



JUNOS® Software

System Basics and Services Command Reference

Release 9.5

Juniper Networks, Inc.

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About This Guide

This preface provides the following guidelines for using the *JUNOS® Software System Basics and Services Command Reference*:

- JUNOS Documentation and Release Notes on page xxi
- Objectives on page xxii
- Audience on page xxiii
- Supported Platforms on page xxiv
- Using the Indexes on page xxiv
- Documentation Conventions on page xxiv
- Documentation Feedback on page xxvi
- Requesting Technical Support on page xxvi

JUNOS Documentation and Release Notes

For a list of related JUNOS documentation, see <http://www.juniper.net/techpubs/software/junos/>.

If the information in the latest *JUNOS Release Notes* differs from the information in the documentation, follow the *JUNOS Release Notes*.

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

Table 1 on page xxi lists additional books on Juniper Networks solutions that you can order through your bookstore. A complete list of such books is available at <http://www.juniper.net/books>.

Table 1: Additional Books Available Through <http://www.juniper.net/books>

Book	Description
<i>Interdomain Multicast Routing</i>	Provides background and in-depth analysis of multicast routing using Protocol Independent Multicast sparse mode (PIM SM) and Multicast Source Discovery Protocol (MSDP); details any-source and source-specific multicast delivery models; explores multiprotocol BGP (MBGP) and multicast IS-IS; explains Internet Gateway Management Protocol (IGMP) versions 1, 2, and 3; lists packet formats for IGMP, PIM, and MSDP; and provides a complete glossary of multicast terms.

Table 1: Additional Books Available Through <http://www.juniper.net/books> (continued)

Book	Description
<i>JUNOS Cookbook</i>	Provides detailed examples of common JUNOS software configuration tasks, such as basic router configuration and file management, security and access control, logging, routing policy, firewalls, routing protocols, MPLS, and VPNs.
<i>MPLS-Enabled Applications</i>	Provides an overview of Multiprotocol Label Switching (MPLS) applications (such as Layer 3 virtual private networks [VPNs], Layer 2 VPNs, virtual private LAN service [VPLS], and pseudowires), explains how to apply MPLS, examines the scaling requirements of equipment at different points in the network, and covers the following topics: point-to-multipoint label switched paths (LSPs), DiffServ-aware traffic engineering, class of service, interdomain traffic engineering, path computation, route target filtering, multicast support for Layer 3 VPNs, and management and troubleshooting of MPLS networks.
<i>OSPF and IS-IS: Choosing an IGP for Large-Scale Networks</i>	Explores the full range of characteristics and capabilities for the two major link-state routing protocols: Open Shortest Path First (OSPF) and IS-IS. Explains architecture, packet types, and addressing; demonstrates how to improve scalability; shows how to design large-scale networks for maximum security and reliability; details protocol extensions for MPLS-based traffic engineering, IPv6, and multipoint-to-multipoint routing; and covers troubleshooting for OSPF and IS-IS networks.
<i>Routing Policy and Protocols for Multivendor IP Networks</i>	Provides a brief history of the Internet, explains IP addressing and routing (Routing Information Protocol [RIP], OSPF, IS-IS, and Border Gateway Protocol [BGP]), explores ISP peering and routing policies, and displays configurations for both Juniper Networks and other vendors' routers.
<i>The Complete IS-IS Protocol</i>	Provides the insight and practical solutions necessary to understand the IS-IS protocol and how it works by using a multivendor, real-world approach.

Objectives

This guide provides descriptions of the JUNOS software commands that you use to monitor and troubleshoot basic system operations and services on the router.

For additional commands, see these references:

- *JUNOS Routing Protocols and Policies Command Reference*
- *JUNOS Interfaces Command Reference*



NOTE: For additional information about the JUNOS software—either corrections to or information that might have been omitted from this guide—see the software release notes at <http://www.juniper.net/>.

For information about configuration statements and guidelines related to the commands described in this reference, see the following configuration guides:

- *JUNOS CLI User Guide*—Describes how to use the JUNOS command-line interface (CLI) to configure, monitor, and manage Juniper Networks routing platforms.
- *JUNOS Software Installation and Upgrade Guide*—Provides a description of JUNOS software components and packaging, and includes detailed information about how to initially configure, reinstall, and upgrade the JUNOS system software.
- *JUNOS System Basics Configuration Guide*—Describes Juniper Networks routing platforms, and provides information about how to configure basic system parameters, supported protocols and software processes, authentication, and a variety of utilities for managing your router on the network.
- *JUNOS Services Interfaces Configuration Guide*—Includes configuration statements and guidelines for real-time performance monitoring (RPM) and all services, such as Compressed Real-Time Transport Protocol (CRTP), Data Link Switching (DLSw), flow collection and monitoring, and stateful firewall filters.
- *JUNOS Class of Service Configuration Guide*—Includes configuration statements and guidelines for class of service (CoS) features.
- *JUNOS Network Interfaces Configuration Guide*—Includes configuration statements and guidelines for bit error rate test (BERT) parameters and Automatic Protection Switching (APS).
- *JUNOS Network Management Configuration Guide*—Includes configuration statements and guidelines for accounting parameters and the Simple Network Management Protocol (SNMP).

