    16K mdwait   0:06  0.00% md8
1784 root        1  96    0    98M 33720K select   0:05  0.00% authd
1646 root        1  96    0  7776K  2944K select   0:03  0.00% license-check
1807 root        1  96    0 41340K  9944K select   0:02  0.00% mib2d

[...Output truncated...]
```

show system processes host processes (OCX1100 Switch)

```
user@switch> show system processes host processes
fpc0:
--------------------------------------------------------------------------
top - 14:14:32 up  2:05,  0 users,  load average: 0.11, 0.39, 0.39
Tasks: 101 total,   1 running,  98 sleeping,   0 stopped,   2 zombie
Cpu(s):  3.1%us,  2.2%sy,  0.0%ni, 94.2%id,  0.4%wa,  0.0%hi,  0.0%si,  0.0%st
Mem:   3881300k total,  2667040k used,  1214260k free,    53232k buffers
Swap:    15620k total,        0k used,    15620k free,   808492k cached

  PID USER      PR  NI  VIRT  RES  SHR S %CPU %MEM    TIME+  COMMAND
 2780 root      20   0 1860m 1.5g 3780 S   14 41.7  20:56.05 kvm
 1482 bind      20   0 24676 5912 1944 S    2  0.2   0:00.07 named
 4631 root      20   0  648m  94m  13m S    2  2.5   4:19.59 dcpfe
 9230 root      20   0 15208 1092  832 R    2  0.0   0:00.01 top
    1 root      20   0  4216  660  576 S    0  0.0   2:09.61 init
    2 root      20   0     0    0    0 S    0  0.0   0:00.00 kthreadd
    3 root      20   0     0    0    0 S    0  0.0   0:00.21 ksoftirqd/0
    4 root      20   0     0    0    0 S    0  0.0   0:00.00 kworker/0:0
    5 root       0 -20     0    0    0 S    0  0.0   0:00.00 kworker/0:0H
    7 root      RT   0     0    0    0 S    0  0.0   0:00.52 migration/0
    8 root      20   0     0    0    0 S    0  0.0   0:04.36 rcu_preempt
    9 root      20   0     0    0    0 S    0  0.0   0:00.00 rcu_bh
   10 root      20   0     0    0    0 S    0  0.0   0:00.00 rcu_sched
   11 root      RT   0     0    0    0 S    0  0.0   0:00.53 migration/1

[...Output truncated...]
```

show system processes lcc wide (TX Matrix Routing Matrix)

```
user@host> show system processes lcc 2 wide
lcc2-re0:
--------------------------------------------------------------------------
  PID  TT  STAT      TIME COMMAND
    0  ??  DLs    0:00.00  (swapper)
    1  ??  ILs    0:00.10 /sbin/preinit -- (init)
    2  ??  DL     0:00.00  (pagedaemon)
    3  ??  DL     0:00.00  (vmdaemon)
    4  ??  DL     0:00.00  (bufdaemon)
    5  ??  DL     0:00.04  (syncer)
    6  ??  DL     0:00.00  (netdaemon)
    7  ??  IL     0:00.00  (if_pic_listen)
    8  ??  IL     0:00.00  (scs_housekeeping)
    9  ??  IL     0:00.00  (if_pfe_listen)
   10  ??  DL     0:00.00  (vmuncachedaemon)
   11  ??  SL     0:00.02  (cb_poll)
  172  ??  ILs    0:00.21 mfs -o noauto /dev/ad1s1b /tmp (newfs)
 2909  ??  Is     0:00.00 pccardd
 2932  ??  Ss     0:00.07 syslogd -r -s
 3039  ??  Is     0:00.00 cron
 3217  ??  I      0:00.00 /sbin/watchdog -d
 3218  ??  I      0:00.02 /usr/sbin/tnetd -N
 3221  ??  S      0:00.11 /usr/sbin/alarmd -N
 3222  ??  S      0:00.85 /usr/sbin/craftd -N
 3223  ??  S      0:00.05 /usr/sbin/mgd -N
 3224  ??  I      0:00.02 /usr/sbin/inetd -N
 3225  ??  I      0:00.00 /usr/sbin/tnp.sntpd -N
 3226  ??  I      0:00.01 /usr/sbin/tnp.sntpc -N
 3228  ??  I      0:00.01 /usr/sbin/smartd -N
 3231  ??  I      0:00.01 /usr/sbin/eccd -N
```


Copyright © 2016, Juniper Networks, Inc.

```
 3425  ??  S      0:00.09 /usr/sbin/dfwd -N
 3426  ??  S      0:00.19 /sbin/dcd -N
 3427  ??  I      0:00.04 /usr/sbin/pfed -N
 3430  ??  S      0:00.10 /usr/sbin/ksyncd -N
 3482  ??  S      1:53.63 /usr/sbin/chassisd -N
 4285  ??  SL     0:00.01  (peer proxy)
 4286  ??  SL     0:00.00  (peer proxy)
 4303  ??  Ss     0:00.00 mgd: (mgd) (root) (mgd)
 4304  ??  R      0:00.00 /bin/ps -ax -ww
 3270  d0  Is+    0:00.00 /usr/libexec/getty std.9600 ttyd0
```

show system processes summary

```
user@host> show system processes summary
last pid:   543;  load averages:  0.00,  0.00,  0.00    18:29:47
37 processes:  1 running, 36 sleeping

Mem: 25M Active, 3976K Inact, 19M Wired, 8346K Buf, 202M Free
Swap: 528M Total, 64K Used, 528M Free

  PID USERNAME PRI NICE SIZE    RES STATE    TIME   WCPU    CPU COMMAND
  527 root      2   0   176K   580K select   0:00  0.04%  0.04% rlogind
  543 root     30   0   604K   768K RUN      0:00  0.00%  0.00% top
```

show system processes (TX Matrix Plus Router)

```
user@host> show system processes
sfc0-re0:
--------------------------------------------------------------------------
  PID  TT  STAT      TIME COMMAND
    0  ??  WLs    0:00.00 [swapper]
    1  ??  ILs    0:00.18 /packages/mnt/jbase/sbin/init --
    2  ??  DL     0:00.20 [g_event]
    3  ??  DL     0:00.39 [g_up]
    4  ??  DL     0:00.32 [g_down]
    5  ??  DL     0:00.00 [thread taskq]
    6  ??  DL     0:00.09 [kqueue taskq]
    7  ??  DL     0:00.01 [pagedaemon]
    8  ??  DL     0:00.00 [vmdaemon]
    9  ??  DL     0:06.63 [pagezero]
   10  ??  DL     0:00.00 [ktrace]
   11  ??  RL   310:52.98 [idle]
   12  ??  WL     0:11.03 [swi2: net]
   13  ??  WL     0:27.58 [swi7: clock sio]
   14  ??  WL     0:00.00 [swi6: vm]
   15  ??  DL     0:03.02 [yarrow]
   16  ??  WL     0:00.00 [swi9: +]
   17  ??  WL     0:00.00 [swi8: +]
   18  ??  WL     0:00.00 [swi5: cambio]
   19  ??  WL     0:00.00 [swi9: task queue]
   20  ??  WL     0:11.41 [irq16: uhci0 uhci*]
   21  ??  DL     0:00.00 [usb0]
   22  ??  DL     0:00.00 [usbtask]
   23  ??  WL     0:39.51 [irq17: uhci1 uhci*]
   24  ??  DL     0:00.00 [usb1]
   25  ??  WL     0:00.00 [irq18: uhci2 uhci*]
   26  ??  DL     0:00.83 [usb2]
   27  ??  DL     0:00.00 [usb3]
   28  ??  DL     0:00.00 [usb4]
   29  ??  DL     0:00.00 [usb5]
   30  ??  DL     0:00.73 [usb6]
```

```
   31  ??  DL     0:00.00 [usb7]
   32  ??  WL     0:00.00 [irq14: ata0]
   33  ??  WL     0:00.00 [irq15: ata1]
   34  ??  WL     0:00.00 [irq1: atkbd0]
   35  ??  WL     0:00.00 [swi0: sio]
   36  ??  WL     0:00.00 [irq11: isab0]
   37  ??  WL     0:00.00 [swi3: ip6opt ipopt]
   38  ??  WL     0:00.00 [swi4: ip6mismatch+]
   39  ??  WL     0:00.00 [swi1: ipfwd]
   40  ??  DL     0:00.02 [bufdaemon]
   41  ??  DL     0:00.02 [vnlru]
   42  ??  DL     0:00.39 [syncer]
   43  ??  DL     0:00.05 [softdepflush]
   44  ??  DL     0:00.00 [netdaemon]
   45  ??  DL     0:00.02 [vmuncachedaemon]
   46  ??  DL     0:00.00 [if_pic_listen]
   47  ??  DL     0:00.35 [vmkmemdaemon]
   48  ??  DL     0:00.00 [cb_poll]
   49  ??  DL     0:00.06 [if_pfe_listen]
   50  ??  DL     0:00.00 [scs_housekeeping]
   51  ??  IL     0:00.00 [kern_dump_proc]
   52  ??  IL     0:00.00 [nfsiod 0]
   53  ??  IL     0:00.00 [nfsiod 1]
   54  ??  IL     0:00.00 [nfsiod 2]
   55  ??  IL     0:00.00 [nfsiod 3]
   56  ??  DL     0:00.37 [schedcpu]
   57  ??  DL     0:00.56 [md0]
   79  ??  DL     0:02.58 [md1]
  100  ??  DL     0:00.03 [md2]
  118  ??  DL     0:00.01 [md3]
  139  ??  DL     0:00.95 [md4]
  160  ??  DL     0:00.12 [md5]
  181  ??  DL     0:00.00 [md6]
  217  ??  DL     0:00.02 [md7]
  227  ??  DL     0:00.05 [md8]
 1341  ??  SL     0:01.34 [bcmTX]
 1342  ??  SL     0:01.68 [bcmXGS3AsyncTX]
 1343  ??  SL     0:41.40 [bcmLINK.0]
 1345  ??  SL     0:33.83 [bcmLINK.1]
 1350  ??  Is     0:00.01 /usr/sbin/cron
 1502  ??  S      0:00.01 /sbin/watchdog -t-1
 1503  ??  S      0:00.86 /usr/libexec/bslockd -mp -N
 1504  ??  S      0:00.01 /usr/sbin/tnetd -N
 1507  ??  S      0:01.32 /usr/sbin/alarmd -N
 1508  ??  S      0:14.54 /usr/sbin/craftd -N
 1509  ??  S      0:01.19 /usr/sbin/mgd -N
 1512  ??  I      0:00.05 /usr/sbin/inetd -N
 1513  ??  S      0:00.10 /usr/sbin/tnp.sntpd -N
 1517  ??  S      0:00.11 /usr/sbin/smartd -N
 1525  ??  S      0:01.10 /usr/sbin/idpd -N
 1526  ??  S      0:01.43 /usr/sbin/license-check -U -M -p 10 -i 10
 1527  ??  I      0:00.01 /usr/libexec/getty Pc ttyv0
 1616  ??  DL     0:00.30 [peer proxy]
 1617  ??  DL     0:00.32 [peer proxy]
 1618  ??  DL     0:00.34 [peer proxy]
 1619  ??  DL     0:00.30 [peer proxy]
 2391  ??  Is     0:00.01 telnetd
 7331  ??  Ss     0:00.03 telnetd
 9538  ??  DL     0:01.16 [jsr_kkcm]
 9613  ??  DL     0:00.18 [peer proxy]
23781  ??  Ss     0:00.01 telnetd
```


Copyright © 2016, Juniper Networks, Inc.

```
23926  ??  Ss     0:00.01 mgd: (mgd) (user)/dev/ttyp2 (mgd)
36867  ??  S      0:03.14 /usr/sbin/rpd -N
36874  ??  S      0:00.08 /usr/sbin/lmpd
36876  ??  S      0:00.17 /usr/sbin/lacpd -N
36877  ??  S      0:00.15 /usr/sbin/bfdd -N
36878  ??  S      0:05.05 /usr/sbin/ppmd -N
36907  ??  S      0:25.07 /usr/sbin/chassisd -N
37775  ??  S      0:00.01 /usr/sbin/bdbrepd -N
45727  ??  S      0:00.02 /usr/sbin/xntpd -j -N -g (ntpd)
45729  ??  S      0:00.38 /usr/sbin/l2ald -N
45730  ??  S<     0:00.12 /usr/sbin/apsd -N
45731  ??  SN     0:00.10 /usr/sbin/sampled -N
45732  ??  S      0:00.03 /usr/sbin/ilmid -N
45733  ??  S      0:00.09 /usr/sbin/rmopd -N
45734  ??  S      0:00.30 /usr/sbin/cosd
45735  ??  I      0:00.00 /usr/sbin/rtspd -N
45736  ??  S      0:00.06 /usr/sbin/fsad -N
45737  ??  S      0:00.05 /usr/sbin/rdd -N
45738  ??  S      0:00.10 /usr/sbin/pppd -N
45739  ??  S      0:00.05 /usr/sbin/dfcd -N
45740  ??  S      0:00.07 /usr/sbin/lfmd -N
45741  ??  S      0:00.01 /usr/sbin/mplsoamd -N
45742  ??  I      0:00.01 /usr/sbin/sendd -N
45743  ??  S      0:00.08 /usr/sbin/appidd -N
45744  ??  S      0:00.05 /usr/sbin/mspd -N
45745  ??  S      0:00.25 /usr/sbin/jdiameterd -N
45746  ??  S      0:00.10 /usr/sbin/pfed -N
45747  ??  S      0:00.19 /usr/sbin/lpdfd -N
45748  ??  S      0:00.63 /sbin/dcd -N
45750  ??  S      0:00.45 /usr/sbin/mib2d -N
45751  ??  S      0:00.15 /usr/sbin/dfwd -N
45752  ??  S      0:00.15 /usr/sbin/irsd -N
45764  ??  S      0:20.59 /usr/sbin/snmpd -N
56479  ??  Ss     0:00.00 mgd: (mgd) (root) (mgd)
56480  ??  R      0:00.00 /bin/ps -ax
 1142  d0- I      0:00.01 /usr/sbin/usbd -N
 1160  d0- S      0:29.17 /usr/sbin/eventd -N -r -s -A
 6527  d0  Is+    0:00.00 /usr/libexec/getty std.9600 ttyd0
 2392  p1  Is     0:00.00 login [pam] (login)
 2393  p1  I      0:00.00 -csh (csh)
 2394  p1  I      0:00.00 su -
 2395  p1  I+     0:00.01 -su (csh)
23782  p2  Is     0:00.00 login [pam] (login)
23881  p2  I      0:00.00 -csh (csh)
23925  p2  S+     0:00.03 cli
 7332  p3  Is     0:00.00 login [pam] (login)
 7333  p3  I      0:00.00 -csh (csh)
23780  p3  S+     0:00.02 telnet aj

lcc0-re0:
--------------------------------------------------------------------------
  PID  TT  STAT      TIME COMMAND
    0  ??  WLs    0:00.00 [swapper]
    1  ??  ILs    0:00.16 /packages/mnt/jbase/sbin/init --
    2  ??  DL     0:00.01 [g_event]
    3  ??  DL     0:00.16 [g_up]
    4  ??  DL     0:00.11 [g_down]
    5  ??  DL     0:00.00 [thread taskq]
    6  ??  DL     0:00.00 [kqueue taskq]
    7  ??  DL     0:00.00 [pagedaemon]
    8  ??  DL     0:00.00 [vmdaemon]
```

```
    9  ??  DL     0:01.77 [pagezero]
   10  ??  DL     0:00.00 [ktrace]
   11  ??  RL    17:22.31 [idle]
   12  ??  WL     0:00.32 [swi2: net]
   13  ??  WL     0:01.21 [swi7: clock sio]
   14  ??  WL     0:00.00 [swi6: vm]
   15  ??  DL     0:00.10 [yarrow]
   16  ??  WL     0:00.00 [swi9: +]
   17  ??  WL     0:00.00 [swi8: +]
   18  ??  WL     0:00.00 [swi5: cambio]
   19  ??  WL     0:00.00 [swi9: task queue]
   20  ??  WL     0:02.73 [irq10: bcm0 uhci1*]
   21  ??  WL     0:00.02 [irq11: cb0 uhci0+*]
   22  ??  DL     0:00.00 [usb0]
   23  ??  DL     0:00.00 [usbtask]
   24  ??  DL     0:00.00 [usb1]
   25  ??  DL     0:00.05 [usb2]
   26  ??  DL     0:00.00 [usb3]
   27  ??  DL     0:00.00 [usb4]
   28  ??  DL     0:00.00 [usb5]
   29  ??  DL     0:00.04 [usb6]
   30  ??  DL     0:00.00 [usb7]
   31  ??  WL     0:00.00 [irq14: ata0]
   32  ??  WL     0:00.00 [irq15: ata1]
   33  ??  WL     0:00.00 [irq1: atkbd0]
   34  ??  WL     0:00.00 [swi0: sio]
   35  ??  WL     0:00.00 [swi3: ip6opt ipopt]
   36  ??  WL     0:00.00 [swi4: ip6mismatch+]
   37  ??  WL     0:00.00 [swi1: ipfwd]
   38  ??  DL     0:00.00 [bufdaemon]
   39  ??  DL     0:00.00 [vnlru]
   40  ??  DL     0:00.01 [syncer]
   41  ??  DL     0:00.00 [softdepflush]
   42  ??  DL     0:00.00 [netdaemon]
   43  ??  DL     0:00.00 [vmuncachedaemon]
   44  ??  DL     0:00.00 [if_pic_listen]
   45  ??  DL     0:00.02 [vmkmemdaemon]
   46  ??  DL     0:00.01 [cb_poll]
   47  ??  DL     0:00.00 [if_pfe_listen]
   48  ??  DL     0:00.00 [scs_housekeeping]
   49  ??  IL     0:00.00 [kern_dump_proc]
   50  ??  IL     0:00.00 [nfsiod 0]
   51  ??  IL     0:00.00 [nfsiod 1]
   52  ??  IL     0:00.00 [nfsiod 2]
   53  ??  IL     0:00.00 [nfsiod 3]
   54  ??  DL     0:00.01 [schedcpu]
   55  ??  DL     0:00.73 [md0]
   77  ??  DL     0:03.54 [md1]
   98  ??  DL     0:00.37 [md2]
  116  ??  DL     0:00.02 [md3]
  137  ??  DL     0:00.56 [md4]
  158  ??  DL     0:00.15 [md5]
  179  ??  DL     0:00.00 [md6]
  215  ??  DL     0:00.03 [md7]
  225  ??  DL     0:00.03 [md8]
 1078  ??  DL     0:00.00 [jsr_kkcm]
 1363  ??  SL     0:00.09 [bcmTX]
 1364  ??  SL     0:00.10 [bcmXGS3AsyncTX]
 1365  ??  SL     0:03.08 [bcmLINK.0]
 1370  ??  Is     0:00.00 /usr/sbin/cron
 1522  ??  S      0:00.00 /sbin/watchdog -t-1
```


Copyright © 2016, Juniper Networks, Inc.

```
 1523  ??  S      0:00.05 /usr/libexec/bslockd -mp -N
 1524  ??  I      0:00.01 /usr/sbin/tnetd -N
 1526  ??  S      0:04.98 /usr/sbin/chassisd -N
 1527  ??  S      0:00.04 /usr/sbin/alarmd -N
 1528  ??  I      0:00.40 /usr/sbin/craftd -N
 1529  ??  S      0:00.08 /usr/sbin/mgd -N
 1532  ??  I      0:00.04 /usr/sbin/inetd -N
 1533  ??  I      0:00.00 /usr/sbin/tnp.sntpd -N
 1534  ??  I      0:00.00 /usr/sbin/tnp.sntpc -N
 1536  ??  S      0:00.01 /usr/sbin/smartd -N
 1540  ??  I      0:00.07 /usr/sbin/jcsd -N
 1541  ??  S      0:00.11 /usr/sbin/idpd -N
 1542  ??  I      0:00.00 /usr/libexec/getty Pc ttyv0
 2089  ??  DL     0:00.01 [peer proxy]
 2090  ??  DL     0:00.01 [peer proxy]
 2091  ??  DL     0:00.01 [peer proxy]
 2657  ??  S      0:00.02 /usr/sbin/dfwd -N
 2658  ??  S      0:00.02 /sbin/dcd -N
 2659  ??  S      0:00.05 /usr/sbin/snmpd -N
 2660  ??  S      0:00.01 /usr/sbin/mib2d -N
 2661  ??  S      0:00.01 /usr/sbin/pfed -N
 2662  ??  S      0:00.01 /usr/sbin/irsd -N
 2667  ??  S      0:00.13 /usr/sbin/ksyncd -N
 2690  ??  Ss     0:00.00 mgd: (mgd) (root) (mgd)
 2691  ??  R      0:00.00 /bin/ps -ax
 1164  d0- S      0:00.00 /usr/sbin/usbd -N
 1182  d0- S      0:00.34 /usr/sbin/eventd -N -r -s -A
 1543  d0  Is+    0:00.00 /usr/libexec/getty std.9600 ttyd0

lcc1-re0:
--------------------------------------------------------------------------
  PID  TT  STAT      TIME COMMAND
    0  ??  WLs    0:00.00 [swapper]
    1  ??  ILs    0:00.17 /packages/mnt/jbase/sbin/init --
    2  ??  DL     0:00.01 [g_event]
    3  ??  DL     0:00.16 [g_up]
    4  ??  DL     0:00.11 [g_down]
    5  ??  DL     0:00.00 [thread taskq]
    6  ??  DL     0:00.00 [kqueue taskq]
    7  ??  DL     0:00.00 [pagedaemon]
    8  ??  DL     0:00.00 [vmdaemon]
    9  ??  DL     0:01.77 [pagezero]
   10  ??  DL     0:00.00 [ktrace]
   11  ??  RL    17:22.83 [idle]
   12  ??  WL     0:00.35 [swi2: net]
   13  ??  WL     0:01.20 [swi7: clock sio]
   14  ??  WL     0:00.00 [swi6: vm]
   15  ??  DL     0:00.10 [yarrow]
   16  ??  WL     0:00.00 [swi9: +]
   17  ??  WL     0:00.00 [swi8: +]
   18  ??  WL     0:00.00 [swi5: cambio]
   19  ??  WL     0:00.00 [swi9: task queue]
   20  ??  WL     0:02.87 [irq10: bcm0 uhci1*]
   21  ??  WL     0:00.02 [irq11: cb0 uhci0+*]
   22  ??  DL     0:00.00 [usb0]
   23  ??  DL     0:00.00 [usbtask]
   24  ??  DL     0:00.00 [usb1]
   25  ??  DL     0:00.05 [usb2]
   26  ??  DL     0:00.00 [usb3]
   27  ??  DL     0:00.00 [usb4]
   28  ??  DL     0:00.00 [usb5]
```

```
   29  ??  DL     0:00.04 [usb6]
   30  ??  DL     0:00.00 [usb7]
   31  ??  WL     0:00.00 [irq14: ata0]
   32  ??  WL     0:00.00 [irq15: ata1]
   33  ??  WL     0:00.00 [irq1: atkbd0]
   34  ??  WL     0:00.00 [swi0: sio]
   35  ??  WL     0:00.00 [swi3: ip6opt ipopt]
   36  ??  WL     0:00.00 [swi4: ip6mismatch+]
   37  ??  WL     0:00.00 [swi1: ipfwd]
   38  ??  DL     0:00.00 [bufdaemon]
   39  ??  DL     0:00.00 [vnlru]
   40  ??  DL     0:00.01 [syncer]
   41  ??  DL     0:00.00 [softdepflush]
   42  ??  DL     0:00.00 [netdaemon]
   43  ??  DL     0:00.00 [vmuncachedaemon]
   44  ??  DL     0:00.00 [if_pic_listen]
   45  ??  DL     0:00.02 [vmkmemdaemon]
   46  ??  DL     0:00.01 [cb_poll]
   47  ??  DL     0:00.00 [if_pfe_listen]
   48  ??  DL     0:00.00 [scs_housekeeping]
   49  ??  IL     0:00.00 [kern_dump_proc]
   50  ??  IL     0:00.00 [nfsiod 0]
   51  ??  IL     0:00.00 [nfsiod 1]
   52  ??  IL     0:00.00 [nfsiod 2]
   53  ??  IL     0:00.00 [nfsiod 3]
   54  ??  DL     0:00.02 [schedcpu]
   55  ??  DL     0:00.75 [md0]
   77  ??  DL     0:03.40 [md1]
   98  ??  DL     0:00.37 [md2]
  116  ??  DL     0:00.02 [md3]
  137  ??  DL     0:00.56 [md4]
  158  ??  DL     0:00.15 [md5]
  179  ??  DL     0:00.00 [md6]
  215  ??  DL     0:00.03 [md7]
  225  ??  DL     0:00.03 [md8]
 1052  ??  DL     0:00.00 [jsr_kkcm]
 1337  ??  SL     0:00.09 [bcmTX]
 1338  ??  SL     0:00.10 [bcmXGS3AsyncTX]
 1339  ??  SL     0:03.10 [bcmLINK.0]
 1344  ??  Is     0:00.00 /usr/sbin/cron
 1496  ??  S      0:00.00 /sbin/watchdog -t-1
 1497  ??  S      0:00.05 /usr/libexec/bslockd -mp -N
 1498  ??  I      0:00.01 /usr/sbin/tnetd -N
 1500  ??  S      0:04.97 /usr/sbin/chassisd -N
 1501  ??  S      0:00.04 /usr/sbin/alarmd -N
 1502  ??  I      0:00.40 /usr/sbin/craftd -N
 1503  ??  S      0:00.08 /usr/sbin/mgd -N
 1506  ??  I      0:00.04 /usr/sbin/inetd -N
 1507  ??  I      0:00.00 /usr/sbin/tnp.sntpd -N
 1508  ??  I      0:00.00 /usr/sbin/tnp.sntpc -N
 1510  ??  S      0:00.01 /usr/sbin/smartd -N
 1514  ??  I      0:00.07 /usr/sbin/jcsd -N
 1515  ??  S      0:00.18 /usr/sbin/idpd -N
 1516  ??  I      0:00.00 /usr/libexec/getty Pc ttyv0
 2068  ??  DL     0:00.01 [peer proxy]
 2069  ??  DL     0:00.01 [peer proxy]
 2070  ??  DL     0:00.01 [peer proxy]
 2666  ??  S      0:00.02 /sbin/dcd -N
 2667  ??  S      0:00.01 /usr/sbin/irsd -N
 2668  ??  S      0:00.01 /usr/sbin/pfed -N
 2669  ??  S      0:00.05 /usr/sbin/snmpd -N
```


Copyright © 2016, Juniper Networks, Inc.

```
 2670  ??  S      0:00.01 /usr/sbin/mib2d -N
 2671  ??  S      0:00.02 /usr/sbin/dfwd -N
 2675  ??  S      0:00.13 /usr/sbin/ksyncd -N
 2699  ??  Ss     0:00.00 mgd: (mgd) (root) (mgd)
 2700  ??  R      0:00.00 /bin/ps -ax
 1138  d0- S      0:00.00 /usr/sbin/usbd -N
 1156  d0- S      0:00.37 /usr/sbin/eventd -N -r -s -A
 1517  d0  Is+    0:00.00 /usr/libexec/getty std.9600 ttyd0

lcc2-re0:
--------------------------------------------------------------------------
  PID  TT  STAT      TIME COMMAND
    0  ??  WLs    0:00.00 [swapper]
    1  ??  ILs    0:00.18 /packages/mnt/jbase/sbin/init --
    2  ??  DL     0:00.01 [g_event]
    3  ??  DL     0:00.17 [g_up]
    4  ??  DL     0:00.12 [g_down]
    5  ??  DL     0:00.00 [thread taskq]
    6  ??  DL     0:00.00 [kqueue taskq]
    7  ??  DL     0:00.00 [pagedaemon]
    8  ??  DL     0:00.00 [vmdaemon]
    9  ??  DL     0:01.77 [pagezero]
   10  ??  DL     0:00.00 [ktrace]
   11  ??  RL    17:19.13 [idle]
   12  ??  WL     0:00.36 [swi2: net]
   13  ??  WL     0:01.20 [swi7: clock sio]
   14  ??  WL     0:00.00 [swi6: vm]
   15  ??  DL     0:00.13 [yarrow]
   16  ??  WL     0:00.00 [swi9: +]
   17  ??  WL     0:00.00 [swi8: +]
   18  ??  WL     0:00.00 [swi5: cambio]
   19  ??  WL     0:00.00 [swi9: task queue]
   20  ??  WL     0:03.03 [irq10: bcm0 uhci1*]
   21  ??  WL     0:00.02 [irq11: cb0 uhci0+*]
   22  ??  DL     0:00.00 [usb0]
   23  ??  DL     0:00.00 [usbtask]
   24  ??  DL     0:00.00 [usb1]
   25  ??  DL     0:00.05 [usb2]
   26  ??  DL     0:00.00 [usb3]
   27  ??  DL     0:00.00 [usb4]
   28  ??  DL     0:00.00 [usb5]
   29  ??  DL     0:00.04 [usb6]
   30  ??  DL     0:00.00 [usb7]
   31  ??  WL     0:00.00 [irq14: ata0]
   32  ??  WL     0:00.00 [irq15: ata1]
   33  ??  WL     0:00.00 [irq1: atkbd0]
   34  ??  WL     0:00.00 [swi0: sio]
   35  ??  WL     0:00.00 [swi3: ip6opt ipopt]
   36  ??  WL     0:00.00 [swi4: ip6mismatch+]
   37  ??  WL     0:00.00 [swi1: ipfwd]
   38  ??  DL     0:00.00 [bufdaemon]
   39  ??  DL     0:00.00 [vnlru]
   40  ??  DL     0:00.01 [syncer]
   41  ??  DL     0:00.00 [softdepflush]
   42  ??  DL     0:00.00 [netdaemon]
   43  ??  DL     0:00.00 [vmuncachedaemon]
   44  ??  DL     0:00.00 [if_pic_listen]
   45  ??  DL     0:00.02 [vmkmemdaemon]
   46  ??  DL     0:00.01 [cb_poll]
   47  ??  DL     0:00.00 [if_pfe_listen]
   48  ??  DL     0:00.00 [scs_housekeeping]
```

```
   49  ??  IL     0:00.00 [kern_dump_proc]
   50  ??  IL     0:00.00 [nfsiod 0]
   51  ??  IL     0:00.00 [nfsiod 1]
   52  ??  IL     0:00.00 [nfsiod 2]
   53  ??  IL     0:00.00 [nfsiod 3]
   54  ??  DL     0:00.02 [schedcpu]
   55  ??  DL     0:00.75 [md0]
   77  ??  DL     0:03.48 [md1]
   98  ??  DL     0:00.59 [md2]
  116  ??  DL     0:00.02 [md3]
  137  ??  DL     0:00.56 [md4]
  158  ??  DL     0:00.15 [md5]
  179  ??  DL     0:00.00 [md6]
  215  ??  DL     0:00.03 [md7]
  225  ??  DL     0:00.03 [md8]
 1052  ??  DL     0:00.00 [jsr_kkcm]
 1337  ??  SL     0:00.09 [bcmTX]
 1338  ??  SL     0:00.10 [bcmXGS3AsyncTX]
 1339  ??  SL     0:03.22 [bcmLINK.0]
 1344  ??  Is     0:00.00 /usr/sbin/cron
 1496  ??  S      0:00.00 /sbin/watchdog -t-1
 1497  ??  S      0:00.05 /usr/libexec/bslockd -mp -N
 1498  ??  S      0:00.01 /usr/sbin/tnetd -N
 1500  ??  R      0:05.17 /usr/sbin/chassisd -N
 1501  ??  S      0:00.04 /usr/sbin/alarmd -N
 1502  ??  I      0:00.39 /usr/sbin/craftd -N
 1503  ??  S      0:00.08 /usr/sbin/mgd -N
 1506  ??  I      0:00.05 /usr/sbin/inetd -N
 1507  ??  I      0:00.00 /usr/sbin/tnp.sntpd -N
 1508  ??  I      0:00.00 /usr/sbin/tnp.sntpc -N
 1510  ??  S      0:00.01 /usr/sbin/smartd -N
 1514  ??  I      0:00.07 /usr/sbin/jcsd -N
 1515  ??  S      0:00.17 /usr/sbin/idpd -N
 1516  ??  I      0:00.00 /usr/libexec/getty Pc ttyv0
 2591  ??  DL     0:00.01 [peer proxy]
 2592  ??  DL     0:00.01 [peer proxy]
 2593  ??  DL     0:00.01 [peer proxy]
 2597  ??  DL     0:00.00 [peer proxy]
 3192  ??  S      0:00.01 /usr/sbin/irsd -N
 3193  ??  S      0:00.05 /usr/sbin/snmpd -N
 3194  ??  S      0:00.02 /sbin/dcd -N
 3195  ??  S      0:00.01 /usr/sbin/pfed -N
 3196  ??  S      0:00.01 /usr/sbin/mib2d -N
 3197  ??  S      0:00.02 /usr/sbin/dfwd -N
 3198  ??  S      0:00.13 /usr/sbin/ksyncd -N
 3228  ??  Ss     0:00.00 mgd: (mgd) (root) (mgd)
 3229  ??  R      0:00.00 /bin/ps -ax
 1138  d0- S      0:00.00 /usr/sbin/usbd -N
 1156  d0- S      0:00.42 /usr/sbin/eventd -N -r -s -A
 1517  d0  Is+    0:00.00 /usr/libexec/getty std.9600 ttyd0
...
```

show system processes sfc (TX Matrix Plus Router)

```
user@host> show system processes sfc 0
sfc0-re0:
--------------------------------------------------------------------------
  PID  TT  STAT      TIME COMMAND
    0  ??  WLs    0:00.00 [swapper]
    1  ??  SLs    0:00.18 /packages/mnt/jbase/sbin/init --
    2  ??  DL     0:00.20 [g_event]
```


Copyright © 2016, Juniper Networks, Inc.

```
  3  ??  DL     0:00.39 [g_up]
  4  ??  DL     0:00.32 [g_down]
  5  ??  DL     0:00.00 [thread taskq]
  6  ??  DL     0:00.09 [kqueue taskq]
  7  ??  DL     0:00.01 [pagedaemon]
  8  ??  DL     0:00.00 [vmdaemon]
  9  ??  DL     0:06.63 [pagezero]
 10  ??  DL     0:00.00 [ktrace]
 11  ??  RL   312:09.00 [idle]
 12  ??  WL     0:11.07 [swi2: net]
 13  ??  WL     0:27.70 [swi7: clock sio]
 14  ??  WL     0:00.00 [swi6: vm]
 15  ??  DL     0:03.03 [yarrow]
 16  ??  WL     0:00.00 [swi9: +]
 17  ??  WL     0:00.00 [swi8: +]
 18  ??  WL     0:00.00 [swi5: cambio]
 19  ??  WL     0:00.00 [swi9: task queue]
 20  ??  WL     0:11.46 [irq16: uhci0 uhci*]
 21  ??  DL     0:00.00 [usb0]
 22  ??  DL     0:00.00 [usbtask]
 23  ??  WL     0:39.63 [irq17: uhci1 uhci*]
 24  ??  DL     0:00.00 [usb1]
 25  ??  WL     0:00.00 [irq18: uhci2 uhci*]
 26  ??  DL     0:00.84 [usb2]
 27  ??  DL     0:00.00 [usb3]
 28  ??  DL     0:00.00 [usb4]
 29  ??  DL     0:00.00 [usb5]
 30  ??  DL     0:00.73 [usb6]
 31  ??  DL     0:00.00 [usb7]
 32  ??  WL     0:00.00 [irq14: ata0]
 33  ??  WL     0:00.00 [irq15: ata1]
 34  ??  WL     0:00.00 [irq1: atkbd0]
 35  ??  WL     0:00.00 [swi0: sio]
 36  ??  WL     0:00.00 [irq11: isab0]
 37  ??  WL     0:00.00 [swi3: ip6opt ipopt]
 38  ??  WL     0:00.00 [swi4: ip6mismatch+]
 39  ??  WL     0:00.00 [swi1: ipfwd]
 40  ??  DL     0:00.02 [bufdaemon]
 41  ??  DL     0:00.02 [vnlru]
 42  ??  DL     0:00.39 [syncer]
 43  ??  DL     0:00.05 [softdepflush]
 44  ??  DL     0:00.00 [netdaemon]
 45  ??  DL     0:00.02 [vmuncachedaemon]
 46  ??  DL     0:00.00 [if_pic_listen]
 47  ??  DL     0:00.35 [vmkmemdaemon]
 48  ??  DL     0:00.00 [cb_poll]
 49  ??  DL     0:00.06 [if_pfe_listen]
 50  ??  DL     0:00.00 [scs_housekeeping]
 51  ??  IL     0:00.00 [kern_dump_proc]
 52  ??  IL     0:00.00 [nfsiod 0]
 53  ??  IL     0:00.00 [nfsiod 1]
 54  ??  IL     0:00.00 [nfsiod 2]
 55  ??  IL     0:00.00 [nfsiod 3]
 56  ??  DL     0:00.37 [schedcpu]
 57  ??  DL     0:00.56 [md0]
 79  ??  DL     0:02.58 [md1]
100  ??  DL     0:00.03 [md2]
118  ??  DL     0:00.01 [md3]
139  ??  DL     0:00.95 [md4]
160  ??  DL     0:00.12 [md5]
181  ??  DL     0:00.00 [md6]
```

```
  217  ??  DL     0:00.02 [md7]
  227  ??  DL     0:00.05 [md8]
 1341  ??  SL     0:01.35 [bcmTX]
 1342  ??  SL     0:01.69 [bcmXGS3AsyncTX]
 1343  ??  SL     0:41.57 [bcmLINK.0]
 1345  ??  SL     0:33.97 [bcmLINK.1]
 1350  ??  Is     0:00.01 /usr/sbin/cron
 1502  ??  S      0:00.01 /sbin/watchdog -t-1
 1503  ??  S      0:00.86 /usr/libexec/bslockd -mp -N
 1504  ??  I      0:00.01 /usr/sbin/tnetd -N
 1507  ??  S      0:01.32 /usr/sbin/alarmd -N
 1508  ??  S      0:14.54 /usr/sbin/craftd -N
 1509  ??  S      0:01.20 /usr/sbin/mgd -N
 1512  ??  S      0:00.05 /usr/sbin/inetd -N
 1513  ??  S      0:00.10 /usr/sbin/tnp.sntpd -N
 1517  ??  S      0:00.11 /usr/sbin/smartd -N
 1525  ??  S      0:01.11 /usr/sbin/idpd -N
 1526  ??  S      0:01.43 /usr/sbin/license-check -U -M -p 10 -i 10
 1527  ??  I      0:00.01 /usr/libexec/getty Pc ttyv0
 1616  ??  DL     0:00.30 [peer proxy]
 1617  ??  DL     0:00.32 [peer proxy]
 1618  ??  DL     0:00.34 [peer proxy]
 1619  ??  DL     0:00.30 [peer proxy]
 2391  ??  Is     0:00.01 telnetd
 7331  ??  Ss     0:00.03 telnetd
 9538  ??  DL     0:01.16 [jsr_kkcm]
 9613  ??  DL     0:00.18 [peer proxy]
23781  ??  Ss     0:00.01 telnetd
23926  ??  Ss     0:00.03 mgd: (mgd) (user)/dev/ttyp2 (mgd)
36867  ??  S      0:03.14 /usr/sbin/rpd -N
36874  ??  S      0:00.08 /usr/sbin/lmpd
36876  ??  S      0:00.17 /usr/sbin/lacpd -N
36877  ??  S      0:00.15 /usr/sbin/bfdd -N
36878  ??  S      0:05.05 /usr/sbin/ppmd -N
36907  ??  S      0:26.63 /usr/sbin/chassisd -N
37775  ??  S      0:00.01 /usr/sbin/bdbrepd -N
45727  ??  S      0:00.02 /usr/sbin/xntpd -j -N -g (ntpd)
45729  ??  S      0:00.40 /usr/sbin/l2ald -N
45730  ??  S<     0:00.13 /usr/sbin/apsd -N
45731  ??  SN     0:00.10 /usr/sbin/sampled -N
45732  ??  S      0:00.03 /usr/sbin/ilmid -N
45733  ??  S      0:00.09 /usr/sbin/rmopd -N
45734  ??  S      0:00.31 /usr/sbin/cosd
45735  ??  I      0:00.00 /usr/sbin/rtspd -N
45736  ??  S      0:00.06 /usr/sbin/fsad -N
45737  ??  S      0:00.05 /usr/sbin/rdd -N
45738  ??  S      0:00.10 /usr/sbin/pppd -N
45739  ??  S      0:00.05 /usr/sbin/dfcd -N
45740  ??  S      0:00.08 /usr/sbin/lfmd -N
45741  ??  S      0:00.01 /usr/sbin/mplsoamd -N
45742  ??  I      0:00.01 /usr/sbin/sendd -N
45743  ??  S      0:00.08 /usr/sbin/appidd -N
45744  ??  S      0:00.05 /usr/sbin/mspd -N
45745  ??  S      0:00.27 /usr/sbin/jdiameterd -N
45746  ??  S      0:00.10 /usr/sbin/pfed -N
45747  ??  S      0:00.19 /usr/sbin/lpdfd -N
45748  ??  S      0:00.64 /sbin/dcd -N
45750  ??  S      0:00.46 /usr/sbin/mib2d -N
45751  ??  S      0:00.16 /usr/sbin/dfwd -N
45752  ??  S      0:00.15 /usr/sbin/irsd -N
45764  ??  S      0:20.60 /usr/sbin/snmpd -N
```


Copyright © 2016, Juniper Networks, Inc.

```
56481  ??  Ss     0:00.02 telnetd
56548  ??  Rs     0:00.19 mgd: (mgd) (user)/dev/ttyp0 (mgd)
56577  ??  Ss     0:00.00 mgd: (mgd) (root) (mgd)
56578  ??  R      0:00.00 /bin/ps -ax
 1142  d0- S      0:00.01 /usr/sbin/usbd -N
 1160  d0- S      0:29.71 /usr/sbin/eventd -N -r -s -A
 6527  d0  Is+    0:00.00 /usr/libexec/getty std.9600 ttyd0
56482  p0  Is     0:00.00 login [pam] (login)
56483  p0  S      0:00.01 -csh (csh)
56547  p0  S+     0:00.02 cli
 2392  p1  Is     0:00.00 login [pam] (login)
 2393  p1  I      0:00.00 -csh (csh)
 2394  p1  I      0:00.00 su -
 2395  p1  I+     0:00.01 -su (csh)
23782  p2  Is     0:00.00 login [pam] (login)
23881  p2  I      0:00.00 -csh (csh)
23925  p2  S+     0:00.03 cli
 7332  p3  Is     0:00.00 login [pam] (login)
 7333  p3  I      0:00.00 -csh (csh)
23780  p3  S+     0:00.02 telnet aj
```

show system processes lcc wide (TX Matrix Plus Routing Matrix)

```
user@host> show system processes lcc 2 wide
lcc2-re0:
--------------------------------------------------------------------------
  PID  TT  STAT      TIME PROVIDER COMMAND
    0  ??  WLs    0:00.00 (null)   [swapper]
    1  ??  ILs    0:00.19          /packages/mnt/jbase/sbin/init --
    2  ??  DL     0:00.02          [g_event]
    3  ??  DL     0:00.19          [g_up]
    4  ??  DL     0:00.13          [g_down]
    5  ??  DL     0:00.00          [thread taskq]
    6  ??  DL     0:00.00          [kqueue taskq]
    7  ??  DL     0:00.00          [pagedaemon]
    8  ??  DL     0:00.00          [vmdaemon]
    9  ??  DL     0:01.77          [pagezero]
   10  ??  DL     0:00.00          [ktrace]
   11  ??  RL    20:33.81          [idle]
   12  ??  WL     0:00.38          [swi2: net]
   13  ??  WL     0:01.43          [swi7: clock sio]
   14  ??  WL     0:00.00          [swi6: vm]
   15  ??  DL     0:00.14          [yarrow]
   16  ??  WL     0:00.00          [swi9: +]
   17  ??  WL     0:00.00          [swi8: +]
   18  ??  WL     0:00.00          [swi5: cambio]
   19  ??  WL     0:00.00          [swi9: task queue]
   20  ??  WL     0:03.18          [irq10: bcm0 uhci1*]
   21  ??  WL     0:00.03          [irq11: cb0 uhci0+*]
   22  ??  DL     0:00.00          [usb0]
   23  ??  DL     0:00.00          [usbtask]
   24  ??  DL     0:00.00          [usb1]
   25  ??  DL     0:00.06          [usb2]
   26  ??  DL     0:00.00          [usb3]
   27  ??  DL     0:00.00          [usb4]
   28  ??  DL     0:00.00          [usb5]
   29  ??  DL     0:00.05          [usb6]
   30  ??  DL     0:00.00          [usb7]
   31  ??  WL     0:00.00          [irq14: ata0]
   32  ??  WL     0:00.00          [irq15: ata1]
   33  ??  WL     0:00.00          [irq1: atkbd0]
```

```
   34  ??  WL     0:00.00          [swi0: sio]
   35  ??  WL     0:00.00          [swi3: ip6opt ipopt]
   36  ??  WL     0:00.00          [swi4: ip6mismatch+]
   37  ??  WL     0:00.00          [swi1: ipfwd]
   38  ??  DL     0:00.00          [bufdaemon]
   39  ??  DL     0:00.00          [vnlru]
   40  ??  DL     0:00.02          [syncer]
   41  ??  DL     0:00.01          [softdepflush]
   42  ??  DL     0:00.00          [netdaemon]
   43  ??  DL     0:00.00          [vmuncachedaemon]
   44  ??  DL     0:00.00          [if_pic_listen]
   45  ??  DL     0:00.03          [vmkmemdaemon]
   46  ??  DL     0:00.01          [cb_poll]
   47  ??  DL     0:00.00          [if_pfe_listen]
   48  ??  DL     0:00.00          [scs_housekeeping]
   49  ??  IL     0:00.00          [kern_dump_proc]
   50  ??  IL     0:00.00          [nfsiod 0]
   51  ??  IL     0:00.00          [nfsiod 1]
   52  ??  IL     0:00.00          [nfsiod 2]
   53  ??  IL     0:00.00          [nfsiod 3]
   54  ??  DL     0:00.02          [schedcpu]
   55  ??  DL     0:00.75          [md0]
   77  ??  DL     0:03.84          [md1]
   98  ??  DL     0:00.59          [md2]
  116  ??  DL     0:00.02          [md3]
  137  ??  DL     0:00.72          [md4]
  158  ??  DL     0:00.15          [md5]
  179  ??  DL     0:00.00          [md6]
  215  ??  DL     0:00.03          [md7]
  225  ??  DL     0:00.03          [md8]
 1052  ??  DL     0:00.00          [jsr_kkcm]
 1337  ??  SL     0:00.11          [bcmTX]
 1338  ??  SL     0:00.12          [bcmXGS3AsyncTX]
 1339  ??  SL     0:03.82          [bcmLINK.0]
 1344  ??  Is     0:00.00          /usr/sbin/cron
 1496  ??  I      0:00.00          /sbin/watchdog -t-1
 1497  ??  S      0:00.06          /usr/libexec/bslockd -mp -N
 1498  ??  I      0:00.01          /usr/sbin/tnetd -N
 1500  ??  S      0:09.93          /usr/sbin/chassisd -N
 1501  ??  S      0:00.05          /usr/sbin/alarmd -N
 1502  ??  I      0:00.39          /usr/sbin/craftd -N
 1503  ??  S      0:00.09          /usr/sbin/mgd -N
 1506  ??  I      0:00.05          /usr/sbin/inetd -N
 1507  ??  I      0:00.00          /usr/sbin/tnp.sntpd -N
 1508  ??  I      0:00.00          /usr/sbin/tnp.sntpc -N
 1510  ??  S      0:00.01          /usr/sbin/smartd -N
 1514  ??  I      0:00.07          /usr/sbin/jcsd -N
 1515  ??  S      0:00.17          /usr/sbin/idpd -N
 1516  ??  I      0:00.00          /usr/libexec/getty Pc ttyv0
 2591  ??  DL     0:00.01          [peer proxy]
 2592  ??  DL     0:00.01          [peer proxy]
 2593  ??  DL     0:00.01          [peer proxy]
 2597  ??  DL     0:00.01          [peer proxy]
 3192  ??  S      0:00.02          /usr/sbin/irsd -N
 3193  ??  S      0:00.05          /usr/sbin/snmpd -N
 3194  ??  S      0:00.04          /sbin/dcd -N
 3195  ??  I      0:00.01          /usr/sbin/pfed -N
 3196  ??  S      0:00.02          /usr/sbin/mib2d -N
 3197  ??  I      0:00.03          /usr/sbin/dfwd -N
 3198  ??  S      0:00.15          /usr/sbin/ksyncd -N
 3559  ??  Ss     0:00.00          mgd: (mgd) (root) (mgd)
```


Copyright © 2016, Juniper Networks, Inc.