For information about related tasks performed by network operations center (NOC) personnel, see the following Network Operations Guides:

- *JUNOS Hardware Network Operations Guide*
- *JUNOS Baseline Network Operations Guide*

Audience

This guide is designed for network administrators who are configuring and monitoring a Juniper Networks M-series, MX-series, T-series, EX-series, or J-series router or switch.

To use this guide, you need a broad understanding of networks in general, the Internet in particular, networking principles, and network configuration. You must also be familiar with one or more of the following Internet routing protocols:

- Border Gateway Protocol (BGP)
- Distance Vector Multicast Routing Protocol (DVMRP)
- Intermediate System-to-Intermediate System (IS-IS)
- Internet Control Message Protocol (ICMP) router discovery
- Internet Group Management Protocol (IGMP)
- Multiprotocol Label Switching (MPLS)
- Open Shortest Path First (OSPF)
- Protocol-Independent Multicast (PIM)

- Resource Reservation Protocol (RSVP)
- Routing Information Protocol (RIP)
- Simple Network Management Protocol (SNMP)

Personnel operating the equipment must be trained and competent; must not conduct themselves in a careless, willfully negligent, or hostile manner; and must abide by the instructions provided by the documentation.

Supported Platforms

For the features described in this manual, the JUNOS software currently supports the following platforms:

- J-series
- M-series
- MX-series
- T-series
- EX-series

Using the Indexes

This reference contains two indexes: a standard index with topic entries, and an index of commands.

Documentation Conventions

Table 2 on page xxiv defines notice icons used in this guide.

Table 2: Notice Icons





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

Table 3 on page xxv defines the text and syntax conventions used in this guide.

Table 3: Text and Syntax Conventions

Convention	Description	Examples
Bold text like this	Represents text that you type.	To enter configuration mode, type the <code>configure</code> command: user@host> configure
Fixed-width text like this	Represents output that appears on the terminal screen.	user@host> show chassis alarms No alarms currently active
<i>Italic text like this</i>	<ul style="list-style-type: none"> Introduces important new terms. Identifies book names. Identifies RFC and Internet draft titles. 	<ul style="list-style-type: none"> A policy <i>term</i> is a named structure that defines match conditions and actions. <i>JUNOS System Basics Configuration Guide</i> RFC 1997, <i>BGP Communities Attribute</i>
<i>Italic text like this</i>	Represents variables (options for which you substitute a value) in commands or configuration statements.	Configure the machine's domain name: [edit] root@# set system domain-name domain-name
Plain text like this	Represents names of configuration statements, commands, files, and directories; IP addresses; configuration hierarchy levels; or labels on routing platform components.	<ul style="list-style-type: none"> To configure a stub area, include the <code>stub</code> statement at the [edit <code>protocols ospf area area-id</code>] hierarchy level. The console port is labeled <code>CONSOLE</code>.
< > (angle brackets)	Enclose optional keywords or variables.	stub <default-metric <i>metric</i> >;
(pipe symbol)	Indicates a choice between the mutually exclusive keywords or variables on either side of the symbol. The set of choices is often enclosed in parentheses for clarity.	broadcast multicast (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)	Enclose a variable for which you can substitute one or more values.	community name members [<i>community-ids</i>]
Indentation and braces ({ })	Identify a level in the configuration hierarchy.	[edit] routing-options { static { route default { nexthop address; retain; } } }
; (semicolon)	Identifies a leaf statement at a configuration hierarchy level.	

Table 3: Text and Syntax Conventions (*continued*)

Convention	Description	Examples
J-Web GUI Conventions		
Bold text like this	Represents J-Web graphical user interface (GUI) items you click or select.	<ul style="list-style-type: none"> ■ In the Logical Interfaces box, select All Interfaces. ■ To cancel the configuration, click Cancel.
> (bold right angle bracket)	Separates levels in a hierarchy of J-Web selections.	In the configuration editor hierarchy, select Protocols > Ospf .

Documentation Feedback

We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation. You can send your comments to techpubs-comments@juniper.net, or fill out the documentation feedback form at <https://www.juniper.net/cgi-bin/docbugreport/>. If you are using e-mail, be sure to include the following information with your comments:

- Document name
- Document part number
- Page number
- Software release version (not required for *Network Operations Guides [NOGs]*)

Requesting Technical Support

Technical product support is available through the Juniper Networks Technical Assistance Center (JTAC). If you are a customer with an active J-Care or JNASC support contract, or are covered under warranty, and need postsales 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/customers/support/downloads/710059.pdf>.
- Product warranties—For product warranty information, visit <http://www.juniper.net/support/warranty/>.
- JTAC Hours of Operation —The JTAC centers have resources available 24 hours a day, 7 days a week, 365 days a year.

Self-Help Online Tools and Resources

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

- Find CSC offerings: <http://www.juniper.net/customers/support/>
- Search for known bugs: <http://www2.juniper.net/kb/>
- Find product documentation: <http://www.juniper.net/techpubs/>
- Find solutions and answer questions using our Knowledge Base:
<http://kb.juniper.net/>
- Download the latest versions of software and review release notes:
<http://www.juniper.net/customers/csc/software/>
- Search technical bulletins for relevant hardware and software notifications:
<https://www.juniper.net/alerts/>
- Join and participate in the Juniper Networks Community Forum:
<http://www.juniper.net/company/communities/>
- Open a case online in the CSC Case Management tool: <http://www.juniper.net/cm/>

To verify service entitlement by product serial number, use our Serial Number Entitlement (SNE) Tool located at <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, visit us at <http://www.juniper.net/support/requesting-support.html>.

Part 1

Monitoring and Testing Tools

- Connectivity Operational Mode Commands on page 3
- Interface Diagnostics Operational Mode Commands on page 27
- RADIUS Diagnostics Operational Mode Commands on page 47
- Real-Time Performance Monitoring Operational Mode Commands on page 55
- Real-Time Router Monitoring Operational Mode Commands on page 71

Chapter 1

Connectivity Operational Mode Commands

Table 4 on page 3 summarizes the command-line interface (CLI) commands you can use to perform and monitor connectivity functions. Commands are listed in alphabetical order.

Table 4: Connectivity Operational Mode Commands

Task	Command
Check host reachability and network connectivity.	ping
Check the reachability of a remote Asynchronous Transfer Mode (ATM) node.	ping atm
Check the operability of a remote Connectionless Network Service (CLNS) node.	ping clns
Check the operability of a Layer 2 circuit.	ping mpls l2circuit
Check the operability of a Layer 2 virtual private network (VPN).	ping mpls l2vpn
Check the operability of a Layer 3 VPN.	ping mpls l3vpn
Check the operability of a Multiprotocol Label Switching (MPLS) connection.	ping mpls ldp
Check the operability of MPLS label-switched path (LSP) endpoint connections.	ping mpls lsp-end-point
Check the operability of MPLS Resource Reservation Protocol (RSVP)-signaled LSP connections.	ping mpls rsvp
Check the operability of VPLS connections.	ping vpls instance



NOTE: For information about related tasks performed by network operations center (NOC) personnel, see the *JUNOS Baseline Network Operations Guide*.

ping

Syntax `ping host`
 `<bypass-routing>`
 `<count requests>`
 `<detail>`
 `<do-not-fragment>`
 `<inet | inet6>`
 `<interface source-interface>`
 `<interval seconds>`
 `<logical-system (all | logical-system-name)>`
 `<loose-source value>`
 `<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 Release 7.4.

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. Type 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) bit in the IP header of the ping packets.

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 (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

loose-source *value*—(Optional) Intermediate loose source route entry (IPv4). Open a set of values.

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.

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.

wait *seconds*—(Optional) Delay, in seconds, after sending the last packet. If this option is not specified, the default delay is 10 seconds. If this option is used without the count option, a default count of 5 packets is used.

Required Privilege Level network

List of Sample Output ping hostname on page 6
ping hostname size count on page 6
ping hostname rapid on page 6

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.

ping hostname user@host> **ping skye**
PING skye.net (192.168.169.254): 56 data bytes
64 bytes from 192.168.169.254: icmp_seq=0 ttl=253 time=1.028 ms
64 bytes from 192.168.169.254: icmp_seq=1 ttl=253 time=1.053 ms
64 bytes from 192.168.169.254: icmp_seq=2 ttl=253 time=1.025 ms
64 bytes from 192.168.169.254: icmp_seq=3 ttl=253 time=1.098 ms
64 bytes from 192.168.169.254: icmp_seq=4 ttl=253 time=1.032 ms
64 bytes from 192.168.169.254: icmp_seq=5 ttl=253 time=1.044 ms
^C [abort]

ping hostname size count user@host> **ping skye size 200 count 5**
PING skye.net (192.168.169.254): 200 data bytes
208 bytes from 192.168.169.254: icmp_seq=0 ttl=253 time=1.759 ms
208 bytes from 192.168.169.254: icmp_seq=1 ttl=253 time=2.075 ms
208 bytes from 192.168.169.254: icmp_seq=2 ttl=253 time=1.843 ms
208 bytes from 192.168.169.254: icmp_seq=3 ttl=253 time=1.803 ms
208 bytes from 192.168.169.254: icmp_seq=4 ttl=253 time=17.898 ms

--- skye.net ping statistics ---
5 packets transmitted, 5 packets received, 0% packet loss
round-trip min/avg/max = 1.759/5.075/17.898 ms

ping hostname rapid user@host> **ping skye rapid**
PING skye.net (192.168.169.254): 56 data bytes
!!!!
--- skye.net ping statistics ---
5 packets transmitted, 5 packets received, 0% packet loss
round-trip min/avg/max/stddev = 0.956/0.974/1.025/0.026 ms

ping atm

Syntax ping atm interface *interface-name* vci *vci*
 <brief>
 <count *count*>
 <end-to-end | segment>
 <interval *seconds*>
 <sequence-number *sequence-number*>

Release Information Command introduced before JUNOS Release 7.4.