```
 3560  ??  R      0:00.00          /bin/ps -ax -Jpww
 1138  d0- S      0:00.00          /usr/sbin/usbd -N
 1156  d0- S      0:00.50          /usr/sbin/eventd -N -r -s -A
 1517  d0  Is+    0:00.00          /usr/libexec/getty std.9600 ttyd0
```

show system processes (QFX Series and OCX Series)

```
user@switch> show system processes
PID  TT  STAT      TIME COMMAND
    0  ??  WLs  -2341043:-31.01 [swapper]
    1  ??  SLs    0:01.34 /packages/mnt/jbase/sbin/init --
    2  ??  DL     2:48.31 [g_event]
    3  ??  DL     1:47.44 [g_up]
    4  ??  DL     1:37.82 [g_down]
    5  ??  DL     0:00.00 [kdm_tcp_poller]
    6  ??  DL     0:00.00 [thread taskq]
    7  ??  DL     0:04.86 [kqueue taskq]
    9  ??  DL     0:03.94 [pagedaemon]
   10  ??  DL     0:00.00 [ktrace]
   11  ??  RL     0:00.00 [idle: cpu31]
   12  ??  RL     0:00.00 [idle: cpu30]
   13  ??  RL     0:00.00 [idle: cpu29]
   14  ??  RL     0:00.00 [idle: cpu28]
   15  ??  RL     0:00.00 [idle: cpu27]
   16  ??  RL     0:00.00 [idle: cpu26]
   17  ??  RL     0:00.00 [idle: cpu25]
   18  ??  RL     0:00.00 [idle: cpu24]
   19  ??  RL     0:00.00 [idle: cpu23]
   20  ??  RL     0:00.00 [idle: cpu22]
   21  ??  RL     0:00.00 [idle: cpu21]
   22  ??  RL     0:00.00 [idle: cpu20]
   23  ??  RL     0:00.00 [idle: cpu19]
   24  ??  RL     0:00.00 [idle: cpu18]
   25  ??  RL     0:00.00 [idle: cpu17]
   26  ??  RL     0:00.00 [idle: cpu16]
   27  ??  RL     0:00.00 [idle: cpu15]
   28  ??  RL     0:00.00 [idle: cpu14]
   29  ??  RL     0:00.00 [idle: cpu13]
   30  ??  RL     0:00.00 [idle: cpu12]
   31  ??  RL     0:00.00 [idle: cpu11]
   32  ??  RL     0:00.00 [idle: cpu10]
   33  ??  RL     0:00.00 [idle: cpu9]
   34  ??  RL   18184:07.25 [idle: cpu8]
   35  ??  RL     0:00.00 [idle: cpu7]
   36  ??  RL   17862:11.31 [idle: cpu6]
   37  ??  RL   19343:45.16 [idle: cpu5]
   38  ??  RL   5192:38.30 [idle: cpu4]
   39  ??  RL     0:00.00 [idle: cpu3]
   40  ??  RL   19278:02.24 [idle: cpu2]
   41  ??  RL   19291:00.72 [idle: cpu1]
   42  ??  RL   18910:31.21 [idle: cpu0]
   43  ??  WL    19:03.74 [swi2: net]
   44  ??  WL   261:43.82 [swi7: clock sio]
   45  ??  WL     0:00.00 [swi6: vm]
   46  ??  DL     2:18.57 [yarrow]
   47  ??  WL     0:00.00 [swi9: +]
   48  ??  WL     0:00.00 [swi8: +]
   49  ??  WL     0:12.36 [swi5: cambio]
   50  ??  WL     0:00.00 [swi9: task queue]
   51  ??  WL     0:00.00 [swi0: sio]
   52  ??  WL     0:32.40 [irq39: ehci0]
```

```
 53  ??  DL     0:00.21 [usb0]
 54  ??  DL     0:00.00 [usbtask]
 55  ??  WL     0:00.00 [irq22: xlr_lbus0]
 56  ??  WL     0:00.00 [irq38: xlr_lbus0]
 57  ??  WL     0:00.00 [swi3: ip6opt ipopt]
 58  ??  WL     0:00.00 [swi4: ip6mismatch+]
 59  ??  WL     0:00.00 [swi1: ipfwd]
 60  ??  DL     0:18.65 [pagezero]
 61  ??  DL     0:18.59 [bufdaemon]
 62  ??  DL     1:10.44 [vnlru_mem]
 63  ??  DL     1:51.66 [syncer]
 64  ??  DL     0:20.22 [vnlru]
 65  ??  DL     0:40.48 [softdepflush]
 66  ??  DL     0:00.00 [netdaemon]
 67  ??  DL    20:47.67 [vmkmemdaemon]
 68  ??  DL     0:00.00 [if_pfe_listen]
 69  ??  SL     0:02.80 [kdm_checkkcore]
 70  ??  SL     0:03.34 [kdm_savekcore]
 71  ??  SL     0:04.31 [kdm_livekcore]
 72  ??  SL     0:06.14 [kdm_logger]
 73  ??  SL     0:04.31 [kdm_kdb]
 74  ??  SL     0:00.02 [devrt_kernel_thread]
 75  ??  DL     0:21.54 [vmuncachedaemon]
 76  ??  DL     0:00.00 [if_pic_listen0]
 77  ??  SL     0:00.00 [nfsiod 0]
 78  ??  SL     0:00.00 [nfsiod 1]
 79  ??  SL     0:00.00 [nfsiod 2]
 80  ??  SL     0:00.00 [nfsiod 3]
 81  ??  WL     5:59.98 [irq13: +]
 82  ??  RL   105:06.81 [pkt_sender: cpu0]
 83  ??  DL     0:03.62 [md0]
 95  ??  DL     0:37.04 [md1]
115  ??  DL     0:06.01 [md2]
135  ??  DL     0:00.75 [md3]
155  ??  DL     0:21.17 [md4]
175  ??  DL     0:01.90 [md5]
195  ??  DL     0:06.26 [md6]
231  ??  DL     0:00.01 [md7]
755  ??  Ss     0:04.17 /usr/sbin/cron
847  ??  S      0:00.10 /usr/sbin/tnetd -N
849  ??  S      0:06.82 /usr/sbin/mgd -N
850  ??  S      0:00.32 /usr/sbin/inetd -N
852  ??  S      1:05.34 /usr/sbin/dhcpd -N
853  ??  S      0:00.18 /usr/sbin/inetd -p /var/run/inetd_4.pid -N -JU __juni
855  ??  L    1181:02.21 /usr/sbin/dc-pfe -N (pafxpc)
857  ??  S     17:55.86 /usr/sbin/vccpd -N
896  ??  S     93:43.45 /usr/sbin/chassism -N
953  ??  S      0:02.89 /sbin/watchdog -t-1
954  ??  S      3:34.00 /sbin/dcd -N
955  ??  S     10:30.13 /usr/sbin/chassisd -N
956  ??  DL     0:00.21 [peer proxy]
957  ??  S      4:07.43 /usr/sbin/alarmd -N
958  ??  S      0:31.69 /usr/sbin/craftd -N
959  ??  S      0:55.16 /usr/sbin/mib2d -N
960  ??  S      3:40.64 /usr/sbin/rpd -N
961  ??  S      0:00.03 /usr/sbin/tnp.sntpd -N
962  ??  S      0:51.94 /usr/sbin/pfed -N
963  ??  S      0:47.31 /usr/sbin/rmopd -N
964  ??  S      0:33.65 /usr/sbin/cosd
965  ??  S      1:48.41 /usr/sbin/ppmd -N
966  ??  S      0:07.18 /usr/sbin/dfwd -N
```


Copyright © 2016, Juniper Networks, Inc.

```
  967  ??  S      1:02.56 /usr/sbin/bfdd -N
  968  ??  S      0:00.63 /usr/sbin/rdd -N
  969  ??  S      0:40.61 /usr/sbin/dfcd -N
  971  ??  S      0:07.81 /usr/sbin/bdbrepd -N
  972  ??  S      0:00.28 /usr/sbin/sendd -N
  973  ??  S      1:37.69 /usr/sbin/xntpd -j -N -g -JU __example_process4__ (nt
  974  ??  S      5:56.28 /usr/sbin/snmpd -N -JU __example_process4__
  975  ??  S     16:46.82 /usr/sbin/jdiameterd -N
  976  ??  S      2:34.13 /usr/sbin/eswd -N
  977  ??  S      1:03.05 /usr/sbin/sflowd -N
  978  ??  S      0:22.30 /usr/sbin/fcd -N
  979  ??  S      1:07.01 /usr/sbin/vccpdf -N
  982  ??  S      0:25.25 /usr/sbin/mcsnoopd -N
  983  ??  S      3:45.68 /usr/sbin/rpdf -N
 1043  ??  S      0:37.87 /usr/sbin/lacpd -N
 1048  ??  DL     0:01.29 [peer proxy]
 1111  ??  WL     0:00.00 [swi2: FMNITHRD+]
 1112  ??  DL     0:00.03 [peer proxy]
12816  ??  S     15:35.32 /usr/sbin/sfid -N
30893  ??  Ss     0:00.65 sshd: tlewis@ttyp0 (sshd)
30897  ??  Ss     0:00.15 mgd: (mgd) (tlewis)/dev/ttyp0 (mgd)
30905  ??  Ss     0:00.64 sshd: tlewis@ttyp1 (sshd)
30909  ??  Ss     0:00.15 mgd: (mgd) (tlewis)/dev/ttyp1 (mgd)
30910  ??  Ss     0:01.26 sshd: tcheng@ttyp2 (sshd)
30914  ??  Ss     0:00.80 mgd: (mgd) (tcheng)/dev/ttyp2 (mgd)
30937  ??  R      0:00.03 /bin/ps -ax
  661  d0- S      0:21.24 /usr/sbin/eventd -N -r -s -A
  860  d0  Ss+    0:00.07 /usr/libexec/getty std.9600 ttyd0
30896  p0  Ss+    0:00.55 -cli (cli)
30908  p1  Ss+    0:00.50 -cli (cli)
30913  p2  Ss+    0:00.85 -cli (cli)
```

show system reboot

List of Syntax

Syntax on page 1064
Syntax (EX Series Switches) on page 1064
Syntax (TX Matrix Router) on page 1064
Syntax (TX Matrix Plus Router) on page 1064
Syntax (MX Series Router) on page 1064
Syntax (QFX Series and OCX Series) on page 1064

Syntax

show system reboot
<both-routing-engines>

Syntax (EX Series Switches)

show system reboot
<all-members>
<both-routing-engines>
<local>
<member *member-id*>

Syntax (TX Matrix Router)

show system reboot
<all-chassis | all-lcc | lcc *number* | scc>
<both-routing-engines>

Syntax (TX Matrix Plus Router)

show system reboot
<all-chassis| all-lcc | lcc *number* | sfc *number*>
<both-routing-engines>

Syntax (MX Series Router)

show system reboot
<all-members>
<both-routing-engines>
<local>
<member *member-id*>

Syntax (QFX Series and OCX Series)

show system reboot
<both-routing-engines>
<infrastructure *name*>
<interconnect-device *name*>
<node-device *name*>

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.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display pending system reboots or halts.

Options

none—Display pending reboots or halts on the active Routing Engine.

all-chassis—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display halt or reboot request information for all the T640 routers in the chassis that are connected to the TX Matrix router. On a TX Matrix router, display

Copyright © 2016, Juniper Networks, Inc.

halt or reboot request information for all the T1600 or T4000 routers in the chassis that are connected to the TX Matrix Plus router.

all-members—(EX4200 switches and MX Series routers only) (Optional) Display halt or reboot request information for all members of the Virtual Chassis configuration.

all-lcc—(TX Matrix routers and TX Matrix Plus router only) (Optional) On a TX Matrix router, display system halt or reboot request information for all T640 routers connected to the TX Matrix router. On a TX Matrix Plus router, display halt or reboot request information for all connected T1600 or T4000 LCCs.

both-routing-engines—(Systems with multiple Routing Engines) (Optional) Display halt or reboot request information on both Routing Engines.

infrastructure ***name***—(QFabric systems only) (Optional) Display reboot request information on the fabric manager Routing Engines and fabric control Routing Engines.

interconnect-device ***name***—(QFabric systems only) (Optional) Display reboot request information on the Interconnect device.

lcc ***number***—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display halt or reboot request information for a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, display halt or reboot request information for a specific router that is connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(EX4200 switches and MX Series routers only) (Optional) Display halt or reboot request information for the local Virtual Chassis member.

member ***member-id***—(EX4200 switches and MX Series routers only) (Optional) Display halt or reboot request information for the specified member of the Virtual Chassis configuration. For EX4200 switches, replace ***member-id*** with a value from 0 through 9. For an MX Series Virtual Chassis, replace ***member-id*** with a value of 0 or 1.

node-group ***name***—(QFabric systems only) (Optional) Display reboot request information on the Node group.

scc—(TX Matrix router only) (Optional) Display halt or reboot request information for the TX Matrix router (or switch-card chassis).

sfc—(TX Matrix Plus router only) (Optional) Display halt or reboot request information for the TX Matrix Plus router.

Additional Information

By default, when you issue the **show system reboot** command on a TX Matrix or TX Matrix Plus master Routing Engine, the command is broadcast to all the T640 (in a routing matrix based on the TX Matrix router) or T1600 (in a routing matrix based on the TX Matrix Plus router) master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix or TX Matrix Plus backup Routing Engine, the command is broadcast to all the T640 (in a routing matrix based on the TX Matrix router) or T1600 (in a routing matrix based on the TX Matrix Plus router) backup Routing Engines that are connected to it.

Required Privilege Level

maintenance

Related Documentation

- *Routing Matrix with a TX Matrix Plus Router Solutions Page*

List of Sample Output

show system reboot on page 1066
show system reboot all-lcc (TX Matrix Router) on page 1066
show system reboot sfc (TX Matrix Plus Router) on page 1066
show system reboot (QFX3500 Switch) on page 1066

Sample Output

show system reboot

```
user@host> show system reboot
reboot requested by root at Wed Feb 10 17:40:46 1999
[process id 17885]
```

show system reboot all-lcc (TX Matrix Router)

```
user@host> show system reboot all-lcc
lcc0-re0:
--------------------------------------------------------------------------
No shutdown/reboot scheduled.

lcc2-re0:
--------------------------------------------------------------------------
No shutdown/reboot scheduled.
```

show system reboot sfc (TX Matrix Plus Router)

```
user@host> show system sfc 0
No shutdown/reboot scheduled.
```

show system reboot (QFX3500 Switch)

```
user@switch> show system reboot
No shutdown/reboot scheduled.
```


Copyright © 2016, Juniper Networks, Inc.

show system resource-cleanup processes

Syntax

show system resource-cleanup processes
<detail>
<pid *number*>
<process-name *name*>

Release Information

Command introduced in Junos OS Release 9.3.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display the list of processes that have been registered for resource cleanup services.

Options

detail—(Optional) Display the list of processes that have been registered for resource cleanup services, along with the resources that have been requested for cleanup.

pid *number*—(Optional) Display a process that has been registered for resource cleanup services by specifying the Process Identifier number.

process-name *name*—(Optional) Display a process that has been registered for resource cleanup services by name of the process.

Required Privilege Level

view

Related Documentation

- *resource-cleanup*
- *traceoptions (Resource Cleanup)*

List of Sample Output

show system resource-cleanup processes on page 1067
show system resource-cleanup processes detail on page 1068

Output Fields

For a description of the output fields, see Table 55 on page 1067. Output fields are listed in the approximate order in which they appear.

Table 55: show system resource-cleanup processes Output Fields

Field Name	Field Description
PID	Process ID, a number that identifies a process.
Process name	String that identifies the process.
Resources to clean	Resources that have been registered to be cleaned up.

Sample Output

show system resource-cleanup processes

```
user@host> show system resource-cleanup processes
PID     Process name          Resources to clean
420     jnx-exampled          GENCFG, SYSV shared memory
```

show system resource-cleanup processes detail

```
user@host> show system resource-cleanup processes detail
PID     Process name          Resources to clean
420     jnx-exampled          GENCFG blob major ID 0x8000, minor ID 0x0000
                              SYSV shared memory ID 65536, key 1108955839
                              SYSV shared memory ID 65537, key 1108955837
```


Copyright © 2016, Juniper Networks, Inc.

show system services service-deployment

Syntax show system services service-deployment

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Display information about a Session and Resource Control (SRC) client.

Options This command has no options.

Required Privilege Level system
view

List of Sample Output show system services service-deployment on page 1069

Output Fields Table 56 on page 1069 lists the output fields for the **show system services service-deployment** command. Output fields are listed in the approximate order in which they appear.

Table 56: show system services service-deployment Output Fields

Field Name	Field Description
PDT Keepalive settings	Configured PDT keepalive interval, in seconds.
Keepalives sent	Number of keepalives sent.
Notifications sent	Number of notifications sent.
Last update from peer	Time at which the last update from a peer was received.

Sample Output

show system services service-deployment

```
user@host> show system services service-deployment
Connected to 192.4.4.4 port 10288 since 2004-05-03 11:04:34 PDT Keepalive settings:
 Interval 15 seconds Keepalives sent: 750 Notifications sent: 0 Last update from
 peer: 00:00:06 ago
```

show system software

List of Syntax

Syntax on page 1070
Syntax (EX Series Switches) on page 1070
Syntax (TX Matrix Router) on page 1070
Syntax (TX Matrix Plus Router) on page 1070
Syntax (QFX Series) on page 1070

Syntax

show system software
<detail>

Syntax (EX Series Switches)

show system software
<all-members>
<detail>
<local>
<member *member-id*>

Syntax (TX Matrix Router)

show system software
<all-chassis | all-lcc | lcc *number* | scc>
<detail>

Syntax (TX Matrix Plus Router)

show system software
<all-chassis | all-lcc | lcc *number* | sfc *number*>
<detail>

Syntax (QFX Series)

show system software
<detail>
<infrastructure *name*>
<interconnect-device *name*>
<node-group *name*>

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.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display the Junos OS extensions loaded on your router or switch.

Options

none—Display standard information about all loaded Junos OS extensions.

all-chassis—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Display system software information for all the T640 routers (TX Matrix Router) or all the routers (TX Matrix Plus Router) in the chassis.

all-lcc—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display system software information for all T640 routers connected to the TX Matrix router. On a TX Matrix Plus router, display system software information for all connected T1600 or T4000 LCCs.

all-members—(EX4200 switches only) (Optional) Display the system software running on all members of the Virtual Chassis configuration.

Copyright © 2016, Juniper Networks, Inc.

detail—(Optional) Display detailed information about available Junos OS extensions.

infrastructure ***name***—(QFabric systems only) (Optional) Display the system software running on the fabric control Routing Engine and the fabric manager Routing Engine.

interconnect-device ***name***—(QFabric systems only) (Optional) Display the system software running on the Interconnect device.

lcc ***number***—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display system software information for a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, display system software information for a specific router that is connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(EX4200 switches only) (Optional) Display the system software running on the local Virtual Chassis member.

member ***member-id***—(EX4200 switches only) (Optional) Display the system software running on the specified member of the Virtual Chassis configuration. Replace ***member-id*** with a value from 0 through 9.

node-group ***name***—(QFabric systems only) (Optional) Display the system software running on the Node group.

scc—(Routing matrix only) (Optional) Display the system software running on a TX Matrix router (or switch-card chassis).

sfc—(TX Matrix Plus routers only) (Optional) Display system software information for the TX Matrix Plus router.

Required Privilege Level

maintenance

Related Documentation

- *Routing Matrix with a TX Matrix Plus Router Solutions Page*

List of Sample Output

show system software on page 1072
show system software (TX Matrix Plus Router) on page 1072
show system software (QFX Series) on page 1076

Output Fields When you enter this command, you are provided a list of Junos OS packages installed on the router and their corresponding Junos OS release number.

Sample Output

show system software

```
user@host> show system software
Information for jbase:

Comment:
JUNOS Base OS Software Suite [7.2R1.7]


Information for jcrypto:

Comment:
JUNOS Crypto Software Suite [7.2R1.7]
Information for jdocs:

Comment:
JUNOS Online Documentation [7.2R1.7]


Information for jkernel:

Comment:
JUNOS Kernel Software Suite [7.2R1.7]


Information for jpfe:

Comment:
JUNOS Packet Forwarding Engine Support (M20/M40) [7.2R1.7]


Information for jroute:

Comment:
JUNOS Routing Software Suite [7.2R1.7]


Information for junos:

Comment:
JUNOS Base OS boot [7.2R1.7]
```

show system software (TX Matrix Plus Router)

```
user@host> show system software
sfc0-re0:
--------------------------------------------------------------------------
Information for jbase:

Comment:
JUNOS Base OS Software Suite [9.6-20090515.0]



Information for jcrypto:
```

 Copyright © 2016, Juniper Networks, Inc.

```
Comment:
JUNOS Crypto Software Suite [9.6-20090515.0]



Information for jdocs:

Comment:
JUNOS Online Documentation [9.6-20090515.0]
Information for jkernel:

Comment:
JUNOS Kernel Software Suite [9.6-20090515.0]



Information for jpfe:

Comment:
JUNOS Packet Forwarding Engine Support (T-Series) [9.6-20090515.0]



Information for jpfe-common:

Comment:
JUNOS Packet Forwarding Engine Support (M/T Common) [9.6-20090515.0]



Information for jroute:Comment:
JUNOS Routing Software Suite [9.6-20090515.0]



Information for jservices-aacl:

Comment:
JUNOS Services AACL Container package [9.6-20090515.0]



Information for jservices-appid:

Comment:
JUNOS AppId Services [9.6-20090515.0]



Information for jservices-bgf:

Comment:
JUNOS Border Gateway Function package [9.6-20090515.0]
Information for jservices-idp:

Comment:
JUNOS IDP Services [9.6-20090515.0]
```

```
Information for jservices-llpdf:

Comment:
JUNOS Services LL-PDF Container package [9.6-20090515.0]



Information for jservices-sfw:

Comment:
JUNOS Services Stateful Firewall [9.6-20090515.0]
Information for jservices-voice:

Comment:
JUNOS Voice Services Container package [9.6-20090515.0]



Information for junos:

Comment:
JUNOS Base OS boot [9.6-20090515.0]
...
lcc0-re0:
--------------------------------------------------------------------------
Information for jbase:

Comment:
JUNOS Base OS Software Suite [9.6-20090515.0]



Information for jcrypto:

Comment:
JUNOS Crypto Software Suite [9.6-20090515.0]



Information for jdocs:

Comment:
JUNOS Online Documentation [9.6-20090515.0]



Information for jkernel:

Comment:
JUNOS Kernel Software Suite [9.6-20090515.0]



Information for jpfe:

Comment:
JUNOS Packet Forwarding Engine Support (T-Series) [9.6-20090515.0]



Information for jpfe-common:
```


Copyright © 2016, Juniper Networks, Inc.

```
Comment:
JUNOS Packet Forwarding Engine Support (M/T Common) [9.6-20090515.0]


Information for jroute:

Comment:
JUNOS Routing Software Suite [9.6-20090515.0]


Information for jservices-aacl:

Comment:
JUNOS Services AACL Container package [9.6-20090515.0]


Information for jservices-appid:

Comment:
JUNOS AppId Services [9.6-20090515.0]


Information for jservices-bgf:

Comment:
JUNOS Border Gateway Function package [9.6-20090515.0]


Information for jservices-idp:

Comment:
JUNOS IDP Services [9.6-20090515.0]


Information for jservices-llpdf:

Comment:
JUNOS Services LL-PDF Container package [9.6-20090515.0]


Information for jservices-sfw:

Comment:
JUNOS Services Stateful Firewall [9.6-20090515.0]


Information for jservices-voice:

Comment:
JUNOS Voice Services Container package [9.6-20090515.0]
```

```
Information for junos:

Comment:
JUNOS Base OS boot [9.6-20090515.0]



lcc1-re0:
--------------------------------------------------------------------------
Information for jbase:

Comment:
JUNOS Base OS Software Suite [9.6-20090515.0]



Information for jcrypto:

Comment:
JUNOS Crypto Software Suite [9.6-20090515.0]
...
```

show system software (QFX Series)

```
user@switch> show system software
Information for jbase:

Comment:
JUNOS Base OS Software Suite [11.3-20110730.0]



Information for jcrypto:

Comment:
JUNOS Crypto Software Suite [11.3-20110730.0]



Information for jdocs:

Comment:
JUNOS Online Documentation [11.3-20110730.0]



Information for jkernel:

Comment:
JUNOS Kernel Software Suite [11.3-20110730.0]



Information for jpfe:

Comment:
JUNOS Packet Forwarding Engine Support (QFX) [11.3-20110730.0]
```


Copyright © 2016, Juniper Networks, Inc.

```
Information for jroute:

Comment:
JUNOS Routing Software Suite [11.3-20110730.0]


Information for jswitch:

Comment:
JUNOS Enterprise Software Suite [11.3-20110730.0]


Information for junos:

Comment:
JUNOS Base OS boot [11.3-20110730.0]


Information for jweb:

Comment:
JUNOS Web Management [11.3-20110730.0]
```

show system statistics

List of Syntax

Syntax on page 1078
Syntax (EX Series Switches) on page 1078
Syntax (TX Matrix Router) on page 1078
Syntax (TX Matrix Plus Router) on page 1078
Syntax (MX Series Router) on page 1078
Syntax (QFX Series) on page 1078

Syntax

show system statistics

Syntax (EX Series Switches)

show system statistics
<all-members>
<local>
<member *member-id*>

Syntax (TX Matrix Router)

show system statistics
<all-chassis | all-lcc | lcc *number* | scc>

Syntax (TX Matrix Plus Router)

show system statistics
<all-chassis | all-lcc | lcc *number* | sfc *number*>

Syntax (MX Series Router)

show system statistics
<all-members>
<local>
<member *member-id*>

Syntax (QFX Series)

show system statistics

Release Information

Command introduced before JUNOS 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 Release 9.6.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display system-wide protocol-related statistics.

Options

none—Display system statistics for all the following protocols:

- **arp**—Address Resolution Protocol
- **bridge**—IEEE 802.1 Bridging
- **clns**—Connectionless Network Service
- **esis**—End System-to-Intermediate System
- **ethoamcfm**—Ethernet OAM protocol for connectivity fault management
- **ethoamlfm**—Ethernet OAM protocol for link fault management
- **icmp**—Internet Control Message Protocol
- **icmp6**—Internet Control Message Protocol version 6

Copyright © 2016, Juniper Networks, Inc.

- **igmp**—Internet Group Management Protocol
- **ip**—Internet Protocol version 4
- **ip6**—Internet Protocol version 6
- **jsr**—Juniper Socket Replication
- **mpls**—Multiprotocol Label Switching
- **rdp**—Reliable Datagram Protocol
- **tcp**—Transmission Control Protocol
- **tnp**—Trivial Network Protocol
- **ttp**—TNP Tunneling Protocol
- **tudp**—Trivial User Datagram Protocol
- **udp**—User Datagram Protocol
- **vpls**—Virtual Private LAN Service

all-chassis—(TX Matrix and TX Matrix Plus routers only) (Optional) Display system statistics for a protocol for all the routers in the chassis.

all-lcc—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display system statistics for a protocol for all T640 routers (or line-card chassis) connected to the TX Matrix router. On a TX Matrix Plus router, display system statistics for a protocol for all routers (line-card chassis) connected to the TX Matrix Plus router

all-members—(EX4200 switches and MX Series routers only) (Optional) Display system statistics for a protocol for all members of the Virtual Chassis configuration.

lcc *number*—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display system statistics for a protocol for a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, display system statistics for a protocol for a specific router that is connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(EX4200 switches and MX Series routers only) (Optional) Display system statistics for a protocol for the local Virtual Chassis member.

member ***member-id***—(EX4200 switches and MX Series routers only) (Optional) Display system statistics for a protocol for the specified member of the Virtual Chassis configuration. For EX4200 switches, replace ***member-id*** with a value from 0 through 9. For an MX Series Virtual Chassis, replace ***member-id*** with a value of 0 or 1.

scc—(TX Matrix routers only) (Optional) Display system statistics for a protocol for the TX Matrix router (or switch-card chassis).

sfc ***number***—(TX Matrix Plus routers only) (Optional) Display system statistics for a protocol for the TX Matrix Plus router (or switch-fabric chassis). Replace ***number*** with 0.

Additional Information

By default, when you issue the **show system statistics** command on a TX Matrix or TX Matrix Plus master Routing Engine, the command is broadcast to all the T640 (in a routing matrix based on the TX Matrix router) or T1600 (in a routing matrix based on the TX Matrix Plus router) master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix or TX Matrix Plus backup Routing Engine, the command is broadcast to all the T640 (in a routing matrix based on the TX Matrix router) or T1600 (in a routing matrix based on the TX Matrix Plus router) backup Routing Engines that are connected to it.

Required Privilege Level

view

List of Sample Output

show system statistics on page 1080
show system statistics (EX Series Switches) on page 1090
show system statistics (TX Matrix Router) on page 1099
show system statistics (QFX Series) on page 1105

Sample Output

show system statistics

```
user@host> show system statistics
ip:
        3682087 total packets received
        0 bad header checksums
        0 with size smaller than minimum
        0 with data size < data length
        0 with header length < data size
        0 with data length < header length
        0 with incorrect version number
        0 packets destined to dead next hop
        0 fragments received
        0 fragments dropped (dup or out of space)
        0 fragments dropped (queue overflow)
        0 fragments dropped after timeout
        0 fragments dropped due to over limit
        0 packets reassembled ok
        3664774 packets for this host
        17316 packets for unknown/unsupported protocol
        0 packets forwarded
        0 packets not forwardable
        0 redirects sent
        6528 packets sent from this host
```


Copyright © 2016, Juniper Networks, Inc.

```
        0 packets sent with fabricated ip header
        0 output packets dropped due to no bufs
        0 output packets discarded due to no route
        0 output datagrams fragmented
        0 fragments created
        0 datagrams that can't be fragmented
        0 packets with bad options
        1123 packets with options handled without error
        0 strict source and record route options
        0 loose source and record route options
        0 record route options
        0 timestamp options
        0 timestamp and address options
        0 timestamp and prespecified address options
        0 option packets dropped due to rate limit
        1123 router alert options
        0 multicast packets dropped (no iflist)
        0 packets dropped (src and int don't match)
icmp:
        0 drops due to rate limit
        0 calls to icmp_error
        0 errors not generated because old message was icmp
        Output histogram:
                echo reply: 75
        0 messages with bad code fields
        0 messages less than the minimum length
        0 messages with bad checksum
        0 messages with bad source address
        0 messages with bad length
        0 echo drops with broadcast or multicast destination address
        0 timestamp drops with broadcast or multicast destination address
        Input histogram:
                echo: 75
                router advertisement: 130
        75 message responses generated
tcp:
        3844 packets sent
                3618 data packets (1055596 bytes)
                0 data packets (0 bytes) retransmitted
                0 resends initiated by MTU discovery
                205 ack-only packets (148 packets delayed)
                0 URG only packets
                0 window probe packets
                0 window update packets
                1079 control packets
        5815 packets received
                3377 acks (for 1055657 bytes)
                24 duplicate acks
                0 acks for unsent data
                2655 packets (15004 bytes) received in-sequence
                1 completely duplicate packet  (0 bytes)
                0 old duplicate packets
                0 packets with some dup. data (0 bytes duped)
                0 out-of-order packets (0 bytes)
                0 packets (0 bytes) of data after window
                0 window probes
                7 window update packets
                0 packets received after close
                0 discarded for bad checksums
                0 discarded for bad header offset fields
                0 discarded because packet too short
```

```
        1 connection request
        32 connection accepts
        0 bad connection attempts
        0 listen queue overflows
        33 connections established (including accepts)
        30 connections closed (including 0 drops)
                27 connections updated cached RTT on close
                27 connections updated cached RTT variance on close
                0 connections updated cached ssthresh on close
        0 embryonic connections dropped
        3374 segments updated rtt (of 3220 attempts)
        0 retransmit timeouts
                0 connections dropped by rexmit timeout
        0 persist timeouts
                0 connections dropped by persist timeout
        344 keepalive timeouts
                0 keepalive probes sent
                0 connections dropped by keepalive
        1096 correct ACK header predictions
        1314 correct data packet header predictions
        32 syncache entries added
                0 retransmitted
                0 dupsyn
                0 dropped
                32 completed
                0 bucket overflow
                0 cache overflow
                0 reset
                0 stale
                0 aborted
                0 badack
                0 unreach
                0 zone failures
        0 cookies sent
        0 cookies received
        0 ACKs sent in response to in-window but not exact RSTs
        0 ACKs sent in response to in-window SYNs on established connections
        0 rcv packets dropped by TCP due to bad address
        0 out-of-sequence segment drops due to insufficient memory
        1058 RST packets
        0 ICMP packets ignored by TCP
        0 send packets dropped by TCP due to auth errors
        0 rcv packets dropped by TCP due to auth errors
udp:
        3658884 datagrams received
        0 with incomplete header
        0 with bad data length field
        0 with bad checksum
        3657342 dropped due to no socket
        3657342 broadcast/multicast datagrams dropped due to no socket
        0 dropped due to full socket buffers
        0 not for hashed pcb
        4291311496 delivered
        1551 datagrams output
ipsec:
        0 inbound packets processed successfully
        0 inbound packets violated process security policy
        0 inbound packets with no SA available
        0 invalid inbound packets
        0 inbound packets failed due to insufficient memory
        0 inbound packets failed getting SPI
```

 Copyright © 2016, Juniper Networks, Inc.

```
        0 inbound packets failed on AH replay check
        0 inbound packets failed on ESP replay check
        0 inbound AH packets considered authentic
        0 inbound AH packets failed on authentication
        0 inbound ESP packets considered authentic
        0 inbound ESP packets failed on authentication
        0 outbound packets processed successfully
        0 outbound packets violated process security policy
        0 outbound packets with no SA available
        0 invalid outbound packets
        0 outbound packets failed due to insufficient memory
        0 outbound packets with no route
igmp:
        17186 messages received
        0 messages received with too few bytes
        0 messages received with bad checksum
        0 membership queries received
        0 membership queries received with invalid field(s)
        0 membership reports received
        0 membership reports received with invalid field(s)
        0 membership reports received for groups to which we belong
        0 membership reports sent
arp:
        44181302 datagrams received
        2 ARP requests received
        2028 ARP replies received
        3156 resolution requests received
        0 unrestricted proxy requests
        0 received proxy requests
        0 proxy requests not proxied
        0 with bogus interface
        787 with incorrect length
        712 for non-IP protocol
        0 with unsupported op code
        0 with bad protocol address length
        0 with bad hardware address length
        0 with multicast source address
        7611 with multicast target address
        0 with my own hardware address
        14241699 for an address not on the interface
        0 with a broadcast source address
        0 with source address duplicate to mine
        29929250 which were not for me
        0 packets discarded waiting for resolution
        6 packets sent after waiting for resolution
        17812 ARP requests sent
        2 ARP replies sent
        0 requests for memory denied
        0 requests dropped on entry
        0 requests dropped during retry
ip6:
        0 total packets received
        0 with size smaller than minimum
        0 with data size < data length
        0 with bad options
        0 with incorrect version number
        0 fragments received
        0 fragments dropped (dup or out of space)
        0 fragments dropped after timeout
        0 fragments that exceeded limit
        0 packets reassembled ok
```

```
        0 packets for this host
        0 packets forwarded
        0 packets not forwardable
        0 redirects sent
        0 packets sent from this host
        0 packets sent with fabricated ip header
        0 output packets dropped due to no bufs, etc.
        0 output packets discarded due to no route
        0 output datagrams fragmented
        0 fragments created
        0 datagrams that can't be fragmented
        0 packets that violated scope rules
        0 multicast packets which we don't join
        Mbuf statistics:
        0 packets whose headers are not continuous
        0 tunneling packets that can't find gif
        0 packets discarded due to too may headers
        0 failures of source address selection
        0 forward cache hit
        0 forward cache miss
        0 packets destined to dead next hop
        0 option packets dropped due to rate limit
        0 packets dropped (src and int don't match)
        0 packets dropped due to bad protocol
icmp6:
        0 calls to icmp_error
        0 errors not generated because old message was icmp error or so
        0 errors not generated because rate limitation
        0 messages with bad code fields
        0 messages < minimum length
        0 bad checksums
        0 messages with bad length
        Histogram of error messages to be generated:
                0 no route
                0 administratively prohibited
                0 beyond scope
                0 address unreachable
                0 port unreachable
                0 packet too big
                0 time exceed transit
                0 time exceed reassembly
                0 erroneous header field
                0 unrecognized next header
                0 unrecognized option
                0 redirect
                0 unknown
        0 message responses generated
        0 messages with too many ND options
ipsec6:
        0 inbound packets processed successfully
        0 inbound packets violated process security policy
        0 inbound packets with no SA available
        0 invalid inbound packets
        0 inbound packets failed due to insufficient memory
        0 inbound packets failed getting SPI
        0 inbound packets failed on AH replay check
        0 inbound packets failed on ESP replay check
        0 inbound AH packets considered authentic
        0 inbound AH packets failed on authentication
        0 inbound ESP packets considered authentic
        0 inbound ESP packets failed on authentication
```

 Copyright © 2016, Juniper Networks, Inc.

```
        0 outbound packets processed successfully
        0 outbound packets violated process security policy
        0 outbound packets with no SA available
        0 invalid outbound packets
        0 outbound packets failed due to insufficient memory
        0 outbound packets with no route
clnl:
        0 total packets received
        0 packets delivered
        0 too small
        0 bad header length
        0 bad checksum
        0 bad version
        0 unknown or unsupported protocol
        0 bogus sdl size
        0 no free memory in socket buffer
        0 send packets discarded
        0 sbappend failure
        0 mcopy failure
        0 address fields were not reasonable
        0 segment information forgotten
        0 forwarded packets
        0 total packets sent
        0 output packets discarded
        0 non-forwarded packets
        0 packets fragmented
        0 fragments sent
        0 fragments discarded
        0 fragments timed out
        0 fragmentation prohibited
        0 packets reconstructed
        0 packets destined to dead nexthop
        0 packets discarded due to no route
        0 Error pdu rate drops
        0 ER pdu generation failure
esis:
        0 total pkts received
        0 total packets consumed by protocol
        0 pdus received with bad checksum
        0 pdus received with bad version number
        0 pdus received with bad type field
        0 short pdus received
        0 bogus sdl size
        0 bad header length
        0 unknown or unsupported protocol
        0 no free memory in socket buffer
        0 send packets discarded
        0 sbappend failure
        0 mcopy failure
        0 ISO family not configured
tnp:
        146776365 unicast packets received
        0 broadcast packets received
        0 fragmented packets received
        0 hello packets dropped
        0 fragments dropped
        0 fragment reassembly queue flushes
        0 hello packets received
        0 control packets received
        49681642 rdp packets received
        337175 udp packets received
```

```
        96757548 tunnel packets received
        0 input packets discarded with no protocol
        98397591 unicast packets sent
        0 broadcast packets sent
        0 fragmented packets sent
        0 hello packets dropped
        0 fragments dropped
        0 hello packets sent
        0 control packets sent
        49681642 rdp packets sent
        337175 udp packets sent
        48378774 tunnel packets sent
        0 packets sent with unknown protocol
rdp:
        49681642 input packets
        0 discards for bad checksum
        0 discards bad sequence number
        0 refused connections
        2031964 acks received
        0 dropped due to full socket buffers
        49692 retransmits
        49681642 output packets
        24815968 acks sent
        28 connects
        0 closes
        22783990 keepalives received
        22783990 keepalives sent
tudp:
        337175 datagrams received
        0 with incomplete header
        0 with bad data length field
        0 with bad checksum
        0 dropped due to no socket
        0 broadcast/multicast datagrams dropped due to no socket
        0 dropped due to full socket buffers
        337175 delivered
        337175 datagrams output
ttp:
        398749 packets sent
        0 packets sent while unconnected
        0 packets sent while interface down
        0 packets sent couldn't get buffer
        0 packets sent couldn't find neighbor
        44696687 L2 packets received
        0 unknown L3 packets received
        3682087 IPv4 L3 packets received
        0 MPLS L3 packets received
        0 MPLS->IPv4 L3 packets received
        0 IPv4->MPLS L3 packets received
        0 IPv6 L3 packets received
        0 ARP L3 packets received
        0 CLNP L3 packets received
        0 TNP L3 packets received
        0 NULL L3 packets received
        0 cyclotron cycle L3 packets received
        0 cyclotron send L3 packets received
        0 packets received while unconnected
        0 packets received from unknown ifl
        0 input packets couldn't get buffer
        0 input packets with bad type
        0 input packets with discard type
```

 Copyright © 2016, Juniper Networks, Inc.

```
        0 Input packets with too many tlvs
        0 Input packets with bad tlv header
        70633 Input packets with bad tlv type
        68877 Input packets dropped based on tlv result
        0 input packets for which rt lookup is bypassed
mpls:
        0 total mpls packets received
        0 packets forwarded
        0 packets dropped
        0 with header too small
        0 after tagging, can't fit link MTU
        0 with IPv4 explicit NULL tag
        0 with IPv4 explicit NULL cksum errors
        0 with router alert tag
        0 lsp ping packets (ttl-expired/router alert)
        0 with ttl expired
        0 with tag encoding error
        0 packets discarded, no route
jsr:
     Handle-inf:o
         0 Handles in use
         0 Handles allocated so far
         0 Handles freed so far
         0 Handles in delayed free state
     IHA:
         0 IHA invalid subtype messages
         0 IHA invalid length messages
         0 IHA invalid version messages
         0 IHA too short messages
         0 IHA invalid dst handle messages
         0 IHA invalid src handle messages
         0 IHA unmatched src handle messages
         0 IHA invalid messages for primary
         0 IHA invalid messages for secondary
         0 IHA invalid messages for current state
         0 IHA messages sent for subtype init
         0 IHA messages rcvd for subytpe init
         0 IHA messages sent for subtype init
         0 IHA messages rcvd for subytpe init
         0 IHA messages sent for subtype init
         0 IHA messages rcvd for subytpe init
         0 IHA messages sent for subtype init
         0 IHA messages rcvd for subytpe init
         0 IHA messages sent for subtype init
         0 IHA messages rcvd for subytpe init
         0 IHA message timeouts
         0 IHA socket unreplicate messages
     SDRL:
         0 SDRL socket teardowns
         0 SDRL socket teardown failures
         0 SDRL socket unreplicates
         0 SDRL socket unreplicate failures
         0 SDRL external timeouts
         0 SDRL internal timeouts
         0 SDRL ipc messages sent
         0 SDRL ipc send failures
         0 SDRL ipc messages recvd
         0 SDRL ipc messages recvd
         0 SDRL primary replication messages sent
         0 SDRL primary replication message send failures
         0 SDRL primary ack messages received
```

```
    0 SDRL primary ack message receive failures
    0 SDRL primary sock replication inits
    0 SDRL primary sock replication init failures
    0 SDRL primary throttle remove messages
    0 SDRL primary throttle remove failures
    0 SDRL primary init handshake messages
    0 SDRL primary init handshake failures
    0 SDRL secondary replication messages received
    0 SDRL secondary replication message receive failures
    0 SDRL secondary replication acks sent
    0 SDRL secondary replication ack send failures
    0 SDRL secondary sock splits
    0 SDRL secondary sock split failures
    0 SDRL secondary sock merges
    0 SDRL secondary sock merge failures
    0 SDRL secondary sockets closed
    0 SDRL secondary rcv snoop fd close failures
    0 SDRL secondary snd snoop fd close failures
    0 SDRL secondary init handshake messages
    0 SDRL secondary init handshake failures
PRL:
    0 PRL packets enqueued
    0 PRL packets failed to enqueue
    0 PRL packets dequeued
    0 PRL packets failed to dequeue
    0 PRL queue entry allocations
    0 PRL queue entry frees
    0 calls to layer 4 input handlers
    0 failed calls to layer 4 input handlers
    0 PRL queue drains
    0 PRL replication timeouts
    0 PRL replication messages sent
    0 PRL replication message send failures
    0 PRL acknowledgment messages sent
    0 PRL acknowledgement message send failures
    0 PRL replication messages received
    0 PRL replication message receive failures
    0 PRL acknowledgement messages received
    0 PRL acknowledgement receive failures
    0 PRL messages with bad IPC type
    0 PRL messages with no handler
    2 PRL global state initializations
    1 PRL global state cleanups
    0 PRL per-socket state creations
    0 PRL per-socket state creation failures
    0 PRL per-socket state cleanups
    0 PRL socket closes
    0 PRL socket merges
    0 PRL socket unreplicates
    0 PRL primary socket replication initializations
    0 PRL secondary socket replication initializations
    0 PRL primary socket replication activations
    0 PRL secondary socket replication activations
    0 packets received from peers
    0 PRL packets receive operations from peer failed
    0 PRL buffer pullup failures
    0 new pkts dropped on secondary socket
PSRM:
    0 PSRM replication timeouts
    0 PSRM replication messages sent
    0 PSRM replication message send failures
```

 Copyright © 2016, Juniper Networks, Inc.

```
            0 PSRM acknowledgment messages sent
            0 PSRM acknowledgement message send failures
            0 PSRM flow control messages sent
            0 PSRM flow control message send failures
            0 PSRM replication messages received
            0 PSRM replication message receive failures
            0 PSRM acknowledgment messages received
            0 PSRM acknowledgment message receive failures
            0 PSRM flow control messages received
            0 PSRM flow control message receive failures
            0 SRM messages with bad IPC type
            0 PSRM messages with no handler
            2 PSRM global state initializations
            1 PSRM global state cleanups
            0 PSRM per-socket state creations
            0 PSRM per-socket state creation failures
            0 PSRM per-socket state cleanups
            0 PSRM socket closes
            0 PSRM socket merges
            0 PSRM socket unreplicates
            0 PSRM primary socket replication initializations
            0 psrm-secondary-socket-replication-initializations
            0 PSRM primary socket replication activations
            0 secondary socket replication activations
            0 PSRM tcpcb updates
            0 PSRM buffer pullup failures
            73 PSRM tcp timestamp msg recv counters
            0 PSRM tcp timestamp msg recv failures
            0 PSRM tcp timestamp msg send counters
            0 PSRM tcp timestamp msg send failures
        TCP:
            0 TCP out-of-order packets on JSR sockets
    vpls:
            0 total packets received
            0 with size smaller than minimum
            0 with incorrect version number
            0 packets for this host
            0 packets with no logical interface
            0 packets with no family
            0 packets with no route table
            0 packets with no auxiliary table
            0 packets with no corefacing entry
            0 packets with no CE-facing entry
            0 mac route learning requests
            0 mac routes learnt
            0 requests to learn an existing route
            0 learning requests while learning disabled on interface
            0 learning requests over capacity
            0 mac routes moved
            0 requests to move static route
            0 mac route aging requests
            0 mac routes aged
            0 bogus address in aging requests
            0 requests to age static route
            0 requests to re-ageout aged route
            0 requests involving multiple peer FEs
            0 aging acks from PFE
            0 aging non-acks from PFE
            0 aging requests timed out waiting on FEs
            0 aging requests over max-rate
            0 errors finding peer FEs
```

show system statistics (EX Series Switches)

```
user@host> show system statistics
Tcp:
        571779 packets sent
                21517 data packets (1797102 bytes)
                2 data packets retransmitted (20 bytes)
                0 resends initiated by MTU discovery
                3708 ack only packets (531 packets delayed)
                0 URG only packets
                1 window probe packets
                1 window update packets
                1093063 control packets
        1132541 packets received
                20961 acks(for 1796102 bytes)
                5861 duplicate acks
                0 acks for unsent data
                19556  packets received in-sequence(232079 bytes)
                3018 completely duplicate packets(0 bytes)
                0 old duplicate packets
                4 packets with some duplicate data(4 bytes duped)
                2 out-of-order packets(2 bytes)
                0 packets of data after window(0 bytes)
                0 window probes
                39 window update packets
                0 packets received after close
                0 discarded for bad checksums
                0 discarded for bad header offset fields
                0 discarded because packet too short
        546519 connection requests
        78 connection accepts
        0 bad connection attempts
        0 listen queue overflows
        100 connections established (including accepts)
        546596 connections closed (including 6 drops)
                47 connections updated cached RTT on close
                47 connections updated cached RTT variance on close
                0 connections updated cached ssthresh on close
        546497 embryonic connections dropped
        20453 segments updated rtt(of 566914 attempts)
        2 retransmit timeouts
                0 connections dropped by retransmit timeout
        0 persist timeouts
                0 connections dropped by persist timeout
        3028 keepalive timeouts
                3027 keepalive probes sent
                1 connections dropped by keepalive
        7515 correct ACK header predictions
        12258 correct data packet header predictions
        78 syncache entries added
                0 retransmitted
                0 dupsyn
                4 dropped
                78 completed
                0 bucket overflow
                0 cache overflow
                0 reset
                0 stale
                0 aborted
                0 badack
                0 unreach
```


Copyright © 2016, Juniper Networks, Inc.