Description Check the reachability of a remote Asynchronous Transfer Mode (ATM) node. All packets are 53 bytes. Type Ctrl + c to interrupt a ping atm command.

Options interface *interface-name*—Interface to use to send the ATM ping requests. For ATM 1 and ATM 2 interfaces, you must include a logical unit number in the interface name

vci *vci*—ATM point-to-point virtual circuit identifier. It can be a virtual circuit identifier (vci) or a virtual private identifier (vpi.vci).

brief—(Optional) Display only the ATM ping summary statistics. These are displayed after you type Ctrl + c to interrupt the ping atm command.

count *count*—(Optional) Number of ping requests to send. The range of values is 0 through 10,000. The default value is an unlimited number of requests.

end-to-end—(Optional) Cells are sent to the end node. This is the default.

segment—(Optional) Cells are sent only to the intermediate node.

interval *seconds*—(Optional) How often to send ping requests. The range of values, in seconds, is 1 through 10,000. The default value is 1.

sequence-number *sequence-number*—(Optional) Starting sequence number (correlation tag). The range of values is 0 through 65,468. The default value is 1.

Required Privilege Level network

List of Sample Output ping atm on page 8

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.

```
ping atm  user@host> ping atm interface at-5/3/0 vci 0.128
53 byte oam cell received on (vpi=0 vci=128): seq=1
53 byte oam cell received on (vpi=0 vci=128): seq=2
^C[abort]
--- atmping statistics ---
5 cells transmitted, 5 cells received, 0% cell loss
```

ping clns

Syntax ping clns *host*
 <brief>
 <count *requests*>
 <detail>
 <do-not-fragment>
 <interval *seconds*>
 <no-resolve>
 <pattern *string*>
 <rapid>
 <routing-instance *routing-instance-name*>
 <size *bytes*>
 <source *source-address*>
 <ttl *value*>
 <verbose>
 <wait *seconds*>

Release Information Command introduced before JUNOS Release 7.4.

Description Check the reachability of a remote Connectionless Network Service (CLNS) node. Type Ctrl + c to interrupt a ping clns command.

Options *host*—IP address or hostname of the remote system to ping.

brief—(Optional) Display brief information.

count requests—(Optional) Number of ping requests to send. The range of values is 1 through 2,000,000,000. The default 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) bit in the IP header of the ping packets.

interval seconds—(Optional) How often to send ping requests. The range of values, in seconds, is 1 through infinity. The default value is 1.

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 request, include the count option.

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.

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.

wait *seconds*—(Optional) Delay, in seconds, after sending the last packet. If this option is not specified, the default delay is 10 seconds. If this option is used without the count option, a default count of 5 packets is used.

Required Privilege Level network

List of Sample Output ping clns on page 10

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.

```

ping clns user@host> ping clns 47.0005.9000.f800.0000.0108.0001.1921.6812.4058.00
PING 47.0005.9000.f800.0000.0108.0001.1921.6812.4058.00
(47.0005.9000.f800.0000.0108.0001.1921.6812.4058.00): 55 data bytes
64 bytes from 47.0005.9000.f800.0000.0108.0001.1921.6812.4058.00: seq=0 ttl=30
time=15.051 ms
64 bytes from 47.0005.9000.f800.0000.0108.0001.1921.6812.4058.00: seq=1 ttl=30
time=10.370 ms
64 bytes from 47.0005.9000.f800.0000.0108.0001.1921.6812.4058.00: seq=2 ttl=30
time=10.367 ms
--- ping statistics ---
3 packets transmitted, 3 packets received, 0% packet loss
round-trip min/avg/max/stddev = 10.367/11.929/15.051/2.207 ms

```

ping mpls l2circuit

Syntax ping mpls l2circuit (interface *interface-name* | virtual-circuit *virtual-circuit-id* neighbor *prefix-name*)
 <count *count*>
 <destination *address*>
 <detail>
 <exp *forwarding-class*>
 <source *source-address*>
 <v1>

Release Information Command introduced before JUNOS Release 7.4.

Description Check the operability of the Multiprotocol Label Switching (MPLS) Layer 2 circuit connections. Type Ctrl + c to interrupt a ping mpls l2circuit command.

Options interface *interface-name*—Ping an interface configured for the Layer 2 circuit on the egress provider edge (PE) router.

virtual-circuit *virtual-circuit-id* neighbor *prefix-name*—Ping a combination of the virtual circuit identifier on the egress PE router and the IPv4 prefix, testing the integrity of the Layer 2 circuit between the ingress and egress PE routers.

count *count*—(Optional) Number of ping requests to send. If *count* is not specified, five ping requests are sent. The range of values is 1 through 1,000,000. The default value is 5.

destination *address*—(Optional) Specify an address other than the default (127.0.0.1/32) for the ping echo requests. The address can be anything within the 127/8 subnet.

detail—(Optional) Display detailed information about the echo requests sent and received.

exp *forwarding class*—(Optional) Value of the forwarding class for the MPLS ping packets.

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).

v1—(Optional) Use the type 9 Layer 2 circuit type, length, and value (TLV).