```
                0 zone failures
            0 cookies sent
            0 cookies received
            1 SACK recovery episodes
            1 segment retransmits in SACK recovery episodes
            1 byte retransmits in SACK recovery episodes
            71 SACK options (SACK blocks) received
            1 SACK options (SACK blocks) sent
            0 SACK scoreboard overflow
            0 ACKs sent in response to in-window but not exact RSTs
            0 ACKs sent in response to in-window SYNs on established connections
            0 rcv packets dropped by TCP due to bad address
            0 out-of-sequence segment drops due to insufficient memory
            546544 RST packets
            0 ICMP packets ignored by TCP
            0 send packets dropped by TCP due to auth errors
            0 rcv packets dropped by TCP due to auth errors
            0 outgoing segments dropped due to policing
udp:
            147 datagrams received
            0 with incomplete header
            0 with bad data length field
            0 with bad checksum
            9 dropped due to no socket
            0 broadcast/multicast datagrams dropped due to no socket
            0 dropped due to full socket buffers
            0 not for hashed pcb
            138 delivered
            0 datagrams output
ip:
            73704 total packets received
            0 bad header checksums
            0 with size smaller than minimum
            0 with data size < data length
            0 with header length < data size
            0 with data length < header length
            0 with incorrect version number
            0 packets destined to dead next hop
            0 fragments received
            0 fragments dropped (dup or out of space)
            0 fragments dropped (queue overflow)
            0 fragments dropped after timeout
            0 fragments dropped due to over limit
            0 packets reassembled ok
            1133057 packets for this host
            0 packets for unknown/unsupported protocol
            40146 packets forwarded
            0 packets not forwardable
            40146 redirects sent
            1121700 packets sent from this host
            0 packets sent with fabricated ip header
            0 output packets dropped due to no bufs
            0 output packets discarded due to no route
            0 output datagrams fragmented
            0 fragments created
            0 datagrams that can't be fragmented
            0 packets with bad options
            0 packets with options handled without error
            0 strict source and record route options
            0 loose source and record route options
            0 record route options
```

```
          0 timestamp options
          0 timestamp and address options
          0 timestamp and prespecified address options
          0 option packets dropped due to rate limit
          0 router alert options
          0 multicast packets dropped (no iflist)
          0 packets dropped (src and int don't match)
          0 transit re packets dropped on mgmt i/f
          0 packets used first nexthop in ecmp unilist
          0 incoming ttpoip packets received
          0 incoming ttpoip packets dropped
           0 outgoing TTPoIP packets sent
          0 outgoing TTPoIP packets dropped
icmp:
          0 drops due to rate limit
          9 calls to icmp_error
          0 errors not generated because old message was icmp
          Output histogram:
                  295 echo reply
                  9 destination unreachable
          0 messages with bad code fields
          0 messages less than the minimum length
          0 messages with bad checksum
          0 messages with bad source address
          0 messages with bad length
          0 echo drops with broadcast or multicast destinaton address
          0 timestamp drops with broadcast or multicast destination address
          Input histogram:
                  295 echo
          295 message responses generated
igmp:
          0 messages received
          0 messages received with too few bytes
          0 messages received with bad checksum
          0 membership queries received
          0 membership queries received with invalid fields
          0 membership reports received
          0 membership reports received with invalid fields
          0 membership reports received for groups to which we belong
          0 Membership reports sent
raw_if:
          0 RAW packets transmitted
          0 PPPOE packets transmitted
          0 ISDN packets transmitted
          0 DIALER packets transmitted
          0 PPP packets transmitted to pppd
          0 PPP packets transmitted to jppd
          0 IGMPL2 packets transmitted
          13 output drops due to tx error
          0 MPU packets transmitted
          0 PPPOE packets received
          0 ISDN packets received
          0 DIALER packets received
          0 PPP packets received from pppd
          0 MPU packets received
          0 PPP packets received from jppd
          0 IGMPL2 packets received
          0 Input drops due to bogus protocol
          0 input drops due to no mbufs available
          0 input drops due to no space in socket
          0 input drops due to no socket
```


Copyright © 2016, Juniper Networks, Inc.

```
arp:
        186413 datagrams received
        88 ARP requests received
        88 ARP replies received
        0 resolution request  received
        0 unrestricted proxy requests
        0 restricted proxy requests
        0 received proxy requests
        0 proxy requests not proxied
        0 restricted proxy requests not proxied
        0 datagrams with bogus interface
        0 datagrams with incorrect length
        0 datagrams for non-IP protocol
        0 datagrams with unsupported op code
        0 datagrams with bad protocol address length
         0 datagrams with bad hardware address length
        0 datagrams with multicast source address
        0 datagrams with multicast source address
        0 datagrams with my own hardware address
        164 datagrams for an address not on the interface
        0 datagrams with a broadcast source address
        0 datagrams with source address duplicate to mine
        186065 datagrams which were not for me
        0 packets discarded waiting for resolution
        0 packets sent after waiting for resolution
        50 ARP requests sent
        88 ARP replies sent
        0 requests for memory denied
        0 requests dropped on entry
        0 requests dropped during retry
        0 requests dropped due to interface deletion
        0 requests on unnumbered interfaces
        0 new requests on unnumbered interfaces
        0 replies for from unnumbered interfaces
        0 requests on unnumbered interface with non-subnetted donor
        0 replies from unnumbered interface with non-subnetted donor
ip6:
        0 total packets received
        0 packets with size smaller than minimum
        0 packets with data size < data length
        0 packets with bad options
        0 packets with incorrect version number
        0 fragments received
        0 fragments dropped (dup or out of space)
        0 fragments dropped after timeout
        0 fragments that exceeded limit
        0 packets reassembled ok
        0 packets for this host
        0 packets forwarded
        0 packets not forwardable
        0 redirects sent
        0 packets sent from this host
        0 packets sent with fabricated ip header
        0 output packets dropped due to no bufs, etc.
        0 output datagrams fragmented
        0 fragments created
        0 datagrams that can't be fragmented
        0 packets that violated scope rules
        0 multicast packets which we don't join
        0 packets whose headers are not continuous
        0 tunneling packets that can't find gif
```

```
        0 packets discarded due to too may headers
        0 failures of source address selection
        0 forward cache hit
        0 forward cache miss
        0 Packets destined to dead next hop
        0 option packets dropped due to rate limit
        0 Packets dropped (src and int don't match)
        0 packets dropped due to bad protocol
        0 transit re packet(null) dropped on mgmt i/f
icmp6:
        0 Calls to icmp_error
        0 Errors not generated because old message was icmp error
        0 Errors not generated because rate limitation
        0 Messages with bad code fields
        0 Messages < minimum length
        0 Bad checksums
        0 Messages with bad length
                0 No route
                0 Administratively prohibited
                 0 Beyond scope
                0 Address unreachable
                0 Port unreachable
                0 packet too big
                0 Time exceed transit
                0 Time exceed reassembly
                0 Erroneous header field
                0 Unrecognized next header
                0 Unrecognized option
                0 redirect
                0 Unknown
        0 Message responses generated
        0 Messages with too many ND options
pfkey:
        0 Requests sent from userland
        0 Bytes sent from userland
        histogram by message type:
                0 reserved
                0 dump
        0 Messages with invalid length field
        0 Messages with invalid version field
        0 Messages with invalid message type field
        0 Messages too short
        0 Messages with memory allocation failure
        0 Messages with duplicate extension
        0 Messages with invalid extension type
        0 Messages with invalid sa type
        0 Messages with invalid address extension
        0 Requests sent to userland
        0 Bytes sent to userland
        histogram by message type:
                0 reserved
                0 dump
        0 Messages toward single socket
        0 Messages toward all sockets
        0 Messages toward registered sockets
        0 Messages with memory allocation failure
clnl:
        0 Total packets received
        0 Packets delivered
        0 Too small packets
        0 Packets with bad header length
```

 Copyright © 2016, Juniper Networks, Inc.

```
            0 Packets with bad checksum
            0 Bad version packets
            0 Unknown or unsupported protocol packets
            0 Packets with bogus sdl size
            0 No free memory in socket buffer
            0 Send packets discarded
            0 Sbappend failure
            0 Mcopy failure
            0 Address fields were not reasonable
            0 Segment information forgotten
            0 Forwarded packets
            0 Total packets sent
            0 Output packets discarded
            0 Non-forwarded packets
            0 Packets fragmented
            0 Fragments sent
            0 Fragments discarded
            0 Fragments timed out
            0 Fragmentation prohibited
            0 Packets reconstructed
            0 Packets destined to dead nexthop
            0 Packets discarded due to no route
            0 Error pdu rate drops
             0 ER pdu generation failure
esis:
            0 Total pkts received
            0 Total packets consumed by protocol
            0 Pdus received with bad checksum
            0 Pdus received with bad version number
            0 Pdus received with bad type field
            0 Short pdus received
            0 Pdus withbogus sdl size
            0 Pdus with bad header length
            0 Pdus with unknown or unsupport protocol
            0 No free memory in socket buffer
            0 Send packets discarded
            0 Sbappend failure
            0 Mcopy failure
            0 ISO family not configured
tnp:
            0 Unicast packets received
            0 Broadcast packets received
            0 Fragmented packets received
            0 Hello packets dropped
            0 Fragments dropped
            0 Fragment reassembly queue flushes
            0 Packets with tnp src address collision received
            0 Hello packets received
            0 Control packets received
            0 Rdp packets received
            0 Udp packets received
            0 Tunnel packets received
            0 Input packets discarded with no protocol
            0 Packets of version unspecified received
            0 Packets of version 1 received
            0 Packets of version 2 received
            0 Packets of version 3 received
            0 Unicast packets sent
            0 Broadcast packets sent
            0 Fragmented packets sent
            0 Hello packets dropped
```

```
            0 Fragments dropped
            0 Hello packets sent
            0 Control packets sent
            0 Rdp packets sent
            0 Udp packets sent
            0 Tunnel packets sent
            0 Packets sent with unknown protocol
            0 Packets of version unspecified sent
            0 Packets of version 1 sent
            0 Packets of version 2 sent
            0 Packets of version 3 sent
    rdp:
            0 Input packets
            0 Packets discarded for bad checksum
            0 Packets discarded due to bad sequence number
            0 Refused connections
            0 Acks received
            0 Packets dropped due to full socket buffers
            0 Retransmits
            0 Output packets
            0 Acks sent
            0 Connects
            0 Closes
            0 Keepalives received
            0 Keepalives sent
    tudp:
            67 Datagrams received
            0 Datagrams with incomplete header
            0 Datagrams with bad data length field
            0 Datagrams with bad checksum
            0 Datagrams dropped due to no socket
            0 Broadcast/multicast datagrams dropped due to no socket
            0 Datagrams dropped due to full socket buffers
            67 Delivered
            68 Datagrams output
    ttp:
            0 Packets sent
            0 Packets sent while unconnected
            0 Packets sent while interface down
            0 Packets sent couldn't get buffer
            0 Packets sent couldn't find neighbor
            0 L2 packets received
            0 Unknown L3 packets received
            0 IPv4 L3 packets received
            0 MPLS L3 packets received
            0 MPLS->IPV4 L3 packets received
            0 IPv4->MPLS L3 packets received
            0 IPv6 L3 packets received
            0 ARP L3 packets received
            0 CLNP L3 packets received
            0 TNP L3 packets received
            0 NULL L3 packets received
            0 Cyclotron cycle L3 packets received
            0 Cyclotron send L3 packets received
            0 Packets received while unconnected
            0 Packets received from unknown ifl
            0 Input packets couldn't get buffer
            0 Input packets with bad type
            0 Input packets with discard type
            0 Input packets with too many tlvs
            0 Input packets with bad tlv header
```


Copyright © 2016, Juniper Networks, Inc.

```
            70633 Input packets with bad tlv type
            68877 Input packets dropped based on tlv result
            0 Input packets for which rt lookup is bypassed
mpls:
            0 Total MPLS packets received
            0 Packets forwarded
            0 Packets dropped
            0 Packets with header too small
            0 After tagging, packets can't fit link MTU
            0 Packets with IPv4 explicit NULL tag
            0 Packets with IPv4 explicit NULL cksum errors
            0 Packets with router alert tag
            0 LSP ping packets (ttl-expired/router alert)
            0 Packets with ttl expired
            0 Packets with tag encoding error
            0 Packets discarded due to no route
            0 Packets used first nexthop in ecmp unilist
vpls:
            0 Total packets received
            0 Packets with size smaller than minimum
            0 Packets with incorrect version number
            0 Packets for this host
            0 Packets with no logical interface
            0 Packets with no family
            0 Packets with no route table
            0 Packets with no auxiliary table
            0 Packets with no corefacing entry
            0 packets with no CE-facing entry
            0 MAC route learning requests
            0 MAC routes learnt
            0 Requests to learn an existing route
            0 Learning requests while learning disabled on interface
            0 Learning requests over capacity
            0 MAC routes moved
            0 Requests to move static route
            0 MAC route aging requests
            0 MAC routes aged
            0 Bogus address in aging requests
            0 Requests to age static route
            0 Requests to re-ageout aged route
            0 Requests involving multiple peer FEs
            0 Aging acks from PFE
            0 Aging non-acks from PFE
            0 Aging requests timed out waiting on FEs
            0 Aging requests over max-rate
            0 Errors finding peer FEs
            0 Unsupported platform
            0 Packets dropped due to no l3 route table
            0 Packets dropped due to no local ifl
            0 Packets punted
            0 Packets dropped due to no socket
bridge:
            Input:
            0 packets received
            0 packets forwarded
            0 packets failed to forward
            0 packets dropped
            0 packets with vmember lookup failures
            0 packets with vlan lookup failures
            0 packets with stp state lookup failures
            0 packets dropped due to stp blocked/listening
```

```
0 packets dropped due to stp learning
0 packets with src MAC learning failures
0 packets with input control processing failures
Forward:
0 packets sent successfully
0 packets with send failures
0 packets forwarded to l3 interface
0 packets with l3 send failures
0 packets discarded
0 packets with l2ifl store failures
0 packets with ifl mismatch failures
0 packets with packet duplication failures
0 packets with tag lookup failures
0 packets with no route for DMAC
0 packets with no route table
0 packets with no nexthop
0 packets with dead nexthop
0 packets with eof reached error
Learning:
0 MACs learned
0 packets sent to l3 interface
0 packets with l3 send failures
0 packets hit holdq while learning
0 MAC moves
0 packets discarded
0 packets with no route for SMAC
0 packets with no nexthop
0 packets with dead nexthop
0 packets dropped due to no resolve route
0 packets with l3 ifd lookup failures
0 packets with l3 ifl lookup failures
0 packets with l3 invalid rnh
0 packets with no route for SMAC in clone learning
0 packets with no nexhop in clone learning
0 packets with dead nexthop in clone learning
0 packets dropped due to no resolve nh in clone learning
Output:
0 packets forwarded
0 packets failed to forward
0 packets with vmember lookup failures
 0 packets with vlan lookup failures
0 packets with input control processing failures
Send:
0 packets sent successfully
0 packets with send failures
0 packets dropped due to interface down
0 packets with dev output failures
0 blocked ifl discards
0 packets with tag lookup failures
0 packets with stp state lookup failures
0 packets with tag insertion failures
0 packets with tag removal failures
Flood:
0 packets flooded
0 flood failures
IGMP:
0 packets sent successfully
0 packets with send failures
0 packets forwarded
0 packets failed to forward
0 packets with mpull failures
```

 Copyright © 2016, Juniper Networks, Inc.

```
                0 packets with vmember lookup failures
                0 packets with vlan lookup failures
                0 packets with ifl lookup failures
                0 packets with tag lookup failures
                Misc:
                0 packets with size smaller than minimum
                0 packets with double tags
                0 packets with no ifl
                0 packets with no family
                0 packets with no route table
```

show system statistics (TX Matrix Router)

```
user@host> show system statistics
sfc0-re0:
--------------------------------------------------------------------------
Tcp:
         361694 packets sent
                 326507 data packets (103237236 bytes)
                 2343 data packets retransmitted (2673324 bytes)
                 0 resends initiated by MTU discovery
                 33857 ack only packets (31613 packets delayed)
                 0 URG only packets
                 14 window probe packets
                 387 window update packets
                 1108 control packets
         345879 packets received
                 298207 acks(for 103141728 bytes)
                 438 duplicate acks
                 0 acks for unsent data
                 204578  packets received in-sequence(13820995 bytes)
                 6 completely duplicate packets(18 bytes)
                 0 old duplicate packets
                 0 packets with some duplicate data(0 bytes duped)
                 0 out-of-order packets(0 bytes)
                 0 packets of data after window(0 bytes)
                 0 window probes
                 899 window update packets
                 166 packets received after close
                 0 discarded for bad checksums
                 0 discarded for bad header offset fields
                 0 discarded because packet too short
         406 connection requests
         233 connection accepts
         0 bad connection attempts
         0 listen queue overflows
         616 connections established (including accepts)
         911 connections closed (including 41 drops)
                 346 connections updated cached RTT on close
                 346 connections updated cached RTT variance on close
                 200 connections updated cached ssthresh on close
         23 embryonic connections dropped
         298155 segments updated rtt(of 287216 attempts)
         1163 retransmit timeouts
                 27 connections dropped by retransmit timeout
         0 persist timeouts
                 0 connections dropped by persist timeout
         5 keepalive timeouts
                 5 keepalive probes sent
                 0 connections dropped by keepalive
         69922 correct ACK header predictions
```

```
        34993 correct data packet header predictions
        233 syncache entries added
                0 retransmitted
                0 dupsyn
                0 dropped
                233 completed
                0 bucket overflow
                0 cache overflow
                0 reset
                0 stale
                0 aborted
                0 badack
                0 unreach
                0 zone failures
        0 cookies sent
        0 cookies received
        23 SACK recovery episodes
        68 segment retransmits in SACK recovery episodes
        71542 byte retransmits in SACK recovery episodes
        158 SACK options (SACK blocks) received
        0 SACK options (SACK blocks) sent
        0 SACK scoreboard overflow
        0 ACKs sent in response to in-window but not exact RSTs
        0 ACKs sent in response to in-window SYNs on established connections
        0 rcv packets dropped by TCP due to bad address
        0 out-of-sequence segment drops due to insufficient memory
        259 RST packets
        0 ICMP packets ignored by TCP
        0 send packets dropped by TCP due to auth errors
        0 rcv packets dropped by TCP due to auth errors
        0 outgoing segments dropped due to policing

lcc0-re0:
--------------------------------------------------------------------------
Tcp:
        346 packets sent
                222 data packets (22894 bytes)
                0 data packets retransmitted (0 bytes)
                0 resends initiated by MTU discovery
                80 ack only packets (12 packets delayed)
                0 URG only packets
                0 window probe packets
                5 window update packets
                42 control packets
        358 packets received
                268 acks(for 22939 bytes)
                9 duplicate acks
                0 acks for unsent data
                203  packets received in-sequence(33820 bytes)
                0 completely duplicate packets(0 bytes)
                0 old duplicate packets
                0 packets with some duplicate data(0 bytes duped)
                0 out-of-order packets(0 bytes)
                0 packets of data after window(0 bytes)
                0 window probes
                6 window update packets
                0 packets received after close
                0 discarded for bad checksums
                0 discarded for bad header offset fields
                0 discarded because packet too short
        13 connection requests
```


Copyright © 2016, Juniper Networks, Inc.

```
            18 connection accepts
            0 bad connection attempts
            0 listen queue overflows
            31 connections established (including accepts)
            35 connections closed (including 2 drops)
                    3 connections updated cached RTT on close
                    3 connections updated cached RTT variance on close
                    0 connections updated cached ssthresh on close
            0 embryonic connections dropped
            268 segments updated rtt(of 247 attempts)
            0 retransmit timeouts
                    0 connections dropped by retransmit timeout
            0 persist timeouts
                    0 connections dropped by persist timeout
            0 keepalive timeouts
                    0 keepalive probes sent
                    0 connections dropped by keepalive
            0 correct ACK header predictions
            42 correct data packet header predictions
            18 syncache entries added
                    0 retransmitted
                    0 dupsyn
                    0 dropped
                    18 completed
                    0 bucket overflow
                    0 cache overflow
                    0 reset
                    0 stale
                    0 aborted
                    0 badack
                    0 unreach
                    0 zone failures
            0 cookies sent
            0 cookies received
            0 SACK recovery episodes
            0 segment retransmits in SACK recovery episodes
            0 byte retransmits in SACK recovery episodes
            0 SACK options (SACK blocks) received
            0 SACK options (SACK blocks) sent
            0 SACK scoreboard overflow
            0 ACKs sent in response to in-window but not exact RSTs
            0 ACKs sent in response to in-window SYNs on established connections
            0 rcv packets dropped by TCP due to bad address
            0 out-of-sequence segment drops due to insufficient memory
            5 RST packets
            0 ICMP packets ignored by TCP
            0 send packets dropped by TCP due to auth errors
            0 rcv packets dropped by TCP due to auth errors
            0 outgoing segments dropped due to policing

    lcc1-re0:
    --------------------------------------------------------------------------
    Tcp:
            348 packets sent
                    223 data packets (22895 bytes)
                    0 data packets retransmitted (0 bytes)
                    0 resends initiated by MTU discovery
                    81 ack only packets (13 packets delayed)
                    0 URG only packets
                    0 window probe packets
                    5 window update packets
```

```
        42 control packets
360 packets received
        269 acks(for 22940 bytes)
        9 duplicate acks
        0 acks for unsent data
        203  packets received in-sequence(33820 bytes)
        0 completely duplicate packets(0 bytes)
        0 old duplicate packets
        0 packets with some duplicate data(0 bytes duped)
        0 out-of-order packets(0 bytes)
        0 packets of data after window(0 bytes)
        0 window probes
        6 window update packets
        0 packets received after close
        0 discarded for bad checksums
        0 discarded for bad header offset fields
        0 discarded because packet too short
13 connection requests
18 connection accepts
0 bad connection attempts
0 listen queue overflows
31 connections established (including accepts)
36 connections closed (including 2 drops)
        3 connections updated cached RTT on close
        3 connections updated cached RTT variance on close
        0 connections updated cached ssthresh on close
0 embryonic connections dropped
269 segments updated rtt(of 248 attempts)
0 retransmit timeouts
        0 connections dropped by retransmit timeout
0 persist timeouts
        0 connections dropped by persist timeout
0 keepalive timeouts
        0 keepalive probes sent
        0 connections dropped by keepalive
0 correct ACK header predictions
43 correct data packet header predictions
18 syncache entries added
        0 retransmitted
        0 dupsyn
        0 dropped
        18 completed
        0 bucket overflow
        0 cache overflow
        0 reset
        0 stale
        0 aborted
        0 badack
        0 unreach
        0 zone failures
0 cookies sent
0 cookies received
0 SACK recovery episodes
0 segment retransmits in SACK recovery episodes
0 byte retransmits in SACK recovery episodes
0 SACK options (SACK blocks) received
0 SACK options (SACK blocks) sent
0 SACK scoreboard overflow
0 ACKs sent in response to in-window but not exact RSTs
0 ACKs sent in response to in-window SYNs on established connections
0 rcv packets dropped by TCP due to bad address
```

 Copyright © 2016, Juniper Networks, Inc.

```
        0 out-of-sequence segment drops due to insufficient memory
        5 RST packets
        0 ICMP packets ignored by TCP
        0 send packets dropped by TCP due to auth errors
        0 rcv packets dropped by TCP due to auth errors
        0 outgoing segments dropped due to policing

lcc2-re0:
--------------------------------------------------------------------------
Tcp:
        405 packets sent
                271 data packets (23926 bytes)
                0 data packets retransmitted (0 bytes)
                0 resends initiated by MTU discovery
                86 ack only packets (13 packets delayed)
                0 URG only packets
                0 window probe packets
                5 window update packets
                46 control packets
        418 packets received
                321 acks(for 23975 bytes)
                9 duplicate acks
                0 acks for unsent data
                234  packets received in-sequence(34403 bytes)
                0 completely duplicate packets(0 bytes)
                0 old duplicate packets
                0 packets with some duplicate data(0 bytes duped)
                0 out-of-order packets(0 bytes)
                0 packets of data after window(0 bytes)
                0 window probes
                7 window update packets
                0 packets received after close
                0 discarded for bad checksums
                0 discarded for bad header offset fields
                0 discarded because packet too short
        15 connection requests
        19 connection accepts
        0 bad connection attempts
        0 listen queue overflows
        34 connections established (including accepts)
        39 connections closed (including 2 drops)
                4 connections updated cached RTT on close
                4 connections updated cached RTT variance on close
                0 connections updated cached ssthresh on close
        0 embryonic connections dropped
        321 segments updated rtt(of 299 attempts)
        0 retransmit timeouts
                0 connections dropped by retransmit timeout
        0 persist timeouts
                0 connections dropped by persist timeout
        0 keepalive timeouts
                0 keepalive probes sent
                0 connections dropped by keepalive
        0 correct ACK header predictions
        48 correct data packet header predictions
        19 syncache entries added
                0 retransmitted
                0 dupsyn
                0 dropped
                19 completed
                0 bucket overflow
```

```
                0 cache overflow
                0 reset
                0 stale
                0 aborted
                0 badack
                0 unreach
                0 zone failures
        0 cookies sent
        0 cookies received
        0 SACK recovery episodes
        0 segment retransmits in SACK recovery episodes
        0 byte retransmits in SACK recovery episodes
        0 SACK options (SACK blocks) received
        0 SACK options (SACK blocks) sent
        0 SACK scoreboard overflow
        0 ACKs sent in response to in-window but not exact RSTs
        0 ACKs sent in response to in-window SYNs on established connections
        0 rcv packets dropped by TCP due to bad address
        0 out-of-sequence segment drops due to insufficient memory
        5 RST packets
        0 ICMP packets ignored by TCP
        0 send packets dropped by TCP due to auth errors
        0 rcv packets dropped by TCP due to auth errors
        0 outgoing segments dropped due to policing

lcc3-re0:
--------------------------------------------------------------------------
Tcp:
        346 packets sent
                221 data packets (22895 bytes)
                0 data packets retransmitted (0 bytes)
                0 resends initiated by MTU discovery
                81 ack only packets (13 packets delayed)
                0 URG only packets
                0 window probe packets
                5 window update packets
                42 control packets
        360 packets received
                267 acks(for 22940 bytes)
                9 duplicate acks
                0 acks for unsent data
                203  packets received in-sequence(33820 bytes)
                0 completely duplicate packets(0 bytes)
                0 old duplicate packets
                0 packets with some duplicate data(0 bytes duped)
                0 out-of-order packets(0 bytes)
                0 packets of data after window(0 bytes)
                0 window probes
                6 window update packets
                0 packets received after close
                0 discarded for bad checksums
                0 discarded for bad header offset fields
                0 discarded because packet too short
        13 connection requests
        18 connection accepts
        0 bad connection attempts
        0 listen queue overflows
        31 connections established (including accepts)
        35 connections closed (including 2 drops)
                3 connections updated cached RTT on close
                3 connections updated cached RTT variance on close
```


Copyright © 2016, Juniper Networks, Inc.

```
        0 connections updated cached ssthresh on close
0 embryonic connections dropped
267 segments updated rtt(of 246 attempts)
0 retransmit timeouts
        0 connections dropped by retransmit timeout
0 persist timeouts
        0 connections dropped by persist timeout
0 keepalive timeouts
        0 keepalive probes sent
        0 connections dropped by keepalive
0 correct ACK header predictions
43 correct data packet header predictions
18 syncache entries added
        0 retransmitted
        0 dupsyn
        0 dropped
        18 completed
        0 bucket overflow
        0 cache overflow
        0 reset
        0 stale
        0 aborted
        0 badack
        0 unreach
        0 zone failures
0 cookies sent
0 cookies received
0 SACK recovery episodes
0 segment retransmits in SACK recovery episodes
0 byte retransmits in SACK recovery episodes
0 SACK options (SACK blocks) received
0 SACK options (SACK blocks) sent
0 SACK scoreboard overflow
0 ACKs sent in response to in-window but not exact RSTs
0 ACKs sent in response to in-window SYNs on established connections
0 rcv packets dropped by TCP due to bad address
0 out-of-sequence segment drops due to insufficient memory
5 RST packets
0 ICMP packets ignored by TCP
0 send packets dropped by TCP due to auth errors
0 rcv packets dropped by TCP due to auth errors
0 outgoing segments dropped due to policing
```

show system statistics (QFX Series)

```
user@switch> show system statistics
Tcp:
571779 packets sent
21517 data packets (1797102 bytes)
2 data packets retransmitted (20 bytes)
0 resends initiated by MTU discovery
3708 ack only packets (531 packets delayed)
0 URG only packets
1 window probe packets
1 window update packets
1093063 control packets
1132541 packets received
20961 acks(for 1796102 bytes)
5861 duplicate acks
0 acks for unsent data
19556 packets received in-sequence(232079 bytes)
```

```
3018 completely duplicate packets(0 bytes)
0 old duplicate packets
4 packets with some duplicate data(4 bytes duped)
2 out-of-order packets(2 bytes)
0 packets of data after window(0 bytes)
0 window probes
39 window update packets
0 packets received after close
0 discarded for bad checksums
0 discarded for bad header offset fields
0 discarded because packet too short
546519 connection requests
78 connection accepts
0 bad connection attempts
0 listen queue overflows
100 connections established (including accepts)
546596 connections closed (including 6 drops)
47 connections updated cached RTT on close
47 connections updated cached RTT variance on close
0 connections updated cached ssthresh on close
546497 embryonic connections dropped
20453 segments updated rtt(of 566914 attempts)
2 retransmit timeouts
0 connections dropped by retransmit timeout
0 persist timeouts
0 connections dropped by persist timeout
3028 keepalive timeouts
3027 keepalive probes sent
1 connections dropped by keepalive
7515 correct ACK header predictions
12258 correct data packet header predictions
78 syncache entries added
0 retransmitted
0 dupsyn
4 dropped
78 completed
0 bucket overflow
0 cache overflow
0 reset
0 stale
0 aborted
0 badack
0 unreach
0 zone failures
0 cookies sent
0 cookies received
1 SACK recovery episodes
1 segment retransmits in SACK recovery episodes
1 byte retransmits in SACK recovery episodes
71 SACK options (SACK blocks) received
1 SACK options (SACK blocks) sent
0 SACK scoreboard overflow
0 ACKs sent in response to in-window but not exact RSTs
0 ACKs sent in response to in-window SYNs on established connections
0 rcv packets dropped by TCP due to bad address
0 out-of-sequence segment drops due to insufficient memory
546544 RST packets
0 ICMP packets ignored by TCP
0 send packets dropped by TCP due to auth errors
0 rcv packets dropped by TCP due to auth errors
0 outgoing segments dropped due to policing
```

 Copyright © 2016, Juniper Networks, Inc.

```
udp:
147 datagrams received
0 with incomplete header
0 with bad data length field
0 with bad checksum
9 dropped due to no socket
0 broadcast/multicast datagrams dropped due to no socket
0 dropped due to full socket buffers
0 not for hashed pcb
138 delivered
0 datagrams output
ip:
73704 total packets received
0 bad header checksums
0 with size smaller than minimum
0 with data size < data length
0 with header length < data size
0 with data length < header length
0 with incorrect version number
0 packets destined to dead next hop
0 fragments received
0 fragments dropped (dup or out of space)
0 fragments dropped (queue overflow)
0 fragments dropped after timeout
0 fragments dropped due to over limit
0 packets reassembled ok
1133057 packets for this host
0 packets for unknown/unsupported protocol
40146 packets forwarded
0 packets not forwardable
40146 redirects sent
1121700 packets sent from this host
0 packets sent with fabricated ip header
0 output packets dropped due to no bufs
0 output packets discarded due to no route
0 output datagrams fragmented
0 fragments created
0 datagrams that can't be fragmented
0 packets with bad options
0 packets with options handled without error
0 strict source and record route options
0 loose source and record route options
0 record route options
0 timestamp options
0 timestamp and address options
0 timestamp and prespecified address options
0 option packets dropped due to rate limit
0 router alert options
0 multicast packets dropped (no iflist)
0 packets dropped (src and int don't match)
0 transit re packets dropped on mgmt i/f
0 packets used first nexthop in ecmp unilist
0 incoming ttpoip packets received
0 incoming ttpoip packets dropped
0 outgoing TTPoIP packets sent
0 outgoing TTPoIP packets dropped
icmp:
0 drops due to rate limit
9 calls to icmp_error
0 errors not generated because old message was icmp
Output histogram:
```

```
295 echo reply
9 destination unreachable
0 messages with bad code fields
0 messages less than the minimum length
0 messages with bad checksum
0 messages with bad source address
0 messages with bad length
0 echo drops with broadcast or multicast destinaton address
0 timestamp drops with broadcast or multicast destination address
Input histogram:
295 echo
295 message responses generated
igmp:
0 messages received
0 messages received with too few bytes
0 messages received with bad checksum
0 membership queries received
0 membership queries received with invalid fields
0 membership reports received
0 membership reports received with invalid fields
0 membership reports received for groups to which we belong
0 Membership reports sent
raw_if:
0 RAW packets transmitted
0 PPPOE packets transmitted
0 ISDN packets transmitted
0 DIALER packets transmitted
0 PPP packets transmitted to pppd
0 PPP packets transmitted to jppd
0 IGMPL2 packets transmitted
13 output drops due to tx error
0 MPU packets transmitted
0 PPPOE packets received
0 ISDN packets received
0 DIALER packets received
0 PPP packets received from pppd
0 MPU packets received
0 PPP packets received from jppd
0 IGMPL2 packets received
0 Input drops due to bogus protocol
0 input drops due to no mbufs available
0 input drops due to no space in socket
0 input drops due to no socket
arp:
186413 datagrams received
88 ARP requests received
88 ARP replies received
0 resolution request received
0 unrestricted proxy requests
0 restricted proxy requests
0 received proxy requests
0 proxy requests not proxied
0 restricted proxy requests not proxied
0 datagrams with bogus interface
0 datagrams with incorrect length
0 datagrams for non-IP protocol
0 datagrams with unsupported op code
0 datagrams with bad protocol address length
0 datagrams with bad hardware address length
0 datagrams with multicast source address
0 datagrams with multicast source address
```

 Copyright © 2016, Juniper Networks, Inc.

```
0 datagrams with my own hardware address
164 datagrams for an address not on the interface
0 datagrams with a broadcast source address
0 datagrams with source address duplicate to mine
186065 datagrams which were not for me
0 packets discarded waiting for resolution
0 packets sent after waiting for resolution
50 ARP requests sent
88 ARP replies sent
0 requests for memory denied
0 requests dropped on entry
0 requests dropped during retry
0 requests dropped due to interface deletion
0 requests on unnumbered interfaces
0 new requests on unnumbered interfaces
0 replies for from unnumbered interfaces
0 requests on unnumbered interface with non-subnetted donor
0 replies from unnumbered interface with non-subnetted donor
ip6:
0 total packets received
0 packets with size smaller than minimum
0 packets with data size < data length
0 packets with bad options
0 packets with incorrect version number
0 fragments received
0 fragments dropped (dup or out of space)
0 fragments dropped after timeout
0 fragments that exceeded limit
0 packets reassembled ok
0 packets for this host
0 packets forwarded
0 packets not forwardable
0 redirects sent
0 packets sent from this host
0 packets sent with fabricated ip header
0 output packets dropped due to no bufs, etc.
0 output datagrams fragmented
0 fragments created
0 datagrams that can't be fragmented
0 packets that violated scope rules
0 multicast packets which we don't join
0 packets whose headers are not continuous
0 tunneling packets that can't find gif
0 packets discarded due to too may headers
0 failures of source address selection
0 forward cache hit
0 forward cache miss
0 Packets destined to dead next hop
0 option packets dropped due to rate limit
0 Packets dropped (src and int don't match)
0 packets dropped due to bad protocol
0 transit re packet(null) dropped on mgmt i/f
icmp6:
0 Calls to icmp_error
0 Errors not generated because old message was icmp error
0 Errors not generated because rate limitation
0 Messages with bad code fields
0 Messages < minimum length
0 Bad checksums
0 Messages with bad length
0 No route
```

```
0 Administratively prohibited
0 Beyond scope
0 Address unreachable
0 Port unreachable
0 packet too big
0 Time exceed transit
0 Time exceed reassembly
0 Erroneous header field
0 Unrecognized next header
0 Unrecognized option
0 redirect
0 Unknown
0 Message responses generated
0 Messages with too many ND options
pfkey:
0 Requests sent from userland
0 Bytes sent from userland
histogram by message type:
0 reserved
0 dump
0 Messages with invalid length field
0 Messages with invalid version field
0 Messages with invalid message type field
0 Messages too short
0 Messages with memory allocation failure
0 Messages with duplicate extension
0 Messages with invalid extension type
0 Messages with invalid sa type
0 Messages with invalid address extension
0 Requests sent to userland
0 Bytes sent to userland
histogram by message type:
0 reserved
0 dump
0 Messages toward single socket
0 Messages toward all sockets
0 Messages toward registered sockets
0 Messages with memory allocation failure
clnl:
0 Total packets received
0 Packets delivered
0 Too small packets
0 Packets with bad header length
0 Packets with bad checksum
0 Bad version packets
0 Unknown or unsupported protocol packets
0 Packets with bogus sdl size
0 No free memory in socket buffer
0 Send packets discarded
0 Sbappend failure
0 Mcopy failure
0 Address fields were not reasonable
0 Segment information forgotten
0 Forwarded packets
0 Total packets sent
0 Output packets discarded
0 Non-forwarded packets
0 Packets fragmented
0 Fragments sent
0 Fragments discarded
0 Fragments timed out
```

 Copyright © 2016, Juniper Networks, Inc.

```
0 Fragmentation prohibited
0 Packets reconstructed
0 Packets destined to dead nexthop
0 Packets discarded due to no route
0 Error pdu rate drops
0 ER pdu generation failure
esis:
0 Total pkts received
0 Total packets consumed by protocol
0 Pdus received with bad checksum
0 Pdus received with bad version number
0 Pdus received with bad type field
0 Short pdus received
0 Pdus withbogus sdl size
0 Pdus with bad header length
0 Pdus with unknown or unsupport protocol
0 No free memory in socket buffer
0 Send packets discarded
0 Sbappend failure
0 Mcopy failure
0 ISO family not configured
tnp:
0 Unicast packets received
0 Broadcast packets received
0 Fragmented packets received
0 Hello packets dropped
0 Fragments dropped
0 Fragment reassembly queue flushes
0 Packets with tnp src address collision received
0 Hello packets received
0 Control packets received
0 Rdp packets received
0 Udp packets received
0 Tunnel packets received
0 Input packets discarded with no protocol
0 Packets of version unspecified received
0 Packets of version 1 received
0 Packets of version 2 received
0 Packets of version 3 received
0 Unicast packets sent
0 Broadcast packets sent
0 Fragmented packets sent
0 Hello packets dropped
0 Fragments dropped
0 Hello packets sent
0 Control packets sent
0 Rdp packets sent
0 Udp packets sent
0 Tunnel packets sent
0 Packets sent with unknown protocol
0 Packets of version unspecified sent
0 Packets of version 1 sent
0 Packets of version 2 sent
0 Packets of version 3 sent
rdp:
0 Input packets
0 Packets discarded for bad checksum
0 Packets discarded due to bad sequence number
0 Refused connections
0 Acks received
0 Packets dropped due to full socket buffers
```

```
0 Retransmits
0 Output packets
0 Acks sent
0 Connects
0 Closes
0 Keepalives received
0 Keepalives sent
tudp:
67 Datagrams received
0 Datagrams with incomplete header
0 Datagrams with bad data length field
0 Datagrams with bad checksum
0 Datagrams dropped due to no socket
0 Broadcast/multicast datagrams dropped due to no socket
0 Datagrams dropped due to full socket buffers
67 Delivered
68 Datagrams output
ttp:
0 Packets sent
0 Packets sent while unconnected
0 Packets sent while interface down
0 Packets sent couldn't get buffer
0 Packets sent couldn't find neighbor
0 L2 packets received
0 Unknown L3 packets received
0 IPv4 L3 packets received
0 MPLS L3 packets received
0 MPLS->IPV4 L3 packets received
0 IPv4->MPLS L3 packets received
0 IPv6 L3 packets received
0 ARP L3 packets received
0 CLNP L3 packets received
0 TNP L3 packets received
0 NULL L3 packets received
0 Cyclotron cycle L3 packets received
0 Cyclotron send L3 packets received
0 Packets received while unconnected
0 Packets received from unknown ifl
0 Input packets couldn't get buffer
0 Input packets with bad type
0 Input packets with discard type
0 Input packets with too many tlvs
0 Input packets with bad tlv header
70633 Input packets with bad tlv type
68877 Input packets dropped based on tlv result0 Input packets for which rt lookup
 is bypassed
mpls:
0 Total MPLS packets received
0 Packets forwarded
0 Packets dropped
0 Packets with header too small
0 After tagging, packets can't fit link MTU
0 Packets with IPv4 explicit NULL tag
0 Packets with IPv4 explicit NULL cksum errors
0 Packets with router alert tag
0 LSP ping packets (ttl-expired/router alert)
0 Packets with ttl expired
0 Packets with tag encoding error
0 Packets discarded due to no route
0 Packets used first nexthop in ecmp unilist
vpls:
```


Copyright © 2016, Juniper Networks, Inc.

```
0 Total packets received
0 Packets with size smaller than minimum
0 Packets with incorrect version number
0 Packets for this host
0 Packets with no logical interface
0 Packets with no family
0 Packets with no route table
582 Copyright © 2010, Juniper Networks, Inc.
0 Packets with no auxiliary table
0 Packets with no corefacing entry
0 packets with no CE-facing entry
0 MAC route learning requests
0 MAC routes learnt
0 Requests to learn an existing route
0 Learning requests while learning disabled on interface
0 Learning requests over capacity
0 MAC routes moved
0 Requests to move static route
0 MAC route aging requests
0 MAC routes aged
0 Bogus address in aging requests
0 Requests to age static route
0 Requests to re-ageout aged route
0 Requests involving multiple peer FEs
0 Aging acks from PFE
0 Aging non-acks from PFE
0 Aging requests timed out waiting on FEs
0 Aging requests over max-rate
0 Errors finding peer FEs
0 Unsupported platform
0 Packets dropped due to no l3 route table
0 Packets dropped due to no local ifl
0 Packets punted
0 Packets dropped due to no socket
bridge:
Input:
0 packets received
0 packets forwarded
0 packets failed to forward
0 packets dropped
0 packets with vmember lookup failures
0 packets with vlan lookup failures
0 packets with stp state lookup failures
0 packets dropped due to stp blocked/listening
0 packets dropped due to stp learning
0 packets with src MAC learning failures
0 packets with input control processing failures
Forward:
0 packets sent successfully
0 packets with send failures
0 packets forwarded to l3 interface
0 packets with l3 send failures
0 packets discarded
0 packets with l2ifl store failures
0 packets with ifl mismatch failures
0 packets with packet duplication failures
0 packets with tag lookup failures
0 packets with no route for DMAC
0 packets with no route table
0 packets with no nexthop
0 packets with dead nexthop
```

```
0 packets with eof reached error
Learning:
0 MACs learned
0 packets sent to l3 interface
0 packets with l3 send failures
0 packets hit holdq while learning
0 MAC moves
0 packets discarded
0 packets with no route for SMAC
0 packets with no nexthop
0 packets with dead nexthop
0 packets dropped due to no resolve route
0 packets with l3 ifd lookup failures
0 packets with l3 ifl lookup failures
0 packets with l3 invalid rnh
0 packets with no route for SMAC in clone learning
0 packets with no nexhop in clone learning
0 packets with dead nexthop in clone learning
0 packets dropped due to no resolve nh in clone learning
Output:
0 packets forwarded
0 packets failed to forward
0 packets with vmember lookup failures
0 packets with vlan lookup failures
0 packets with input control processing failures
Send:
0 packets sent successfully
0 packets with send failures
0 packets dropped due to interface down
0 packets with dev output failures
0 blocked ifl discards
0 packets with tag lookup failures
0 packets with stp state lookup failures
0 packets with tag insertion failures
0 packets with tag removal failures
Flood:
0 packets flooded
0 flood failures
IGMP:
0 packets sent successfully
0 packets with send failures
0 packets forwarded
0 packets failed to forward
0 packets with mpull failures
0 packets with vmember lookup failures
0 packets with vlan lookup failures
0 packets with ifl lookup failures
0 packets with tag lookup failures
Misc:
0 packets with size smaller than minimum
0 packets with double tags
0 packets with no ifl
0 packets with no family
0 packets with no route table
```


Copyright © 2016, Juniper Networks, Inc.

show system storage

List of Syntax

Syntax on page 1115
Syntax (EX Series Switches) on page 1115
Syntax (MX Series Router) on page 1115
Syntax (QFX Series) on page 1115
Syntax (SRX Series) on page 1115
Syntax (TX Matrix Router) on page 1115
Syntax (TX Matrix Plus Router and TX Matrix Plus Router with 3D SIBs) on page 1115

Syntax

```
show system storage
<detail>
<invoke-on (all-routing-engines | other-routing-engine)>
```

Syntax (EX Series Switches)

```
show system storage
<detail>
<all-members>
<local>
<member member-id>
<invoke-on (all-routing-engines | other-routing-engine)>
```

Syntax (MX Series Router)

```
show system storage
<detail>
<all-members>
<local>
<member member-id>
<invoke-on (all-routing-engines | other-routing-engine)>
```

Syntax (QFX Series)

```
show system storage
<detail>
<infrastructure name>
<interconnect-device name>
<node-group name>
<invoke-on (all-routing-engines | other-routing-engine)>
```

Syntax (SRX Series)

```
show system storage
<detail>
<partitions>
<invoke-on (all-routing-engines | other-routing-engine)>
```

Syntax (TX Matrix Router)

```
show system storage
<detail>
<all-chassis | all-lcc | lcc number | scc>
<invoke-on (all-routing-engines | other-routing-engine)>
```

Syntax (TX Matrix Plus Router and TX Matrix Plus Router with 3D SIBs)

```
show system storage
<detail>
<all-chassis | all-lcc | lcc number | sfc number>
<invoke-on (all-routing-engines | other-routing-engine)>
```

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 Release 9.6.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Option **invoke-on (all-routing-engines | other-routing-engine)** introduced in Junos OS Release 14.1
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Display statistics about the amount of free disk space in the router's or switch's file systems.

Options

none—Display standard information about the amount of free disk space in the router's or switch's file systems.

detail—(Optional) Display detailed output.

invoke-on all-routing-engines—(Optional) Display the system storage information on all master and backup Routing Engines on a routing matrix based on the TX Matrix or TX Matrix Plus router or on a router that has dual Routing Engines.

invoke-on other-routing-engines—(Optional) Display the system storage information on the other Routing Engine. For example, if you issue this command on the master Routing Engine on an M320 router, the JUNOS Software displays the system storage information on the backup Routing Engine. On a routing matrix based on the TX Matrix or TX Matrix Plus router, if you issue this command on the TX Matrix or TX Matrix Plus router's master Routing Engine, the JUNOS Software displays all the system storage information on all the backup Routing Engines.

all-chassis—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Display system storage statistics for all the routers in the chassis.

all-lcc—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display system storage statistics for all T640 routers connected to the TX Matrix router. On a TX Matrix Plus router, display system storage statistics for all routers connected to the TX Matrix Plus router.

all-members—(EX4200 switches and MX Series routers only) (Optional) Display system storage statistics for all members of the Virtual Chassis configuration.

infrastructure ***name***—(QFabric systems only) (Optional) Display system storage statistics for the fabric control Routing Engines or fabric manager Routing Engines.

interconnect-device ***name***—(QFabric systems only) (Optional) Display system storage statistics for the Interconnect device.

lcc ***number***—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display system storage statistics for a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, display system storage statistics for a specific router that is connected to the TX Matrix Plus router.

 Copyright © 2016, Juniper Networks, Inc.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(EX4200 switches and MX Series routers only) (Optional) Display system storage statistics for the local Virtual Chassis member.

member ***member-id***—(EX4200 switches and MX Series routers only) (Optional) Display system storage statistics for the specified member of the Virtual Chassis configuration. For EX4200 switches, replace ***member-id*** with a value from 0 through 9. For an MX Series Virtual Chassis, replace ***member-id*** with a value of 0 or 1.

node-group ***name***—(QFabric systems only) (Optional) Display system storage statistics for the Node group.

scc—(TX Matrix routers only) (Optional) Display system storage statistics for the TX Matrix router (or switch-card chassis).

sfc ***number***—(TX Matrix Plus routers only) (Optional) Display system storage statistics for the TX Matrix Plus router. Replace ***number*** with 0.

Additional Information

By default, when you issue the **show system storage** command on the master Routing Engine of a TX Matrix router or a TX Matrix Plus router, the command is broadcast to all the master Routing Engines of the LCCs connected to it in the routing matrix. Likewise, if you issue the same command on the backup Routing Engine of a TX Matrix or a TX Matrix Plus router, the command is broadcast to all backup Routing Engines of the LCCs that are connected to it in the routing matrix.

Required Privilege Level

view

Related Documentation

- *Routing Matrix with a TX Matrix Plus Router Solutions Page*
- *show system storage partitions (View SRX Series)*

List of Sample Output

show system storage on page 1118
show system storage (TX Matrix Plus Router) on page 1118
show system storage (QFX3500 Switch) on page 1120
show system storage invoke-on all-routing-engines on page 1121
show system storage invoke-on other-routing-engine on page 1122

Output Fields Table 57 on page 1118 describes the output fields for the **show system storage** command. Output fields are listed in the approximate order in which they appear.

Table 57: show system storage Output Fields

Field Name	Field Description
Filesystem	Name of the filesystem.
Size	Size of the filesystem.
Used	Amount of space used in the filesystem.
Avail	Amount of space available in the filesystem.
Capacity	Percentage of the filesystem space that is being used.
Mounted on	Directory in which the filesystem is mounted.

Sample Output

show system storage

```
user@host> show system storage
Filesystem              Size       Used      Avail  Capacity   Mounted on
/dev/ad0s1a              77M        37M        34M       52%  /
devfs                    16K        16K         0B      100%  /dev/
/dev/vn0                 12M        12M         0B      100%  /packages/mnt/jbase
/dev/vn1                 39M        39M         0B      100%
/packages/mnt/jkernel-7.2R1.7
/dev/vn2                 12M        12M         0B      100%
/packages/mnt/jpfe-M40-7.2R1.7
/dev/vn3                2.3M       2.3M         0B      100%
/packages/mnt/jdocs-7.2R1.7
/dev/vn4                 14M        14M         0B      100%
/packages/mnt/jroute-7.2R1.7
/dev/vn5                4.5M       4.5M         0B      100%
/packages/mnt/jcrypto-7.2R1.7
mfs:172                 1.5G       4.0K       1.3G        0%  /tmp
/dev/ad0s1e              12M        20K        11M        0%  /config
procfs                  4.0K       4.0K         0B      100%  /proc
/dev/ad1s1f             9.4G       4.9G       3.7G       57%  /var
```

show system storage (TX Matrix Plus Router)

```
user@host> show system storage
sfc0-re0:
--------------------------------------------------------------------------
Filesystem              Size       Used      Avail  Capacity   Mounted on
/dev/ad0s1a             3.4G       178M       2.9G        6%  /
devfs                   1.0K       1.0K         0B      100%  /dev
devfs                   1.0K       1.0K         0B      100%  /dev/
/dev/md0                 33M        33M         0B      100%  /packages/mnt/jbase
/dev/md1                216M       216M         0B      100%
/packages/mnt/jkernel-9.6-20090519.0
/dev/md2                 66M        66M         0B      100%
/packages/mnt/jpfe-T-9.6-20090519.0
```


Copyright © 2016, Juniper Networks, Inc.