Additional Information You must configure MPLS at the [edit protocols mpls] hierarchy level on the egress PE router (the router receiving the MPLS echo packets) to ping a Layer 2 circuit.

Required Privilege Level network

List of Sample Output ping mpls l2circuit interface detail on page 12
 ping mpls l2circuit virtual-circuit detail on page 12

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.

ping mpls l2circuit interface detail user@host> **ping mpls l2circuit interface so-1/0/0.1**
Request for seq 1, to interface 69, labels <100000, 100208>
Reply for seq 1, return code: Egress-ok, time: 0.439 ms

ping mpls l2circuit virtual-circuit detail user@host> **ping mpls l2circuit virtual-circuit 200 neighbor 10.255.245.122/32**
detail
Request for seq 1, to interface 68, labels <100048, 100128>
Reply for seq 1, return code: Egress-ok time: 0.539 ms

ping mpls l2vpn

Syntax ping mpls l2vpn (instance *instance-name* local-site-id *local-site-id-number* remote-site-id *remote-site-id-number* | interface *interface-name*)
 <bottom-label-ttl>
 <count *count*>
 <destination *address*>
 <detail>
 <exp *forwarding-class*>
 <source *source-address*>

Release Information Command introduced before JUNOS Release 7.4.

Description Check the operability of Multiprotocol Label Switching (MPLS) Layer 2 virtual private network (VPN) connections. Type Ctrl + c to interrupt a ping mpls l2vpn command.

Options instance *instance-name* local-site-id *local-site-id-number* remote-site-id *remote-site-id-number*—Ping a combination of the Layer 2 VPN routing instance name, the local site identifier, and the remote site identifier, testing the integrity of the Layer 2 VPN circuit (specified by the identifiers) between the ingress and egress provider edge (PE) routers.

interface *interface-name*—Ping an interface configured for the Layer 2 VPN on the egress PE router.

bottom-label-ttl—(Optional) Display the time-to-live value for the bottom label in the label stack.

count *count*—(Optional) Number of ping requests to send. If *count* is not specified, five ping requests are sent. The range of values is 1 through 1,000,000. The default value is 5.

destination *address*—(Optional) Specify an address other than the default (127.0.0.1/32) for the ping echo requests. The address can be anything within the 127/8 subnet.

detail—(Optional) Display detailed information about the echo requests sent and received.

exp *forwarding class*—(Optional) Value of the forwarding class for the MPLS ping packets.

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).

Additional Information	You must configure MPLS at the [edit protocols mpls] hierarchy level on the egress PE router (the router receiving the MPLS echo packets) to ping a Layer 2 circuit.
Required Privilege Level	network
List of Sample Output	ping mpls l2vpn instance on page 14 ping mpls l2vpn instance detail on page 14
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.
ping mpls l2vpn instance	<pre> user@host> ping mpls l2vpn instance vpn1 remote-site-id 1 local-site-id 2 !!!! --- lsping statistics --- 5 packets transmitted, 5 packets received, 0% packet loss </pre>
ping mpls l2vpn instance detail	<pre> user@host> ping mpls l2vpn instance vpn1 remote-site-id 1 local-site-id 2 detail Request for seq 1, to interface 68, labels <800001, 100176> Reply for seq 1, return code: Egress-ok Request for seq 2, to interface 68, labels <800001, 100176> Reply for seq 2, return code: Egress-ok Request for seq 3, to interface 68, labels <800001, 100176> Reply for seq 3, return code: Egress-ok Request for seq 4, to interface 68, labels <800001, 100176> Reply for seq 4, return code: Egress-ok Request for seq 5, to interface 68, labels <800001, 100176> Reply for seq 5, return code: Egress-ok --- lsping statistics --- 5 packets transmitted, 5 packets received, 0% packet loss </pre>

ping mpls l3vpn

Syntax ping mpls l3vpn prefix *prefix-name*
 <*l3vpn-name*>
 <bottom-label-ttl>
 <count *count*>
 <destination *address*>
 <detail>
 <exp *forwarding-class*>
 <source *source-address*>

Release Information Command introduced before JUNOS Release 7.4.

Description Check the operability of a Multiprotocol Label Switching (MPLS) Layer 3 virtual private network (VPN) connection. Type Ctrl + c to interrupt a ping mpls l3vpn command.

Options prefix *prefix-name*—Ping to test whether a prefix is present in a provider edge (PE) router's VPN routing and forwarding (VRF) table, by means of a Layer 3 VPN destination prefix. This option does not test the connection between a PE router and a customer edge (CE) router.

l3vpn-name—(Optional) Layer 3 VPN name.

bottom-label-ttl—(Optional) Display the time-to-live value for the bottom label in the label stack.

count *count*—(Optional) Number of ping requests to send. If *count* is not specified, five ping requests are sent. The range of values is 1 through 1,000,000. The default value is 5.

destination *address*—(Optional) Specify an address other than the default (127.0.0.1/32) for the ping echo requests. The address can be anything within the 127/8 subnet.

detail—(Optional) Display detailed information about the echo requests sent and received.

exp *forwarding class*—(Optional) Value of the forwarding class for the MPLS ping packets.