```
/dev/md3                4.1M       4.1M         0B      100%
/packages/mnt/jdocs-9.6-20090519.0
/dev/md4                 57M        57M         0B      100%
/packages/mnt/jroute-9.6-20090519.0
/dev/md5                 15M        15M         0B      100%
/packages/mnt/jcrypto-9.6-20090519.0
/dev/md6                 34M        34M         0B      100%
/packages/mnt/jpfe-common-9.6-20090519.0
/dev/md7                2.0G      10.0K       1.8G        0%  /tmp
/dev/md8                2.0G       1.0M       1.8G        0%  /mfs
/dev/ad0s1e             383M        82K       352M        0%  /config
procfs                  4.0K       4.0K         0B      100%  /proc
/dev/ad1s1f              52G       7.5G        40G       16%  /var

lcc0-re0:
--------------------------------------------------------------------------
Filesystem              Size       Used      Avail  Capacity   Mounted on
/dev/ad0s1a             3.4G       178M       2.9G        6%  /
devfs                   1.0K       1.0K         0B      100%  /dev
devfs                   1.0K       1.0K         0B      100%  /dev/
/dev/md0                 33M        33M         0B      100%  /packages/mnt/jbase
/dev/md1                216M       216M         0B      100%
/packages/mnt/jkernel-9.6-20090519.0
/dev/md2                 66M        66M         0B      100%
/packages/mnt/jpfe-T-9.6-20090519.0
/dev/md3                4.1M       4.1M         0B      100%
/packages/mnt/jdocs-9.6-20090519.0
/dev/md4                 57M        57M         0B      100%
/packages/mnt/jroute-9.6-20090519.0
/dev/md5                 15M        15M         0B      100%
/packages/mnt/jcrypto-9.6-20090519.0
/dev/md6                 34M        34M         0B      100%
/packages/mnt/jpfe-common-9.6-20090519.0
/dev/md7                2.0G      10.0K       1.8G        0%  /tmp
/dev/md8                2.0G       540K       1.8G        0%  /mfs
/dev/ad0s1e             383M        88K       352M        0%  /config
procfs                  4.0K       4.0K         0B      100%  /proc
/dev/ad1s1f              52G       6.3G        41G       13%  /var

lcc1-re0:
--------------------------------------------------------------------------
Filesystem              Size       Used      Avail  Capacity   Mounted on
/dev/ad0s1a             3.4G       178M       2.9G        6%  /
devfs                   1.0K       1.0K         0B      100%  /dev
devfs                   1.0K       1.0K         0B      100%  /dev/
/dev/md0                 33M        33M         0B      100%  /packages/mnt/jbase
/dev/md1                216M       216M         0B      100%
/packages/mnt/jkernel-9.6-20090519.0
/dev/md2                 66M        66M         0B      100%
/packages/mnt/jpfe-T-9.6-20090519.0
/dev/md3                4.1M       4.1M         0B      100%
/packages/mnt/jdocs-9.6-20090519.0
/dev/md4                 57M        57M         0B      100%
/packages/mnt/jroute-9.6-20090519.0
/dev/md5                 15M        15M         0B      100%
/packages/mnt/jcrypto-9.6-20090519.0
/dev/md6                 34M        34M         0B      100%
/packages/mnt/jpfe-common-9.6-20090519.0
/dev/md7                2.0G      10.0K       1.8G        0%  /tmp
/dev/md8                2.0G       540K       1.8G        0%  /mfs
/dev/ad0s1e             383M        88K       352M        0%  /config
```

```
procfs                  4.0K       4.0K         0B      100%  /proc
/dev/ad1s1f              23G        13G       7.7G       64%  /var

lcc2-re0:
--------------------------------------------------------------------------
Filesystem              Size       Used      Avail  Capacity   Mounted on
/dev/ad0s1a             3.4G       178M       2.9G        6%  /
devfs                   1.0K       1.0K         0B      100%  /dev
devfs                   1.0K       1.0K         0B      100%  /dev/
/dev/md0                 33M        33M         0B      100%  /packages/mnt/jbase
/dev/md1                216M       216M         0B      100%
/packages/mnt/jkernel-9.6-20090519.0
/dev/md2                 66M        66M         0B      100%
/packages/mnt/jpfe-T-9.6-20090519.0
/dev/md3                4.1M       4.1M         0B      100%
/packages/mnt/jdocs-9.6-20090519.0
/dev/md4                 57M        57M         0B      100%
/packages/mnt/jroute-9.6-20090519.0
/dev/md5                 15M        15M         0B      100%
/packages/mnt/jcrypto-9.6-20090519.0
/dev/md6                 34M        34M         0B      100%
/packages/mnt/jpfe-common-9.6-20090519.0
/dev/md7                2.0G      10.0K       1.8G        0%  /tmp
/dev/md8                2.0G       540K       1.8G        0%  /mfs
/dev/ad0s1e             383M        64K       352M        0%  /config
procfs                  4.0K       4.0K         0B      100%  /proc
/dev/ad1s1f              23G       3.7G        17G       18%  /var

lcc3-re0:
--------------------------------------------------------------------------
Filesystem              Size       Used      Avail  Capacity   Mounted on
/dev/ad0s1a             3.4G       178M       2.9G        6%  /
devfs                   1.0K       1.0K         0B      100%  /dev
devfs                   1.0K       1.0K         0B      100%  /dev/
/dev/md0                 33M        33M         0B      100%  /packages/mnt/jbase
/dev/md1                216M       216M         0B      100%
/packages/mnt/jkernel-9.6-20090519.0
/dev/md2                 66M        66M         0B      100%
/packages/mnt/jpfe-T-9.6-20090519.0
/dev/md3                4.1M       4.1M         0B      100%
/packages/mnt/jdocs-9.6-20090519.0
/dev/md4                 57M        57M         0B      100%
/packages/mnt/jroute-9.6-20090519.0
/dev/md5                 15M        15M         0B      100%
/packages/mnt/jcrypto-9.6-20090519.0
/dev/md6                 34M        34M         0B      100%
/packages/mnt/jpfe-common-9.6-20090519.0
/dev/md7                2.0G      10.0K       1.8G        0%  /tmp
/dev/md8                2.0G       540K       1.8G        0%  /mfs
/dev/ad0s1e             383M        34K       352M        0%  /config
procfs                  4.0K       4.0K         0B      100%  /proc
/dev/ad1s1f              23G        18G       3.5G       84%  /var
```

show system storage (QFX3500 Switch)

```
user@switch> show system storage
Filesystem              Size       Used      Avail  Capacity   Mounted on
/dev/da0s2a             343M       192M       123M       61%  /
devfs                   1.0K       1.0K         0B      100%  /dev
/dev/md0                119M       119M         0B      100%  /packages/mnt/jbase
/dev/md1                513M       513M         0B      100%
```


Copyright © 2016, Juniper Networks, Inc.

```
/packages/mnt/jkernel-qfx-11.1R1.5
/dev/md2                 37M        37M         0B      100%
/packages/mnt/jpfe-qfx-e9xxx-11.1R1.5
/dev/md3                6.0M       6.0M         0B      100%
/packages/mnt/jdocs-qfx-11.1R1.5
/dev/md4                216M       216M         0B      100%
/packages/mnt/jroute-qfx-11.1R1.5
/dev/md5                 59M        59M         0B      100%
/packages/mnt/jcrypto-qfx-11.1R1,5
/dev/md6                 85M        85M         0B      100%
/packages/mnt/jswitch-qfx-11.1R1.5
/dev/md7                 63M       8.0K        58M        0%  /tmp
/dev/da0s2f             228M        14M       196M        7%  /var
/dev/da0s3d             590M       3.0M       540M        1%  /var/tmp
/dev/da0s3e             104M       162K        95M        0%  /config
procfs                  4.0K       4.0K         0B      100%  /proc
```

show system storage invoke-on all-routing-engines

```
user@host> show system storage invoke-on all-routing-engines
re0:
--------------------------------------------------------------------------
Filesystem              Size       Used      Avail  Capacity   Mounted on
/dev/ad0s1a             3.3G       440M       2.6G       14%  /
devfs                   1.0K       1.0K         0B      100%  /dev
/dev/md0                 76M        76M         0B      100%  /packages/mnt/jbase
/dev/md1                 40M        40M         0B      100%
/packages/mnt/jkernel64-14.1-20140407.1
/dev/md2                219M       219M         0B      100%
/packages/mnt/jpfe-T-14.1-20140407.1
/dev/md3                5.4M       5.4M         0B      100%
/packages/mnt/jdocs-14.1-20140407.1
/dev/md4                116M       116M         0B      100%
/packages/mnt/jroute-14.1-20140407.1
/dev/md5                 44M        44M         0B      100%
/packages/mnt/jcrypto64-14.1-20140407.1
/dev/md6                 70M        70M         0B      100%
/packages/mnt/jpfe-common-14.1-20140407.1
/dev/md7                182K       182K         0B      100%
/packages/mnt/jplatform-14.1-20140407.1
/dev/md8                499M       499M         0B      100%
/packages/mnt/jruntime-14.1-20140407.1
/dev/md9                 41M        41M         0B      100%
/packages/mnt/jruntime64-14.1-20140407.1
/dev/md10                12M        12M         0B      100%
/packages/mnt/py-base-i386-14.1-20140407.1
/dev/md11               3.2G       8.0K       2.9G        0%  /tmp
/dev/md12               3.2G       1.1M       2.9G        0%  /mfs
/dev/ad0s1e             376M       220K       346M        0%  /config
procfs                  4.0K       4.0K         0B      100%  /proc
/dev/ad1s1f              50G        43G       3.2G       93%  /var

re1:
--------------------------------------------------------------------------
Filesystem              Size       Used      Avail  Capacity   Mounted on
/dev/ad0s1a             3.3G       440M       2.6G       14%  /
devfs                   1.0K       1.0K         0B      100%  /dev
/dev/md0                 76M        76M         0B      100%  /packages/mnt/jbase
/dev/md1                 40M        40M         0B      100%
/packages/mnt/jkernel64-14.1-20140407.1
/dev/md2                219M       219M         0B      100%
```

```
/packages/mnt/jpfe-T-14.1-20140407.1
/dev/md3                5.4M       5.4M         0B      100%
/packages/mnt/jdocs-14.1-20140407.1
/dev/md4                116M       116M         0B      100%
/packages/mnt/jroute-14.1-20140407.1
/dev/md5                 44M        44M         0B      100%
/packages/mnt/jcrypto64-14.1-20140407.1
/dev/md6                 70M        70M         0B      100%
/packages/mnt/jpfe-common-14.1-20140407.1
/dev/md7                182K       182K         0B      100%
/packages/mnt/jplatform-14.1-20140407.1
/dev/md8                499M       499M         0B      100%
/packages/mnt/jruntime-14.1-20140407.1
/dev/md9                 41M        41M         0B      100%
/packages/mnt/jruntime64-14.1-20140407.1
/dev/md10                12M        12M         0B      100%
/packages/mnt/py-base-i386-14.1-20140407.1
/dev/md11               3.2G       8.0K       2.9G        0%  /tmp
/dev/md12               3.2G       662K       2.9G        0%  /mfs
/dev/ad0s1e             375M       230K       344M        0%  /config
procfs                  4.0K       4.0K         0B      100%  /proc
/dev/ad1s1f              52G        46G       2.2G       95%  /var
```

show system storage invoke-on other-routing-engine

```
user@host> show system storage invoke-on other-routing-engine
re1:
--------------------------------------------------------------------------
Filesystem              Size       Used      Avail  Capacity   Mounted on
/dev/ad0s1a             3.3G       440M       2.6G       14%  /
devfs                   1.0K       1.0K         0B      100%  /dev
/dev/md0                 76M        76M         0B      100%  /packages/mnt/jbase
/dev/md1                 40M        40M         0B      100%
/packages/mnt/jkernel64-14.1-20140407.1
/dev/md2                219M       219M         0B      100%
/packages/mnt/jpfe-T-14.1-20140407.1
/dev/md3                5.4M       5.4M         0B      100%
/packages/mnt/jdocs-14.1-20140407.1
/dev/md4                116M       116M         0B      100%
/packages/mnt/jroute-14.1-20140407.1
/dev/md5                 44M        44M         0B      100%
/packages/mnt/jcrypto64-14.1-20140407.1
/dev/md6                 70M        70M         0B      100%
/packages/mnt/jpfe-common-14.1-20140407.1
/dev/md7                182K       182K         0B      100%
/packages/mnt/jplatform-14.1-20140407.1
/dev/md8                499M       499M         0B      100%
/packages/mnt/jruntime-14.1-20140407.1
/dev/md9                 41M        41M         0B      100%
/packages/mnt/jruntime64-14.1-20140407.1
/dev/md10                12M        12M         0B      100%
/packages/mnt/py-base-i386-14.1-20140407.1
/dev/md11               3.2G       8.0K       2.9G        0%  /tmp
/dev/md12               3.2G       662K       2.9G        0%  /mfs
/dev/ad0s1e             375M       230K       344M        0%  /config
procfs                  4.0K       4.0K         0B      100%  /proc
/dev/ad1s1f              52G        46G       2.2G       95%  /var
```


Copyright © 2016, Juniper Networks, Inc.

show system uptime

List of Syntax

Syntax on page 1123
Syntax (EX Series Switches) on page 1123
Syntax (QFX Series) on page 1123
Syntax (TX Matrix Router) on page 1123
Syntax (TX Matrix Plus Router) on page 1123
Syntax (MX Series Router) on page 1123

Syntax

show system uptime

Syntax (EX Series Switches)

show system uptime
<all-members>
<local>
<member *member-id*>

Syntax (QFX Series)

show system uptime
<director-group *name*>
<infrastructure *name*>
<interconnect-device *name*>
<node-group *name*>

Syntax (TX Matrix Router)

show system uptime
<all-chassis | all-lcc | lcc *number* | scc>

Syntax (TX Matrix Plus Router)

show system uptime
<detail>
<all-chassis | all-lcc | lcc *number* | sfc *number*>

Syntax (MX Series Router)

show system uptime
<all-members>
<invoke-on>
<local>
<member *member-id*>

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 Release 9.6.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display the current time and information about how long the router or switch, router or switch software, and routing protocols have been running.

Options

none—Show time since the system rebooted and processes started.

all-chassis—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Show time since the system rebooted and processes started on all the routers in the chassis.

all-lcc—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, show time since the system rebooted and processes started for all T640 routers (or line-card chassis) connected to the TX Matrix router. On a TX Matrix Plus

router, show time since the system rebooted and processes started for all connected T1600 or T4000 LCCs.

all-members—(EX4200 switches and MX Series routers only) (Optional) Show time since the system rebooted and processes started on all members of the Virtual Chassis configuration.

director-group ***name***—(QFabric systems only) (Optional) Show time since the system rebooted and processes started on the Director group.

infrastructure ***name***—(QFabric systems only) (Optional) Show time since the system rebooted and processes started on the fabric control Routing Engine and fabric manager Routing Engine.

interconnect-device ***name***—(QFabric systems only) (Optional) Show time since the system rebooted and processes started on the Interconnect device.

invoke-on—(MX Series routers only) (Optional) Display the time since the system rebooted and processes started on the master Routing Engine, backup Routing Engine, or both, on a router with two Routing Engines.

lcc ***number***—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, show time since the system rebooted and processes started for a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, show time since the system rebooted and processes started for a specific router that is connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(EX4200 switches and MX Series routers only) (Optional) Show time since the system rebooted and processes started on the local Virtual Chassis member.

member ***member-id***—(EX4200 switches and MX Series routers only) (Optional) Show time since the system rebooted and processes started on the specified member of the Virtual Chassis configuration. For EX4200 switches, replace ***member-id*** with a value from 0 through 9. For an MX Series Virtual Chassis, replace ***member-id*** with a value of 0 or 1.

node-group ***name***—(QFabric systems only) (Optional) Show time since the system rebooted and processes started on the Node group.

 Copyright © 2016, Juniper Networks, Inc.

scc—(TX Matrix routers only) (Optional) Show time since the system rebooted and processes started for the TX Matrix router (or switch-card chassis).

sfc ***number***—(TX Matrix Plus routers only) (Optional) Show time since the system rebooted and processes started for the TX Matrix Plus router. Replace *number* with 0.

Additional Information

By default, when you issue the **show system uptime** command on the master Routing Engine of a TX Matrix router or a TX Matrix Plus router, the command is broadcast to all the master Routing Engines of the LCCs connected to it in the routing matrix. Likewise, if you issue the same command on the backup Routing Engine of a TX Matrix or a TX Matrix Plus router, the command is broadcast to all backup Routing Engines of the LCCs that are connected to it in the routing matrix.

Required Privilege Level

view

Related Documentation

- *10-Gigabit Ethernet LAN/WAN PIC with XFP (T640 Router)*
- *Routing Matrix with a TX Matrix Plus Router Solutions Page*

List of Sample Output

show system uptime on page 1126
show system uptime all-lcc (TX Matrix Router) on page 1126
show system uptime all-lcc (TX Matrix Plus Router) on page 1126
show system uptime (EX Series) on page 1127
show system uptime (QFX Series) on page 1127

Output Fields

Table 58 on page 1125 describes the output fields for the **show system uptime** command. Output fields are listed in the approximate order in which they appear.

Table 58: show system uptime Output Fields

Field Name	Field Description
Current time	Current system time in UTC.
Time Source	Reference time source that the system is locked to.
System booted	Date and time when the Routing Engine on the router or switch was last booted and how long it has been running.
Protocols started	Date and time when the routing protocols were last started and how long they have been running.
Last configured	Date and time when a configuration was last committed. Also shows the name of the user who issued the last **commit** command.
***time* and up**	Current time, in the local time zone, and how long the router or switch has been operational.
users	Number of users logged in to the router or switch.
load averages	Load averages for the last 1 minute, 5 minutes, and 15 minutes.

Sample Output

show system uptime

```
user@host> show system uptime
Current time:      1998-10-13 19:45:47 UTC
Time Source:       NTP CLOCK
System booted:     1998-10-12 20:51:41 UTC (22:54:06 ago)
Protocols started: 1998-10-13 19:33:45 UTC (00:12:02 ago)
Last configured:   1998-10-13 19:33:45 UTC (00:12:02 ago) by abc
12:45PM  up 22:54, 2 users, load averages: 0.07, 0.02, 0.01
```

show system uptime all-lcc (TX Matrix Router)

```
user@host> show system uptime all-lcc
lcc0-re0:
--------------------------------------------------------------------------
Current time: 2004-09-13 09:55:35 PDT
Time Source: LOCAL CLOCK
System booted: 2004-09-13 03:13:55 PDT (06:41:40 ago)
Last configured: 2004-09-13 03:17:48 PDT (06:37:47 ago) by root
9:55AM PDT up 6:42, 1 user, load averages: 0.02, 0.03, 0.00
lcc2-re0:
--------------------------------------------------------------------------
Current time: 2004-09-13 09:55:35 PDT
Time Source: LOCAL CLOCK
System booted: 2004-09-12 03:23:43 PDT (1d 06:31 ago)
Last configured: 2004-09-13 03:05:36 PDT (06:49:59 ago) by root
9:55AM PDT up 1 day,  6:32, 1 user, load averages: 0.02, 0.01, 0.00
```

show system uptime all-lcc (TX Matrix Plus Router)

```
user@host> show system uptime all-lcc
sfc0-re0:
--------------------------------------------------------------------------
Current time: 2009-05-25 00:24:30 PDT
Time Source: NTP CLOCK
System booted: 2009-05-24 06:39:33 PDT (17:44:57 ago)
Protocols started: 2009-05-24 06:40:30 PDT (17:44:00 ago)
Last configured: 2009-05-24 06:33:27 PDT (17:51:03 ago) by user1
12:24AM  up 17:45, 2 users, load averages: 0.07, 0.05, 0.01

lcc0-re0:
--------------------------------------------------------------------------
Current time: 2009-05-25 00:24:30 PDT
Time Source: NTP CLOCK
System booted: 2009-05-24 06:39:46 PDT (17:44:44 ago)
error: the routing subsystem is not running
Last configured: 2009-05-24 06:40:47 PDT (17:43:43 ago) by root
12:24AM  up 17:45, 0 users, load averages: 0.00, 0.00, 0.00

lcc1-re0:
--------------------------------------------------------------------------
Current time: 2009-05-25 00:24:30 PDT
Time Source: NTP CLOCK
System booted: 2009-05-24 06:39:38 PDT (17:44:52 ago)
error: the routing subsystem is not running
Last configured: 2009-05-24 06:40:18 PDT (17:44:12 ago) by root
12:24AM  up 17:45, 0 users, load averages: 0.00, 0.00, 0.00

lcc2-re0:
```


Copyright © 2016, Juniper Networks, Inc.

```
--------------------------------------------------------------------------
Current time: 2009-05-25 00:24:30 PDT
Time Source: NTP CLOCK
System booted: 2009-05-24 06:39:48 PDT (17:44:42 ago)
error: the routing subsystem is not running
Last configured: 2009-05-24 06:40:44 PDT (17:43:46 ago) by root
12:24AM  up 17:45, 0 users, load averages: 0.00, 0.00, 0.00

lcc3-re0:
--------------------------------------------------------------------------
Current time: 2009-05-25 00:24:30 PDT
Time Source: NTP CLOCK
System booted: 2009-05-24 06:39:44 PDT (17:44:46 ago)
error: the routing subsystem is not running
Last configured: 2009-05-24 06:40:08 PDT (17:44:22 ago) by root
12:24AM  up 17:45, 0 users, load averages: 0.00, 0.00, 0.00
```

show system uptime (EX Series)

```
user@switch> show system uptime
Current time: 2014-03-12 16:39:56 UTC
Time Source: NTP CLOCK
System booted: 2014-03-12 14:58:05 UTC (01:41:51 ago)
Protocols started: 2014-03-12 14:59:48 UTC (01:40:08 ago)
Last configured: 2014-03-12 14:58:58 UTC (01:40:58 ago) by root
 4:39PM  up 1:42, 4 users, load averages: 0.02, 0.02, 0.00
```

show system uptime (QFX Series)

```
user@switch> show system uptime
Current time: 2010-08-27 03:12:30 PDT
Time Source: NTP CLOCK
System booted: 2010-08-13 17:11:54 PDT (1w6d 10:00 ago)
Protocols started: 2010-08-13 17:13:56 PDT (1w6d 09:58 ago)
Last configured: 2010-08-26 05:54:00 PDT (21:18:30 ago) by user
 3:12AM  up 13 days, 10:01, 3 users, load averages: 0.00, 0.00, 0.00
```

show system users

List of Syntax

Syntax on page 1128
Syntax (TX Matrix Router) on page 1128
Syntax (TX Matrix Plus Router) on page 1128
Syntax (MX Series Router) on page 1128

Syntax

show system users
<no-resolve>

Syntax (TX Matrix Router)

show system users
<all-chassis | all-lcc | lcc*number* | scc>
<no-resolve>

Syntax (TX Matrix Plus Router)

show system users
<detail>
<all-chassis | all-lcc | lcc *number* | sfc *number*> <no-resolve>

Syntax (MX Series Router)

show system users
<all-members>
<local>
<member *member-id*>
<no-resolve>

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.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

List information about the users who are currently logged in to the router or switch.

NOTE: The **show system users** command lists the information about administrative users that are logged in to a router or switch using the CLI, J-Web, or an SSH client. The output does not list information about web users or automated users that are logged in from a remote client application using Junos XML APIs, such as NETCONF.

Options

none—List information about the users who are currently logged in to the router or switch.

all-chassis—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Show users currently logged in to all the routers in the chassis.

all-lcc—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, show users currently logged in to all T640 routers (or line-card chassis) connected to the TX Matrix router. On a TX Matrix Plus router, show users currently logged in to all connected T1600 or T4000 LCCs.

Copyright © 2016, Juniper Networks, Inc.

all-members—(MX Series routers only) (Optional) Display users currently logged in to all members of the Virtual Chassis configuration.

lcc ***number***—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, show users currently logged in to a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, show users currently logged in to a specific router that is connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(MX Series routers only) (Optional) Display users currently logged in to the local Virtual Chassis member.

member ***member-id***—(MX Series routers only) (Optional) Display users currently logged in to the specified member of the Virtual Chassis configuration. Replace ***member-id*** with a value of 0 or 1.

no-resolve—(Optional) Do not attempt to resolve IP addresses to hostnames.

scc—(TX Matrix routers only) (Optional) Show users currently logged in to the TX Matrix router (or switch-card chassis).

sfc ***number***—(TX Matrix Plus routersonly) (Optional) Show users currently logged in to the TX Matrix Plus router. Replace ***number*** with 0.

Additional Information

By default, when you issue the **show system users** command on the master Routing Engine of a TX Matrix router or a TX Matrix Plus router, the command is broadcast to all the master Routing Engines of the LCCs connected to it in the routing matrix. Likewise, if you issue the same command on the backup Routing Engine of a TX Matrix or a TX Matrix Plus router, the command is broadcast to all backup Routing Engines of the LCCs that are connected to it in the routing matrix.

Required Privilege Level

view

Related Documentation

- *Routing Matrix with a TX Matrix Plus Router Solutions Page*

List of Sample Output

show system users on page 1130
show system users lcc no-resolve (TX Matrix, TX Matrix Plus Router) on page 1130
show system users (TX Matrix Plus Router) on page 1130

show system users (QFX Series) on page 1131
show system users no-resolve (QFX Series) on page 1131

Output Fields Table 59 on page 1130 describes the output fields for the **show system users** command. Output fields are listed in the approximate order in which they appear.

Table 59: show system users Output Fields

Field Name	Field Description
***time* and up**	Current time, in the local time zone, and how long the router or switch has been operational.
users	Number of users logged in to the router or switch.
load averages	Load averages for the last 1 minute, 5 minutes, and 15 minutes.
USER	Username.
TTY	Terminal through which the user is logged in.
FROM	System from which the user has logged in. A hyphen indicates that the user is logged in through the console.
LOGIN@	Time when the user logged in.
IDLE	How long the user has been idle.
WHAT	Processes that the user is running.

Sample Output

show system users

```
user@host> show system users
 7:30PM  up 4 days,  2:26, 2 users, load averages: 0.07, 0.02, 0.01
USER     TTY FROM              LOGIN@  IDLE WHAT
root     d0  -                Fri05PM 4days -csh (csh)
blue   p0 level5.company.net 7:30PM     - cli
```

show system users lcc no-resolve (TX Matrix, TX Matrix Plus Router)

```
user@host> show system users lcc 2 no-resolve

lcc2-re0:
--------------------------------------------------------------------------
10:34AM PDT up 1 day,  7:11, 5 users, load averages: 0.03, 0.01, 0.00
USER     TTY      FROM                              LOGIN@  IDLE WHAT
root     d0       -                                3:21AM   7:12 /bin/csh
user1    p0       scc-re0                          10:15AM     - telnet hostA
user1    p1       scc-re0                          10:16AM     - telnet hostA
user1    p2       scc-re0                          10:19AM     - telnet hostA
user1    p3       scc-re0                          10:24AM     - telnet hostA
```

show system users (TX Matrix Plus Router)

```
user@host> show system users
```

 Copyright © 2016, Juniper Networks, Inc.

```
sfc0-re0:
--------------------------------------------------------------------------
 1:41AM  up 26 mins, 3 users, load averages: 0.08, 0.04, 0.03
USER     TTY      FROM                              LOGIN@  IDLE WHAT
user2    p0       10.209.208.123                   1:18AM     21 cli
user2    p1       172.17.29.207                    1:37AM      2 cli
user2    p2       172.17.28.19                     1:40AM      - cli

lcc0-re0:
--------------------------------------------------------------------------
 1:41AM  up 26 mins, 0 users, load averages: 0.00, 0.00, 0.03

lcc1-re0:
--------------------------------------------------------------------------
 1:41AM  up 26 mins, 0 users, load averages: 0.00, 0.02, 0.03

lcc2-re0:
--------------------------------------------------------------------------
 1:41AM  up 26 mins, 0 users, load averages: 0.16, 0.06, 0.02

lcc3-re0:
--------------------------------------------------------------------------
 1:41AM  up 26 mins, 0 users, load averages: 0.12, 0.04, 0.04

user3@aj> show system users
sfc0-re0:
--------------------------------------------------------------------------
 1:42AM  up 28 mins, 4 users, load averages: 0.02, 0.03, 0.02
USER     TTY      FROM                              LOGIN@  IDLE WHAT
user  p0       device1.example.com              1:18AM     22 cli
user  p1       device2.example.com              1:37AM      - cli
user  p2       device3.example.com              1:40AM      - cli
user  p3       device4.example.com              1:42AM      - -csh (csh)

lcc0-re0:
--------------------------------------------------------------------------
 1:42AM  up 28 mins, 0 users, load averages: 0.02, 0.01, 0.03

lcc1-re0:
--------------------------------------------------------------------------
 1:42AM  up 28 mins, 0 users, load averages: 0.07, 0.04, 0.03

lcc2-re0:
--------------------------------------------------------------------------
 1:42AM  up 27 mins, 0 users, load averages: 0.07, 0.06, 0.02

lcc3-re0:
--------------------------------------------------------------------------
 1:42AM  up 28 mins, 0 users, load averages: 0.05, 0.04, 0.04
```

show system users (QFX Series)

```
user@switch> show system users
USER     TTY      FROM                              LOGIN@  IDLE WHAT
tlewis   p0       192.168.18.117                   2:54AM     39 -cli (cli)
tlewis   p1       192.168.18.117                   3:01AM      - -cli (cli)
tcheng   p2       192.168.17.197                   3:08AM     11 -cli (cli)
```

show system users no-resolve (QFX Series)

```
user@switch> show system users no-resolve
```

```
USER     TTY      FROM                              LOGIN@  IDLE WHAT
tlewis   p0       192.168.18.117                    2:54AM     39 -cli (cli)
tlewis   p1       192.168.18.117                    3:01AM      - -cli (cli)
tcheng   p2       192.168.17.197                    3:08AM     11 -cli (cli)
```


Copyright © 2016, Juniper Networks, Inc.

show system virtual-memory

List of Syntax

Syntax on page 1133
Syntax (EX Series) on page 1133
Syntax (TX Matrix Router) on page 1133
Syntax (TX Matrix Plus Router) on page 1133
Syntax (MX Series Router) on page 1133
Syntax (QFX Series) on page 1133

Syntax

show system virtual-memory

Syntax (EX Series)

show system virtual-memory
<all-members>
<local>
<member *member-id*>

Syntax (TX Matrix Router)

show system virtual-memory
<all-chassis | all-lcc | lcc *number* | scc>

Syntax (TX Matrix Plus Router)

show system virtual-memory
<all-chassis | all-lcc | lcc *number* | sfc *number*>

Syntax (MX Series Router)

show system virtual-memory
<all-members>
<local>
<member *member-id*>

Syntax (QFX Series)

show system virtual-memory
<infrastructure *name*>
<interconnect-device *name*>
<node-group *name*>

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.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display the usage of Junos OS kernel memory listed first by size of allocation and then by type of usage. Use the **show system virtual-memory** command for troubleshooting with Juniper Networks Customer Support.

Options

none—Display kernel dynamic memory usage information.

all-chassis—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Display kernel dynamic memory usage information for all chassis.

all-lcc—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display kernel dynamic memory usage information for all T640 routers connected to the TX Matrix router. On a TX Matrix Plus router, display kernel dynamic memory usage information for all connected T1600 or T4000 LCCs.

all-members—(EX4200 switches and MX Series routers only) (Optional) Display kernel dynamic memory usage information for all members of the Virtual Chassis configuration.

infrastructure ***name***—(QFabric systems only) (Optional) Display kernel dynamic memory usage information for the fabric control Routing Engine and fabric manager Routing Engine.

interconnect-device ***name***—(QFabric systems only) (Optional) Display kernel dynamic memory usage information for the Interconnect device.

lcc ***number***—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display kernel dynamic memory usage information for a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, display kernel dynamic memory usage information for a specific router that is connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(EX4200 switches and MX Series routers only) (Optional) Display kernel dynamic memory usage information for the local Virtual Chassis member.

member ***member-id***—(EX4200 switches and MX Series routers only) (Optional) Display kernel dynamic memory usage information for the specified member of the Virtual Chassis configuration. For EX4200 switches, replace ***member-id*** with a value from 0 through 9. For an MX Series Virtual Chassis, replace ***member-id*** with a value of 0 or 1.

node-group ***name***—(QFabric systems only) (Optional) Display kernel dynamic memory usage information for the Node group.

scc—(TX Matrix routers only) (Optional) Display kernel dynamic memory usage information for the TX Matrix router (or switch-card chassis).

sfc ***number***—(TX Matrix Plus routers only) (Optional) Display kernel dynamic memory usage information for the TX Matrix Plus router. Replace ***number*** with 0.

Additional Information

By default, when you issue the **show system virtual-memory** command on the master Routing Engine of a TX Matrix router or a TX Matrix Plus router, the command is broadcast to all the master Routing Engines of the LCCs connected to it in the routing matrix. Likewise, if you issue the same command on the backup Routing Engine of a TX Matrix

Copyright © 2016, Juniper Networks, Inc.

or a TX Matrix Plus router, the command is broadcast to all backup Routing Engines of the LCCs that are connected to it in the routing matrix.

NOTE: The **show system virtual-memory** command with the **| display XML** pipe option now displays XML output for the command in the parent tags: **<vmstat-memstat-malloc>**, **<vmstat-memstat-zone>**, **<vmstat-sumstat>**, **<vmstat-intr>**, and **<vmstat-kernel-state>** with each child element as a separate XML tag. In Junos OS Releases 10.1 and earlier, the **| display XML** option for this command does not have an XML API element and the entire output is displayed in a single **<output>** tag element.

Required Privilege Level

view

Related Documentation

- *Routing Matrix with a TX Matrix Plus Router Solutions Page*

List of Sample Output

show system virtual-memory on page 1137
show system virtual-memory scc (TX Matrix Router) on page 1141
show system virtual-memory sfc (TX Matrix Plus Router) on page 1142
show system virtual-memory | display xml on page 1145
show system virtual-memory (QFX Series) on page 1168

Output Fields

Table 60 on page 1136 lists the output fields for the **show system virtual-memory** command. Output fields are listed in the approximate order in which they appear.

Table 60: show system virtual-memory Output Fields

Field Name	Field Description
Memory statistics by bucket size	
Size	Memory block size (bytes). The kernel memory allocator appropriates blocks of memory whose size is exactly a power of 2.
In Use	Number of memory blocks of this size that are in use (bytes).
Free	Number of memory blocks of this size that are free (bytes).
Requests	Number of memory allocation requests made.
HighWater	Maximum value the free list can have. Once the system starts reclaiming physical memory, it continues until the free list is increased to this value.
Couldfree	Total number of times that the free elements for a bucket size exceed the high-water mark for that bucket size.
Memory usage type by bucket size	
Size	Memory block size (bytes).
Type(s)	Kernel modules that are using these memory blocks. For a definition of each type, refer to a FreeBSD book.
Memory statistics by type	
Type	Kernel module that is using dynamic memory.
InUse	Number of memory blocks used by this type. The number is rounded up.
MemUse	Amount of memory in use, in kilobytes (KB).
HighUse	Maximum memory ever used by this type.
Limit	Maximum memory that can be allocated to this type.
Requests	Total number of dynamic memory allocation requests this type has made.
Type Limit	Number of times requests were blocked for reaching the maximum limit.
Kern Limit	Number of times requests were blocked for the kernel map.
Size(s)	Memory block sizes this type is using.
Memory Totals	
In Use	Total kernel dynamic memory in use (bytes, rounded up).
Free	Total kernel dynamic memory free (bytes, rounded up).

Copyright © 2016, Juniper Networks, Inc.

Table 60: show system virtual-memory Output Fields *(continued)*

Field Name	Field Description
Requests	Total number of memory allocation requests.
ITEM	Kernel module that is using memory.
Size	Memory block size (bytes).
LImit	Maximum memory that can be allocated to this type.
Used	Number of memory blocks used by this type. The number is rounded up.
Free	Number of memory blocks available to this type.
Requests	Total number of memory allocation requests this type has made.
interrupt	Timer events and scheduling interruptions.
total	Total number of interruptions for each type.
rate	Interruption rate.
Total	Total for all interruptions.

Sample Output

show system virtual-memory

```
user@host> show system virtual-memory
Memory statistics by bucket size
Size   In Use   Free   Requests  HighWater  Couldfree
  16      906    118     154876    1280          0
  32      455    313     209956     640          0
  64     4412    260      75380     320         20
 128     3200     32      19361     160         81
 256     1510     10       8844      80          4
 512      446      2       5085      40          0
  1K       18      2       5901      20          0
  2K     1128      2       4445      10       1368
  4K      185      1        456       5          0
  8K        5      1       2653       5          0
 16K      181      0        233       5          0
 32K        2      0       1848       5          0
 64K       20      0         22       5          0
128K        5      0          5       5          0
256K        2      0          2       5          0
512K        1      0          1       5          0

Memory usage type by bucket size
Size  Type(s)
  16  uc_devlist, nexusdev, iftable, temp, devbuf, atexit, COS, BPF,
          DEVFS mount, DEVFS node, vnodes, mount, pcb, soname, proc-args, kld,
          MD disk, rman, ATA generic, bus, sysctl, ippool, pfestat, ifstate,
```

```
          pfe_ipc, mkey, rtable, ifmaddr, ipfw, rnode
  32  atkbddev, dirrem, mkdir, diradd, freefile, freefrag, indirdep,
          bmsafemap, newblk, temp, devbuf, COS, vnodes, cluster_save buffer,
          pcb, soname, proc-args, sigio, kld, Gzip trees, taskqueue, SWAP,
          eventhandler, bus, sysctl, uidinfo, subproc, pgrp, pfestat, itable32,
          ifstate, pfe_ipc, mkey, rtable, ifmaddr, ipfw, rnode, rtnexthop
  64  isadev, iftable, MFS node, allocindir, allocdirect, pagedep, temp,
          devbuf, lockf, COS, NULLFS hash, DEVFS name, vnodes,
          cluster_save buffer, vfscache, pcb, soname, proc-args, file,
          AR driver, AD driver, Gzip trees, rman, eventhandler, bus, sysctl,
          subproc, pfestat, pic, ifstate, pfe_ipc, mkey, ifaddr, rtable, ipfw
 128  ZONE, freeblks, inodedep, temp, devbuf, zombie, COS, DEVFS node,
          vnodes, mount, vfscache, pcb, soname, proc-args, ttys, dev_t,
          timecounter, kld, Gzip trees, ISOFS node, bus, uidinfo, cred,
          session, pic, itable16, ifstate, pfe_ipc, rtable, ifstat, metrics,
          rtnexthop, iffamily
 256  iflogical, iftable, MFS node, FFS node, newblk, temp, devbuf,
          NFS daemon, vnodes, proc-args, kqueue, file desc, Gzip trees, bus,
          subproc, itable16, ifstate, pfe_ipc, sysctl, rtnexthop
 512  UFS mount, temp, devbuf, mount, BIO buffer, ptys, ttys, AR driver,
          Gzip trees, ISOFS mount, msg, ioctlops, ATA generic, bus, proc,
          pfestat, lr, ifstate, pfe_ipc, rtable, ipfw, ifstat, rtnexthop
  1K  iftable, temp, devbuf, NQNFS Lease, kqueue, kld, AD driver,
          Gzip trees, sem, MD disk, bus, ifstate, pfe_ipc, ipfw
  2K  uc_devlist, UFS mount, temp, devbuf, BIO buffer, pcb, AR driver,
          Gzip trees, ioctlops, bus, ipfw, ifstat, rcache
  4K  memdesc, iftable, UFS mount, temp, devbuf, kld, Gzip trees, sem, msg
  8K  temp, devbuf, syncache, Gzip trees
 16K  indirdep, temp, devbuf, shm, msg
 32K  pagedep, kld, Gzip trees
 64K  VM pgdata, devbuf, MSDOSFS mount
128K  UFS ihash, inodedep, NFS hash, kld, ISOFS mount
256K  mbuf, vfscache
512K  SWAP

Memory statistics by type                          Type  Kern
        Type  InUse MemUse HighUse  Limit Requests Limit Limit Size(s)
       isadev    13     1K      1K127753K       13    0     0  64
     atkbddev     2     1K      1K127753K        2    0     0  32
   uc_devlist    24     3K      3K127753K       24    0     0  16,2K
     nexusdev     3     1K      1K127753K        3    0     0  16
      memdesc     1     4K      4K127753K        1    0     0  4K
         mbuf     1   152K    152K127753K        1    0     0  256K
    iflogical     6     2K      2K127753K        6    0     0  256
      iftable    17     9K      9K127753K       18    0     0  16,64,256,1K,4K
         ZONE    15     2K      2K127753K       15    0     0  128
    VM pgdata     1    64K     64K127753K        1    0     0  64K
    UFS mount    12    26K     26K127753K       12    0     0  512,2K,4K
    UFS ihash     1   128K    128K127753K        1    0     0  128K
     MFS node     6     2K      3K127753K       35    0     0  64,256
     FFS node   906   227K    227K127753K     1352    0     0  256
       dirrem     0     0K      4K127753K      500    0     0  32
        mkdir     0     0K      1K127753K       38    0     0  32
       diradd     0     0K      6K127753K      521    0     0  32
     freefile     0     0K      4K127753K      374    0     0  32
     freeblks     0     0K      8K127753K      219    0     0  128
     freefrag     0     0K      1K127753K      193    0     0  32
   allocindir     0     0K     25K127753K     1518    0     0  64
     indirdep     0     0K     17K127753K       76    0     0  32,16K
  allocdirect     0     0K     10K127753K      760    0     0  64
    bmsafemap     0     0K      1K127753K       72    0     0  32
```


Copyright © 2016, Juniper Networks, Inc.