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.

Additional Information You must configure MPLS at the [edit protocols mpls] hierarchy level on the egress PE router (the router receiving the MPLS echo packets) to ping a Layer 2 circuit.

Required Privilege Level network

List of Sample Output ping mpls l3vpn on page 16
 ping mpls l3vpn detail on page 16

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.

```
ping mpls l3vpn user@host> ping mpls l3vpn vpn1 prefix 10.255.245.122/32
!!!!!!
--- lsping statistics ---
5 packets transmitted, 5 packets received, 0% packet loss
```

```
ping mpls l3vpn detail user@host> ping mpls l3vpn vpn1 prefix 10.255.245.122/32 detail
Request for seq 1, to interface 68, labels <100128, 100112>
Reply for seq 1, return code: Egress-ok
Request for seq 2, to interface 68, labels <100128, 100112>
Reply for seq 2, return code: Egress-ok
Request for seq 3, to interface 68, labels <100128, 100112>
Reply for seq 3, return code: Egress-ok
Request for seq 4, to interface 68, labels <100128, 100112>
Reply for seq 4, return code: Egress-ok
Request for seq 5, to interface 68, labels <100128, 100112>
Reply for seq 5, return code: Egress-ok
--- lsping statistics ---
5 packets transmitted, 5 packets received, 0% packet loss
```

ping mpls ldp

Syntax ping mpls ldp fec
 <count *count*>
 <destination *address*>
 <detail>
 <exp *forwarding-class*>
 <source *source-address*>

Release Information Command introduced before JUNOS Release 7.4.

Description Check the operability of Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP)-signaled label-switched path (LSP) connections. Type Ctrl + c to interrupt a ping mpls command.

Options *fec*—(Optional) Ping an LDP-signaled LSP using the forwarding equivalence class (FEC) prefix and length.

count count—(Optional) Number of ping requests to send. If *count* is not specified, five ping requests are sent. The range of values is 1 through 1,000,000. The default value is 5.

destination address—(Optional) Specify an address other than the default (127.0.0.1/32) for the ping echo requests. The address can be anything within the 127/8 subnet.

detail—(Optional) Display detailed information about the echo requests sent and received.

exp forwarding class—(Optional) Value of the forwarding class for the MPLS ping packets.

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.

Additional Information If the LSP changes, the label and interface information displayed when the ping command was issued continues to be used. You must configure MPLS at the [edit protocols mpls] hierarchy level on the remote router to ping an LSP terminating there. You must configure MPLS even if you intend to ping only LDP forwarding equivalence classes (FECs).

Required Privilege Level network

List of Sample Output ping mpls ldp fec count on page 18

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.

ping mpls ldp fec count user@host> **ping mpls ldp 10.255.245.222 count 10**
 !!!xx...x-- lsping statistics ---10 packets transmitted, 3 packets received,
 70% packet loss4 packets received with error status, not counted as received.

ping mpls lsp-end-point

Syntax ping mpls lsp-end-point *prefix-name*
 <count *count*>
 <destination *address*>
 <detail>
 <exp *forwarding-class*>
 <source *source-address*>

Release Information Command introduced before JUNOS Release 7.4.

Description Check the operability of Multiprotocol Label Switching (MPLS) label-switched path (LSP) endpoint connections. Type Ctrl + c to interrupt a ping mpls command.

Options *prefix-name*—Label Distribution Protocol (LDP) forwarding equivalence class (FEC) prefix or Resource Reservation Protocol (RSVP) LSP endpoint address.

count count—(Optional) Number of ping requests to send. If *count* is not specified, five ping requests are sent. The range of values is 1 through 1,000,000. The default value is 5.

destination address—(Optional) Specify an address other than the default (127.0.0.1/32) for the ping echo requests. The address can be anything within the 127/8 subnet.

detail—(Optional) Display detailed information about the echo requests sent and received.

exp forwarding class—(Optional) Value of the forwarding class for the MPLS ping packets.

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.

Additional Information If the LSP changes, the label and interface information displayed when the ping command was issued continues to be used. You must configure MPLS at the [edit protocols mpls] hierarchy level on the remote router to ping an LSP terminating there. You must configure MPLS even if you intend to ping only LDP forwarding equivalence classes (FECs).

Required Privilege Level network

List of Sample Output ping mpls lsp-end-point detail on page 20

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.

```

ping mpls lsp-end-point user@host> ping mpls lsp-end-point 10.255.245.119 detail
detail Route to end point address is via LDP FEC
Request for seq 1, to interface 67, label 100032
Reply for seq 1, return code: Egress-ok
Request for seq 2, to interface 67, label 100032
Reply for seq 2, return code: Egress-ok
Request for seq 3, to interface 67, label 100032
Reply for seq 3, return code: Egress-ok
Request for seq 4, to interface 67, label 100032
Reply for seq 4, return code: Egress-ok
Request for seq 5, to interface 67, label 100032
Reply for seq 5, return code: Egress-ok
--- lsping statistics ---
5 packets transmitted, 5 packets received, 0% packet loss

```


ping mpls rsvp

Syntax ping mpls rsvp *lsp-name*
 <count *count*>
 <destination *address*>
 <detail>
 <egress *egress-address*>
 <exp *forwarding-class*>
 <multipoint>
 <source *source-address*>
 <standby *standby-path-name*>

Release Information Command introduced before JUNOS Release 7.4. The **egress** and **multipoint** options were introduced in JUNOS Release 9.2.

Description Check the operability of Multiprotocol Label Switching (MPLS) Resource Reservation Protocol (RSVP)-signaled label-switched path (LSP) connections. Type Ctrl + c to interrupt a **ping mpls** command.

Options *lsp-name*—Ping an RSVP-signaled LSP using an LSP name.

count count—(Optional) Number of ping requests to send. If *count* is not specified, five ping requests are sent. The range of values is 1 through 1,000,000. The default value is 5.

destination address—(Optional) Specify an address other than the default (127.0.0.1/32) for the ping echo requests. The address can be anything within the 127/8 subnet.

detail—(Optional) Display detailed information about the echo requests sent and received.

egress egress-address—(Optional) Only the specified egress router responds to the ping request.

exp forwarding class—(Optional) Value of the forwarding class for the MPLS ping packets.

multipoint—(Optional) For point-to-multipoint LSPs (P2MP LSPs), sends ping requests to each of the egress routers participating in a P2MP LSP. You can also include the **egress** option to ping a specific egress router participating in a P2MP LSP.

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.

standby standby-path-name—(Optional) Name of the standby path.

Additional Information If the LSP changes, the label and interface information displayed when the **ping** command was issued continues to be used. You must configure MPLS at the [edit protocols mpls] hierarchy level on the remote router to ping an LSP terminating there.

You must configure MPLS even if you intend to ping only LDP forwarding equivalence classes (FECs).

Required Privilege Level network

List of Sample Output	<p>ping mpls rsvp (Echo Reply Received) on page 23</p> <p>ping mpls rsvp (Echo Reply with Error Code) on page 23</p> <p>ping mpls rsvp detail on page 23</p> <p>ping mpls rsvp multipoint egress detail count on page 23</p> <p>ping mpls rsvp multipoint detail count on page 23</p>
Output Fields	<p>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.</p>
ping mpls rsvp (Echo Reply Received)	<pre>user@host> ping mpls rsvp test1 !!!!!--- lsping statistics ---5 packets transmitted, 5 packets received, 0% packet loss</pre>
ping mpls rsvp (Echo Reply with Error Code)	<pre>user@host> ping mpls rsvp test2 !!xxx--- lsping statistics ---5 packets transmitted, 2 packets received, 60% packet loss3 packets received with error status, not counted as received.</pre>
ping mpls rsvp detail	<pre>user@host> ping mpls rsvp to-green detail Request for seq 1, to interface 67, labels <100095, 0, 0> Reply for seq 1, return code: Egress-ok Request for seq 2, to interface 67, labels <100095, 0, 0> Reply for seq 2, return code: Egress-ok</pre>
ping mpls rsvp multipoint egress detail count	<pre>user@host>ping mpls rsvp sample-lsp multipoint egress 192.168.1.3 detail count 1 Request for seq 1, to interface 70, label 299952 Request for seq 1, to interface 70, no label stack. Request for seq 1, to interface 67, no label stack. Reply for seq 1, egress 192.168.1.3, return code: Egress-ok, time: 0.242 ms Local transmit time: 1205310695s 215737us Remote receive time: 1205310695s 215979us --- lsping, egress 192.168.1.3 statistics --- 1 packets transmitted, 1 packets received, 0% packet loss</pre>
ping mpls rsvp multipoint detail count	<pre>user@host>ping mpls rsvp sample-lsp multipoint detail count 1 Request for seq 1, to interface 70, label 299952 Request for seq 1, to interface 70, no label stack. Request for seq 1, to interface 67, no label stack. Reply for seq 1, return code: Unknown TLV, time: 9.877 ms Local transmit time: 1205310615s 347317us Remote receive time: 1205310615s 357194us Reply for seq 1, egress 192.168.1.3, return code: Egress-ok, time: 0.351 ms Local transmit time: 1205310615s 347262us Remote receive time: 1205310615s 347613us Reply for seq 1, egress 192.168.1.13, return code: Egress-ok, time: 0.301 ms Local transmit time: 1205310615s 347167us Remote receive time: 1205310615s 347468us Timeout for seq 1, egress 192.168.1.1 Timeout for seq 1, egress 192.168.1.4 Timeout for seq 1, egress 192.168.1.14 --- lsping, egress 192.168.1.1 statistics --- 1 packets transmitted, 0 packets received, 100% packet loss</pre>

```
--- lsping, egress 192.168.1.3 statistics ---  
1 packets transmitted, 1 packets received, 0% packet loss  
  
--- lsping, egress 192.168.1.4 statistics ---  
1 packets transmitted, 0 packets received, 100% packet loss  
  
--- lsping, egress 192.168.1.13 statistics ---  
1 packets transmitted, 1 packets received, 0% packet loss  
  
--- lsping, egress 192.168.1.14 statistics ---  
1 packets transmitted, 0 packets received, 100% packet loss
```

ping vpls instance

Syntax ping vpls instance *instance-name* destination-mac *address* source-ip *address*
 <count *number*>
 <data-plane-response>
 <detail>
 <learning-vlan-id *number*>
 <logical-system *logical-system-name*>

Release Information Command introduced in JUNOS Release 9.1.