```
         newblk     1     1K      1K127753K     2279    0     0  32,256
      inodedep     1   128K    175K127753K     2367    0     0  128,128K
       pagedep     1    32K     33K127753K       47    0     0  64,32K
          temp  1239    92K     96K127753K     8364    0     0  16,32,64K
        devbuf  1413  5527K   5527K127753K     1535    0     0  16,32,64,128,256
         lockf    38     3K      3K127753K     2906    0     0  64
        atexit     1     1K      1K127753K        1    0     0  16
        zombie     0     0K      2K127753K     3850    0     0  128
      NFS hash     1   128K    128K127753K        1    0     0  128K
  NQNFS Lease      1     1K      1K127753K        1    0     0  1K
   NFS daemon      1     1K      1K127753K        1    0     0  256
     syncache     1     8K      8K127753K        1    0     0  8K
          COS   353    44K     44K127753K      353    0     0  16,32,64,128
          BPF   189     3K      3K127753K      189    0     0  16
MSDOSFS mount     1    64K     64K127753K        1    0     0  64K
  NULLFS hash     1     1K      1K127753K        1    0     0  64
  DEVFS mount     2     1K      1K127753K        2    0     0  16
   DEVFS name   487    31K     31K127753K      487    0     0  64
   DEVFS node   471    58K     58K127753K      479    0     0  16,128
        vnodes    28     7K      7K127753K      429    0     0  16,32,64,128,256
         mount    15     8K      8K127753K       18    0     0  16,128,512
cluster_save buffer     0     0K      1K127753K       55    0     0  32,64
      vfscache  1898   376K    376K127753K     3228    0     0  64,128,256K
   BIO buffer    49    98K    398K127753K      495    0     0  512,2K
          pcb   159    16K     17K127753K      399    0     0  16,32,64,128,2K
       soname    82    10K     10K127753K    42847    0     0  16,32,64,128
    proc-args    57     2K      3K127753K     2105    0     0  16,32,64,128,256
         ptys    32    16K     16K127753K       32    0     0  512
         ttys   254    33K     33K127753K      522    0     0  128,512
       kqueue     5     3K      4K127753K       23    0     0  256,1K
        sigio     1     1K      1K127753K       27    0     0  32
         file   383    24K     24K127753K    16060    0     0  64
    file desc    76    19K     20K127753K     3968    0     0  256
          shm     1    12K     12K127753K        1    0     0  16K
        dev_t   286    36K     36K127753K      286    0     0  128
  timecounter    10     2K      2K127753K       10    0     0  128
          kld    11   117K    122K127753K       34    0     0  16,32,128,1K,4K
    AR driver     1     1K      3K127753K        5    0     0  64,512,2K
    AD driver     2     2K      3K127753K     2755    0     0  64,1K
   Gzip trees     0     0K     46K127753K   133848    0     0  32,64,128,256
   ISOFS node  1136   142K    142K127753K     1189    0     0  128
  ISOFS mount     9   132K    132K127753K       10    0     0  512,128K
          sem     3     6K      6K127753K        3    0     0  1K,4K
      MD disk     2     2K      2K127753K        2    0     0  16,1K
          msg     4    25K     25K127753K        4    0     0  512,4K,16K
         rman    59     4K      4K127753K      461    0     0  16,64
     ioctlops     0     0K      2K127753K      992    0     0  512,2K
    taskqueue     2     1K      1K127753K        2    0     0  32
         SWAP     2   413K    413K127753K        2    0     0  32,512K
  ATA generic     6     3K      3K127753K        6    0     0  16,512
 eventhandler    17     1K      1K127753K       17    0     0  32,64
          bus   340    30K     31K127753K      794    0     0  16,32,64,128,256
       sysctl     0     0K      1K127753K   130262    0     0  16,32,64
      uidinfo     4     1K      1K127753K       10    0     0  32,128
         cred    22     3K      3K127753K     3450    0     0  128
      subproc   156    10K     10K127753K     7882    0     0  32,64,256
         proc     2     1K      1K127753K        2    0     0  512
      session    12     2K      2K127753K       34    0     0  128
         pgrp    16     1K      1K127753K       45    0     0  32
       ippool     1     1K      1K127753K        1    0     0  16
      pfestat     0     0K      1K127753K    47349    0     0  16,32,64,512
```

```
           pic     5     1K      1K127753K        5    0     0  64,128
            lr     1     1K      1K127753K        1    0     0  512
     itable32   110     4K      4K127753K      110    0     0  32
     itable16   161    26K     26K127753K      161    0     0  128,256
      ifstate   694   159K    160K127753K     1735    0     0  16,32,64,128,1K
      pfe_ipc     0     0K      1K127753K    56218    0     0  16,32,64,128,1K
         mkey   250     4K      4K127753K      824    0     0  16,32,64
       ifaddr     9     1K      1K127753K        9    0     0  64
       sysctl     0     0K      1K127753K       30    0     0  256
       rtable    49     6K      6K127753K      307    0     0  16,32,64,128,512
      ifmaddr    22     1K      1K127753K       22    0     0  16,32
         ipfw    23    10K     10K127753K       48    0     0  16,32,64,512,2K
       ifstat   698   805K    805K127753K      698    0     0  128,512,2K
       rcache     4     8K      8K127753K        4    0     0  2K
        rnode    27     1K      1K127753K      285    0     0  16,32
      metrics     1     1K      1K127753K        3    0     0  128
    rtnexthop    57     9K      9K127753K      312    0     0  32,128,256,512
     iffamily    12     2K      2K127753K       12    0     0  128

Memory Totals:  In Use       Free    Requests
                 9311K        54K      489068

ITEM            SIZE     LIMIT    USED    FREE  REQUESTS
PIPE:            192,        0,      4,     81,     4422
SWAPMETA:        160,    95814,      0,      0,        0
unpcb:           160,        0,    114,     36,      279
ripcb:           192,    25330,      5,     37,        5
syncache:        128,    15359,      0,     64,        5
tcpcb:           576,    25330,     23,     12,       32
udpcb:           192,    25330,     14,     28,      255
socket:          256,    25330,    246,     26,      819
KNOTE:            96,        0,     27,     57,       71
NFSNODE:         352,        0,      0,      0,        0
NFSMOUNT:        544,        0,      0,      0,        0
VNODE:           224,        0,   2778,     43,     2778
NAMEI:          1024,        0,      0,      8,    40725
VMSPACE:         192,        0,     57,     71,     3906
PROC:            448,        0,     73,     17,     3923
DP fakepg:        64,        0,      0,      0,        0
PV ENTRY:         28,   499566,  44530, 152053,  1525141
MAP ENTRY:        48,        0,   1439,    134,   351075
KMAP ENTRY:       48,    35645,    179,    119,    10904
MAP:             108,        0,      7,      3,        7
VM OBJECT:        92,        0,   2575,    109,    66912

   792644 cpu context switches
  9863474 device interrupts
   286510 software interrupts
   390851 traps
  3596829 system calls
       16 kernel threads created
     3880  fork() calls
       27 vfork() calls
        0 rfork() calls
        0 swap pager pageins
        0 swap pager pages paged in
        0 swap pager pageouts
        0 swap pager pages paged out
      380 vnode pager pageins
      395 vnode pager pages paged in
      122 vnode pager pageouts
```


Copyright © 2016, Juniper Networks, Inc.

```
     1476 vnode pager pages paged out
        0 page daemon wakeups
        0 pages examined by the page daemon
      101 pages reactivated
   161722 copy-on-write faults
        0 copy-on-write optimized faults
    84623 zero fill pages zeroed
    83063 zero fill pages prezeroed
        7 intransit blocking page faults
   535606 total VM faults taken
        0 pages affected by kernel thread creation
   238254 pages affected by  fork()
     2535 pages affected by vfork()
        0 pages affected by rfork()
   283379 pages freed
        0 pages freed by daemon
   190091 pages freed by exiting processes
    17458 pages active
    29166 pages inactive
        0 pages in VM cache
    10395 pages wired down
   134610 pages free
     4096 bytes per page
   183419 total name lookups
          cache hits (90% pos + 7% neg) system 0% per-directory
          deletions 0%, falsehits 0%, toolong 0%

interrupt                   total       rate
ata0 irq14                 113338          3
mux irq7                   727643         21
fxp1 irq10                1178671         34
sio0 irq4                     833          0
clk irq0                  3439769         99
rtc irq8                  4403221        127
Total                     9863475        286

Kernel direct memory map:
        4423  pages used
     4057340  pages maximum
```

Note: **Kernel direct memory map** only displays for 64 bit platform.

show system virtual-memory scc (TX Matrix Router)

```
user@host> show system virtual-memory scc

Memory statistics by bucket size
Size   In Use   Free   Requests  HighWater  Couldfree
  16      898    126     749493    1280          0
  32     2018   1310     980643     640        632
  64     3490  13342     935420     320       5365
...

Memory usage type by bucket size
Size  Type(s)
  16  uc_devlist, COS, BPF, DEVFS mount, DEVFS node, vnodes, mount, pcb,
          soname, rman, bus, sysctl, ifstate, pfe_ipc, mkey, socket, rtable,
          ifmaddr, ipfw, rnode, iftable, temp, devbuf, atexit, proc-args, kld,
          MD disk
  32  atkbddev, Gzip trees, dirrem, mkdir, diradd, freefile, freefrag,
          indirdep, bmsafemap, newblk, tseg_qent, COS, vnodes,
```

```
...

Memory statistics by type                          Type  Kern
        Type  InUse MemUse HighUse  Limit Requests Limit Limit Size(s)
       isadev    12     1K      1K166400K       12    0     0  64
     atkbddev     2     1K      1K166400K        2    0     0  32
   uc_devlist    24     3K      3K166400K       24    0     0  16,2K
....

Memory Totals:  In Use    Free    Requests
                 6091K   1554K     2897122
```

show system virtual-memory sfc (TX Matrix Plus Router)

```
user@host> show system virtual-memory sfc 0
sfc0-re0:
--------------------------------------------------------------------------
         Type InUse MemUse HighUse Requests  Size(s)
CAM dev queue     1     1K       -        1  64
      entropy  1024    64K       -     1024  64
       linker   487  6272K       -     1163  16,32,64,4096,32768,131072
          USB   127    10K       -      127  16,32,64,128,256,1024,2048
        lockf    46     3K       -    98418  64
       USBdev    10     2K       -       34  16,128,2048,16384
ifstateSLLNode     0     0K       -     1096 16
       devbuf 21243 15683K       -    21810
16,32,64,128,256,512,1024,2048,4096,8192,16384,32768,65536,131072
         temp  1283   151K       -  2483472
16,32,64,128,256,512,2048,4096,8192,16384,32768,65536,131072
       ip6ndp     0     0K       -        4  64
   in6ifmulti     1     1K       -        1  64
   in6grentry     1     1K       -        1  64
    iflogical    20     5K       -       29  2048
     iffamily    45     6K       -       69  32,1024,2048
    rtnexthop   266    46K       -   608013  32,256,512,1024,2048,4096
      metrics    31     4K       -       54  256
        rnode   212     4K       -   607848  16,32
       rcache     4     8K       -        4  65536
       iflist     0     0K       -        6  16,64
     ifdevice    11     8K       -       17  16,32768
      ifstat   424   472K       -      427  512,16384,65536
        ipfw    42    23K       -      145
16,32,64,128,256,512,1024,16384,32768,65536,131072
      ifmaddr   415    11K       -      415  16,32
       rtable   329    28K       -   608066  16,32,64,128,1024,16384
       sysctl     0     0K       -   887976  16,32,64,4096,16384,32768
       ifaddr    64     5K       -       70  32,64,128
         mkey   331     6K       -    12528  16,128
      pfe_ipc     0     0K       -  7299115
16,32,64,128,256,512,1024,2048,4096,8192,16384,32768,65536,131072
      ifstate 1245054 70088K       -  3040437
16,32,64,128,256,512,1024,2048,4096,8192,16384,32768
    idxbucket     1     1K       -        1  16
     itable16  5069  1250K       -     5103  1024,4096
     itable32   157    10K       -      157  64
     itable64     2     1K       -        2  128
           lr     1     1K       -        4  16384
          pic    37     6K       -       37  64,16384
      pfestat     0     0K       -     6220  32,64,128,256,131072
       gencfg  1486   424K       -     2614  16,32,64,256,512,16384,32768,65536
```


Copyright © 2016, Juniper Networks, Inc.

```
          jsr     2     1K       -       22  16
          idl     1     4K       -      165
32,64,128,256,512,1024,2048,8192,16384,32768,65536,131072
       rtsmsg     0     0K       -       16  131072
       module   250    16K       -      250  64,128
     mtx_pool     1     8K       -        1  64,128
       DEVFS3   113    13K       -      114  256
       DEVFS1   106    24K       -      106  2048
         pgrp    15     1K       -     8600  64
      session    11     2K       -     2829  512
         proc     2     1K       -        2  16384
      subproc   296   572K       -    24689  2048,131072
         cred    38     5K       -   619244  256
       plimit    18     4K       -    21311  2048
      uidinfo     3     1K       -       10  32,512
    sysctloid  2701    82K       -     2701  16,32,64
    sysctltmp     0     0K       -    15572  16,32,64,1024
         umtx   171    11K       -      171  64
         SWAP     2   277K       -        2  64
          bus   779   125K       -     3072  16,32,64,128,32768
       bus-sc    67    62K       -     1477
16,32,64,512,1024,2048,8192,16384,65536,131072
      devstat     8    17K       -        8  16,131072
 eventhandler    46     2K       -       47  32,128
         kobj    93   186K       -      111  65536
        DEVFS     8     1K       -        9  16,64
         rman   106     7K       -      490  16,32,64
         sbuf     0     0K       -    28234  16,32,32768,131072
...
lcc0-re0:
------------------------------------------------------------------------
         Type InUse MemUse HighUse Requests  Size(s)
CAM dev queue     1     1K       -        1  64
      entropy  1024    64K       -     1024  64
       linker   487  6272K       -     1163  16,32,64,4096,32768,131072
          USB   127    10K       -      127  16,32,64,128,256,1024,2048
        lockf    23     2K       -   169585  64
       USBdev    10     2K       -       34  16,128,2048,16384
       devbuf  5128 10760K       -     5310
16,32,64,128,256,512,1024,2048,4096,8192,16384,32768,65536,131072
         temp  1285   151K       -    10770
16,32,64,128,256,512,2048,4096,8192,16384,32768,65536,131072
       ip6ndp     0     0K       -        4  64
    iflogical    20     5K       -       29  2048
     iffamily    45     6K       -       69  32,1024,2048
    rtnexthop   189    29K       -  1211988  32,256,512,1024,2048,4096
      metrics    11     2K       -       16  256
        rnode   135     3K       -   606391  16,32
       rcache     4     8K       -        4  65536
       iflist     0     0K       -        6  16,64
     ifdevice    11     8K       -       17  16,32768
       ifstat   412   471K       -      415  512,16384,65536
         ipfw    42    23K       -       91
16,32,64,128,256,512,1024,16384,32768,65536,131072
      ifmaddr   415    11K       -      415  16,32
       rtable   225    20K       -   606584  16,32,64,128,1024,16384
       sysctl     0     0K       -  2302479  16,32,64
       ifaddr    53     4K       -       69  32,64,128
         mkey   133     3K       -     8974  16,128
      pfe_ipc     0     0K       - 19035108
16,32,64,128,512,1024,2048,8192,16384,32768,65536,131072
```

```
      ifstate 710270 42176K       -  9583703
16,32,64,128,256,512,1024,2048,8192,16384,32768
    idxbucket     1     1K       -        1  16
     itable16  5045  1245K       -  1825178  1024,4096
     itable32   157    10K       -      157  64
     itable64     2     1K       -        2  128
           lr     1     1K       -        4  16384
          pic    37     6K       -       37  64,16384
      pfestat     0     0K       -     1682  32,64,128,256,131072
       gencfg  1486   424K       -     2812  16,32,64,256,512,16384,32768,65536
          jsr     0     0K       -       22  16
          idl     0     0K       -        4  32768,131072
       rtsmsg     0     0K       -        3  131072
       module   250    16K       -      250  64,128
     mtx_pool     1     8K       -        1  64,128
       DEVFS3   108    12K       -      109  256
       DEVFS1   101    23K       -      101  2048
         pgrp     5     1K       -      917  64
      session     5     1K       -      917  512
         proc     2     1K       -        2  16384
      subproc   217   441K       -     4867  2048,131072
         cred    21     3K       -    48719  256
       plimit     9     2K       -     5255  2048
      uidinfo     2     1K       -        2  32,512
    sysctloid  2786    85K       -     2786  16,32,64
    sysctltmp     0     0K       -     1833  16,32,64,1024
         umtx   126     8K       -      126  64
         SWAP     2   277K       -        2  64
          bus   780   125K       -     2734  16,32,64,128,32768
       bus-sc    69    69K       -     1194
16,32,64,512,1024,2048,8192,16384,65536,131072
      devstat     8    17K       -        8  16,131072
 eventhandler    45     2K       -       46  32,128
         kobj    93   186K       -      111  65536
        DEVFS     8     1K       -        9  16,64
         rman    94     6K       -      477  16,32,64
         sbuf     0     0K       -      532  16,32,32768,131072
  NULLFS hash     1     1K       -        1  64
    taskqueue     5     1K       -        5  64
   turnstiles   127     8K       -      127  64
       Unitno     6     1K       -       44  16,64
     ioctlops     0     0K       -  1771718  16,32,64,128,8192,16384,65536,131072

          iov     0     0K       -    79425  16,64,128,256,512,1024,2048,131072
          msg     4    25K       -        4  32768,131072
          sem     4     7K       -        4  16384,32768,131072
          shm     2    13K       -        4  32768
         ttys    93    16K       -      195  512,32768
       soname    31     3K       -   389284  16,32,64,256
          pcb   101    16K       -     4374
16,32,64,128,1024,2048,4096,16384,65536
   BIO buffer    40    80K       -      750  65536
     vfscache     1   512K       -        1  65536
cluster_save buffer     0     0K       -       55 32,64
     VFS hash     1   256K       -        1  32,64
       vnodes     1     1K       -        1  512
        mount   266    21K       -      481  16,32,64,128,256,4096,32768
  vnodemarker     0     0K       -     2497  16384
    pfs_nodes    25     3K       -       25  128
  pfs_vncache   144     5K       -      386  32
          STP     1     1K       -        1  64
```


Copyright © 2016, Juniper Networks, Inc.

```
         GEOM   173    15K       -     1068
16,32,64,128,256,512,2048,16384,32768,131072
     syncache     1     8K       -        1
16,32,64,128,256,512,2048,16384,32768,131072
     tlv_stat     0     0K       -      223
16,32,64,128,256,512,2048,16384,32768,131072
   NFS daemon     1     8K       -        1
16,32,64,128,256,512,2048,16384,32768,131072
     p1003.1b     1     1K       -        1  16
      MD disk     9    18K       -        9  65536
  ata_generic     2     2K       -       25  16,16384,32768
  ISOFS mount     7     1K       -       13  512
   ISOFS node  1439   135K       -     1453  128
      CAM SIM     1     1K       -        1  64
      CAM XPT     6     1K       -        9  16,64,16384
   CAM periph     1     1K       -        1  128
    ad_driver     2     1K       -        2  256
      pagedep     1    64K       -      105  64
     inodedep     1   256K       -      552  256
       newblk     1     1K       -      327  64,4096
    bmsafemap     0     0K       -       19  64
  allocdirect     0     0K       -      326  128
     freefrag     0     0K       -       31  32
     freeblks     0     0K       -      103  2048
     freefile     0     0K       -      175  32
       diradd     0     0K       -      590  64
        mkdir     0     0K       -      166  32
       dirrem     0     0K       -      382  32
     savedino     0     0K       -      283  512
    UFS mount    15    36K       -       15  2048,65536,131072
      ata_dma     6     1K       -        6  256
      UMAHash     1     4K       -        5  4096,16384,32768,65536,131072
         cdev    26     3K       -       26  256
    file desc   111    25K       -     5199  16,1024,2048,16384
    VM pgdata     2    65K       -        2  64
        sigio     1     1K       -       27  32
         kenv    30     5K       -       33  16,32,64,131072
     atkbddev     2     1K       -        2  32
       kqueue     0     0K       -       88  1024,4096,32768
    proc-args    28     2K       -     3970  32,64,128,256,512,1024
       isadev    23     2K       -       23  64
       zombie     1     1K       -     4651  128
      ithread    92     7K       -       92  16,64,256
    legacydrv     3     1K       -        3  16
      memdesc     1     4K       -        1  131072
     nexusdev     2     1K       -        2  16
    CAM queue     3     1K       -        3  16
       KTRACE   100    10K       -      100  128
       kbdmux     5     9K       -        5  128,2048,65536,131072
ITEM            SIZE     LIMIT     USED    FREE  REQUESTS
UMA Kegs:        136,        0,      71,      1,       71
...
```

show system virtual-memory | display xml

```
user@host> show system virtual-memory | display xml
<rpc-reply xmlns:junos="http://xml.device.net/junos/10.2R1/junos">
    <system-virtual-memory-information>
        <vmstat-memstat-malloc>
            <memstat-name>CAM dev queue</memstat-name>
            <inuse>1</inuse>
```

```
                <memuse>1</memuse>
                <high-use>-</high-use>
                <memstat-req>1</memstat-req>
                <memstat-size>64</memstat-size>
                <memstat-name>entropy</memstat-name>
                <inuse>1024</inuse>
                <memuse>64</memuse>
                <high-use>-</high-use>
                <memstat-req>1024</memstat-req>
                <memstat-size>64</memstat-size>
                <memstat-name>linker</memstat-name>
                <inuse>481</inuse>
                <memuse>1871</memuse>
                <high-use>-</high-use>
                <memstat-req>1145</memstat-req>
                <memstat-size>16,32,64,4096,32768,131072</memstat-size>
                <memstat-name>lockf</memstat-name>
                <inuse>56</inuse>
                <memuse>4</memuse>
                <high-use>-</high-use>
                <memstat-req>5998</memstat-req>
                <memstat-size>64</memstat-size>
                <memstat-name>devbuf</memstat-name>
                <inuse>2094</inuse>
                <memuse>3877</memuse>
                <high-use>-</high-use>
                <memstat-req>2099</memstat-req>

<memstat-size>16,32,64,128,512,1024,4096,8192,16384,32768,65536,131072</memstat-size>

                <memstat-name>temp</memstat-name>
                <inuse>21</inuse>
                <memuse>66</memuse>
                <high-use>-</high-use>
                <memstat-req>3127</memstat-req>

<memstat-size>16,32,64,128,256,512,2048,4096,8192,16384,32768,65536,131072</memstat-size>

                <memstat-name>ip6ndp</memstat-name>
                <inuse>0</inuse>
                <memuse>0</memuse>
                <high-use>-</high-use>
                <memstat-req>4</memstat-req>
                <memstat-size>64</memstat-size>
                <memstat-name>in6ifmulti</memstat-name>
                <inuse>1</inuse>
                <memuse>1</memuse>
                <high-use>-</high-use>
                <memstat-req>1</memstat-req>
                <memstat-size>64</memstat-size>
                <memstat-name>in6grentry</memstat-name>
                <inuse>1</inuse>
                <memuse>1</memuse>
                <high-use>-</high-use>
                <memstat-req>1</memstat-req>
                <memstat-size>64</memstat-size>
                <memstat-name>iflogical</memstat-name>
                <inuse>13</inuse>
                <memuse>3</memuse>
                <high-use>-</high-use>
                <memstat-req>13</memstat-req>
```


 Copyright © 2016, Juniper Networks, Inc.

```
<memstat-size>64,2048</memstat-size>
<memstat-name>iffamily</memstat-name>
<inuse>28</inuse>
<memuse>4</memuse>
<high-use>-</high-use>
<memstat-req>28</memstat-req>
<memstat-size>32,1024,2048</memstat-size>
<memstat-name>rtnexthop</memstat-name>
<inuse>127</inuse>
<memuse>18</memuse>
<high-use>-</high-use>
<memstat-req>129</memstat-req>
<memstat-size>32,256,512,1024,2048,4096</memstat-size>
<memstat-name>metrics</memstat-name>
<inuse>3</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>5</memstat-req>
<memstat-size>256</memstat-size>
<memstat-name>inifmulti</memstat-name>
<inuse>3</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>3</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>ingrentry</memstat-name>
<inuse>6</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>6</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>rnode</memstat-name>
<inuse>68</inuse>
<memuse>2</memuse>
<high-use>-</high-use>
<memstat-req>76</memstat-req>
<memstat-size>16,32</memstat-size>
<memstat-name>rcache</memstat-name>
<inuse>4</inuse>
<memuse>8</memuse>
<high-use>-</high-use>
<memstat-req>4</memstat-req>
<memstat-size>65536</memstat-size>
<memstat-name>ifdevice</memstat-name>
<inuse>4</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>4</memstat-req>
<memstat-size>16</memstat-size>
<memstat-name>ifstat</memstat-name>
<inuse>40</inuse>
<memuse>22</memuse>
<high-use>-</high-use>
<memstat-req>40</memstat-req>
<memstat-size>512,16384,32768</memstat-size>
<memstat-name>ipfw</memstat-name>
<inuse>42</inuse>
<memuse>23</memuse>
<high-use>-</high-use>
<memstat-req>91</memstat-req>
```

```
<memstat-size>16,32,64,128,256,512,1024,16384,32768,65536,131072</memstat-size>
            <memstat-name>ifmaddr</memstat-name>
            <inuse>103</inuse>
            <memuse>3</memuse>
            <high-use>-</high-use>
            <memstat-req>103</memstat-req>
            <memstat-size>16,32</memstat-size>
            <memstat-name>rtable</memstat-name>
            <inuse>129</inuse>
            <memuse>14</memuse>
            <high-use>-</high-use>
            <memstat-req>139</memstat-req>
            <memstat-size>16,32,64,128,1024,16384</memstat-size>
            <memstat-name>sysctl</memstat-name>
            <inuse>0</inuse>
            <memuse>0</memuse>
            <high-use>-</high-use>
            <memstat-req>14847</memstat-req>
            <memstat-size>16,32,64,4096,16384,32768</memstat-size>
            <memstat-name>ifaddr</memstat-name>
            <inuse>29</inuse>
            <memuse>3</memuse>
            <high-use>-</high-use>
            <memstat-req>29</memstat-req>
            <memstat-size>64,128</memstat-size>
            <memstat-name>mkey</memstat-name>
            <inuse>345</inuse>
            <memuse>6</memuse>
            <high-use>-</high-use>
            <memstat-req>2527</memstat-req>
            <memstat-size>16,128</memstat-size>
            <memstat-name>pfe_ipc</memstat-name>
            <inuse>0</inuse>
            <memuse>0</memuse>
            <high-use>-</high-use>
            <memstat-req>1422</memstat-req>

<memstat-size>16,32,64,128,512,1024,2048,8192,16384,32768,65536,131072</memstat-size>

            <memstat-name>ifstate</memstat-name>
            <inuse>594</inuse>
            <memuse>51</memuse>
            <high-use>-</high-use>
            <memstat-req>655</memstat-req>

<memstat-size>16,32,64,128,256,1024,2048,4096,16384,32768</memstat-size>
            <memstat-name>itable16</memstat-name>
            <inuse>276</inuse>
            <memuse>52</memuse>
            <high-use>-</high-use>
            <memstat-req>294</memstat-req>
            <memstat-size>1024,4096</memstat-size>
            <memstat-name>itable32</memstat-name>
            <inuse>160</inuse>
            <memuse>10</memuse>
            <high-use>-</high-use>
            <memstat-req>160</memstat-req>
            <memstat-size>64</memstat-size>
            <memstat-name>itable64</memstat-name>
            <inuse>2</inuse>
            <memuse>1</memuse>
```


 Copyright © 2016, Juniper Networks, Inc.

```
  <high-use>-</high-use>
  <memstat-req>2</memstat-req>
  <memstat-size>128</memstat-size>
  <memstat-name>lr</memstat-name>
  <inuse>1</inuse>
  <memuse>1</memuse>
  <high-use>-</high-use>
  <memstat-req>1</memstat-req>
  <memstat-size>16384</memstat-size>
  <memstat-name>pic</memstat-name>
  <inuse>5</inuse>
  <memuse>1</memuse>
  <high-use>-</high-use>
  <memstat-req>5</memstat-req>
  <memstat-size>64,512</memstat-size>
  <memstat-name>pfestat</memstat-name>
  <inuse>0</inuse>
  <memuse>0</memuse>
  <high-use>-</high-use>
  <memstat-req>162</memstat-req>
  <memstat-size>16,32,128,256,16384</memstat-size>
  <memstat-name>gencfg</memstat-name>
  <inuse>224</inuse>
  <memuse>56</memuse>
  <high-use>-</high-use>
  <memstat-req>540</memstat-req>
  <memstat-size>16,32,64,256,512,32768,65536</memstat-size>
  <memstat-name>jsr</memstat-name>
  <inuse>2</inuse>
  <memuse>1</memuse>
  <high-use>-</high-use>
  <memstat-req>4</memstat-req>
  <memstat-size>16</memstat-size>
  <memstat-name>idl</memstat-name>
  <inuse>0</inuse>
  <memuse>0</memuse>
  <high-use>-</high-use>
  <memstat-req>13</memstat-req>
<memstat-size>16,32,64,128,256,4096,16384,32768,131072</memstat-size>

  <memstat-name>rtsmsg</memstat-name>
  <inuse>0</inuse>
  <memuse>0</memuse>
  <high-use>-</high-use>
  <memstat-req>2</memstat-req>
  <memstat-size>131072</memstat-size>
  <memstat-name>module</memstat-name>
  <inuse>249</inuse>
  <memuse>16</memuse>
  <high-use>-</high-use>
  <memstat-req>249</memstat-req>
  <memstat-size>64,128</memstat-size>
  <memstat-name>mtx_pool</memstat-name>
  <inuse>1</inuse>
  <memuse>8</memuse>
  <high-use>-</high-use>
  <memstat-req>1</memstat-req>
  <memstat-size>64,128</memstat-size>
  <memstat-name>DEVFS3</memstat-name>
  <inuse>109</inuse>
  <memuse>12</memuse>
```

```
<high-use>-</high-use>
<memstat-req>117</memstat-req>
<memstat-size>256</memstat-size>
<memstat-name>DEVFS1</memstat-name>
<inuse>102</inuse>
<memuse>23</memuse>
<high-use>-</high-use>
<memstat-req>109</memstat-req>
<memstat-size>2048</memstat-size>
<memstat-name>pgrp</memstat-name>
<inuse>12</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>21</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>session</memstat-name>
<inuse>8</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>15</memstat-req>
<memstat-size>512</memstat-size>
<memstat-name>proc</memstat-name>
<inuse>2</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>2</memstat-req>
<memstat-size>16384</memstat-size>
<memstat-name>subproc</memstat-name>
<inuse>244</inuse>
<memuse>496</memuse>
<high-use>-</high-use>
<memstat-req>1522</memstat-req>
<memstat-size>2048,131072</memstat-size>
<memstat-name>cred</memstat-name>
<inuse>30</inuse>
<memuse>4</memuse>
<high-use>-</high-use>
<memstat-req>11409</memstat-req>
<memstat-size>256</memstat-size>
<memstat-name>plimit</memstat-name>
<inuse>17</inuse>
<memuse>4</memuse>
<high-use>-</high-use>
<memstat-req>133</memstat-req>
<memstat-size>2048</memstat-size>
<memstat-name>uidinfo</memstat-name>
<inuse>3</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>6</memstat-req>
<memstat-size>32,512</memstat-size>
<memstat-name>sysctloid</memstat-name>
<inuse>1117</inuse>
<memuse>34</memuse>
<high-use>-</high-use>
<memstat-req>1117</memstat-req>
<memstat-size>16,32,64</memstat-size>
<memstat-name>sysctltmp</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>-</high-use>
```


 Copyright © 2016, Juniper Networks, Inc.

```
                <memstat-req>743</memstat-req>
                <memstat-size>16,32,64,1024</memstat-size>
                <memstat-name>umtx</memstat-name>
                <inuse>144</inuse>
                <memuse>9</memuse>
                <high-use>-</high-use>
                <memstat-req>144</memstat-req>
                <memstat-size>64</memstat-size>
                <memstat-name>SWAP</memstat-name>
                <inuse>2</inuse>
                <memuse>209</memuse>
                <high-use>-</high-use>
                <memstat-req>2</memstat-req>
                <memstat-size>64</memstat-size>
                <memstat-name>bus</memstat-name>
                <inuse>496</inuse>
                <memuse>55</memuse>
                <high-use>-</high-use>
                <memstat-req>1196</memstat-req>
                <memstat-size>16,32,64,128,32768</memstat-size>
                <memstat-name>bus-sc</memstat-name>
                <inuse>23</inuse>
                <memuse>33</memuse>
                <high-use>-</high-use>
                <memstat-req>335</memstat-req>

<memstat-size>16,32,64,512,1024,2048,8192,16384,65536,131072</memstat-size>
                <memstat-name>devstat</memstat-name>
                <inuse>10</inuse>
                <memuse>21</memuse>
                <high-use>-</high-use>
                <memstat-req>10</memstat-req>
                <memstat-size>16,131072</memstat-size>
                <memstat-name>eventhandler</memstat-name>
                <inuse>35</inuse>
                <memuse>2</memuse>
                <high-use>-</high-use>
                <memstat-req>36</memstat-req>
                <memstat-size>32,128</memstat-size>
                <memstat-name>kobj</memstat-name>
                <inuse>93</inuse>
                <memuse>186</memuse>
                <high-use>-</high-use>
                <memstat-req>111</memstat-req>
                <memstat-size>65536</memstat-size>
                <memstat-name>DEVFS</memstat-name>
                <inuse>8</inuse>
                <memuse>1</memuse>
                <high-use>-</high-use>
                <memstat-req>9</memstat-req>
                <memstat-size>16,64</memstat-size>
                <memstat-name>rman</memstat-name>
                <inuse>71</inuse>
                <memuse>5</memuse>
                <high-use>-</high-use>
                <memstat-req>433</memstat-req>
                <memstat-size>16,32,64</memstat-size>
                <memstat-name>sbuf</memstat-name>
                <inuse>0</inuse>
                <memuse>0</memuse>
                <high-use>-</high-use>
```

```
<memstat-req>522</memstat-req>
<memstat-size>16,32,32768,131072</memstat-size>
<memstat-name>NULLFS hash</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>1</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>taskqueue</memstat-name>
<inuse>5</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>5</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>turnstiles</memstat-name>
<inuse>145</inuse>
<memuse>10</memuse>
<high-use>-</high-use>
<memstat-req>145</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>Unitno</memstat-name>
<inuse>8</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>44</memstat-req>
<memstat-size>16,64</memstat-size>
<memstat-name>ioctlops</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>-</high-use>
<memstat-req>27622</memstat-req>
<memstat-size>16,64,8192,16384,131072</memstat-size>
<memstat-name>iov</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>-</high-use>
<memstat-req>18578</memstat-req>
<memstat-size>16,64,128,256,512,1024,2048,131072</memstat-size>
<memstat-name>msg</memstat-name>
<inuse>4</inuse>
<memuse>25</memuse>
<high-use>-</high-use>
<memstat-req>4</memstat-req>
<memstat-size>32768,131072</memstat-size>
<memstat-name>sem</memstat-name>
<inuse>4</inuse>
<memuse>7</memuse>
<high-use>-</high-use>
<memstat-req>4</memstat-req>
<memstat-size>16384,32768,131072</memstat-size>
<memstat-name>shm</memstat-name>
<inuse>9</inuse>
<memuse>20</memuse>
<high-use>-</high-use>
<memstat-req>14</memstat-req>
<memstat-size>32768</memstat-size>
<memstat-name>ttys</memstat-name>
<inuse>321</inuse>
<memuse>61</memuse>
<high-use>-</high-use>
<memstat-req>528</memstat-req>
```


 Copyright © 2016, Juniper Networks, Inc.

```
                <memstat-size>512,32768</memstat-size>
                <memstat-name>ptys</memstat-name>
                <inuse>1</inuse>
                <memuse>1</memuse>
                <high-use>-</high-use>
                <memstat-req>1</memstat-req>
                <memstat-size>128</memstat-size>
                <memstat-name>mbuf_tag</memstat-name>
                <inuse>0</inuse>
                <memuse>0</memuse>
                <high-use>-</high-use>
                <memstat-req>23383</memstat-req>
                <memstat-size>16</memstat-size>
                <memstat-name>soname</memstat-name>
                <inuse>115</inuse>
                <memuse>12</memuse>
                <high-use>-</high-use>
                <memstat-req>24712</memstat-req>
                <memstat-size>16,32,64,256</memstat-size>
                <memstat-name>pcb</memstat-name>
                <inuse>216</inuse>
                <memuse>33</memuse>
                <high-use>-</high-use>
                <memstat-req>484</memstat-req>

<memstat-size>16,32,64,128,1024,2048,4096,16384,32768,65536</memstat-size>
                <memstat-name>BIO buffer</memstat-name>
                <inuse>43</inuse>
                <memuse>86</memuse>
                <high-use>-</high-use>
                <memstat-req>405</memstat-req>
                <memstat-size>65536</memstat-size>
                <memstat-name>vfscache</memstat-name>
                <inuse>1</inuse>
                <memuse>256</memuse>
                <high-use>-</high-use>
                <memstat-req>1</memstat-req>
                <memstat-size>65536</memstat-size>
                <memstat-name>cluster_save buffer</memstat-name>
                <inuse>0</inuse>
                <memuse>0</memuse>
                <high-use>-</high-use>
                <memstat-req>2</memstat-req>
                <memstat-size>32,64</memstat-size>
                <memstat-name>VFS hash</memstat-name>
                <inuse>1</inuse>
                <memuse>128</memuse>
                <high-use>-</high-use>
                <memstat-req>1</memstat-req>
                <memstat-size>32,64</memstat-size>
                <memstat-name>vnodes</memstat-name>
                <inuse>1</inuse>
                <memuse>1</memuse>
                <high-use>-</high-use>
                <memstat-req>1</memstat-req>
                <memstat-size>512</memstat-size>
                <memstat-name>mount</memstat-name>
                <inuse>290</inuse>
                <memuse>23</memuse>
                <high-use>-</high-use>
                <memstat-req>535</memstat-req>
```

```
                <memstat-size>16,32,64,128,256,4096,32768</memstat-size>
                <memstat-name>vnodemarker</memstat-name>
                <inuse>0</inuse>
                <memuse>0</memuse>
                <high-use>-</high-use>
                <memstat-req>498</memstat-req>
                <memstat-size>16384</memstat-size>
                <memstat-name>pfs_nodes</memstat-name>
                <inuse>25</inuse>
                <memuse>3</memuse>
                <high-use>-</high-use>
                <memstat-req>25</memstat-req>
                <memstat-size>128</memstat-size>
                <memstat-name>pfs_vncache</memstat-name>
                <inuse>27</inuse>
                <memuse>1</memuse>
                <high-use>-</high-use>
                <memstat-req>53</memstat-req>
                <memstat-size>32</memstat-size>
                <memstat-name>STP</memstat-name>
                <inuse>1</inuse>
                <memuse>1</memuse>
                <high-use>-</high-use>
                <memstat-req>1</memstat-req>
                <memstat-size>64</memstat-size>
                <memstat-name>GEOM</memstat-name>
                <inuse>146</inuse>
                <memuse>11</memuse>
                <high-use>-</high-use>
                <memstat-req>1042</memstat-req>

<memstat-size>16,32,64,128,256,512,2048,16384,32768,131072</memstat-size>
                <memstat-name>syncache</memstat-name>
                <inuse>1</inuse>
                <memuse>8</memuse>
                <high-use>-</high-use>
                <memstat-req>1</memstat-req>

<memstat-size>16,32,64,128,256,512,2048,16384,32768,131072</memstat-size>
                <memstat-name>tlv_stat</memstat-name>
                <inuse>0</inuse>
                <memuse>0</memuse>
                <high-use>-</high-use>
                <memstat-req>8</memstat-req>

<memstat-size>16,32,64,128,256,512,2048,16384,32768,131072</memstat-size>
                <memstat-name>NFS daemon</memstat-name>
                <inuse>1</inuse>
                <memuse>8</memuse>
                <high-use>-</high-use>
                <memstat-req>1</memstat-req>

<memstat-size>16,32,64,128,256,512,2048,16384,32768,131072</memstat-size>
                <memstat-name>p1003.1b</memstat-name>
                <inuse>1</inuse>
                <memuse>1</memuse>
                <high-use>-</high-use>
                <memstat-req>1</memstat-req>
                <memstat-size>16</memstat-size>
                <memstat-name>MD disk</memstat-name>
                <inuse>10</inuse>
```


 Copyright © 2016, Juniper Networks, Inc.

```
<memuse>20</memuse>
<high-use>-</high-use>
<memstat-req>10</memstat-req>
<memstat-size>65536</memstat-size>
<memstat-name>ata_generic</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>6</memstat-req>
<memstat-size>16,16384,32768</memstat-size>
<memstat-name>ISOFS mount</memstat-name>
<inuse>8</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>15</memstat-req>
<memstat-size>512</memstat-size>
<memstat-name>ISOFS node</memstat-name>
<inuse>1440</inuse>
<memuse>135</memuse>
<high-use>-</high-use>
<memstat-req>1457</memstat-req>
<memstat-size>128</memstat-size>
<memstat-name>CAM SIM</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>1</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>CAM XPT</memstat-name>
<inuse>6</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>9</memstat-req>
<memstat-size>16,64,16384</memstat-size>
<memstat-name>CAM periph</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>1</memstat-req>
<memstat-size>128</memstat-size>
<memstat-name>ad_driver</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>1</memstat-req>
<memstat-size>256</memstat-size>
<memstat-name>pagedep</memstat-name>
<inuse>1</inuse>
<memuse>32</memuse>
<high-use>-</high-use>
<memstat-req>106</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>inodedep</memstat-name>
<inuse>1</inuse>
<memuse>128</memuse>
<high-use>-</high-use>
<memstat-req>464</memstat-req>
<memstat-size>256</memstat-size>
<memstat-name>newblk</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
```

```
<high-use>-</high-use>
<memstat-req>336</memstat-req>
<memstat-size>64,4096</memstat-size>
<memstat-name>bmsafemap</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>-</high-use>
<memstat-req>63</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>allocdirect</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>-</high-use>
<memstat-req>320</memstat-req>
<memstat-size>128</memstat-size>
<memstat-name>indirdep</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>-</high-use>
<memstat-req>17</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>allocindir</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>-</high-use>
<memstat-req>15</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>freefrag</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>-</high-use>
<memstat-req>12</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>freeblks</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>-</high-use>
<memstat-req>40</memstat-req>
<memstat-size>2048</memstat-size>
<memstat-name>freefile</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>-</high-use>
<memstat-req>101</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>diradd</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>-</high-use>
<memstat-req>465</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>mkdir</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>-</high-use>
<memstat-req>136</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>dirrem</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>-</high-use>
```


 Copyright © 2016, Juniper Networks, Inc.

```
<memstat-req>168</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>newdirblk</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>-</high-use>
<memstat-req>1</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>savedino</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>-</high-use>
<memstat-req>157</memstat-req>
<memstat-size>512</memstat-size>
<memstat-name>UFS mount</memstat-name>
<inuse>15</inuse>
<memuse>36</memuse>
<high-use>-</high-use>
<memstat-req>15</memstat-req>
<memstat-size>2048,65536,131072</memstat-size>
<memstat-name>ata_dma</memstat-name>
<inuse>2</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>2</memstat-req>
<memstat-size>256</memstat-size>
<memstat-name>UMAHash</memstat-name>
<inuse>1</inuse>
<memuse>2</memuse>
<high-use>-</high-use>
<memstat-req>4</memstat-req>
<memstat-size>4096,16384,32768,65536</memstat-size>
<memstat-name>cdev</memstat-name>
<inuse>22</inuse>
<memuse>3</memuse>
<high-use>-</high-use>
<memstat-req>22</memstat-req>
<memstat-size>256</memstat-size>
<memstat-name>file desc</memstat-name>
<inuse>141</inuse>
<memuse>32</memuse>
<high-use>-</high-use>
<memstat-req>1583</memstat-req>
<memstat-size>16,1024,2048,16384</memstat-size>
<memstat-name>VM pgdata</memstat-name>
<inuse>2</inuse>
<memuse>65</memuse>
<high-use>-</high-use>
<memstat-req>2</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>sigio</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>20</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>kenv</memstat-name>
<inuse>24</inuse>
<memuse>5</memuse>
<high-use>-</high-use>
<memstat-req>27</memstat-req>
```

```
<memstat-size>16,32,64,131072</memstat-size>
<memstat-name>atkbddev</memstat-name>
<inuse>2</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>2</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>kqueue</memstat-name>
<inuse>15</inuse>
<memuse>9</memuse>
<high-use>-</high-use>
<memstat-req>19</memstat-req>
<memstat-size>1024,4096,32768</memstat-size>
<memstat-name>proc-args</memstat-name>
<inuse>57</inuse>
<memuse>3</memuse>
<high-use>-</high-use>
<memstat-req>1001</memstat-req>
<memstat-size>16,32,64,128,256,512,1024</memstat-size>
<memstat-name>isadev</memstat-name>
<inuse>21</inuse>
<memuse>2</memuse>
<high-use>-</high-use>
<memstat-req>21</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>zombie</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>-</high-use>
<memstat-req>1278</memstat-req>
<memstat-size>128</memstat-size>
<memstat-name>ithread</memstat-name>
<inuse>69</inuse>
<memuse>5</memuse>
<high-use>-</high-use>
<memstat-req>69</memstat-req>
<memstat-size>16,64,256</memstat-size>
<memstat-name>legacydrv</memstat-name>
<inuse>4</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>4</memstat-req>
<memstat-size>16</memstat-size>
<memstat-name>memdesc</memstat-name>
<inuse>1</inuse>
<memuse>4</memuse>
<high-use>-</high-use>
<memstat-req>1</memstat-req>
<memstat-size>131072</memstat-size>
<memstat-name>nexusdev</memstat-name>
<inuse>2</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>2</memstat-req>
<memstat-size>16</memstat-size>
<memstat-name>CAM queue</memstat-name>
<inuse>3</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>3</memstat-req>
<memstat-size>16</memstat-size>
```


 Copyright © 2016, Juniper Networks, Inc.

```
        <memstat-name>$PIR</memstat-name>
        <inuse>4</inuse>
        <memuse>1</memuse>
        <high-use>-</high-use>
        <memstat-req>4</memstat-req>
        <memstat-size>32</memstat-size>
        <memstat-name>KTRACE</memstat-name>
        <inuse>100</inuse>
        <memuse>10</memuse>
        <high-use>-</high-use>
        <memstat-req>100</memstat-req>
        <memstat-size>128</memstat-size>
        <memstat-name>kbdmux</memstat-name>
        <inuse>5</inuse>
        <memuse>9</memuse>
        <high-use>-</high-use>
        <memstat-req>5</memstat-req>
        <memstat-size>128,2048,65536,131072</memstat-size>
    </vmstat-memstat-malloc>
    <vmstat-memstat-zone>
        <zone-name>UMA Kegs:</zone-name>
        <zone-size>136</zone-size>
        <count-limit>0</count-limit>
        <used>71</used>
        <free>1</free>
        <zone-req>71</zone-req>
        <zone-name>UMA Zones:</zone-name>
        <zone-size>120</zone-size>
        <count-limit>0</count-limit>
        <used>71</used>
        <free>19</free>
        <zone-req>71</zone-req>
        <zone-name>UMA Slabs:</zone-name>
        <zone-size>64</zone-size>
        <count-limit>0</count-limit>
        <used>490</used>
        <free>41</free>
        <zone-req>579</zone-req>
        <zone-name>UMA RCntSlabs:</zone-name>
        <zone-size>104</zone-size>
        <count-limit>0</count-limit>
        <used>276</used>
        <free>20</free>
        <zone-req>276</zone-req>
        <zone-name>UMA Hash:</zone-name>
        <zone-size>128</zone-size>
        <count-limit>0</count-limit>
        <used>4</used>
        <free>26</free>
        <zone-req>5</zone-req>
        <zone-name>16 Bucket:</zone-name>
        <zone-size>76</zone-size>
        <count-limit>0</count-limit>
        <used>30</used>
        <free>20</free>
        <zone-req>30</zone-req>
        <zone-name>32 Bucket:</zone-name>
        <zone-size>140</zone-size>
        <count-limit>0</count-limit>
        <used>33</used>
        <free>23</free>
```

```
<zone-req>33</zone-req>
<zone-name>64 Bucket:</zone-name>
<zone-size>268</zone-size>
<count-limit>0</count-limit>
<used>33</used>
<free>9</free>
<zone-req>33</zone-req>
<zone-name>128 Bucket:</zone-name>
<zone-size>524</zone-size>
<count-limit>0</count-limit>
<used>49</used>
<free>0</free>
<zone-req>49</zone-req>
<zone-name>VM OBJECT:</zone-name>
<zone-size>128</zone-size>
<count-limit>0</count-limit>
<used>2111</used>
<free>79</free>
<zone-req>25214</zone-req>
<zone-name>MAP:</zone-name>
<zone-size>160</zone-size>
<count-limit>0</count-limit>
<used>7</used>
<free>41</free>
<zone-req>7</zone-req>
<zone-name>KMAP ENTRY:</zone-name>
<zone-size>68</zone-size>
<count-limit>35336</count-limit>
<used>19</used>
<free>149</free>
<zone-req>2397</zone-req>
<zone-name>MAP ENTRY:</zone-name>
<zone-size>68</zone-size>
<count-limit>0</count-limit>
<used>2031</used>
<free>153</free>
<zone-req>62417</zone-req>
<zone-name>PV ENTRY:</zone-name>
<zone-size>24</zone-size>
<count-limit>509095</count-limit>
<used>57177</used>
<free>6333</free>
<zone-req>1033683</zone-req>
<zone-name>DP fakepg:</zone-name>
<zone-size>72</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>mt_zone:</zone-name>
<zone-size>64</zone-size>
<count-limit>0</count-limit>
<used>238</used>
<free>57</free>
<zone-req>238</zone-req>
<zone-name>16:</zone-name>
<zone-size>16</zone-size>
<count-limit>0</count-limit>
<used>2114</used>
<free>119</free>
<zone-req>80515</zone-req>
```


 Copyright © 2016, Juniper Networks, Inc.

```
<zone-name>32:</zone-name>
<zone-size>32</zone-size>
<count-limit>0</count-limit>
<used>1335</used>
<free>134</free>
<zone-req>10259</zone-req>
<zone-name>64:</zone-name>
<zone-size>64</zone-size>
<count-limit>0</count-limit>
<used>3529</used>
<free>129</free>
<zone-req>29110</zone-req>
<zone-name>96:</zone-name>
<zone-size>96</zone-size>
<count-limit>0</count-limit>
<used>2062</used>
<free>58</free>
<zone-req>4365</zone-req>
<zone-name>112:</zone-name>
<zone-size>112</zone-size>
<count-limit>0</count-limit>
<used>361</used>
<free>164</free>
<zone-req>24613</zone-req>
<zone-name>128:</zone-name>
<zone-size>128</zone-size>
<count-limit>0</count-limit>
<used>359</used>
<free>61</free>
<zone-req>942</zone-req>
<zone-name>160:</zone-name>
<zone-size>160</zone-size>
<count-limit>0</count-limit>
<used>364</used>
<free>44</free>
<zone-req>577</zone-req>
<zone-name>224:</zone-name>
<zone-size>224</zone-size>
<count-limit>0</count-limit>
<used>422</used>
<free>20</free>
<zone-req>1950</zone-req>
<zone-name>256:</zone-name>
<zone-size>256</zone-size>
<count-limit>0</count-limit>
<used>204</used>
<free>36</free>
<zone-req>1225</zone-req>
<zone-name>288:</zone-name>
<zone-size>288</zone-size>
<count-limit>0</count-limit>
<used>2</used>
<free>24</free>
<zone-req>10</zone-req>
<zone-name>512:</zone-name>
<zone-size>512</zone-size>
<count-limit>0</count-limit>
<used>49</used>
<free>7</free>
<zone-req>911</zone-req>
<zone-name>1024:</zone-name>
```

```
<zone-size>1024</zone-size>
<count-limit>0</count-limit>
<used>213</used>
<free>11</free>
<zone-req>1076</zone-req>
<zone-name>2048:</zone-name>
<zone-size>2048</zone-size>
<count-limit>0</count-limit>
<used>199</used>
<free>113</free>
<zone-req>640</zone-req>
<zone-name>4096:</zone-name>
<zone-size>4096</zone-size>
<count-limit>0</count-limit>
<used>144</used>
<free>7</free>
<zone-req>2249</zone-req>
<zone-name>Files:</zone-name>
<zone-size>72</zone-size>
<count-limit>0</count-limit>
<used>665</used>
<free>77</free>
<zone-req>16457</zone-req>
<zone-name>MAC labels:</zone-name>
<zone-size>20</zone-size>
<count-limit>0</count-limit>
<used>3998</used>
<free>227</free>
<zone-req>21947</zone-req>
<zone-name>PROC:</zone-name>
<zone-size>544</zone-size>
<count-limit>0</count-limit>
<used>116</used>
<free>10</free>
<zone-req>1394</zone-req>
<zone-name>THREAD:</zone-name>
<zone-size>416</zone-size>
<count-limit>0</count-limit>
<used>127</used>
<free>17</free>
<zone-req>131</zone-req>
<zone-name>KSEGRP:</zone-name>
<zone-size>88</zone-size>
<count-limit>0</count-limit>
<used>127</used>
<free>73</free>
<zone-req>131</zone-req>
<zone-name>UPCALL:</zone-name>
<zone-size>44</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>SLEEPQUEUE:</zone-name>
<zone-size>32</zone-size>
<count-limit>0</count-limit>
<used>145</used>
<free>194</free>
<zone-req>145</zone-req>
<zone-name>VMSPACE:</zone-name>
<zone-size>268</zone-size>
```


 Copyright © 2016, Juniper Networks, Inc.

```
<count-limit>0</count-limit>
<used>57</used>
<free>13</free>
<zone-req>1335</zone-req>
<zone-name>mbuf_packet:</zone-name>
<zone-size>256</zone-size>
<count-limit>180000</count-limit>
<used>256</used>
<free>128</free>
<zone-req>49791</zone-req>
<zone-name>mbuf:</zone-name>
<zone-size>256</zone-size>
<count-limit>180000</count-limit>
<used>50</used>
<free>466</free>
<zone-req>105183</zone-req>
<zone-name>mbuf_cluster:</zone-name>
<zone-size>2048</zone-size>
<count-limit>25190</count-limit>
<used>387</used>
<free>165</free>
<zone-req>5976</zone-req>
<zone-name>mbuf_jumbo_pagesize:</zone-name>
<zone-size>4096</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>mbuf_jumbo_9k:</zone-name>
<zone-size>9216</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>mbuf_jumbo_16k:</zone-name>
<zone-size>16384</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>ACL UMA zone:</zone-name>
<zone-size>388</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>g_bio:</zone-name>
<zone-size>132</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>174</free>
<zone-req>69750</zone-req>
<zone-name>ata_request:</zone-name>
<zone-size>200</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>57</free>
<zone-req>5030</zone-req>
<zone-name>ata_composite:</zone-name>
<zone-size>192</zone-size>
<count-limit>0</count-limit>
```

```
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>GENCFG:</zone-name>
<zone-size>72</zone-size>
<count-limit>1000004</count-limit>
<used>57</used>
<free>102</free>
<zone-req>57</zone-req>
<zone-name>VNODE:</zone-name>
<zone-size>292</zone-size>
<count-limit>0</count-limit>
<used>2718</used>
<free>25</free>
<zone-req>2922</zone-req>
<zone-name>VNODEPOLL:</zone-name>
<zone-size>72</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>S VFS Cache:</zone-name>
<zone-size>68</zone-size>
<count-limit>0</count-limit>
<used>2500</used>
<free>76</free>
<zone-req>3824</zone-req>
<zone-name>L VFS Cache:</zone-name>
<zone-size>291</zone-size>
<count-limit>0</count-limit>
<used>51</used>
<free>14</free>
<zone-req>63</zone-req>
<zone-name>NAMEI:</zone-name>
<zone-size>1024</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>8</free>
<zone-req>53330</zone-req>
<zone-name>NFSMOUNT:</zone-name>
<zone-size>480</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>NFSNODE:</zone-name>
<zone-size>460</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>PIPE:</zone-name>
<zone-size>404</zone-size>
<count-limit>0</count-limit>
<used>27</used>
<free>9</free>
<zone-req>717</zone-req>
<zone-name>KNOTE:</zone-name>
<zone-size>72</zone-size>
<count-limit>0</count-limit>
<used>42</used>
```


 Copyright © 2016, Juniper Networks, Inc.

```
<free>64</free>
<zone-req>3311</zone-req>
<zone-name>socket:</zone-name>
<zone-size>412</zone-size>
<count-limit>25191</count-limit>
<used>343</used>
<free>8</free>
<zone-req>2524</zone-req>
<zone-name>unpcb:</zone-name>
<zone-size>140</zone-size>
<count-limit>25200</count-limit>
<used>170</used>
<free>26</free>
<zone-req>2157</zone-req>
<zone-name>ipq:</zone-name>
<zone-size>52</zone-size>
<count-limit>216</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>udpcb:</zone-name>
<zone-size>232</zone-size>
<count-limit>25194</count-limit>
<used>19</used>
<free>32</free>
<zone-req>31</zone-req>
<zone-name>inpcb:</zone-name>
<zone-size>232</zone-size>
<count-limit>25194</count-limit>
<used>40</used>
<free>28</free>
<zone-req>105</zone-req>
<zone-name>tcpcb:</zone-name>
<zone-size>520</zone-size>
<count-limit>25193</count-limit>
<used>40</used>
<free>16</free>
<zone-req>105</zone-req>
<zone-name>tcptw:</zone-name>
<zone-size>56</zone-size>
<count-limit>5092</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>syncache:</zone-name>
<zone-size>128</zone-size>
<count-limit>15360</count-limit>
<used>0</used>
<free>60</free>
<zone-req>55</zone-req>
<zone-name>tcpreass:</zone-name>
<zone-size>20</zone-size>
<count-limit>1690</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>sackhole:</zone-name>
<zone-size>20</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
```

```
                <zone-req>0</zone-req>
                <zone-name>ripcb:</zone-name>
                <zone-size>232</zone-size>
                <count-limit>25194</count-limit>
                <used>5</used>
                <free>29</free>
                <zone-req>5</zone-req>
                <zone-name>SWAPMETA:</zone-name>
                <zone-size>276</zone-size>
                <count-limit>94948</count-limit>
                <used>0</used>
                <free>0</free>
                <zone-req>0</zone-req>
                <zone-name>FFS inode:</zone-name>
                <zone-size>132</zone-size>
                <count-limit>0</count-limit>
                <used>1146</used>
                <free>72</free>
                <zone-req>1306</zone-req>
                <zone-name>FFS1 dinode:</zone-name>
                <zone-size>128</zone-size>
                <count-limit>0</count-limit>
                <used>1146</used>
                <free>24</free>
                <zone-req>1306</zone-req>
                <zone-name>FFS2 dinode:</zone-name>
                <zone-size>256</zone-size>
                <count-limit>0</count-limit>
                <used>0</used>
                <free>0</free>
                <zone-req>0</zone-req>
            </vmstat-memstat-zone>
            <vmstat-sumstat>
                <cpu-context-switch>934906</cpu-context-switch>
                <dev-intr>1707986</dev-intr>
                <soft-intr>33819</soft-intr>
                <traps>203604</traps>
                <sys-calls>1200636</sys-calls>
                <kernel-thrds>60</kernel-thrds>
                <fork-calls>1313</fork-calls>
                <vfork-calls>21</vfork-calls>
                <rfork-calls>0</rfork-calls>
                <swap-pageins>0</swap-pageins>
                <swap-pagedin>0</swap-pagedin>
                <swap-pageouts>0</swap-pageouts>
                <swap-pagedout>0</swap-pagedout>
                <vnode-pageins>23094</vnode-pageins>
                <vnode-pagedin>23119</vnode-pagedin>
                <vnode-pageouts>226</vnode-pageouts>
                <vnode-pagedout>3143</vnode-pagedout>
                <page-daemon-wakeup>0</page-daemon-wakeup>
                <page-daemon-examined-pages>0</page-daemon-examined-pages>
                <pages-reactivated>8821</pages-reactivated>
                <copy-on-write-faults>48364</copy-on-write-faults>
                <copy-on-write-optimized-faults>31</copy-on-write-optimized-faults>
                <zero-fill-pages-zeroed>74665</zero-fill-pages-zeroed>
                <zero-fill-pages-prezeroed>70061</zero-fill-pages-prezeroed>
                <transit-blocking-page-faults>85</transit-blocking-page-faults>
                <total-vm-faults>191824</total-vm-faults>

        <pages-affected-by-kernel-thrd-creat>0</pages-affected-by-kernel-thrd-creat>
```


 Copyright © 2016, Juniper Networks, Inc.

```
                <pages-affected-by-fork>95343</pages-affected-by-fork>
                <pages-affected-by-vfork>3526</pages-affected-by-vfork>
                <pages-affected-by-rfork>0</pages-affected-by-rfork>
                <pages-freed>221502</pages-freed>
                <pages-freed-by-deamon>0</pages-freed-by-deamon>
                <pages-freed-by-exiting-proc>75630</pages-freed-by-exiting-proc>
                <pages-active>45826</pages-active>
                <pages-inactive>13227</pages-inactive>
                <pages-in-vm-cache>49278</pages-in-vm-cache>
                <pages-wired-down>10640</pages-wired-down>
                <pages-free>70706</pages-free>
                <bytes-per-page>4096</bytes-per-page>
                <swap-pages-used>0</swap-pages-used>
                <peak-swap-pages-used>0</peak-swap-pages-used>
                <total-name-lookups>214496</total-name-lookups>
                <positive-cache-hits>92</positive-cache-hits>
                <negative-cache-hits>5</negative-cache-hits>
                <pass2>0</pass2>
                <cache-deletions>0</cache-deletions>
                <cache-falsehits>0</cache-falsehits>
                <toolong>0</toolong>
            </vmstat-sumstat>
            <vmstat-intr>
                <intr-name>irq0: clk          </intr-name>
                <intr-cnt>1243455</intr-cnt>
                <intr-rate>999</intr-rate>
                <intr-name>irq4: sio0         </intr-name>
                <intr-cnt>1140</intr-cnt>
                <intr-rate>0</intr-rate>
                <intr-name>irq8: rtc          </intr-name>
                <intr-cnt>159164</intr-cnt>
                <intr-rate>127</intr-rate>
                <intr-name>irq9: cbb1 fxp0    </intr-name>
                <intr-cnt>28490</intr-cnt>
                <intr-rate>22</intr-rate>
                <intr-name>irq10: fxp1        </intr-name>
                <intr-cnt>20593</intr-cnt>
                <intr-rate>16</intr-rate>
                <intr-name>irq14: ata0        </intr-name>
                <intr-cnt>5031</intr-cnt>
                <intr-rate>4</intr-rate>
                <intr-name>Total</intr-name>
                <intr-cnt>1457873</intr-cnt>
                <intr-rate>1171</intr-rate>
            </vmstat-intr>
            <vm-kernel-state>
                <vm-kmem-map-free>248524800</vm-kmem-map-free>
            </vm-kernel-state>
            <kernel-direct-mm-size-information>
                <vm-directmm-size-used>4644</vm-directmm-size-used>
                <vm-directmm-size-max>4057334</vm-directmm-size-max>
            </kernel-direct-mm-size-information>
        </system-virtual-memory-information>
        <cli>
            <banner></banner>
        </cli>
    </rpc-reply>
```


Note: <kernel-direct-mm-size-information> only displays for 64 bit platform.

show system virtual-memory (QFX Series)

```
user@switch> show system virtual-memory | display xml
<rpc-reply xmlns:junos="http://xml.device.net/junos/11.1R1/junos">
    <system-virtual-memory-information>
        <vmstat-memstat-malloc>
            <memstat-name>CAM dev queue</memstat-name>
            <inuse>1</inuse>
            <memuse>1</memuse>
            <high-use>-</high-use>
            <memstat-req>1</memstat-req>
            <memstat-size>64</memstat-size>
            <memstat-name>entropy</memstat-name>
            <inuse>1024</inuse>
            <memuse>64</memuse>
            <high-use>-</high-use>
            <memstat-req>1024</memstat-req>
            <memstat-size>64</memstat-size>
            <memstat-name>linker</memstat-name>
            <inuse>481</inuse>
            <memuse>1871</memuse>
            <high-use>-</high-use>
            <memstat-req>1145</memstat-req>
            <memstat-size>16,32,64,4096,32768,131072</memstat-size>
            <memstat-name>lockf</memstat-name>
            <inuse>56</inuse>
            <memuse>4</memuse>
            <high-use>-</high-use>
            <memstat-req>5998</memstat-req>
            <memstat-size>64</memstat-size>
            <memstat-name>devbuf</memstat-name>
            <inuse>2094</inuse>
            <memuse>3877</memuse>
            <high-use>-</high-use>
            <memstat-req>2099</memstat-req>

<memstat-size>16,32,64,128,512,1024,4096,8192,16384,32768,65536,131072</memstat-size>

            <memstat-name>temp</memstat-name>
            <inuse>21</inuse>
            <memuse>66</memuse>
            <high-use>-</high-use>
            <memstat-req>3127</memstat-req>

<memstat-size>16,32,64,128,256,512,2048,4096,8192,16384,32768,65536,131072</memstat-size>

            <memstat-name>ip6ndp</memstat-name>
            <inuse>0</inuse>
            <memuse>0</memuse>
            <high-use>-</high-use>
            <memstat-req>4</memstat-req>
            <memstat-size>64</memstat-size>
            <memstat-name>in6ifmulti</memstat-name>
            <inuse>1</inuse>
            <memuse>1</memuse>
            <high-use>-</high-use>
            <memstat-req>1</memstat-req>
            <memstat-size>64</memstat-size>
            <memstat-name>in6grentry</memstat-name>
            <inuse>1</inuse>
            <memuse>1</memuse>
```


Copyright © 2016, Juniper Networks, Inc.

```
<high-use>-</high-use>
<memstat-req>1</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>iflogical</memstat-name>
<inuse>13</inuse>
<memuse>3</memuse>
<high-use>-</high-use>
<memstat-req>13</memstat-req>
<memstat-size>64,2048</memstat-size>
<memstat-name>iffamily</memstat-name>
<inuse>28</inuse>
<memuse>4</memuse>
<high-use>-</high-use>
<memstat-req>28</memstat-req>
<memstat-size>32,1024,2048</memstat-size>
<memstat-name>rtnexthop</memstat-name>
<inuse>127</inuse>
<memuse>18</memuse>
<high-use>-</high-use>
<memstat-req>129</memstat-req>
<memstat-size>32,256,512,1024,2048,4096</memstat-size>
<memstat-name>metrics</memstat-name>
<inuse>3</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>5</memstat-req>
<memstat-size>256</memstat-size>
<memstat-name>inifmulti</memstat-name>
<inuse>3</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>3</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>ingrentry</memstat-name>
<inuse>6</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>6</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>rnode</memstat-name>
<inuse>68</inuse>
<memuse>2</memuse>
<high-use>-</high-use>
<memstat-req>76</memstat-req>
<memstat-size>16,32</memstat-size>
<memstat-name>rcache</memstat-name>
<inuse>4</inuse>
<memuse>8</memuse>
<high-use>-</high-use>
<memstat-req>4</memstat-req>
<memstat-size>65536</memstat-size>
<memstat-name>ifdevice</memstat-name>
<inuse>4</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>4</memstat-req>
<memstat-size>16</memstat-size>
<memstat-name>ifstat</memstat-name>
<inuse>40</inuse>
<memuse>22</memuse>
<high-use>-</high-use>
```

```
                <memstat-req>40</memstat-req>
                <memstat-size>512,16384,32768</memstat-size>
                <memstat-name>ipfw</memstat-name>
                <inuse>42</inuse>
                <memuse>23</memuse>
                <high-use>-</high-use>
                <memstat-req>91</memstat-req>

<memstat-size>16,32,64,128,256,512,1024,16384,32768,65536,131072</memstat-size>
                <memstat-name>ifmaddr</memstat-name>
                <inuse>103</inuse>
                <memuse>3</memuse>
                <high-use>-</high-use>
                <memstat-req>103</memstat-req>
                <memstat-size>16,32</memstat-size>
                <memstat-name>rtable</memstat-name>
                <inuse>129</inuse>
                <memuse>14</memuse>
                <high-use>-</high-use>
                <memstat-req>139</memstat-req>
                <memstat-size>16,32,64,128,1024,16384</memstat-size>
                <memstat-name>sysctl</memstat-name>
                <inuse>0</inuse>
                <memuse>0</memuse>
                <high-use>-</high-use>
                <memstat-req>14847</memstat-req>
                <memstat-size>16,32,64,4096,16384,32768</memstat-size>
                <memstat-name>ifaddr</memstat-name>
                <inuse>29</inuse>
                <memuse>3</memuse>
                <high-use>-</high-use>
                <memstat-req>29</memstat-req>
                <memstat-size>64,128</memstat-size>
                <memstat-name>mkey</memstat-name>
                <inuse>345</inuse>
                <memuse>6</memuse>
                <high-use>-</high-use>
                <memstat-req>2527</memstat-req>
                <memstat-size>16,128</memstat-size>
                <memstat-name>pfe_ipc</memstat-name>
                <inuse>0</inuse>
                <memuse>0</memuse>
                <high-use>-</high-use>
                <memstat-req>1422</memstat-req>

<memstat-size>16,32,64,128,512,1024,2048,8192,16384,32768,65536,131072</memstat-size>

                <memstat-name>ifstate</memstat-name>
                <inuse>594</inuse>
                <memuse>51</memuse>
                <high-use>-</high-use>
                <memstat-req>655</memstat-req>

<memstat-size>16,32,64,128,256,1024,2048,4096,16384,32768</memstat-size>
                <memstat-name>itable16</memstat-name>
                <inuse>276</inuse>
                <memuse>52</memuse>
                <high-use>-</high-use>
                <memstat-req>294</memstat-req>
                <memstat-size>1024,4096</memstat-size>
                <memstat-name>itable32</memstat-name>
```


 Copyright © 2016, Juniper Networks, Inc.

```
  <inuse>160</inuse>
  <memuse>10</memuse>
  <high-use>-</high-use>
  <memstat-req>160</memstat-req>
  <memstat-size>64</memstat-size>
  <memstat-name>itable64</memstat-name>
  <inuse>2</inuse>
  <memuse>1</memuse>
  <high-use>-</high-use>
  <memstat-req>2</memstat-req>
  <memstat-size>128</memstat-size>
  <memstat-name>lr</memstat-name>
  <inuse>1</inuse>
  <memuse>1</memuse>
  <high-use>-</high-use>
  <memstat-req>1</memstat-req>
  <memstat-size>16384</memstat-size>
  <memstat-name>pic</memstat-name>
  <inuse>5</inuse>
  <memuse>1</memuse>
  <high-use>-</high-use>
  <memstat-req>5</memstat-req>
  <memstat-size>64,512</memstat-size>
  <memstat-name>pfestat</memstat-name>
  <inuse>0</inuse>
  <memuse>0</memuse>
  <high-use>-</high-use>
  <memstat-req>162</memstat-req>
  <memstat-size>16,32,128,256,16384</memstat-size>
  <memstat-name>gencfg</memstat-name>
  <inuse>224</inuse>
  <memuse>56</memuse>
  <high-use>-</high-use>
  <memstat-req>540</memstat-req>
  <memstat-size>16,32,64,256,512,32768,65536</memstat-size>
  <memstat-name>jsr</memstat-name>
  <inuse>2</inuse>
  <memuse>1</memuse>
  <high-use>-</high-use>
  <memstat-req>4</memstat-req>
  <memstat-size>16</memstat-size>
  <memstat-name>idl</memstat-name>
  <inuse>0</inuse>
  <memuse>0</memuse>
  <high-use>-</high-use>
  <memstat-req>13</memstat-req>
<memstat-size>16,32,64,128,256,4096,16384,32768,131072</memstat-size>

  <memstat-name>rtsmsg</memstat-name>
  <inuse>0</inuse>
  <memuse>0</memuse>
  <high-use>-</high-use>
  <memstat-req>2</memstat-req>
  <memstat-size>131072</memstat-size>
  <memstat-name>module</memstat-name>
  <inuse>249</inuse>
  <memuse>16</memuse>
  <high-use>-</high-use>
  <memstat-req>249</memstat-req>
  <memstat-size>64,128</memstat-size>
  <memstat-name>mtx_pool</memstat-name>
```

```
<inuse>1</inuse>
<memuse>8</memuse>
<high-use>-</high-use>
<memstat-req>1</memstat-req>
<memstat-size>64,128</memstat-size>
<memstat-name>DEVFS3</memstat-name>
<inuse>109</inuse>
<memuse>12</memuse>
<high-use>-</high-use>
<memstat-req>117</memstat-req>
<memstat-size>256</memstat-size>
<memstat-name>DEVFS1</memstat-name>
<inuse>102</inuse>
<memuse>23</memuse>
<high-use>-</high-use>
<memstat-req>109</memstat-req>
<memstat-size>2048</memstat-size>
<memstat-name>pgrp</memstat-name>
<inuse>12</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>21</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>session</memstat-name>
<inuse>8</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>15</memstat-req>
<memstat-size>512</memstat-size>
<memstat-name>proc</memstat-name>
<inuse>2</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>2</memstat-req>
<memstat-size>16384</memstat-size>
<memstat-name>subproc</memstat-name>
<inuse>244</inuse>
<memuse>496</memuse>
<high-use>-</high-use>
<memstat-req>1522</memstat-req>
<memstat-size>2048,131072</memstat-size>
<memstat-name>cred</memstat-name>
<inuse>30</inuse>
<memuse>4</memuse>
<high-use>-</high-use>
<memstat-req>11409</memstat-req>
<memstat-size>256</memstat-size>
<memstat-name>plimit</memstat-name>
<inuse>17</inuse>
<memuse>4</memuse>
<high-use>-</high-use>
<memstat-req>133</memstat-req>
<memstat-size>2048</memstat-size>
<memstat-name>uidinfo</memstat-name>
<inuse>3</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>6</memstat-req>
<memstat-size>32,512</memstat-size>
<memstat-name>sysctloid</memstat-name>
<inuse>1117</inuse>
```


 Copyright © 2016, Juniper Networks, Inc.

```
                <memuse>34</memuse>
                <high-use>-</high-use>
                <memstat-req>1117</memstat-req>
                <memstat-size>16,32,64</memstat-size>
                <memstat-name>sysctltmp</memstat-name>
                <inuse>0</inuse>
                <memuse>0</memuse>
                <high-use>-</high-use>
                <memstat-req>743</memstat-req>
                <memstat-size>16,32,64,1024</memstat-size>
                <memstat-name>umtx</memstat-name>
                <inuse>144</inuse>
                <memuse>9</memuse>
                <high-use>-</high-use>
                <memstat-req>144</memstat-req>
                <memstat-size>64</memstat-size>
                <memstat-name>SWAP</memstat-name>
                <inuse>2</inuse>
                <memuse>209</memuse>
                <high-use>-</high-use>
                <memstat-req>2</memstat-req>
                <memstat-size>64</memstat-size>
                <memstat-name>bus</memstat-name>
                <inuse>496</inuse>
                <memuse>55</memuse>
                <high-use>-</high-use>
                <memstat-req>1196</memstat-req>
                <memstat-size>16,32,64,128,32768</memstat-size>
                <memstat-name>bus-sc</memstat-name>
                <inuse>23</inuse>
                <memuse>33</memuse>
                <high-use>-</high-use>
                <memstat-req>335</memstat-req>

<memstat-size>16,32,64,512,1024,2048,8192,16384,65536,131072</memstat-size>
                <memstat-name>devstat</memstat-name>
                <inuse>10</inuse>
                <memuse>21</memuse>
                <high-use>-</high-use>
                <memstat-req>10</memstat-req>
                <memstat-size>16,131072</memstat-size>
                <memstat-name>eventhandler</memstat-name>
                <inuse>35</inuse>
                <memuse>2</memuse>
                <high-use>-</high-use>
                <memstat-req>36</memstat-req>
                <memstat-size>32,128</memstat-size>
                <memstat-name>kobj</memstat-name>
                <inuse>93</inuse>
                <memuse>186</memuse>
                <high-use>-</high-use>
                <memstat-req>111</memstat-req>
                <memstat-size>65536</memstat-size>
                <memstat-name>DEVFS</memstat-name>
                <inuse>8</inuse>
                <memuse>1</memuse>
                <high-use>-</high-use>
                <memstat-req>9</memstat-req>
                <memstat-size>16,64</memstat-size>
                <memstat-name>rman</memstat-name>
                <inuse>71</inuse>
```

```
<memuse>5</memuse>
<high-use>-</high-use>
<memstat-req>433</memstat-req>
<memstat-size>16,32,64</memstat-size>
<memstat-name>sbuf</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>-</high-use>
<memstat-req>522</memstat-req>
<memstat-size>16,32,32768,131072</memstat-size>
<memstat-name>NULLFS hash</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>1</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>taskqueue</memstat-name>
<inuse>5</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>5</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>turnstiles</memstat-name>
<inuse>145</inuse>
<memuse>10</memuse>
<high-use>-</high-use>
<memstat-req>145</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>Unitno</memstat-name>
<inuse>8</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>44</memstat-req>
<memstat-size>16,64</memstat-size>
<memstat-name>ioctlops</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>-</high-use>
<memstat-req>27622</memstat-req>
<memstat-size>16,64,8192,16384,131072</memstat-size>
<memstat-name>iov</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>-</high-use>
<memstat-req>18578</memstat-req>
<memstat-size>16,64,128,256,512,1024,2048,131072</memstat-size>
<memstat-name>msg</memstat-name>
<inuse>4</inuse>
<memuse>25</memuse>
<high-use>-</high-use>
<memstat-req>4</memstat-req>
<memstat-size>32768,131072</memstat-size>
<memstat-name>sem</memstat-name>
<inuse>4</inuse>
<memuse>7</memuse>
<high-use>-</high-use>
<memstat-req>4</memstat-req>
<memstat-size>16384,32768,131072</memstat-size>
<memstat-name>shm</memstat-name>
<inuse>9</inuse>
<memuse>20</memuse>
```


 Copyright © 2016, Juniper Networks, Inc.

```
                <high-use>-</high-use>
                <memstat-req>14</memstat-req>
                <memstat-size>32768</memstat-size>
                <memstat-name>ttys</memstat-name>
                <inuse>321</inuse>
                <memuse>61</memuse>
                <high-use>-</high-use>
                <memstat-req>528</memstat-req>
                <memstat-size>512,32768</memstat-size>
                <memstat-name>ptys</memstat-name>
                <inuse>1</inuse>
                <memuse>1</memuse>
                <high-use>-</high-use>
                <memstat-req>1</memstat-req>
                <memstat-size>128</memstat-size>
                <memstat-name>mbuf_tag</memstat-name>
                <inuse>0</inuse>
                <memuse>0</memuse>
                <high-use>-</high-use>
                <memstat-req>23383</memstat-req>
                <memstat-size>16</memstat-size>
                <memstat-name>soname</memstat-name>
                <inuse>115</inuse>
                <memuse>12</memuse>
                <high-use>-</high-use>
                <memstat-req>24712</memstat-req>
                <memstat-size>16,32,64,256</memstat-size>
                <memstat-name>pcb</memstat-name>
                <inuse>216</inuse>
                <memuse>33</memuse>
                <high-use>-</high-use>
                <memstat-req>484</memstat-req>

<memstat-size>16,32,64,128,1024,2048,4096,16384,32768,65536</memstat-size>
                <memstat-name>BIO buffer</memstat-name>
                <inuse>43</inuse>
                <memuse>86</memuse>
                <high-use>-</high-use>
                <memstat-req>405</memstat-req>
                <memstat-size>65536</memstat-size>
                <memstat-name>vfscache</memstat-name>
                <inuse>1</inuse>
                <memuse>256</memuse>
                <high-use>-</high-use>
                <memstat-req>1</memstat-req>
                <memstat-size>65536</memstat-size>
                <memstat-name>cluster_save buffer</memstat-name>
                <inuse>0</inuse>
                <memuse>0</memuse>
                <high-use>-</high-use>
                <memstat-req>2</memstat-req>
                <memstat-size>32,64</memstat-size>
                <memstat-name>VFS hash</memstat-name>
                <inuse>1</inuse>
                <memuse>128</memuse>
                <high-use>-</high-use>
                <memstat-req>1</memstat-req>
                <memstat-size>32,64</memstat-size>
                <memstat-name>vnodes</memstat-name>
                <inuse>1</inuse>
                <memuse>1</memuse>
```

```
                <high-use>-</high-use>
                <memstat-req>1</memstat-req>
                <memstat-size>512</memstat-size>
                <memstat-name>mount</memstat-name>
                <inuse>290</inuse>
                <memuse>23</memuse>
                <high-use>-</high-use>
                <memstat-req>535</memstat-req>
                <memstat-size>16,32,64,128,256,4096,32768</memstat-size>
                <memstat-name>vnodemarker</memstat-name>
                <inuse>0</inuse>
                <memuse>0</memuse>
                <high-use>-</high-use>
                <memstat-req>498</memstat-req>
                <memstat-size>16384</memstat-size>
                <memstat-name>pfs_nodes</memstat-name>
                <inuse>25</inuse>
                <memuse>3</memuse>
                <high-use>-</high-use>
                <memstat-req>25</memstat-req>
                <memstat-size>128</memstat-size>
                <memstat-name>pfs_vncache</memstat-name>
                <inuse>27</inuse>
                <memuse>1</memuse>
                <high-use>-</high-use>
                <memstat-req>53</memstat-req>
                <memstat-size>32</memstat-size>
                <memstat-name>STP</memstat-name>
                <inuse>1</inuse>
                <memuse>1</memuse>
                <high-use>-</high-use>
                <memstat-req>1</memstat-req>
                <memstat-size>64</memstat-size>
                <memstat-name>GEOM</memstat-name>
                <inuse>146</inuse>
                <memuse>11</memuse>
                <high-use>-</high-use>
                <memstat-req>1042</memstat-req>

<memstat-size>16,32,64,128,256,512,2048,16384,32768,131072</memstat-size>
                <memstat-name>syncache</memstat-name>
                <inuse>1</inuse>
                <memuse>8</memuse>
                <high-use>-</high-use>
                <memstat-req>1</memstat-req>

<memstat-size>16,32,64,128,256,512,2048,16384,32768,131072</memstat-size>
                <memstat-name>tlv_stat</memstat-name>
                <inuse>0</inuse>
                <memuse>0</memuse>
                <high-use>-</high-use>
                <memstat-req>8</memstat-req>

<memstat-size>16,32,64,128,256,512,2048,16384,32768,131072</memstat-size>
                <memstat-name>NFS daemon</memstat-name>
                <inuse>1</inuse>
                <memuse>8</memuse>
                <high-use>-</high-use>
                <memstat-req>1</memstat-req>

<memstat-size>16,32,64,128,256,512,2048,16384,32768,131072</memstat-size>
```


 Copyright © 2016, Juniper Networks, Inc.

```
<memstat-name>p1003.1b</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>1</memstat-req>
<memstat-size>16</memstat-size>
<memstat-name>MD disk</memstat-name>
<inuse>10</inuse>
<memuse>20</memuse>
<high-use>-</high-use>
<memstat-req>10</memstat-req>
<memstat-size>65536</memstat-size>
<memstat-name>ata_generic</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>6</memstat-req>
<memstat-size>16,16384,32768</memstat-size>
<memstat-name>ISOFS mount</memstat-name>
<inuse>8</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>15</memstat-req>
<memstat-size>512</memstat-size>
<memstat-name>ISOFS node</memstat-name>
<inuse>1440</inuse>
<memuse>135</memuse>
<high-use>-</high-use>
<memstat-req>1457</memstat-req>
<memstat-size>128</memstat-size>
<memstat-name>CAM SIM</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>1</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>CAM XPT</memstat-name>
<inuse>6</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>9</memstat-req>
<memstat-size>16,64,16384</memstat-size>
<memstat-name>CAM periph</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>1</memstat-req>
<memstat-size>128</memstat-size>
<memstat-name>ad_driver</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>1</memstat-req>
<memstat-size>256</memstat-size>
<memstat-name>pagedep</memstat-name>
<inuse>1</inuse>
<memuse>32</memuse>
<high-use>-</high-use>
<memstat-req>106</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>inodedep</memstat-name>
```

```
<inuse>1</inuse>
<memuse>128</memuse>
<high-use>-</high-use>
<memstat-req>464</memstat-req>
<memstat-size>256</memstat-size>
<memstat-name>newblk</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>336</memstat-req>
<memstat-size>64,4096</memstat-size>
<memstat-name>bmsafemap</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>-</high-use>
<memstat-req>63</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>allocdirect</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>-</high-use>
<memstat-req>320</memstat-req>
<memstat-size>128</memstat-size>
<memstat-name>indirdep</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>-</high-use>
<memstat-req>17</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>allocindir</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>-</high-use>
<memstat-req>15</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>freefrag</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>-</high-use>
<memstat-req>12</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>freeblks</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>-</high-use>
<memstat-req>40</memstat-req>
<memstat-size>2048</memstat-size>
<memstat-name>freefile</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>-</high-use>
<memstat-req>101</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>diradd</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>-</high-use>
<memstat-req>465</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>mkdir</memstat-name>
<inuse>0</inuse>
```


 Copyright © 2016, Juniper Networks, Inc.

```
<memuse>0</memuse>
<high-use>-</high-use>
<memstat-req>136</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>dirrem</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>-</high-use>
<memstat-req>168</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>newdirblk</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>-</high-use>
<memstat-req>1</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>savedino</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>-</high-use>
<memstat-req>157</memstat-req>
<memstat-size>512</memstat-size>
<memstat-name>UFS mount</memstat-name>
<inuse>15</inuse>
<memuse>36</memuse>
<high-use>-</high-use>
<memstat-req>15</memstat-req>
<memstat-size>2048,65536,131072</memstat-size>
<memstat-name>ata_dma</memstat-name>
<inuse>2</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>2</memstat-req>
<memstat-size>256</memstat-size>
<memstat-name>UMAHash</memstat-name>
<inuse>1</inuse>
<memuse>2</memuse>
<high-use>-</high-use>
<memstat-req>4</memstat-req>
<memstat-size>4096,16384,32768,65536</memstat-size>
<memstat-name>cdev</memstat-name>
<inuse>22</inuse>
<memuse>3</memuse>
<high-use>-</high-use>
<memstat-req>22</memstat-req>
<memstat-size>256</memstat-size>
<memstat-name>file desc</memstat-name>
<inuse>141</inuse>
<memuse>32</memuse>
<high-use>-</high-use>
<memstat-req>1583</memstat-req>
<memstat-size>16,1024,2048,16384</memstat-size>
<memstat-name>VM pgdata</memstat-name>
<inuse>2</inuse>
<memuse>65</memuse>
<high-use>-</high-use>
<memstat-req>2</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>sigio</memstat-name>
<inuse>1</inuse>
<memuse>1</memuse>
```

```
<high-use>-</high-use>
<memstat-req>20</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>kenv</memstat-name>
<inuse>24</inuse>
<memuse>5</memuse>
<high-use>-</high-use>
<memstat-req>27</memstat-req>
<memstat-size>16,32,64,131072</memstat-size>
<memstat-name>atkbddev</memstat-name>
<inuse>2</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>2</memstat-req>
<memstat-size>32</memstat-size>
<memstat-name>kqueue</memstat-name>
<inuse>15</inuse>
<memuse>9</memuse>
<high-use>-</high-use>
<memstat-req>19</memstat-req>
<memstat-size>1024,4096,32768</memstat-size>
<memstat-name>proc-args</memstat-name>
<inuse>57</inuse>
<memuse>3</memuse>
<high-use>-</high-use>
<memstat-req>1001</memstat-req>
<memstat-size>16,32,64,128,256,512,1024</memstat-size>
<memstat-name>isadev</memstat-name>
<inuse>21</inuse>
<memuse>2</memuse>
<high-use>-</high-use>
<memstat-req>21</memstat-req>
<memstat-size>64</memstat-size>
<memstat-name>zombie</memstat-name>
<inuse>0</inuse>
<memuse>0</memuse>
<high-use>-</high-use>
<memstat-req>1278</memstat-req>
<memstat-size>128</memstat-size>
<memstat-name>ithread</memstat-name>
<inuse>69</inuse>
<memuse>5</memuse>
<high-use>-</high-use>
<memstat-req>69</memstat-req>
<memstat-size>16,64,256</memstat-size>
<memstat-name>legacydrv</memstat-name>
<inuse>4</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
<memstat-req>4</memstat-req>
<memstat-size>16</memstat-size>
<memstat-name>memdesc</memstat-name>
<inuse>1</inuse>
<memuse>4</memuse>
<high-use>-</high-use>
<memstat-req>1</memstat-req>
<memstat-size>131072</memstat-size>
<memstat-name>nexusdev</memstat-name>
<inuse>2</inuse>
<memuse>1</memuse>
<high-use>-</high-use>
```


 Copyright © 2016, Juniper Networks, Inc.

```
            <memstat-req>2</memstat-req>
            <memstat-size>16</memstat-size>
            <memstat-name>CAM queue</memstat-name>
            <inuse>3</inuse>
            <memuse>1</memuse>
            <high-use>-</high-use>
            <memstat-req>3</memstat-req>
            <memstat-size>16</memstat-size>
            <memstat-name>$PIR</memstat-name>
            <inuse>4</inuse>
            <memuse>1</memuse>
            <high-use>-</high-use>
            <memstat-req>4</memstat-req>
            <memstat-size>32</memstat-size>
            <memstat-name>KTRACE</memstat-name>
            <inuse>100</inuse>
            <memuse>10</memuse>
            <high-use>-</high-use>
            <memstat-req>100</memstat-req>
            <memstat-size>128</memstat-size>
            <memstat-name>kbdmux</memstat-name>
            <inuse>5</inuse>
            <memuse>9</memuse>
            <high-use>-</high-use>
            <memstat-req>5</memstat-req>
            <memstat-size>128,2048,65536,131072</memstat-size>
        </vmstat-memstat-malloc>
        <vmstat-memstat-zone>
            <zone-name>UMA Kegs:</zone-name>
            <zone-size>136</zone-size>
            <count-limit>0</count-limit>
            <used>71</used>
            <free>1</free>
            <zone-req>71</zone-req>
            <zone-name>UMA Zones:</zone-name>
            <zone-size>120</zone-size>
            <count-limit>0</count-limit>
            <used>71</used>
            <free>19</free>
            <zone-req>71</zone-req>
            <zone-name>UMA Slabs:</zone-name>
            <zone-size>64</zone-size>
            <count-limit>0</count-limit>
            <used>490</used>
            <free>41</free>
            <zone-req>579</zone-req>
            <zone-name>UMA RCntSlabs:</zone-name>
            <zone-size>104</zone-size>
            <count-limit>0</count-limit>
            <used>276</used>
            <free>20</free>
            <zone-req>276</zone-req>
            <zone-name>UMA Hash:</zone-name>
            <zone-size>128</zone-size>
            <count-limit>0</count-limit>
            <used>4</used>
            <free>26</free>
            <zone-req>5</zone-req>
            <zone-name>16 Bucket:</zone-name>
            <zone-size>76</zone-size>
            <count-limit>0</count-limit>
```

```
<used>30</used>
<free>20</free>
<zone-req>30</zone-req>
<zone-name>32 Bucket:</zone-name>
<zone-size>140</zone-size>
<count-limit>0</count-limit>
<used>33</used>
<free>23</free>
<zone-req>33</zone-req>
<zone-name>64 Bucket:</zone-name>
<zone-size>268</zone-size>
<count-limit>0</count-limit>
<used>33</used>
<free>9</free>
<zone-req>33</zone-req>
<zone-name>128 Bucket:</zone-name>
<zone-size>524</zone-size>
<count-limit>0</count-limit>
<used>49</used>
<free>0</free>
<zone-req>49</zone-req>
<zone-name>VM OBJECT:</zone-name>
<zone-size>128</zone-size>
<count-limit>0</count-limit>
<used>2111</used>
<free>79</free>
<zone-req>25214</zone-req>
<zone-name>MAP:</zone-name>
<zone-size>160</zone-size>
<count-limit>0</count-limit>
<used>7</used>
<free>41</free>
<zone-req>7</zone-req>
<zone-name>KMAP ENTRY:</zone-name>
<zone-size>68</zone-size>
<count-limit>35336</count-limit>
<used>19</used>
<free>149</free>
<zone-req>2397</zone-req>
<zone-name>MAP ENTRY:</zone-name>
<zone-size>68</zone-size>
<count-limit>0</count-limit>
<used>2031</used>
<free>153</free>
<zone-req>62417</zone-req>
<zone-name>PV ENTRY:</zone-name>
<zone-size>24</zone-size>
<count-limit>509095</count-limit>
<used>57177</used>
<free>6333</free>
<zone-req>1033683</zone-req>
<zone-name>DP fakepg:</zone-name>
<zone-size>72</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>mt_zone:</zone-name>
<zone-size>64</zone-size>
<count-limit>0</count-limit>
<used>238</used>
```


 Copyright © 2016, Juniper Networks, Inc.

```
<free>57</free>
<zone-req>238</zone-req>
<zone-name>16:</zone-name>
<zone-size>16</zone-size>
<count-limit>0</count-limit>
<used>2114</used>
<free>119</free>
<zone-req>80515</zone-req>
<zone-name>32:</zone-name>
<zone-size>32</zone-size>
<count-limit>0</count-limit>
<used>1335</used>
<free>134</free>
<zone-req>10259</zone-req>
<zone-name>64:</zone-name>
<zone-size>64</zone-size>
<count-limit>0</count-limit>
<used>3529</used>
<free>129</free>
<zone-req>29110</zone-req>
<zone-name>96:</zone-name>
<zone-size>96</zone-size>
<count-limit>0</count-limit>
<used>2062</used>
<free>58</free>
<zone-req>4365</zone-req>
<zone-name>112:</zone-name>
<zone-size>112</zone-size>
<count-limit>0</count-limit>
<used>361</used>
<free>164</free>
<zone-req>24613</zone-req>
<zone-name>128:</zone-name>
<zone-size>128</zone-size>
<count-limit>0</count-limit>
<used>359</used>
<free>61</free>
<zone-req>942</zone-req>
<zone-name>160:</zone-name>
<zone-size>160</zone-size>
<count-limit>0</count-limit>
<used>364</used>
<free>44</free>
<zone-req>577</zone-req>
<zone-name>224:</zone-name>
<zone-size>224</zone-size>
<count-limit>0</count-limit>
<used>422</used>
<free>20</free>
<zone-req>1950</zone-req>
<zone-name>256:</zone-name>
<zone-size>256</zone-size>
<count-limit>0</count-limit>
<used>204</used>
<free>36</free>
<zone-req>1225</zone-req>
<zone-name>288:</zone-name>
<zone-size>288</zone-size>
<count-limit>0</count-limit>
<used>2</used>
<free>24</free>
```

```
<zone-req>10</zone-req>
<zone-name>512:</zone-name>
<zone-size>512</zone-size>
<count-limit>0</count-limit>
<used>49</used>
<free>7</free>
<zone-req>911</zone-req>
<zone-name>1024:</zone-name>
<zone-size>1024</zone-size>
<count-limit>0</count-limit>
<used>213</used>
<free>11</free>
<zone-req>1076</zone-req>
<zone-name>2048:</zone-name>
<zone-size>2048</zone-size>
<count-limit>0</count-limit>
<used>199</used>
<free>113</free>
<zone-req>640</zone-req>
<zone-name>4096:</zone-name>
<zone-size>4096</zone-size>
<count-limit>0</count-limit>
<used>144</used>
<free>7</free>
<zone-req>2249</zone-req>
<zone-name>Files:</zone-name>
<zone-size>72</zone-size>
<count-limit>0</count-limit>
<used>665</used>
<free>77</free>
<zone-req>16457</zone-req>
<zone-name>MAC labels:</zone-name>
<zone-size>20</zone-size>
<count-limit>0</count-limit>
<used>3998</used>
<free>227</free>
<zone-req>21947</zone-req>
<zone-name>PROC:</zone-name>
<zone-size>544</zone-size>
<count-limit>0</count-limit>
<used>116</used>
<free>10</free>
<zone-req>1394</zone-req>
<zone-name>THREAD:</zone-name>
<zone-size>416</zone-size>
<count-limit>0</count-limit>
<used>127</used>
<free>17</free>
<zone-req>131</zone-req>
<zone-name>KSEGRP:</zone-name>
<zone-size>88</zone-size>
<count-limit>0</count-limit>
<used>127</used>
<free>73</free>
<zone-req>131</zone-req>
<zone-name>UPCALL:</zone-name>
<zone-size>44</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
```


 Copyright © 2016, Juniper Networks, Inc.

```
<zone-name>SLEEPQUEUE:</zone-name>
<zone-size>32</zone-size>
<count-limit>0</count-limit>
<used>145</used>
<free>194</free>
<zone-req>145</zone-req>
<zone-name>VMSPACE:</zone-name>
<zone-size>268</zone-size>
<count-limit>0</count-limit>
<used>57</used>
<free>13</free>
<zone-req>1335</zone-req>
<zone-name>mbuf_packet:</zone-name>
<zone-size>256</zone-size>
<count-limit>180000</count-limit>
<used>256</used>
<free>128</free>
<zone-req>49791</zone-req>
<zone-name>mbuf:</zone-name>
<zone-size>256</zone-size>
<count-limit>180000</count-limit>
<used>50</used>
<free>466</free>
<zone-req>105183</zone-req>
<zone-name>mbuf_cluster:</zone-name>
<zone-size>2048</zone-size>
<count-limit>25190</count-limit>
<used>387</used>
<free>165</free>
<zone-req>5976</zone-req>
<zone-name>mbuf_jumbo_pagesize:</zone-name>
<zone-size>4096</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>mbuf_jumbo_9k:</zone-name>
<zone-size>9216</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>mbuf_jumbo_16k:</zone-name>
<zone-size>16384</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>ACL UMA zone:</zone-name>
<zone-size>388</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>g_bio:</zone-name>
<zone-size>132</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>174</free>
<zone-req>69750</zone-req>
<zone-name>ata_request:</zone-name>
```

```
<zone-size>200</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>57</free>
<zone-req>5030</zone-req>
<zone-name>ata_composite:</zone-name>
<zone-size>192</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>GENCFG:</zone-name>
<zone-size>72</zone-size>
<count-limit>1000004</count-limit>
<used>57</used>
<free>102</free>
<zone-req>57</zone-req>
<zone-name>VNODE:</zone-name>
<zone-size>292</zone-size>
<count-limit>0</count-limit>
<used>2718</used>
<free>25</free>
<zone-req>2922</zone-req>
<zone-name>VNODEPOLL:</zone-name>
<zone-size>72</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>S VFS Cache:</zone-name>
<zone-size>68</zone-size>
<count-limit>0</count-limit>
<used>2500</used>
<free>76</free>
<zone-req>3824</zone-req>
<zone-name>L VFS Cache:</zone-name>
<zone-size>291</zone-size>
<count-limit>0</count-limit>
<used>51</used>
<free>14</free>
<zone-req>63</zone-req>
<zone-name>NAMEI:</zone-name>
<zone-size>1024</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>8</free>
<zone-req>53330</zone-req>
<zone-name>NFSMOUNT:</zone-name>
<zone-size>480</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>NFSNODE:</zone-name>
<zone-size>460</zone-size>
<count-limit>0</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>PIPE:</zone-name>
<zone-size>404</zone-size>
```


 Copyright © 2016, Juniper Networks, Inc.

```
<count-limit>0</count-limit>
<used>27</used>
<free>9</free>
<zone-req>717</zone-req>
<zone-name>KNOTE:</zone-name>
<zone-size>72</zone-size>
<count-limit>0</count-limit>
<used>42</used>
<free>64</free>
<zone-req>3311</zone-req>
<zone-name>socket:</zone-name>
<zone-size>412</zone-size>
<count-limit>25191</count-limit>
<used>343</used>
<free>8</free>
<zone-req>2524</zone-req>
<zone-name>unpcb:</zone-name>
<zone-size>140</zone-size>
<count-limit>25200</count-limit>
<used>170</used>
<free>26</free>
<zone-req>2157</zone-req>
<zone-name>ipq:</zone-name>
<zone-size>52</zone-size>
<count-limit>216</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>udpcb:</zone-name>
<zone-size>232</zone-size>
<count-limit>25194</count-limit>
<used>19</used>
<free>32</free>
<zone-req>31</zone-req>
<zone-name>inpcb:</zone-name>
<zone-size>232</zone-size>
<count-limit>25194</count-limit>
<used>40</used>
<free>28</free>
<zone-req>105</zone-req>
<zone-name>tcpcb:</zone-name>
<zone-size>520</zone-size>
<count-limit>25193</count-limit>
<used>40</used>
<free>16</free>
<zone-req>105</zone-req>
<zone-name>tcptw:</zone-name>
<zone-size>56</zone-size>
<count-limit>5092</count-limit>
<used>0</used>
<free>0</free>
<zone-req>0</zone-req>
<zone-name>syncache:</zone-name>
<zone-size>128</zone-size>
<count-limit>15360</count-limit>
<used>0</used>
<free>60</free>
<zone-req>55</zone-req>
<zone-name>tcpreass:</zone-name>
<zone-size>20</zone-size>
<count-limit>1690</count-limit>
```

```
            <used>0</used>
            <free>0</free>
            <zone-req>0</zone-req>
            <zone-name>sackhole:</zone-name>
            <zone-size>20</zone-size>
            <count-limit>0</count-limit>
            <used>0</used>
            <free>0</free>
            <zone-req>0</zone-req>
            <zone-name>ripcb:</zone-name>
            <zone-size>232</zone-size>
            <count-limit>25194</count-limit>
            <used>5</used>
            <free>29</free>
            <zone-req>5</zone-req>
            <zone-name>SWAPMETA:</zone-name>
            <zone-size>276</zone-size>
            <count-limit>94948</count-limit>
            <used>0</used>
            <free>0</free>
            <zone-req>0</zone-req>
            <zone-name>FFS inode:</zone-name>
            <zone-size>132</zone-size>
            <count-limit>0</count-limit>
            <used>1146</used>
            <free>72</free>
            <zone-req>1306</zone-req>
            <zone-name>FFS1 dinode:</zone-name>
            <zone-size>128</zone-size>
            <count-limit>0</count-limit>
            <used>1146</used>
            <free>24</free>
            <zone-req>1306</zone-req>
            <zone-name>FFS2 dinode:</zone-name>
            <zone-size>256</zone-size>
            <count-limit>0</count-limit>
            <used>0</used>
            <free>0</free>
            <zone-req>0</zone-req>
        </vmstat-memstat-zone>
        <vmstat-sumstat>
            <cpu-context-switch>934906</cpu-context-switch>
            <dev-intr>1707986</dev-intr>
            <soft-intr>33819</soft-intr>
            <traps>203604</traps>
            <sys-calls>1200636</sys-calls>
            <kernel-thrds>60</kernel-thrds>
            <fork-calls>1313</fork-calls>
            <vfork-calls>21</vfork-calls>
            <rfork-calls>0</rfork-calls>
            <swap-pageins>0</swap-pageins>
            <swap-pagedin>0</swap-pagedin>
            <swap-pageouts>0</swap-pageouts>
            <swap-pagedout>0</swap-pagedout>
            <vnode-pageins>23094</vnode-pageins>
            <vnode-pagedin>23119</vnode-pagedin>
            <vnode-pageouts>226</vnode-pageouts>
            <vnode-pagedout>3143</vnode-pagedout>
            <page-daemon-wakeup>0</page-daemon-wakeup>
            <page-daemon-examined-pages>0</page-daemon-examined-pages>
            <pages-reactivated>8821</pages-reactivated>
```


 Copyright © 2016, Juniper Networks, Inc.

```
                <copy-on-write-faults>48364</copy-on-write-faults>
                <copy-on-write-optimized-faults>31</copy-on-write-optimized-faults>
                <zero-fill-pages-zeroed>74665</zero-fill-pages-zeroed>
                <zero-fill-pages-prezeroed>70061</zero-fill-pages-prezeroed>
                <transit-blocking-page-faults>85</transit-blocking-page-faults>
                <total-vm-faults>191824</total-vm-faults>

<pages-affected-by-kernel-thrd-creat>0</pages-affected-by-kernel-thrd-creat>
                <pages-affected-by-fork>95343</pages-affected-by-fork>
                <pages-affected-by-vfork>3526</pages-affected-by-vfork>
                <pages-affected-by-rfork>0</pages-affected-by-rfork>
                <pages-freed>221502</pages-freed>
                <pages-freed-by-deamon>0</pages-freed-by-deamon>
                <pages-freed-by-exiting-proc>75630</pages-freed-by-exiting-proc>
                <pages-active>45826</pages-active>
                <pages-inactive>13227</pages-inactive>
                <pages-in-vm-cache>49278</pages-in-vm-cache>
                <pages-wired-down>10640</pages-wired-down>
                <pages-free>70706</pages-free>
                <bytes-per-page>4096</bytes-per-page>
                <swap-pages-used>0</swap-pages-used>
                <peak-swap-pages-used>0</peak-swap-pages-used>
                <total-name-lookups>214496</total-name-lookups>
                <positive-cache-hits>92</positive-cache-hits>
                <negative-cache-hits>5</negative-cache-hits>
                <pass2>0</pass2>
                <cache-deletions>0</cache-deletions>
                <cache-falsehits>0</cache-falsehits>
                <toolong>0</toolong>
            </vmstat-sumstat>
            <vmstat-intr>
                <intr-name>irq0: clk          </intr-name>
                <intr-cnt>1243455</intr-cnt>
                <intr-rate>999</intr-rate>
                <intr-name>irq4: sio0         </intr-name>
                <intr-cnt>1140</intr-cnt>
                <intr-rate>0</intr-rate>
                <intr-name>irq8: rtc          </intr-name>
                <intr-cnt>159164</intr-cnt>
                <intr-rate>127</intr-rate>
                <intr-name>irq9: cbb1 fxp0    </intr-name>
                <intr-cnt>28490</intr-cnt>
                <intr-rate>22</intr-rate>
                <intr-name>irq10: fxp1        </intr-name>
                <intr-cnt>20593</intr-cnt>
                <intr-rate>16</intr-rate>
                <intr-name>irq14: ata0        </intr-name>
                <intr-cnt>5031</intr-cnt>
                <intr-rate>4</intr-rate>
                <intr-name>Total</intr-name>
                <intr-cnt>1457873</intr-cnt>
                <intr-rate>1171</intr-rate>
            </vmstat-intr>
            <vm-kernel-state>
                <vm-kmem-map-free>248524800</vm-kmem-map-free>
            </vm-kernel-state>
        </system-virtual-memory-information>
        <cli>
            <banner></banner>
        </cli>
</rpc-reply>
```

Copyright © 2016, Juniper Networks, Inc.

show version

List of Syntax

Syntax on page 1191
Syntax (EX Series Switches) on page 1191
Syntax (TX Matrix Router) on page 1191
Syntax (TX Matrix Plus Router) on page 1191
Syntax (MX Series Router) on page 1191
Syntax (QFX Series) on page 1191

Syntax

show version
<brief | detail>

Syntax (EX Series Switches)

show version
<all-members>
<brief | detail>
<local>
<member *member-id*>

Syntax (TX Matrix Router)

show version
<brief | detail>
<all-chassis | all-lcc | lcc *number* | scc>

Syntax (TX Matrix Plus Router)

show version
<all-chassis | all-lcc | lcc *number* | sfc *number*>
<brief | detail>

Syntax (MX Series Router)

show version
<brief | detail>
<all-members>
<local>
<member *member-id*>

Syntax (QFX Series)

show version
<brief | detail>
<component *component-name* | all>

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.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display the hostname and version information about the software running on the router or switch.

Beginning in Junos OS Release 13.3, the **show version** command output includes the **Junos** field that displays the Junos OS version running on the device. This field provides a consistent means of identifying the Junos OS version, rather than extracting that information from the list of installed sub-packages.

Options

none—Display standard information about the hostname and version of the software running on the router or switch.

brief | detail—(Optional) Display the specified level of output.

all-members—(EX4200 switches and MX Series routers only) (Optional) Display standard information about the hostname and version of the software running on all members of the Virtual Chassis configuration.

component all—(QFabric systems only) (Optional) Display the host name and version information about the software running on all the components on the QFabric system.

component ***component-name***—(QFabric systems only) (Optional) Display the host name and version information about the software running on a specific QFabric system component. Replace *component-name* with the name of the QFabric system component. The *component-name* can be the name of a diagnostics Routing Engine, Director group, fabric control Routing Engine, fabric manager Routing Engine, Interconnect device, or Node group.

local—(EX4200 switches and MX Series routers only) (Optional) Display standard information about the hostname and version of the software running on the local Virtual Chassis member.

member ***member-id***—(EX4200 switches and MX Series routers only) (Optional) Display standard information about the hostname and version of the software running on the specified member of the Virtual Chassis configuration. For EX4200 switches, replace ***member-id*** with a value from 0 through 9. For an MX Series Virtual Chassis, replace ***member-id*** with a value of 0 or 1.

scc—(TX Matrix routers only) (Optional) Display the hostname and version information about the software running on the TX Matrix router (or switch-card chassis).

lcc ***number***—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display the host name and version information about the software running on for a specified T640 router (line-card chassis or LCC) that is connected to the TX Matrix router. On a TX Matrix Plus router, display the host name and version information about the software running for a specified T1600 or T4000 router (LCC) that is connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

Copyright © 2016, Juniper Networks, Inc.

sfc ***number***—(TX Matrix Plus routers only) (Optional) Display the hostname and version information about the software running on the TX Matrix Plus router (or switch-fabric chassis). Replace *number* with 0.

Additional Information

By default, when you issue the **show version** command on a TX Matrix or TX Matrix Plus master Routing Engine, the command is broadcast to all the T640 (in a routing matrix based on a TX Matrix router) or T1600 or T4000 (in a routing matrix based on a TX Matrix Plus router) master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix or TX Matrix Plus backup Routing Engine, the command is broadcast to all the T640 (in a routing matrix based on a TX Matrix router) or T1600 or T4000 (in a routing matrix based on a TX Matrix Plus router) backup Routing Engines that are connected to it.

Required Privilege Level

view

List of Sample Output

show version (Devices Running Junos OS Release 13.3 and Later) on page 1194
show version on page 1194
show version (TX Matrix Plus Router) on page 1195
show version (TX Matrix Plus Router with 3D SIBs) on page 1197
show version (MX Series Router) on page 1201
show version (QFX3500 Switch) on page 1201
show version (QFabric System) on page 1201
show version component all (QFabric System) on page 1202

Sample Output

show version (Devices Running Junos OS Release 13.3 and Later)

The following output is from the MX240 Router and shows the **Junos** field introduced in Junos OS 13.3. Depending on the platform running Junos OS 13.3, you might see different installed sub-packages, but the **Junos** field is common across all platforms that run Junos OS 13.3 and later.

```
user@host > show version
Hostname: lab
Model: mx240
Junos: 13.3R1.4
JUNOS Base OS boot [13.3R1.4]
JUNOS Base OS Software Suite [13.3R1.4]
JUNOS Kernel Software Suite [13.3R1.4]
JUNOS Crypto Software Suite [13.3R1.4]
JUNOS Packet Forwarding Engine Support (M/T/EX Common) [13.3R1.4]
JUNOS Packet Forwarding Engine Support (MX Common) [13.3R1.4]
JUNOS Online Documentation [113.3R1.4]
JUNOS Services AACL Container package [13.3R1.4]
JUNOS Services Application Level Gateways [13.3R1.4]
JUNOS AppId Services [13.3R1.4]
JUNOS Border Gateway Function package [13.3R1.4]
JUNOS Services Captive Portal and Content Delivery Container package [13.3R1.4]
JUNOS Services HTTP Content Management package [13.3R1.4]
JUNOS IDP Services [13.3R1.4]
JUNOS Services Jflow Container package [13.3R1.4]
JUNOS Services LL-PDF Container package [13.3R1.4]
JUNOS Services MobileNext Software package [13.3R1.4]
JUNOS Services Mobile Subscriber Service Container package [13.3R1.4]
JUNOS Services NAT [13.3R1.4]
JUNOS Services PTSP Container package [13.3R1.4]
JUNOS Services RPM [13.3R1.4]
JUNOS Services Stateful Firewall [13.3R1.4]
JUNOS Voice Services Container package [13.3R1.4]
JUNOS Services Crypto [13.3R1.4]
JUNOS Services SSL [13.3R1.4]
JUNOS Services IPSec [13.3R1.4]
JUNOS platform Software Suite [13.3R1.4]
JUNOS Runtime Software Suite [13.3R1.4]
JUNOS Routing Software Suite [13.3R1.4]
JUNOS py-base-i386 [13.3R1.4]
```

show version

```
user@host> show version
Hostname: router1
Model: m20
JUNOS Base OS boot [7.2-20050312.0]
JUNOS Base OS Software Suite [7.2-20050312.0]
JUNOS Kernel Software Suite [7.2R1.7]
JUNOS Packet Forwarding Engine Support (M20/M40) [7.2R1.7]
JUNOS Routing Software Suite [7.2R1.7]
JUNOS Online Documentation [7.2R1.7]
JUNOS Crypto Software Suite [7.2R1.7]

{master}
```

```
user@host> show version psd 1
```


Copyright © 2016, Juniper Networks, Inc.

```
psd1-re0:
--------------------------------------------------------------------------
Hostname: china
Model: t640
JUNOS Base OS boot [9.1I20080311_1959_builder]
JUNOS Base OS Software Suite [9.1-20080321.0]
JUNOS Kernel Software Suite [9.1-20080321.0]
JUNOS Crypto Software Suite [9.1-20080321.0]
JUNOS Packet Forwarding Engine Support (M/T Common) [9.1-20080321.0]
JUNOS Packet Forwarding Engine Support (T-series) [9.1-20080321.0]
JUNOS Online Documentation [9.1-20080321.0]
JUNOS Routing Software Suite [9.1-20080321.0]
labpkg [7.0]
```

show version (TX Matrix Plus Router)

```
user@host> show version
sfc0-re0:
--------------------------------------------------------------------------
Hostname: host
Model: txp
JUNOS Base OS boot [12.3-20121019.0]
JUNOS Base OS Software Suite [12.3-20121019.0]
JUNOS Kernel Software Suite [12.3-20121019.0]
JUNOS Crypto Software Suite [12.3-20121019.0]
JUNOS Packet Forwarding Engine Support (M/T Common) [12.3-20121019.0]
JUNOS Packet Forwarding Engine Support (T-Series) [12.3-20121019.0]
JUNOS Online Documentation [12.3-20121019.0]
JUNOS Services AACL Container package [12.3-20121019.0]
JUNOS Services Application Level Gateways [12.3-20121019.0]
JUNOS AppId Services [12.3-20121019.0]
JUNOS Border Gateway Function package [12.3-20121019.0]
JUNOS Services Captive Portal and Content Delivery Container package
[12.3-20121019.0]
JUNOS Services HTTP Content Management package [12.3-20121019.0]
JUNOS IDP Services [12.3-20121019.0]
JUNOS Services LL-PDF Container package [12.3-20121019.0]
JUNOS Services NAT [12.3-20121019.0]
JUNOS Services PTSP Container package [12.3-20121019.0]
JUNOS Services RPM [12.3-20121019.0]
JUNOS Services Stateful Firewall [12.3-20121019.0]
JUNOS Voice Services Container package [12.3-20121019.0]
JUNOS Services Example Container package [12.3-20121019.0]
JUNOS Services Crypto [12.3-20121019.0]
JUNOS Services SSL [12.3-20121019.0]
JUNOS Services IPSec [12.3-20121019.0]
JUNOS Runtime Software Suite [12.3-20121019.0]
JUNOS Routing Software Suite [12.3-20121019.0]

lcc0-re0:
--------------------------------------------------------------------------
Hostname: host1
Model: t1600
JUNOS Base OS boot [12.3-20121019.0]
JUNOS Base OS Software Suite [12.3-20121019.0]
JUNOS Kernel Software Suite [12.3-20121019.0]
JUNOS Crypto Software Suite [12.3-20121019.0]
JUNOS Packet Forwarding Engine Support (M/T Common) [12.3-20121019.0]
JUNOS Packet Forwarding Engine Support (T-Series) [12.3-20121019.0]
JUNOS Online Documentation [12.3-20121019.0]
JUNOS Services AACL Container package [12.3-20121019.0]
```

```
JUNOS Services Application Level Gateways [12.3-20121019.0]
JUNOS AppId Services [12.3-20121019.0]
JUNOS Border Gateway Function package [12.3-20121019.0]
JUNOS Services Captive Portal and Content Delivery Container package
[12.3-20121019.0]
JUNOS Services HTTP Content Management package [12.3-20121019.0]
JUNOS IDP Services [12.3-20121019.0]
JUNOS Services LL-PDF Container package [12.3-20121019.0]
JUNOS Services NAT [12.3-20121019.0]
JUNOS Services PTSP Container package [12.3-20121019.0]
JUNOS Services RPM [12.3-20121019.0]
JUNOS Services Stateful Firewall [12.3-20121019.0]
JUNOS Voice Services Container package [12.3-20121019.0]
JUNOS Services Example Container package [12.3-20121019.0]
JUNOS Services Crypto [12.3-20121019.0]
JUNOS Services SSL [12.3-20121019.0]
JUNOS Services IPSec [12.3-20121019.0]
JUNOS Runtime Software Suite [12.3-20121019.0]
JUNOS Routing Software Suite [12.3-20121019.0]

lcc1-re0:
--------------------------------------------------------------------------
Hostname: host2
Model: t1600
JUNOS Base OS boot [12.3-20121019.0]
JUNOS Base OS Software Suite [12.3-20121019.0]
JUNOS Kernel Software Suite [12.3-20121019.0]
JUNOS Crypto Software Suite [12.3-20121019.0]
JUNOS Packet Forwarding Engine Support (M/T Common) [12.3-20121019.0]
JUNOS Packet Forwarding Engine Support (T-Series) [12.3-20121019.0]
JUNOS Online Documentation [12.3-20121019.0]
JUNOS Services AACL Container package [12.3-20121019.0]
JUNOS Services Application Level Gateways [12.3-20121019.0]
JUNOS AppId Services [12.3-20121019.0]
JUNOS Border Gateway Function package [12.3-20121019.0]
JUNOS Services Captive Portal and Content Delivery Container package
[12.3-20121019.0]
JUNOS Services HTTP Content Management package [12.3-20121019.0]
JUNOS IDP Services [12.3-20121019.0]
JUNOS Services LL-PDF Container package [12.3-20121019.0]
JUNOS Services NAT [12.3-20121019.0]
JUNOS Services PTSP Container package [12.3-20121019.0]
JUNOS Services RPM [12.3-20121019.0]
JUNOS Services Stateful Firewall [12.3-20121019.0]
JUNOS Voice Services Container package [12.3-20121019.0]
JUNOS Services Example Container package [12.3-20121019.0]
JUNOS Services Crypto [12.3-20121019.0]
JUNOS Services SSL [12.3-20121019.0]
JUNOS Services IPSec [12.3-20121019.0]
JUNOS Runtime Software Suite [12.3-20121019.0]
JUNOS Routing Software Suite [12.3-20121019.0]

lcc2-re0:
--------------------------------------------------------------------------
Hostname: host3
Model: t1600
JUNOS Base OS boot [12.3-20121019.0]
JUNOS Base OS Software Suite [12.3-20121019.0]
JUNOS Kernel Software Suite [12.3-20121019.0]
JUNOS Crypto Software Suite [12.3-20121019.0]
JUNOS Packet Forwarding Engine Support (M/T Common) [12.3-20121019.0]
```

 Copyright © 2016, Juniper Networks, Inc.

```
JUNOS Packet Forwarding Engine Support (T-Series) [12.3-20121019.0]
JUNOS Online Documentation [12.3-20121019.0]
JUNOS Services AACL Container package [12.3-20121019.0]
JUNOS Services Application Level Gateways [12.3-20121019.0]
JUNOS AppId Services [12.3-20121019.0]
JUNOS Border Gateway Function package [12.3-20121019.0]
JUNOS Services Captive Portal and Content Delivery Container package
[12.3-20121019.0]
JUNOS Services HTTP Content Management package [12.3-20121019.0]
JUNOS IDP Services [12.3-20121019.0]
JUNOS Services LL-PDF Container package [12.3-20121019.0]
JUNOS Services NAT [12.3-20121019.0]
JUNOS Services PTSP Container package [12.3-20121019.0]
JUNOS Services RPM [12.3-20121019.0]
JUNOS Services Stateful Firewall [12.3-20121019.0]
JUNOS Voice Services Container package [12.3-20121019.0]
JUNOS Services Example Container package [12.3-20121019.0]
JUNOS Services Crypto [12.3-20121019.0]
JUNOS Services SSL [12.3-20121019.0]
JUNOS Services IPSec [12.3-20121019.0]
JUNOS Runtime Software Suite [12.3-20121019.0]
JUNOS Routing Software Suite [12.3-20121019.0]

lcc3-re0:
--------------------------------------------------------------------------
Hostname: host4
Model: t1600
JUNOS Base OS boot [12.3-20121019.0]
JUNOS Base OS Software Suite [12.3-20121019.0]
JUNOS Kernel Software Suite [12.3-20121019.0]
JUNOS Crypto Software Suite [12.3-20121019.0]
JUNOS Packet Forwarding Engine Support (M/T Common) [12.3-20121019.0]
JUNOS Packet Forwarding Engine Support (T-Series) [12.3-20121019.0]
JUNOS Online Documentation [12.3-20121019.0]
JUNOS Services AACL Container package [12.3-20121019.0]
JUNOS Services Application Level Gateways [12.3-20121019.0]
JUNOS AppId Services [12.3-20121019.0]
JUNOS Border Gateway Function package [12.3-20121019.0]
JUNOS Services Captive Portal and Content Delivery Container package
[12.3-20121019.0]
JUNOS Services HTTP Content Management package [12.3-20121019.0]
JUNOS IDP Services [12.3-20121019.0]
JUNOS Services LL-PDF Container package [12.3-20121019.0]
JUNOS Services NAT [12.3-20121019.0]
JUNOS Services PTSP Container package [12.3-20121019.0]
JUNOS Services RPM [12.3-20121019.0]
JUNOS Services Stateful Firewall [12.3-20121019.0]
JUNOS Voice Services Container package [12.3-20121019.0]
JUNOS Services Example Container package [12.3-20121019.0]
JUNOS Services Crypto [12.3-20121019.0]
JUNOS Services SSL [12.3-20121019.0]
JUNOS Services IPSec [12.3-20121019.0]
JUNOS Runtime Software Suite [12.3-20121019.0]
JUNOS Routing Software Suite [12.3-20121019.0]
```

show version (TX Matrix Plus Router with 3D SIBs)

```
user@host>show version
sfc0-re0:
--------------------------------------------------------------------------
Hostname: sfc0
```

```
Model: txp
JUNOS Base OS boot [13.1-20130306.0]
JUNOS Base OS Software Suite [13.1-20130306.0]
JUNOS Kernel Software Suite [13.1-20130306.0]
JUNOS Crypto Software Suite [13.1-20130306.0]
JUNOS Packet Forwarding Engine Support (M/T Common) [13.1-20130306.0]
JUNOS Packet Forwarding Engine Support (T-Series) [13.1-20130306.0]
JUNOS Online Documentation [13.1-20130306.0]
JUNOS Services AACL Container package [13.1-20130306.0]
JUNOS Services Application Level Gateways [13.1-20130306.0]
JUNOS AppId Services [13.1-20130306.0]
JUNOS Border Gateway Function package [13.1-20130306.0]
JUNOS Services Captive Portal and Content Delivery Container package
[13.1-20130306.0]
JUNOS Services HTTP Content Management package [13.1-20130306.0]
JUNOS IDP Services [13.1-20130306.0]
JUNOS Services Jflow Container package [13.1-20130306.0]
JUNOS Services LL-PDF Container package [13.1-20130306.0]
JUNOS Services MobileNext Software package [13.1-20130306.0]
JUNOS Services Mobile Subscriber Service Container package [13.1-20130306.0]
JUNOS Services NAT [13.1-20130306.0]
JUNOS Services PTSP Container package [13.1-20130306.0]
JUNOS Services RPM [13.1-20130306.0]
JUNOS Services Stateful Firewall [13.1-20130306.0]
JUNOS Voice Services Container package [13.1-20130306.0]
JUNOS Services Example Container package [13.1-20130306.0]
JUNOS Services Crypto [13.1-20130306.0]
JUNOS Services SSL [13.1-20130306.0]
JUNOS Services IPSec [13.1-20130306.0]
JUNOS Runtime Software Suite [13.1-20130306.0]
JUNOS Routing Software Suite [13.1-20130306.0]

lcc0-re0:
--------------------------------------------------------------------------
Hostname: lcc0
Model: t4000
JUNOS Base OS boot [13.1-20130306.0]
JUNOS Base OS Software Suite [13.1-20130306.0]
JUNOS Kernel Software Suite [13.1-20130306.0]
JUNOS Crypto Software Suite [13.1-20130306.0]
JUNOS Packet Forwarding Engine Support (M/T Common) [13.1-20130306.0]
JUNOS Packet Forwarding Engine Support (T-Series) [13.1-20130306.0]
JUNOS Online Documentation [13.1-20130306.0]
JUNOS Services AACL Container package [13.1-20130306.0]
JUNOS Services Application Level Gateways [13.1-20130306.0]
JUNOS AppId Services [13.1-20130306.0]
JUNOS Border Gateway Function package [13.1-20130306.0]
JUNOS Services Captive Portal and Content Delivery Container package
[13.1-20130306.0]
JUNOS Services HTTP Content Management package [13.1-20130306.0]
JUNOS IDP Services [13.1-20130306.0]
JUNOS Services Jflow Container package [13.1-20130306.0]
JUNOS Services LL-PDF Container package [13.1-20130306.0]
JUNOS Services MobileNext Software package [13.1-20130306.0]
JUNOS Services Mobile Subscriber Service Container package [13.1-20130306.0]
JUNOS Services NAT [13.1-20130306.0]
JUNOS Services PTSP Container package [13.1-20130306.0]
JUNOS Services RPM [13.1-20130306.0]
JUNOS Services Stateful Firewall [13.1-20130306.0]
JUNOS Voice Services Container package [13.1-20130306.0]
JUNOS Services Example Container package [13.1-20130306.0]
```

 Copyright © 2016, Juniper Networks, Inc.

```
JUNOS Services Crypto [13.1-20130306.0]
JUNOS Services SSL [13.1-20130306.0]
JUNOS Services IPSec [13.1-20130306.0]
JUNOS Runtime Software Suite [13.1-20130306.0]
JUNOS Routing Software Suite [13.1-20130306.0]

lcc2-re0:
--------------------------------------------------------------------------
Hostname: lcc2
Model: t4000
JUNOS Base OS boot [13.1-20130306.0]
JUNOS Base OS Software Suite [13.1-20130306.0]
JUNOS Kernel Software Suite [13.1-20130306.0]
JUNOS Crypto Software Suite [13.1-20130306.0]
JUNOS Packet Forwarding Engine Support (M/T Common) [13.1-20130306.0]
JUNOS Packet Forwarding Engine Support (T-Series) [13.1-20130306.0]
JUNOS Online Documentation [13.1-20130306.0]
JUNOS Services AACL Container package [13.1-20130306.0]
JUNOS Services Application Level Gateways [13.1-20130306.0]
JUNOS AppId Services [13.1-20130306.0]
JUNOS Border Gateway Function package [13.1-20130306.0]
JUNOS Services Captive Portal and Content Delivery Container package
[13.1-20130306.0]
JUNOS Services HTTP Content Management package [13.1-20130306.0]
JUNOS IDP Services [13.1-20130306.0]
JUNOS Services Jflow Container package [13.1-20130306.0]
JUNOS Services LL-PDF Container package [13.1-20130306.0]
JUNOS Services MobileNext Software package [13.1-20130306.0]
JUNOS Services Mobile Subscriber Service Container package [13.1-20130306.0]
JUNOS Services NAT [13.1-20130306.0]
JUNOS Services PTSP Container package [13.1-20130306.0]
JUNOS Services RPM [13.1-20130306.0]
JUNOS Services Stateful Firewall [13.1-20130306.0]
JUNOS Voice Services Container package [13.1-20130306.0]
JUNOS Services Example Container package [13.1-20130306.0]
JUNOS Services Crypto [13.1-20130306.0]
JUNOS Services SSL [13.1-20130306.0]
JUNOS Services IPSec [13.1-20130306.0]
JUNOS Runtime Software Suite [13.1-20130306.0]
JUNOS Routing Software Suite [13.1-20130306.0]


lcc4-re0:
--------------------------------------------------------------------------
Hostname: lcc4
Model: t4000
JUNOS Base OS boot [13.1-20130306.0]
JUNOS Base OS Software Suite [13.1-20130306.0]
JUNOS Kernel Software Suite [13.1-20130306.0]
JUNOS Crypto Software Suite [13.1-20130306.0]
JUNOS Packet Forwarding Engine Support (M/T Common) [13.1-20130306.0]
JUNOS Packet Forwarding Engine Support (T-Series) [13.1-20130306.0]
JUNOS Online Documentation [13.1-20130306.0]
JUNOS Services AACL Container package [13.1-20130306.0]
JUNOS Services Application Level Gateways [13.1-20130306.0]
JUNOS AppId Services [13.1-20130306.0]
JUNOS Border Gateway Function package [13.1-20130306.0]
JUNOS Services Captive Portal and Content Delivery Container package
[13.1-20130306.0]
JUNOS Services HTTP Content Management package [13.1-20130306.0]
JUNOS IDP Services [13.1-20130306.0]
```

```
JUNOS Services Jflow Container package [13.1-20130306.0]
JUNOS Services LL-PDF Container package [13.1-20130306.0]
JUNOS Services MobileNext Software package [13.1-20130306.0]
JUNOS Services Mobile Subscriber Service Container package [13.1-20130306.0]
JUNOS Services NAT [13.1-20130306.0]
JUNOS Services PTSP Container package [13.1-20130306.0]
JUNOS Services RPM [13.1-20130306.0]
JUNOS Services Stateful Firewall [13.1-20130306.0]
JUNOS Voice Services Container package [13.1-20130306.0]
JUNOS Services Example Container package [13.1-20130306.0]
JUNOS Services Crypto [13.1-20130306.0]
JUNOS Services SSL [13.1-20130306.0]
JUNOS Services IPSec [13.1-20130306.0]
JUNOS Runtime Software Suite [13.1-20130306.0]
JUNOS Routing Software Suite [13.1-20130306.0]

lcc6-re0:
--------------------------------------------------------------------------
Hostname: lcc6
Model: t1600
JUNOS Base OS boot [13.1-20130306.0]
JUNOS Base OS Software Suite [13.1-20130306.0]
JUNOS Kernel Software Suite [13.1-20130306.0]
JUNOS Crypto Software Suite [13.1-20130306.0]
JUNOS Packet Forwarding Engine Support (M/T Common) [13.1-20130306.0]
JUNOS Packet Forwarding Engine Support (T-Series) [13.1-20130306.0]
JUNOS Online Documentation [13.1-20130306.0]
JUNOS Services AACL Container package [13.1-20130306.0]
JUNOS Services Application Level Gateways [13.1-20130306.0]
JUNOS AppId Services [13.1-20130306.0]
JUNOS Border Gateway Function package [13.1-20130306.0]
JUNOS Services Captive Portal and Content Delivery Container package
[13.1-20130306.0]
JUNOS Services HTTP Content Management package [13.1-20130306.0]
JUNOS IDP Services [13.1-20130306.0]
JUNOS Services Jflow Container package [13.1-20130306.0]
JUNOS Services LL-PDF Container package [13.1-20130306.0]
JUNOS Services MobileNext Software package [13.1-20130306.0]
JUNOS Services Mobile Subscriber Service Container package [13.1-20130306.0]
JUNOS Services NAT [13.1-20130306.0]
JUNOS Services PTSP Container package [13.1-20130306.0]
JUNOS Services RPM [13.1-20130306.0]
JUNOS Services Stateful Firewall [13.1-20130306.0]
JUNOS Voice Services Container package [13.1-20130306.0]
JUNOS Services Example Container package [13.1-20130306.0]
JUNOS Services Crypto [13.1-20130306.0]
JUNOS Services SSL [13.1-20130306.0]
JUNOS Services IPSec [13.1-20130306.0]
JUNOS Runtime Software Suite [13.1-20130306.0]
JUNOS Routing Software Suite [13.1-20130306.0]


lcc7-re0:
--------------------------------------------------------------------------
Hostname: lcc7
Model: t1600
JUNOS Base OS boot [13.1-20130306.0]
JUNOS Base OS Software Suite [13.1-20130306.0]
JUNOS Kernel Software Suite [13.1-20130306.0]
JUNOS Crypto Software Suite [13.1-20130306.0]
JUNOS Packet Forwarding Engine Support (M/T Common) [13.1-20130306.0]
```

 Copyright © 2016, Juniper Networks, Inc.

```
JUNOS Packet Forwarding Engine Support (T-Series) [13.1-20130306.0]
JUNOS Online Documentation [13.1-20130306.0]
JUNOS Services AACL Container package [13.1-20130306.0]
JUNOS Services Application Level Gateways [13.1-20130306.0]
JUNOS AppId Services [13.1-20130306.0]
JUNOS Border Gateway Function package [13.1-20130306.0]
JUNOS Services Captive Portal and Content Delivery Container package
[13.1-20130306.0]
JUNOS Services HTTP Content Management package [13.1-20130306.0]
JUNOS IDP Services [13.1-20130306.0]
JUNOS Services Jflow Container package [13.1-20130306.0]
JUNOS Services LL-PDF Container package [13.1-20130306.0]
JUNOS Services MobileNext Software package [13.1-20130306.0]
JUNOS Services Mobile Subscriber Service Container package [13.1-20130306.0]
JUNOS Services NAT [13.1-20130306.0]
JUNOS Services PTSP Container package [13.1-20130306.0]
JUNOS Services RPM [13.1-20130306.0]
JUNOS Services Stateful Firewall [13.1-20130306.0]
JUNOS Voice Services Container package [13.1-20130306.0]
JUNOS Services Example Container package [13.1-20130306.0]
JUNOS Services Crypto [13.1-20130306.0]
JUNOS Services SSL [13.1-20130306.0]
JUNOS Services IPSec [13.1-20130306.0]
JUNOS Runtime Software Suite [13.1-20130306.0]
JUNOS Routing Software Suite [13.1-20130306.0]
```

show version (MX Series Router)

```
user@host5> show version
Hostname: host5
Model: mx80
JUNOS Base OS boot [11.3-20110717.0]
JUNOS Base OS Software Suite [11.3-20110717.0]
JUNOS Kernel Software Suite [11.3-20110717.0]
JUNOS Crypto Software Suite [11.3-20110717.0]
JUNOS Packet Forwarding Engine Support (MX80) [11.3-20110717.0]
JUNOS Online Documentation [11.3-20110717.0]
JUNOS Routing Software Suite [11.3-20110717.0]
```

show version (QFX3500 Switch)

```
user@switch> show version
Hostname: switch
Model: qfx_s3500
JUNOS Base OS boot [11.1R1]
JUNOS Base OS Software Suite [11.1R1]
JUNOS Kernel Software Suite [11.1R1]
JUNOS Crypto Software Suite [11.1R1
JUNOS Online Documentation [11.1R1]
JUNOS Enterprise Software Suite [11.1R1]
JUNOS Packet Forwarding Engine Support (QFX) [11.1R1]
JUNOS Routing Software Suite [11.1R1]
```

show version (QFabric System)

```
user@qfabric> show version
Hostname: qfabric
Model: qfx3000-g
Serial Number: qfsn-0123456789
QFabric System ID: f158527a-f99e-11e0-9fbd-00e081c57cda
JUNOS Base Version [12.2I20111018_0215_dc-builder]
```

show version component all (QFabric System)

```
user@switch> show version component all
dg1:
-
Hostname: qfabric
Model: qfx3100
JUNOS Base Version [11.3R1.6]

dg0:
-
Hostname: qfabric
Model: qfx3100
JUNOS Base Version [11.3R1.6]

NW-NG-0:
-
Hostname: qfabric
Model: qfx-jvre
JUNOS Base OS boot [11.3R1.6]
JUNOS Base OS Software Suite [11.3R1.6]
JUNOS Kernel Software Suite [11.3R1.6]
JUNOS Crypto Software Suite [11.3R1.6]
JUNOS Online Documentation [11.3R1.6]
JUNOS Enterprise Software Suite [11.3R1.6]
JUNOS Packet Forwarding Engine Support (QFX RE) [11.3R1.6]
JUNOS Routing Software Suite [11.3R1.6]

FC-0:
-
Hostname: qfabric
Model: qfx-jvre
JUNOS Base OS boot [11.3R1.6]
JUNOS Base OS Software Suite [11.3R1.6]
JUNOS Kernel Software Suite [11.3R1.6]
JUNOS Crypto Software Suite [11.3R1.6]
JUNOS Online Documentation [11.3R1.6]
JUNOS Enterprise Software Suite [11.3R1.6]
JUNOS Packet Forwarding Engine Support (QFX RE) [11.3R1.6]
JUNOS Routing Software Suite [11.3R1.6]

FC-1:
Hostname: qfabric
Model: qfx-jvre
JUNOS Base OS boot [11.3R1.6]
JUNOS Base OS Software Suite [11.3R1.6]
JUNOS Kernel Software Suite [11.3R1.6]
JUNOS Crypto Software Suite [11.3R1.6]
JUNOS Online Documentation [11.3R1.6]
JUNOS Enterprise Software Suite [11.3R1.6]
JUNOS Packet Forwarding Engine Support (QFX RE) [11.3R1.6]
JUNOS Routing Software Suite [11.3R1.6]

DRE-0:
-
Hostname: dre-0
Model: qfx-jvre
JUNOS Base OS boot [11.3R1.6]
JUNOS Base OS Software Suite [11.3R1.6]
JUNOS Kernel Software Suite [11.3R1.6]
JUNOS Crypto Software Suite [11.3R1.6]
```

 Copyright © 2016, Juniper Networks, Inc.

```
JUNOS Online Documentation [11.3R1.6]
JUNOS Enterprise Software Suite [11.3R1.6]
JUNOS Packet Forwarding Engine Support (QFX RE) [11.3R1.6]
JUNOS Routing Software Suite [11.3R1.6]

FM-0:
-
Hostname: qfabric
Model: qfx-jvre
JUNOS Base OS boot [11.3R1.6]
JUNOS Base OS Software Suite [11.3R1.6]
JUNOS Kernel Software Suite [11.3R1.6]
JUNOS Crypto Software Suite [11.3R1.6]
JUNOS Online Documentation [11.3R1.6]
JUNOS Enterprise Software Suite [11.3R1.6]
JUNOS Packet Forwarding Engine Support (QFX RE) [11.3R1.6]
JUNOS Routing Software Suite [11.3R1.6]

nodedevice1:
-
Hostname: qfabric
Model: QFX3500
JUNOS Base OS boot [11.3R1.6]
JUNOS Base OS Software Suite [11.3R1.6]
JUNOS Kernel Software Suite [11.3R1.6]
JUNOS Crypto Software Suite [11.3R1.6]
JUNOS Online Documentation [11.3R1.6]
JUNOS Enterprise Software Suite [11.3R1.6]
JUNOS Packet Forwarding Engine Support (QFX RE) [11.3R1.6]
JUNOS Routing Software Suite [11.3R1.6]

interconnectdevice1:
-
Hostname: qfabric
Model: QFX3108
JUNOS Base OS boot [11.3R1.6]
JUNOS Base OS Software Suite [11.3R1.6]
JUNOS Kernel Software Suite [11.3R1.6]
JUNOS Crypto Software Suite [11.3R1.6]
JUNOS Online Documentation [11.3R1.6]
JUNOS Enterprise Software Suite [11.3R1.6]
JUNOS Packet Forwarding Engine Support (QFX RE) [11.3R1.6]
JUNOS Routing Software Suite [11.3R1.6]
warning:  from interconnectdevice0: Disconnected
```

start shell

Syntax

start shell (csh | sh)
<user *username*>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Exit from the CLI environment and create a UNIX-level shell. To return to the CLI, type **exit** from the shell.

NOTE:

- To issue this command, the user must have the required login access privileges configured by including the **permissions** statement at the **[edit system login class *class-name*]** hierarchy level.
- UNIX wheel group membership or permissions are no longer required to issue this command.

Options

csh—Create a UNIX C shell.

sh—Create a UNIX Bourne shell.

user *username*—(Optional) Start the shell as another user.

Additional Information

When you are in the shell, the shell prompt has the following format:

username@hostname%

An example of the prompt is:

root@host%

Required Privilege Level

shell and maintenance

List of Sample Output

start shell csh on page 1204

Output Fields

When you enter this command, you are provided feedback on the status of your request.

Sample Output

start shell csh

```
user@host> start shell csh
%
exit
%
```


Copyright © 2016, Juniper Networks, Inc.

```
username@hostname% start shell sh
%
```

```
exit
user@host>
```

test configuration

Syntax

test configuration *filename*
syntax-only

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
syntax-only option introduced in Junos OS Release 12.1.
Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description

Verify that the syntax of a configuration file is correct. If the configuration contains any syntax or commit check errors, a message is displayed to indicate the line number and column number in which the error was found. This command only accepts text files.

Options

filename—Name of the configuration file.

syntax-only—(Optional) Check the syntax of a partial configuration file, without checking for commit errors.

Required Privilege Level

view

List of Sample Output

test configuration on page 1206

Output Fields

When you enter this command, you are provided feedback on the status of your request.

Sample Output

test configuration

```
user@host> test configuration terminal
[Type ^D to end input]
system {
host-name bluesky;
paris-23;
login;
}
terminal:3:(8) syntax error: paris
  [edit system]
    'paris-23;'
      syntax error
terminal:4:(11) statement must contain additional statements: ;
  [edit system login]
    'login ;'
      statement must contain additional statements
configuration syntax failed
```


Copyright © 2016, Juniper Networks, Inc.

traceroute

List of Syntax

Syntax on page 1207
Syntax (QFX Series and OCX Series) on page 1207

Syntax

traceroute *host*
<as-number-lookup>
<bypass-routing>
<clns>
<gateway *address*>
<inet | inet6>
<interface *interface-name*>
<logical system *logical-system-name*>
<monitor *host*>
<mpls (ldp *FEC address* | rsvp *label-switched-path-name*)>
<no-resolve>
<propagate-ttl>
<routing-instance *routing-instance-name*>
<source *source-address*>
<tos *value*>
<ttl *value*>
<wait *seconds*>

Syntax (QFX Series and OCX Series)

traceroute *host*
<as-number-lookup>
<bypass-routing>
<gateway *address*>
<inet>
<inet6>
<interface *interface-name*>
<monitor *host*>
<no-resolve>
<routing-instance *routing-instance-name*>
<source *source-address*>
<tos *value*>
<ttl *value*>
<wait *seconds*>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
mpls option introduced in Junos OS Release 9.2.
Command introduced in Junos OS Release 11.1 for the QFX Series.
propagate-ttl option introduced in Junos OS Release 12.1.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display the route that packets take to a specified network host. Use **traceroute** as a debugging tool to locate points of failure in a network.

Options

host—IP address or name of remote host.

as-number-lookup—(Optional) Display the autonomous system (AS) number of each intermediate hop on the path from the host to the destination.

bypass-routing—(Optional) Bypass the normal routing tables and send requests directly to a system on an attached network. If the system is not on a directly attached network, an error is returned. Use this option to display a route to a local system through an interface that has no route through it.

clns—(Optional) Trace the route belonging to the Connectionless Network Service (CLNS).

gateway ***address***—(Optional) Address of a router or switch through which the route transits.

inet | inet6—(Optional) Trace the route belonging to IPv4 or IPv6, respectively.

interface ***interface-name***—(Optional) Name of the interface over which to send packets.

logical-system ***logical-system-name***—(Optional) Perform this operation on all logical systems or on a particular logical system.

monitor ***host***—(Optional) Display real-time monitoring information for the specified host.

mpls (ldp ***FEC address*** **| rsvp** ***label-switched-path name*****)**—(Optional) See ***traceroute mpls ldp*** and ***traceroute mpls rsvp***.

no-resolve—(Optional) Do not attempt to determine the hostname that corresponds to the IP address.

propagate-ttl—(Optional) On the PE routing device, use this option to view locally generated Routing Engine transit traffic. This is applicable for MPLS L3VPN traffic only.

Use for troubleshooting, when you want to view hop-by-hop information from the local provider router to the remote provider router, when TTL decrementing is disabled on the core network using the **no-proagate-ttl** configuration statement.

NOTE: **Using propagate-ttl with traceroute on the CE router does not show hop-by-hop information.**

routing-instance ***routing-instance-name***—(Optional) Name of the routing instance for the traceroute attempt.

source ***source-address***—(Optional) Source address of the outgoing traceroute packets.

tos ***value***—(Optional) Value to include in the IP type-of-service (ToS) field. The range of values is **0** through **255**.

ttl ***value***—(Optional) Maximum time-to-live value to include in the traceroute request. The range of values is **0** through **128**.

wait ***seconds***—(Optional) Maximum time to wait for a response to the traceroute request.

Required Privilege Level network

Copyright © 2016, Juniper Networks, Inc.

Related Documentation

- traceroute monitor on page 1211

List of Sample Output

traceroute on page 1209
traceroute as-number-lookup host on page 1209
traceroute no-resolve on page 1209
traceroute propogate-ttl on page 1210
traceroute (Between CE Routers, Layer 3 VPN) on page 1210
traceroute (Through an MPLS LSP) on page 1210

Output Fields

Table 61 on page 1209 describes the output fields for the **traceroute** command. Output fields are listed in the approximate order in which they appear.

Table 61: traceroute Output Fields

Field Name	Field Description
traceroute to	IP address of the receiver.
hops max	Maximum number of hops allowed.
byte packets	Size of packets being sent.
number-of-hops	Number of hops from the source to the named router or switch.
router-name	Name of the router or switch for this hop.
address	Address of the router or switch for this hop.
Round trip time	Average round-trip time, in milliseconds (ms).

Sample Output

traceroute

```
user@host> traceroute santacruz
traceroute to host1.example.com (10.156.169.254), 30 hops max, 40 byte packets
 1  blue23 (10.168.1.254)    2.370 ms  2.853 ms  0.367 ms
 2  red14  (10.168.255.250)  0.778 ms  2.937 ms  0.446 ms
 3  yellow (10.156.169.254)  7.737 ms  89.905 ms  0.834 ms
```

traceroute as-number-lookup host

```
user@host> traceroute as-number-lookup 10.100.1.1
traceroute to 10.100.1.1 (10.100.1.1), 30 hops max, 40 byte packets
 1  10.39.1.1 (10.39.1.1)  0.779 ms  0.728 ms  0.562 ms
 2  10.39.1.6 (10.39.1.6) [AS  32]  0.657 ms  0.611 ms  0.617 ms
 3  10.100.1.1 (10.100.1.1) [AS  10, 40, 50]  0.880 ms  0.808 ms  0.774 ms
```

traceroute no-resolve

```
user@host> traceroute santacruz no-resolve
```

```
traceroute to host1.example.com (10.156.169.254), 30 hops max, 40 byte packets
 1  10.168.1.254  0.458 ms  0.370 ms  0.365 ms
 2  10.168.255.250  0.474 ms  0.450 ms  0.444 ms
 3  10.156.169.254  0.931 ms  0.876 ms  0.862 ms
```

traceroute propogate-ttl

```
user@host> traceroute propagate-ttl 100.200.2.2 routing-instance VPN-A
traceroute to 100.200.2.2 (100.200.2.2) from 1.1.0.2, 30 hops max, 40 byte packets

 1  1.2.0.2 (1.2.0.2)  2.456 ms  1.753 ms  1.672 ms
     MPLS Label=299776 CoS=0 TTL=1 S=0
     MPLS Label=299792 CoS=0 TTL=1 S=1
 2  1.3.0.2 (1.3.0.2)  1.213 ms  1.225 ms  1.166 ms
     MPLS Label=299792 CoS=0 TTL=1 S=1
 3  100.200.2.2 (100.200.2.2)  1.422 ms  1.521 ms  1.443 ms
```

traceroute (Between CE Routers, Layer 3 VPN)

```
user@host> traceroute vpn09
traceroute to host2.example.com (10.255.14.179), 30 hops max, 40
      byte packets
       1  10.39.10.21 (10.39.10.21)  0.598 ms  0.500 ms  0.461 ms
       2  10.39.1.13 (10.39.1.13)  0.796 ms  0.775 ms  0.806 ms
           MPLS Label=100006 CoS=0 TTL=1 S=1
       3  host2.example.com (10.255.14.179)  0.783 ms  0.716 ms  0.686
```

traceroute (Through an MPLS LSP)

```
user@host> traceroute mpls1
traceroute to 10.168.1.224 (10.168.1.224), 30 hops max, 40 byte packets
 1  mpls1-sr0.company.net (10.168.200.101)  0.555 ms  0.393 ms  0.367 ms
     MPLS Label=1024 CoS=0 TTL=1
 2  mpls5-lo0.company.net (10.168.1.224)  0.420 ms  0.394 ms  0.401 ms
```


Copyright © 2016, Juniper Networks, Inc.

traceroute monitor

List of Syntax

Syntax on page 1211
Syntax (QFX Series) on page 1211

Syntax

traceroute monitor *host*
<count *value*>
<inet | inet 6>
<interval *seconds*>
<no resolve>
<size *value*>
<source *source-address*>
<summary>

Syntax (QFX Series)

traceroute monitor *host*
<count *value*>
<inet>
<inet6>
<interval *seconds*>
<no resolve>
<size *value*>
<source *source-address*>
<summary>

Release Information

Command introduced in Junos OS Release 8.0
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Display live monitoring of each hop in the route that packets take to a specified network host. Use as a debugging tool to locate points of failure in a network.

Options

host—IP address or name of remote host.

count *value*—Number of ping requests, in packets, to send in summary mode. The default value is **10**.

inet | inet6—(Optional) Trace the route belonging to IPv4 or IPv6, respectively.

interval *seconds*—(Optional) Number of seconds to wait before sending ping requests. The default value is **1**.

no resolve—(Optional) Do not attempt to display addresses symbolically.

size *value*—(Optional) Receive the specified number of bytes for each packet. The range is **0** through **65468** bytes. The default value is **64**.

source *source-address*—(Optional) Source address of the outgoing ping packets.

summary—(Optional) Generate and display a summary of live monitoring of each hop on the route that packets take to a specified network host.

Copyright © 2016, Juniper Networks, Inc.

Required Privilege Level network

List of Sample Output traceroute monitor on page 1212

Output Fields Table 62 on page 1212 describes the output fields for the **traceroute monitor** command. Output fields are listed in the approximate order in which they appear.

Table 62: traceroute monitor Output Fields

Field Name	Field Description
Host	Hostname or IP address of the router at each hop.
Loss%	Percent of packet loss. The number of ping responses divided by the number of ping requests, specified as a percentage.
Snt	Number of ping requests sent to the routerat this hop.
Last	Most recent round-trip time, in milliseconds, to the router at this hop.
Avg	Average round-trip time, in milliseconds, to the router at this hop.
Best	Shortest round-trip time, in milliseconds, to the router at this hop.
Wrst	Longest round-trip time, in milliseconds, to the router at this hop.
StDev	Standard deviation of round-trip times, in milliseconds, to the router at this hop.

Sample Output

traceroute monitor

```
user@host> traceroute monitor 10.16.0.1

                                   Loss%   Snt   Last   Avg  Best  Wrst StDev
Host
1. 10.17.41.254                    0.0%    17    0.7   1.0   0.6   5.4   1.2
2. secret.net                      0.0%    17    0.6   1.0   0.6   6.6   1.4
3. top-secret.net                  0.0%    17    0.6   0.6   0.6   0.6   0.0
```

 Copyright © 2016, Juniper Networks, Inc.

CHAPTER 33

Standard Software Installation and Upgrade Operational Commands

- request system software add
- request system software delete
- request system software download
- request system software rollback
- request system software validate
- rollback
- show system rollback

Copyright © 2016, Juniper Networks, Inc.

request system software add

List of Syntax

Syntax on page 1214
Syntax (EX Series Switches) on page 1214
Syntax (TX Matrix Router) on page 1214
Syntax (TX Matrix Plus Router) on page 1215
Syntax (MX Series Router) on page 1215
Syntax (QFX Series) on page 1215
Syntax (OCX Series) on page 1215

Syntax

request system software add *package-name*
<best-effort-load>
<delay-restart>
<device-alias *alias-name*>
<force>
<no-copy>
<no-validate>
<re0 | re1>
<reboot>
<satellite *slot-id*>
<set [*package-name package-name*]>
<unlink>
<upgrade-group [all |*upgrade-group-name*]>
<upgrade-with-config>
<upgrade-with-config-format *format*>
<satellite *slot-id*>
<validate>
<version *version-string*>

Syntax (EX Series Switches)

request system software add *package-name*
<best-effort-load>
<delay-restart>
<force>
<no-copy>
<no-validate>
<re0 | re1>
<reboot>
<set [*package-name package-name*]>
<upgrade-with-config>
<upgrade-with-config-format *format*>
<validate>

Syntax (TX Matrix Router)

request system software add *package-name*
<best-effort-load>
<delay-restart>
<force>
<lcc *number* | scc>
<no-copy>
<no-validate>
<re0 | re1>
<reboot>
<set [*package-name package-name*]>
<unlink>

Copyright © 2016, Juniper Networks, Inc.

<upgrade-with-config>
<upgrade-with-config-format *format*>
<validate>

Syntax (TX Matrix Plus Router)

request system software add *package-name*
<best-effort-load>
<delay-restart>
<force>
<lcc *number* | sfc *number*>
<no-copy>
<no-validate>
<re0 | re1>
<reboot>
<set [*package-name package-name*]>
<unlink>
<upgrade-with-config>
<upgrade-with-config-format *format*>
<validate>

Syntax (MX Series Router)

request system software add *package-name*
<best-effort-load>
<delay-restart>
<device-alias *alias-name*>
<force>
<member *member-id*>
<no-copy>
<no-validate>
<re0 | re1>
<reboot>
<satellite *slot-id*>
<set [*package-name package-name*]>
<upgrade-group [all |*upgrade-group-name*]>
<unlink>
<upgrade-with-config>
<upgrade-with-config-format *format*>
<validate>
<version *version-string*>

Syntax (QFX Series)

request system software add *package-name*
<best-effort-load>
<component all>
<delay-restart>
<force>
<force-host>
<no-copy>
<no-validate>
<partition>
<reboot>
<unlink>
<upgrade-with-config>
<upgrade-with-config-format *format*>
<validate>

Syntax (OCX Series)

request system software add *package-name*

<best-effort-load>
<delay-restart>
<force>
<force-host>
<no-copy>
<no-validate>
<reboot>
<unlink>
<upgrade-with-config>
<upgrade-with-config-format *format*>
<validate>

Release Information

Command introduced before Junos OS Release 7.4.
best-effort-load and **unlink** options added in Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6.
Command introduced in Junos OS Release 11.1 for the QFX Series.
set [*package-name package-name*] option added in Junos OS Release 11.1 for EX Series switches.
set [*package-name package-name*] option added in Junos OS Release 12.2 for M Series, MX Series, T Series routers, and Branch SRX Series Services Gateways.

NOTE: On EX Series switches, the **set [*package-name package-name*]** option allows you to install only two software packages on a mixed EX4200 and EX4500 Virtual Chassis, whereas, on M Series, MX Series, T Series routers, and Branch SRX Series Services Gateways, the **set [*package-name package-name*]** option allows you to install multiple software packages and software add-on packages at the same time.

upgrade-with-config and **upgrade-with-config-format *format*** options added in Junos OS Release 12.3 for M Series routers, MX Series routers, T Series routers, EX Series Ethernet switches, and QFX Series devices.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
device-alias, **satellite**, **upgrade-group**, and **version** options introduced in Junos OS Release 14.2R3 for Junos Fusion.

Description

NOTE: We recommend that you always download the software image to **/var/tmp** only. On EX Series and QFX Series switches, you must use the **/var/tmp** directory. Other directories are not supported.

Install a software package or bundle on the router or switch.

WARNING: Any configuration changes performed after inputting the **request system software add** command will be lost when the system reboots with an upgraded version of Junos OS.

Copyright © 2016, Juniper Networks, Inc.

NOTE: When graceful Routing Engine switchover (GRES) is enabled on a device, you must perform a unified ISSU operation to update the software running on the device. With GRES enabled, if you attempt to perform a software upgrade by entering the **request system software add** ***package-name*** command, an error message is displayed stating that only in-service-software-upgrades are supported when GRES is configured. In such a case, you must either remove the GRES configuration before you attempt the upgrade or perform a unified ISSU.

Options ***package-name***—Location from which the software package or bundle is to be installed. For example:

- **/var/tmp/*package-name***—For a software package or bundle that is being installed from a local directory on the router or switch.
- ***protocol://hostname/pathname/package-name***—For a software package or bundle that is to be downloaded and installed from a remote location. Replace ***protocol*** with one of the following:
  - **ftp**—File Transfer Protocol.
    Use **ftp*://hostname/pathname/package-name***. To specify authentication credentials, use **ftp*://<username>:<password>@hostname/pathname/package-name***. To have the system prompt you for the password, specify **prompt** in place of the password. If a password is required, and you do not specify the password or **prompt**, an error message is displayed.
  - **http**—Hypertext Transfer Protocol.
    Use **http*://hostname/pathname/package-name***. To specify authentication credentials, use **http*://<username>:<password>@hostname/pathname/package-name***. If a password is required and you omit it, you are prompted for it.
  - **scp**—Secure copy (available only for Canada and U.S. version).
    Use **scp*://hostname/pathname/package-name***. To specify authentication credentials, use **scp*://<username>:<password>@hostname/pathname/package-name***.

NOTE:

- The *pathname* in the protocol is the relative path to the user's home directory on the remote system and not the root directory.
- Do not use the **scp** protocol in the **request system software add** command to download and install a software package or bundle from a remote location. The previous statement does not apply to the QFabric switch. The software upgrade is handled by the MGD process which does not support scp.
  Use the **file copy** command to copy the software package or bundle from the remote location to the **/var/tmp** directory on the hard disk:
  file copy scp:*//source/package-name* /var/tmp
  Then install the software package or bundle using the **request system software add** command:
  request system software add /var/tmp/*package-name*

best-effort-load—(Optional) Activate a partial load and treat parsing errors as warnings instead of errors.

component all—(QFabric systems only) (Optional) Install software package on all of the QFabric components.

delay-restart—(Optional) Install a software package or bundle, but do not restart software processes.

device-alias *alias-name*—(Junos Fusion only) (Optional) Install the satellite software package onto the specified satellite device using the satellite device's alias name.

force—(Optional) Force the addition of the software package or bundle (ignore warnings).

force-host—(Optional) Force the addition of host software package or bundle (ignore warnings) on the QFX5100 device.

lcc *number* —(TX Matrix routers and TX Matrix Plus routers only) (Optional) In a routing matrix based on the TX Matrix router, install a software package or bundle on a T640 router that is connected to the TX Matrix router. In a routing matrix based on the TX Matrix Plus router, install a software package or bundle on a router that is connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.

Copyright © 2016, Juniper Networks, Inc.

- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

member ***member-id***—(MX Series routers only) (Optional) Install a software package on the specified Virtual Chassis member. Replace ***member-id*** with a value of 0 or 1.

partition—(QFX3500 switches only) (Optional) Format and repartition the media before installation.

satellite ***slot-id***—(Junos Fusion only) (Optional) Install the satellite software package onto the specified satellite device using the satellite devices FPC slot identifier.

scc—(TX Matrix routers only) (Optional) Install a software package or bundle on a Routing Engine on a TX Matrix router (or switch-card chassis).

sfc ***number***—(TX Matrix Plus routers only) (Optional) Install a software package or bundle on a Routing Engine on a TX Matrix Plus router. Replace *number* with 0.

no-copy—(Optional) Install a software package or bundle, but do not save copies of the package or bundle files.

no-validate—(Optional) When loading a software package or bundle with a different release, suppress the default behavior of the **validate** option.

re0 | re1—(Optional) On routers or switches that support dual or redundant Routing Engines, load a software package or bundle on the Routing Engine in slot 0 (re0) or the Routing Engine in slot 1 (re1).

reboot—(Optional) After adding the software package or bundle, reboot the system. On a QFabric switch, the software installation is not complete until you reboot the component for which you have installed the software.

set [*package-name package-name*]—(Mixed EX4200 and EX4500 Virtual Chassis only) (Optional) Install two software packages—a package for an EX4200 switch and the same release of the package for an EX4500 switch—to upgrade all member switches in a mixed EX4200 and EX4500 Virtual Chassis.

set [*package-name package-name*]—(M Series, MX Series, T Series routers, and Branch SRX Series Services Gateways only) (Optional) Install multiple software packages and software add-on packages at the same time.

unlink—(Optional) On M Series, T Series, and MX Series routers, use the unlink option to remove the software package from this directory after a successful upgrade is completed.

upgrade-group [all |*upgrade-group-name*]—(Junos Fusion only) (Required to configure a Junos Fusion using autoconversion or manual conversion) Associate a satellite software image with a satellite software upgrade group. The satellite software package is associated with the specified satellite software upgrade group using the

upgrade-group-name, or for all satellite software upgrade groups in a Junos Fusion when the all keyword is specified.

A satellite software upgrade group is a group of satellite devices in a Junos Fusion that are designated to upgrade to the same satellite software version using the same satellite software package. See *Understanding Software in a Junos Fusion* and *Managing Satellite Software Upgrade Groups in a Junos Fusion*.

upgrade-with-config—(Optional) Install one or more configuration files.

upgrade-with-config-format ***format***—(Optional) Specify the configuration file fomat, **text** or **xml**. The default format is **text**.

NOTE: The **upgrade-with-config** and **upgrade-with-config-format** options are only available locally on the router or switch. In a routing matrix, the configuration is applied only to the local router and is not propagated to other routers.

The options are validated during the validation process and applied to the router or switch during the upgrade process. If the upgrade process is successful, the options are removed from the configuration. If the upgrade process fails, the configuration file is renamed with the **.failed** suffix.

validate—(Optional) Validate the software package or bundle against the current configuration as a prerequisite to adding the software package or bundle. This is the default behavior when the software package or bundle being added is a different release.

NOTE: The **validate** option only works on systems that do not have **graceful-switchover** (GRES) enabled. To use the **validate** option on a system with GRES, either disable GRES for the duration of the installation, or install using the command request system software in-service-upgrade, which requires nonstop active routing (NSR) to be enabled when using GRES.

version ***version-string***—(Junos Fusion only) (Optional) Associate a satellite software package with a satellite software upgrade group by selecting the satellite software package's version. This option can only be used if the specified version of the satellite software has previously been installed on the aggregation device.

Additional Information

Before upgrading the software on the router or switch, when you have a known stable system, issue the **request system snapshot** command to back up the software, including the configuration, to the **/altroot** and **/altconfig** file systems. After you have upgraded the software on the router or switch and are satisfied that the new package or bundle is

Copyright © 2016, Juniper Networks, Inc.

successfully installed and running, issue the **request system snapshot** command again to back up the new software to the **/altroot** and **/altconfig** file systems.

NOTE: The **request system snapshot** command is currently not supported on the QFabric system. Also, you cannot add or install multiple packages on a QFabric system.

After you run the **request system snapshot** command, you cannot return to the previous version of the software, because the running and backup copies of the software are identical.

If you are upgrading more than one package at the same time, delete the operating system package, jkernel, last. Add the operating system package, jkernel, first and the routing software package, jroute, last. If you are upgrading all packages at once, delete and add them in the following order:

```
user@host> request system software add /var/tmp/jbase
user@host> request system software add /var/tmp/jkernel
user@host> request system software add /var/tmp/jpfe
user@host> request system software add /var/tmp/jdocs
user@host> request system software add /var/tmp/jroute
user@host> request system software add /var/tmp/jcrypto
```

By default, when you issue the **request system software add** ***package-name*** command on a TX Matrix master Routing Engine, all the T640 master Routing Engines that are connected to it are upgraded to the same version of software. If you issue the same command on the TX Matrix backup Routing Engine, all the T640 backup Routing Engines that are connected to it are upgraded to the same version of software.

Likewise, when you issue the **request system software add** ***package-name*** command on a TX Matrix Plus master Routing Engine, all the T1600 or T4000 master Routing Engines that are connected to it are upgraded to the same version of software. If you issue the same command on the TX Matrix Plus backup Routing Engine, all the T1600 or T4000 backup Routing Engines that are connected to it are upgraded to the same version of software.

Required Privilege Level

maintenance

Related Documentation

- request system software delete on page 1224
- request system software rollback on page 1230
- request system storage cleanup on page 378
- Upgrading Software on page 168
- *Upgrading Software on a QFabric System*
- *Managing Satellite Software Upgrade Groups in a Junos Fusion*
- *request system software add (Maintenance)*

- *Routing Matrix with a TX Matrix Plus Router Solutions Page*

List of Sample Output

request system software add validate on page 1222
request system software add (Mixed EX4200 and EX4500 Virtual Chassis) on page 1223
request system software add component all (QFabric Systems) on page 1223
request system software add upgrade-group (Junos Fusion) on page 1223

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request system software add validate

```
user@host> request system software add validate /var/tmp/ jinstall-7.2R1.7-domestic-signed.tgz
Checking compatibility with configuration
Initializing...
Using jbase-7.1R2.2
Using /var/tmp/jinstall-7.2R1.7-domestic-signed.tgz
Verified jinstall-7.2R1.7-domestic.tgz signed by PackageProduction_7_2_0
Using /var/validate/tmp/jinstall-signed/jinstall-7.2R1.7-domestic.tgz
Using /var/validate/tmp/jinstall/jbundle-7.2R1.7-domestic.tgz
Checking jbundle requirements on /
Using /var/validate/tmp/jbundle/jbase-7.2R1.7.tgz
Using /var/validate/tmp/jbundle/jkernel-7.2R1.7.tgz
Using /var/validate/tmp/jbundle/jcrypto-7.2R1.7.tgz
Using /var/validate/tmp/jbundle/jpfe-7.2R1.7.tgz
Using /var/validate/tmp/jbundle/jdocs-7.2R1.7.tgz
Using /var/validate/tmp/jbundle/jroute-7.2R1.7.tgz
Validating against /config/juniper.conf.gz
mgd: commit complete
Validation succeeded
Validating against /config/rescue.conf.gz
mgd: commit complete
Validation succeeded
Installing package '/var/tmp/jinstall-7.2R1.7-domestic-signed.tgz' ...
Verified jinstall-7.2R1.7-domestic.tgz signed by PackageProduction_7_2_0
Adding jinstall...

WARNING:     This package will load JUNOS 7.2R1.7 software.
WARNING:     It will save JUNOS configuration files, and SSH keys
WARNING:     (if configured), but erase all other files and information
WARNING:     stored on this machine.  It will attempt to preserve dumps
WARNING:     and log files, but this can not be guaranteed.  This is the
WARNING:     pre-installation stage and all the software is loaded when
WARNING:     you reboot the system.

Saving the config files ...
Installing the bootstrap installer ...

WARNING:     A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the
WARNING:     'request system reboot' command when software installation is
WARNING:     complete. To abort the installation, do not reboot your system,
WARNING:     instead use the 'request system software delete jinstall'
WARNING:     command as soon as this operation completes.

Saving package file in /var/sw/pkg/jinstall-7.2R1.7-domestic-signed.tgz ...
Saving state for rollback ...
```

 Copyright © 2016, Juniper Networks, Inc.

Sample Output

request system software add (Mixed EX4200 and EX4500 Virtual Chassis)

```
user@switch> request system software add set
[/var/tmp/jinstall-ex-4200-11.1R1.1-domestic-signed.tgz
/var/tmp/jinstall-ex-4500-11.1R1.1-domestic-signed.tgz]
...
```

request system software add component all (QFabric Systems)

```
user@switch> request system software add /pbdata/packages/jinstall-qfabric-12.2X50-D1.3.rpm
component all
...
```

request system software add upgrade-group (Junos Fusion)

```
user@aggregation-device> request system software add /var/tmp/satellite-1.0R1.1-signed.tgz
upgrade-group group1
```

request system software delete

List of Syntax

Syntax on page 1224
Syntax (TX Matrix Router) on page 1224
Syntax (TX Matrix Plus Router) on page 1224

Syntax

request system software delete *software-package*
<force>
<reboot>
<set [*package-name package-name*]>
<upgrade-group [all |*upgrade-group-name*]>
<version *version-string*>

Syntax (TX Matrix Router)

request system software delete *software-package*
<force>
<lcc *number* | scc>
<reboot>
<set [*package-name package-name*]>

Syntax (TX Matrix Plus Router)

request system software delete *software-package*
<force>
<lcc *number* | sfc *number*>
<reboot>
<set [*package-name package-name*]>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Option **sfc** 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.
Option **set [*package-name package-name*]** added in Junos OS Release 12.2 for M Series, MX Series, T Series routers, and Branch SRX Services Gateways.
Option reboot introduced in Junos OS Release 12.3.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
Options **upgrade-group**, and **version** introduced in Junos OS Release 14.2R3 for Junos Fusion.

Description

Remove a software package or bundle from the router or switch.

CAUTION: **Before removing a software package or bundle, make sure that you have already placed the new software package or bundle that you intend to load onto the router or switch.**

Options

software-package—Software package or bundle name. You can delete any or all of the following software bundles or packages:

- **jbase**—(Optional) Junos base software suite
- **jcrypto**—(Optional, in domestic version only) Junos security software
- **jdocs**—(Optional) Junos online documentation file

Copyright © 2016, Juniper Networks, Inc.

- **jkernel**—(Optional) Junos kernel software suite
- **jpfe**—(Optional) Junos Packet Forwarding Engine support
- **jroute**—(Optional) Junos routing software suite
- **junos**—(Optional) Junos base software

NOTE: **On EX Series switches, some of the package names are different than those listed. To see the list of packages that you can delete on an EX Series switch, enter the command show system software.**

force—(Optional) Ignore warnings and force removal of the software.

lcc *number*—(TX Matrix routers and TX Matrix Plus routers only) (Optional) In a routing matrix, delete a software package or bundle on a T640 router indicated by **lcc *number*** that is connected to the TX Matrix router. In a routing matrix, delete a software package or bundle on a router indicated by **lcc *number*** 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.

re0 | re1—(Optional) On routers or switches that support dual or redundant Routing Engines, delete a software package or bundle on the Routing Engine in slot 0 (re0) or the Routing Engine in slot 1 (re1).

reboot—As of Junos OS 12.3 and greater, automatically reboot upon completing the **request system software delete** command.

scc—(TX Matrix routers only) (Optional) Remove an extension or upgrade package from the TX Matrix router (or switch-card chassis).

set [*package-name package-name*]—(M Series, MX Series, T Series routers, and Branch SRX Series Services Gateways only) (Optional) Install multiple software packages or software add-on packages at the same time.

sfc *number*—(TX Matrix Plus routers only) (Optional) Remove an extension or upgrade package from the TX Matrix Plus router. Replace *number* with 0.

upgrade-group [all |*upgrade-group-name*]—(Junos Fusion only) Delete the satellite software image association with the specified satellite software upgrade group.

A satellite software upgrade group is a group of satellite devices in the same Junos Fusion that are designated to upgrade to the same satellite software version using the same satellite software package.

version *version-string*—(Junos Fusion only) (Optional) Delete a satellite software package association with a satellite software upgrade group by selecting the satellite software package's version.

Additional Information

Before upgrading the software on the router or switch, when you have a known stable system, issue the **request system snapshot** command to back up the software, including the configuration, to the /altroot and /altconfig file systems (on routers) or the /, /altroot, /config, /var, and /var/tmp file systems (on switches). After you have upgraded the software on the router or switch and are satisfied that the new packages are successfully installed and running, issue the **request system snapshot** command again to back up the new software to the /altroot and /altconfig file systems (on routers) or the /, /altroot, /config, /var, and /var/tmp file systems (on switches). After you run the **request system snapshot** command, you cannot return to the previous version of the software, because the running and backup copies of the software are identical.

Required Privilege Level

maintenance

Related Documentation

- request system software add on page 1214
- request system software rollback on page 1230
- request system software validate on page 1235
- *Routing Matrix with a TX Matrix Plus Router Solutions Page*

List of Sample Output

request system software delete jdocs on page 1226

Output Fields

When you enter this command, you are provided feedback on the status of your request.

Sample Output

request system software delete jdocs

The following example displays the system software packages before and after the **jdocs** package is deleted through the **request system software delete** command:

```
user@host> show system software
Information for jbase:

Comment:
JUNOS Base OS Software Suite [7.2R1.7]


Information for jcrypto:

Comment:
JUNOS Crypto Software Suite [7.2R1.7]
```


Copyright © 2016, Juniper Networks, Inc.

```
Information for jdocs:

Comment:
JUNOS Online Documentation [7.2R1.7]


Information for jkernel:

Comment:
JUNOS Kernel Software Suite [7.2R1.7]

...

user@host> request system software delete jdocs
Removing package 'jdocs' ...

user@host> show system software
Information for jbase:

Comment:
JUNOS Base OS Software Suite [7.2R1.7]


Information for jcrypto:

Comment:
JUNOS Crypto Software Suite [7.2R1.7]


Information for jkernel:

Comment:
JUNOS Kernel Software Suite [7.2R1.7]

...
```

request system software download

Syntax (QFabric System) request system software download *path package-name*

Release Information Command introduced in Junos OS Release 11.3 for the QFX Series.

Description Download a software package from a location on the Director device, mounted external USB flash drive, remote FTP or SCP location, or other location.

Options ***path***—Location where the software package is located. For example:

- **/pbdata/packages/*package-name***—For a software package that is being installed from a local directory on the switch.
- ***protocol://hostname/pathname/package-name***—For a software package or bundle that is to be downloaded and installed from a remote location. Replace ***protocol*** with one of the following:
  - **ftp**—File Transfer Protocol.
    Use **ftp*://hostname/pathname/package-name***. To specify authentication credentials, use **ftp*://<username>:<password>@hostname/pathname/package-name***. To have the system prompt you for the password, specify **prompt** in place of the password. If a password is required, and you do not specify the password or **prompt**, an error message is displayed.
  - **scp**—Secure copy (available only for Canada and U.S. version).
    Use **scp*://hostname/pathname/package-name***. To specify authentication credentials, use **scp*://<username>:<password>@hostname/pathname/package-name***.

Required Privilege Level maintenance

Related Documentation

- request system software add on page 1214
- request system software delete on page 1224
- request system software rollback on page 1230
- request system storage cleanup on page 378
- Upgrading Software on page 168
- *Upgrading Software on a QFabric System*

List of Sample Output request system software download on page 1229

Output Fields When you enter this command, you are provided feedback on the status of your request.

 Copyright © 2016, Juniper Networks, Inc.

Sample Output

request system software download

```
user@switch> request system software download
ftp://ftp.install-directory/jinstall-qfabric-11.3X30.6.rpm
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100  186M  100  186M    0     0  18.4M      0  0:00:10  0:00:10 --:--:-- 18.6M
```

request system software rollback

List of Syntax

Syntax on page 1230
Syntax (EX Series Switches) on page 1230
Syntax (TX Matrix Router) on page 1230
Syntax (TX Matrix Plus Router) on page 1230
Syntax (MX Series Router) on page 1230

Syntax

request system software rollback

Syntax (EX Series Switches)

request system software rollback
<all-members>
<local>
<member *member-id*>
<reboot>

Syntax (TX Matrix Router)

request system software rollback
<lcc *number* | scc>
<reboot>

Syntax (TX Matrix Plus Router)

request system software rollback
<lcc *number* | sfc *number*>
<reboot>

Syntax (MX Series Router)

request system software rollback
<all-members>
<device-alias *alias-name*>
<local>
<member *member-id*
<reboot>
<satellite *slot-id*>
<upgrade-group [all |*upgrade-group-name*]>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Option **sfc** 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.
Command behavior changed in Junos OS Release 12.1.
Option **reboot** introduced in Junos OS Release 12.3.
Options **device-alias**, **satellite**, and **upgrade-group** introduced in Junos OS Release 14.2R3 for Junos Fusion.
Option **force** deprecated for Junos OS with Upgraded FreeBSD in Junos OS Release 15.1.

NOTE: To determine which platforms run Junos OS with Upgraded FreeBSD, see the table listing the platforms currently running Junos OS with upgraded FreeBSD in *Understanding Junos OS with Upgraded FreeBSD*.

Copyright © 2016, Juniper Networks, Inc.

Description For all versions of Junos OS up to and including Junos OS 11.4, revert to the software that was loaded at the last successful **request system software add** command.

As of Junos OS 12.1 and greater, revert to the last known good state before the most recent **request system software (add | delete)** command. For example, using rollback in Junos OS 12.1 after using **request system software add** restores the system to a known good state prior to using the **add** command. Similarly, using rollback in Junos OS 12.1 after using **request system software delete** restores the system to a known good state prior to using the **delete** command.

A software rollback fails if any required package (or a **jbundle** package containing the required package) cannot be found in /var/sw/pkg.

Additional Information

- On a Junos Fusion, the **request system software rollback** command can be used to roll back the version of satellite software associated with a satellite software upgrade group. Rolling back the version of satellite software associated with a satellite software upgrade group triggers a satellite software upgrade.
- On M Series and T Series routers, if **request system software add <jinstall> reboot** was used for the previous installation, then **request system software rollback** has no effect. In this case, use **jinstall** to reinstall the required package.
- On M Series and T Series routers, if **request system software add <sdk1>** was used for the previous installation, then **request system software rollback** removes the last installed SDK package (**sdk1** in this example).
- On SRX Series devices with dual root systems, when **request system software rollback** is run, the system switches to the alternate root. Each root can have a different version of Junos OS. Roll back takes each root back to the previously installed image.
- On QFX3500 and QFX3600 devices in a mixed Virtual Chassis, when the **request system software rollback** command is issued, the system does not rollback to the image stored in the alternate partition.
- On QFX5100 switches, the **reboot** option has been removed. To reboot the switch after a software rollback, issue the **request system reboot** command as a separate, secondary command.

Options **all-members**—(EX4200 switches and MX Series routers only) (Optional) Attempt to roll back to the previous set of packages on all members of the Virtual Chassis configuration.

device-alias ***alias-name***—(Junos Fusion only) (Optional) Rollback the satellite software package onto the specified satellite device using the satellite devices FPC slot identifier.

lcc ***number***—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, attempt to roll back to the previous set of packages on a T640 router connected to the TX Matrix router. On a TX Matrix Plus router, attempt to roll back to the previous set of packages on a connected router connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(EX4200 switches and MX Series routers only) (Optional) Attempt to roll back to the previous set of packages on the local Virtual Chassis member.

member ***member-id***—(EX4200 switches and MX Series routers only) (Optional) Attempt to roll back to the previous set of packages on the specified member of the Virtual Chassis configuration. For EX4200 switches, replace ***member-id*** with a value from 0 through 9. For an MX Series Virtual Chassis, replace *member-id* with a value of 0 or 1.

none—For all versions of Junos OS up to and including Junos OS 11.4, revert to the set of software as of the last successful **request system software add**. As of Junos OS 12.1 and greater, revert to the last known good state before the most recent **request system software (add | delete)** command.

reboot—As of Junos OS 12.3 and greater, automatically reboot upon completing the **request system software rollback** command.

satellite ***slot-id***—(Junos Fusion only) (Optional) Roll back the satellite software package onto the specified satellite device using the satellite devices FPC slot identifier.

scc—(TX Matrix routers only) (Optional) Attempt to roll back to the previous set of packages on the TX Matrix router (or switch-card chassis).

sfc ***number***—(TX Matrix Plus routers only) (Optional) Attempt to roll back to the previous set of packages on the TX Matrix Plus router. Replace *number* with 0.

upgrade-group [all |*upgrade-group-name*]—(Junos Fusion only) Roll back the satellite software image associated with the specified satellite software upgrade group, or for all satellite software upgrade groups in the Junos Fusion when **all** is entered.

Required Privilege Level

maintenance

Related Documentation

- *request system software abort*
- request system software add on page 1214
- request system software delete on page 1224
- request system software validate on page 1235

Copyright © 2016, Juniper Networks, Inc.

- request system configuration rescue delete on page 361
- request system configuration rescue save on page 362
- *Routing Matrix with a TX Matrix Plus Router Solutions Page*

List of Sample Output request system software rollback on page 1234

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request system software rollback

```
user@host> request system software rollback
Verified SHA1 checksum of ./jbase-7.2R1.7.tgz
Verified SHA1 checksum of ./jdocs-7.2R1.7.tgz
Verified SHA1 checksum of ./jroute-7.2R1.7.tgz
Installing package './jbase-7.2R1.7.tgz' ...
Available space: 35495 require: 7335
Installing package './jdocs-7.2R1.7.tgz' ...
Available space: 35339 require: 3497
Installing package './jroute-7.2R1.7.tgz' ...
Available space: 35238 require: 6976
NOTICE: uncommitted changes have been saved in
/var/db/config/juniper.conf.pre-install
Reloading /config/juniper.conf.gz ...
Activating /config/juniper.conf.gz ...
mgd: commit complete
Restarting mgd ...
Restarting aprobed ...
Restarting apsd ...
Restarting cosd ...
Restarting fsad ...
Restarting fud ...
Restarting gcdrd ...
Restarting ilmid ...
Restarting irsd ...
Restarting l2tpd ...
Restarting mib2d ...
Restarting nasd ...
Restarting pppoed ...
Restarting rdd ...
Restarting rmopd ...
Restarting rtspd ...
Restarting sampled ...
Restarting serviced ...
Restarting snmpd ...
Restarting spd ...
Restarting vrrpd ...

WARNING: cli has been replaced by an updated version:
CLI release 7.2R1.7 built by builder on 2005-04-22 02:03:44 UTC
Restart cli using the new version ? [yes,no] (yes) yes

Restarting cli ...
user@host
```


Copyright © 2016, Juniper Networks, Inc.

request system software validate

List of Syntax

Syntax on page 1235
Syntax (TX Matrix Router) on page 1235
Syntax (TX Matrix Plus Router) on page 1235
Syntax (MX Series Router) on page 1235

Syntax

request system software validate *package-name*
<set [*package-name package-name*]>
<upgrade-with-config>
<upgrade-with-config-format *format*>

Syntax (TX Matrix Router)

request system software validate *package-name*
<lcc *number* | scc>
<set [*package-name package-name*]>
<upgrade-with-config>
<upgrade-with-config-format *format*>

Syntax (TX Matrix Plus Router)

request system software validate *package-name*
<lcc *number* | sfc *number*>
<set [*package-name package-name*]>
<upgrade-with-config>
<upgrade-with-config-format *format*>

Syntax (MX Series Router)

request system software validate *package-name*
<member *member-id*>
<set [*package-name package-name*]>
<upgrade-with-config>
<upgrade-with-config-format *format*>

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 11.1 for the QFX Series.
set [*package-name package-name*] option added in Junos OS Release 12.2 for M Series, MX Series, T Series routers, and Branch SRX Series Services Gateways.
upgrade-with-config and **upgrade-with-config-format *format*** options added in Junos OS Release 12.3 for M Series routers, MX Series routers, and T Series routers.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Validate candidate software against the current configuration of the router.

Options

lcc *number*—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, validate the software bundle or package on a specific T640 router (or line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, validate the software bundle or package for a specific router that is connected to the TX Matrix Plus router.

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

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

member ***member-id***—(MX Series routers only) (Optional) Validate the software bundle or package on the specified member of the Virtual Chassis configuration. For an MX Series Virtual Chassis, replace ***member-id*** with a value of 0 or 1.

package-name—Name of the software bundle or package to test.

scc—(TX Matrix routers only) (Optional) Validate the software bundle or package for the TX Matrix router (or switch-card chassis).

set [*package-name package-name*]—(M Series, MX Series, T Series routers, and Branch SRX Series Services Gateways only) (Optional) Install multiple software packages or software add-on packages at the same time.

sfc ***number***—(TX Matrix Plus routers only) (Optional) Validate the software bundle or package for the TX Matrix Plus router.

upgrade-with-config—(Optional) Install one or more configuration files.

upgrade-with-config-format ***format***—(Optional) Specify the configuration file fomat, **text** or **xml**. The default format is **text**.

NOTE: The **upgrade-with-config** and **upgrade-with-config-format** options are only available locally on the router or switch. In a routing matrix, the configuration is applied only to the local router and is not propagated to other routers.

The options are validated during the validation process and applied to the router or switch during the upgrade process. If the upgrade process is successful, the options are removed from the configuration. If the upgrade process fails, the configuration file is renamed with the .failed suffix.

Additional Information

By default, when you issue the **request system software validate** command on a TX Matrix master Routing Engine, all the T640 master Routing Engines that are connected to it are validated. If you issue the same command on the TX Matrix backup Routing Engine, all

Copyright © 2016, Juniper Networks, Inc.

the T640 backup Routing Engines that are connected to it are upgraded to the same version of software.

Likewise, if you issue the **request system software validate** command on a TX Matrix Plus master Routing Engine, all the T1600 or T4000 master Routing Engines that are connected to it are validated. If you issue the same command on a TX Matrix Plus backup Routing Engine, all the T1600 or T4000 backup Routing Engines that are connected to it are upgraded to the same version of software.

Required Privilege Level maintenance

Related Documentation

- *request system software abort*
- request system software add on page 1214
- request system software delete on page 1224
- request system software rollback on page 1230
- *Routing Matrix with a TX Matrix Plus Router Solutions Page*

List of Sample Output

request system software validate (Successful Case) on page 1237
request system software validate (Failure Case) on page 1237

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request system software validate (Successful Case)

```
user@host> request system software validate /var/sw/pkg/jbundle-5.3I20020124_0520_sjg.tgz
Checking compatibility with configuration
Initializing...
Using /packages/jbase-5.3I20020122_1901_sjg
Using /var/sw/pkg/jbundle-5.3I20020124_0520_sjg.tgz
Using /var/chroot/var/tmp/jbundle/jbase-5.3I20020124_0520_sjg.tgz
Using /var/chroot/var/tmp/jbundle/jkernel-5.3I20020124_0520_sjg.tgz
Using /var/chroot/var/tmp/jbundle/jcrypto-5.3I20020124_0520_sjg.tgz
Using /var/chroot/var/tmp/jbundle/jpfe-5.3I20020124_0520_sjg.tgz
Using /var/chroot/var/tmp/jbundle/jdocs-5.3I20020124_0520_sjg.tgz
Using /var/chroot/var/tmp/jbundle/jroute-5.3I20020124_0520_sjg.tgz
Validating against /config/juniper.conf.gz
mgd: commit complete

WARNING: cli has been replaced by an updated version:
CLI release 5.3I0 built by sjg on 2002-01-24 05:23:53 UTC
Restart cli using the new version ? [yes,no] (yes)
```

request system software validate (Failure Case)

```
user@host> request system software validate 6.3/
Pushing bundle to lcc0-re0
error: Failed to transfer package to lcc0-re0


user@host> request system software validate test
```

```
Pushing bundle to lcc0-re0
Pushing bundle to lcc2-re0

lcc0-re0:
gzip: stdin: not in gzip format
tar: child returned status 1
ERROR: Not a valid package: /var/tmp/test
```


Copyright © 2016, Juniper Networks, Inc.

rollback

Syntax

rollback <*number* | rescue>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 11.1 for the QFX Series.

Description

Return to a previously committed configuration. The software saves the last 50 committed configurations, including the rollback number, date, time, and name of the user who issued the **commit** configuration command.

The currently operational Junos OS configuration is stored in the file **juniper.conf**, and the last three committed configurations are stored in the files **juniper.conf.1**, **juniper.conf.2**, and **juniper.conf.3**. These four files are located in the directory **/config**, which is on the router's flash drive. The remaining 46 previous committed configurations, the files **juniper.conf.4** through **juniper.conf.49**, are stored in the directory **/var/db/config**, which is on the router's hard disk.

During rollback, the configuration you specify is loaded from the associated file. Only objects in the rollback configuration that differ from the previously loaded configuration are marked as changed (equivalent to **load update**).

Options

none (Optional)—Return to the most recently saved configuration.

number—(Optional) Configuration to return to. The range of values is from **0** through **49**. The most recently saved configuration is number 0, and the oldest saved configuration is number 49. The default is **0**.

rescue—(Optional) Return to the rescue configuration.

Required Privilege Level

rollback—To roll back to configurations other than the one most recently committed.

Related Documentation

- *Returning to a Previously Committed Junos OS Configuration*
- *Creating and Returning to a Rescue Configuration*

show system rollback

Syntax show system rollback *number*
<compare *number*>

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 14.1X53-D20 for OCX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.

Description Display the contents of a previously committed configuration, or the differences between two previously committed configurations.

NOTE: **The show system rollback command is a purely operational mode command and cannot be issued with run from the configuration mode.**

Options ***number***—Number of a configuration to view. The output displays the configuration. The range of values is 0 through 49.

compare *number* —(Optional) Number of another previously committed (rollback) configuration to compare to rollback ***number***. The output displays the differences between the two configurations. The range of values is 0 through 49.

Required Privilege Level view

List of Sample Output show system rollback compare on page 1240

Sample Output

show system rollback compare

```
user@host> show system rollback 3 compare 1
[edit]
+  interfaces {
+      ge-1/1/1 {
+          unit 0 {
+              family inet {
+                  filter {
+                      input mf_plp;
+                  }
+                  address 10.1.1.1/8;
+              }
+          }
+      }
+      ge-1/2/1 {
+          unit 0 {
+              family inet {
+                  filter {
+                      input mf_plp;
+                  }
+                  address 10.1.1.1/8;
```

 Copyright © 2016, Juniper Networks, Inc.

```
+                }
+            }
+        }
+        ge-1/3/0 {
+            unit 0 {
+                family inet {
+                    filter {
+                        input mf_plp;
+                    }
+                    address 10.1.1.1/8;
+                }
+            }
+        }
+}
```

Copyright © 2016, Juniper Networks, Inc.

CHAPTER 34

System Snapshot Operational Commands

- request system snapshot

Copyright © 2016, Juniper Networks, Inc.

request system snapshot

Syntax

request system snapshot
<config-partition>
<media>
<partition>
<root-partition>
slice alternate

Release Information

Command introduced in Junos OS Release 11.3 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Copy the currently running Junos OS and configuration to alternate media. This command takes a snapshot of the contents of the **/** (root), and **/var** partitions on the media used to boot the switch and then copies the snapshot to alternate media. If the switch was booted from internal flash memory, the snapshot is copied to an external USB flash drive. If the switch was booted from an external USB flash drive, the snapshot is copied to internal flash memory.

NOTE: System snapshot is not supported on QFX10002 switches.

Options

none—Create a snapshot on the alternate media—that is, the external media if you booted the switch using software stored on internal media or internal media if you booted the switch using software stored on external media.

config-partition—(Optional) Create a snapshot of the configuration partition only and store it onto the default /altconfig on the hard disk device or an /altconfig on a USB device.

media *type*—(Optional) Specify the boot device the software is copied to:

- compact-flash—Copy software to the primary compact flash drive.
- external—Copy software to an external mass storage device, such as a USB flash drive. If a USB drive is not connected, the switch displays an error message.
- internal—Copy software to an internal flash drive.
- removable-compact-flash—Copy software to the removable compact flash drive.

partition—(Optional) Partition the destination media before copying over the snapshot.

root-partition—(Optional) Create a snapshot of the root partition only and store it onto the default /altroot on the hard disk device or an /altroot on a USB device.

slice alternate—(Optional) Take a snapshot of the active root partition and copy it to the alternate slice on the boot media.

Copyright © 2016, Juniper Networks, Inc.

Required Privilege Level view

Related Documentation

- *show system snapshot*
- *Creating a Snapshot and Using It to Boot a QFX3500 and QFX3600 Switch*
- *Verifying That a System Snapshot Was Created on a QFX Series Switch*

List of Sample Output request system snapshot partition on page 1245

Sample Output

request system snapshot partition

```
user@switch> request system snapshot partition
Clearing current label...
Partitioning external media (da1) ...
Verifying compatibility of destination media partitions...
Running newfs (334MB) on external media  / partition ...
Running newfs (404MB) on external media  /config partition ...
Running newfs (222MB) on external media  /var partition ...
Copying '/dev/da0s2a' to '/dev/da1s1a' .. (this may take a few minutes)
Copying '/dev/da0s3e' to '/dev/da1s3e' .. (this may take a few minutes)
Copying '/dev/da0s2f' to '/dev/da1s1f' .. (this may take a few minutes)
The following filesystems were archived: / /config /var
```

Copyright © 2016, Juniper Networks, Inc.