Description Check the operability of virtual private LAN service (VPLS) connections. Type Ctrl + c to interrupt a ping vpls instance command.

When you issue a ping vpls instance command, a chassis MAC address is drawn from the ingress PE router's pool of MAC addresses and used to create the VPLS ping packet. The ping packet is then forwarded to the egress PE router. When the egress PE router receives the ping packet, it learns the MAC address from the VPLS ping packet. The MAC address is added to the egress PE router's MAC table.

The ping vpls instance command relies on the LSP ping and trace infrastructure defined in RFC 4379, *Detecting Multi-Protocol Label Switched (MPLS) Data Plane Failures* and further enhancements defined in Internet draft draft-stokes-vkompella-ppvpn-hvpls-oam-02, *Testing Hierarchical Virtual Private LAN Services*.

Options instance *instance-name*—Specify the name of the VPLS routing instance.

destination-mac *address*—Specify a destination MAC address for the ping echo requests.

source ip *address*—IP address of the outgoing interface.

count *number*—(Optional) Number of ping requests to send. If count is not specified, five ping requests are sent. The range of values is 1 through 1,000,000. The default value is 5.

data-plane-response—(Optional) Request VPLS OAM responses using the data plane.

detail—(Optional) Display detailed information about the echo requests sent and received.

learning-vlan-id *number*—(Optional) Specify a learning VLAN identifier for the ping echo requests. The range of values is 0 through 4094.

logical-system *logical-system-name*—(Optional) Specify a logical system name for the ping echo requests.

Additional Information This statement is only supported on the MX-series routers, the M120, the M320, and the T1600.

Required Privilege Level network

List of Sample Output ping vpls instance on page 26

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.

ping vpls instance user@host> ping vpls instance red destination-mac 00:89:67:1a:23:6f source-ip 10.255.17.138

```
! -> sample-router:red:ge-4/1/1.0
! -> sample-router:red:ge-4/1/1.0
! -> sample-router:red:ge-4/1/1.0
! -> sample-router:red:ge-4/1/1.0

--- vpls ping statistics ---
4 packets transmitted, 4 packets received, 0% packet loss
```

Chapter 2

Interface Diagnostics Operational Mode Commands

Table 5 on page 27 summarizes the command-line interface (CLI) commands you can use to run diagnostics on router interfaces. Commands are listed in alphabetical order.

Table 5: Interface Diagnostics Operational Mode Commands

Task	Command
Start a bit error rate test (BERT) on a DS0 interface.	test interface ds0-bert-start
Stop a BERT on a DS0 interface.	test interface ds0-bert-stop
Start a BERT on an E1 interface.	test interface e1-bert-start
Stop a BERT on an E1 interface.	test interface e1-bert-stop
Start a BERT on an E3 interface.	test interface e3-bert-start
Stop a BERT on an E3 interface.	test interface e3-bert-stop
Transmit over a facilities data link (FDL) to initiate or terminate a far-end line loopback.	test interface fdl-line-loop
Transmit over an FDL to initiate or terminate a far-end payload loopback.	test interface fdl-payload-loop
Transmit the line loopback activate code word sequence on the interface's far-end alarm and control (FEAC) channel.	test interface feac-loop-initiate
Transmit the line loopback deactivate code word sequence on the interface's FEAC channel.	test interface feac-loop-terminate
Initiate or terminate a far-end line loopback.	test interface inband-line-loop
Initiate or terminate a far-end payload loopback.	test interface inband-payload-loop
Restart auto-negotiation on a Fast Ethernet or Gigabit Ethernet interface.	test interface restart-auto-negotiation
Start a BERT on a T1 interface.	test interface t1-bert-start

Table 5: Interface Diagnostics Operational Mode Commands *(continued)*

Task	Command
Stop a BERT on a T1 interface.	test interface t1-bert-stop
Start a BERT on a T3 interface.	test interface t3-bert-start
Stop a BERT on a T3 interface.	test interface t3-bert-stop



NOTE: For information about how to configure interface test parameters, see the *JUNOS Network Interfaces Configuration Guide*. For information about related tasks performed by network operations center (NOC) personnel, see the *JUNOS Interfaces Network Operations Guide*.

test interface ds0-bert-start

Syntax	test interface ds0-bert-start <i>ds-fpc/pic/port</i>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Start a bit error rate test (BERT) on a DS0 interface.
Options	<i>ds-fpc/pic/port</i> —DS0 interface name.
Additional Information	Before starting a BERT, you must disable the interface. To do so, include the <code>disable</code> statement at the <code>[edit interfaces <i>interface-name</i>]</code> hierarchy level. You can run a BERT on only one interface per PIC at a time.
Required Privilege Level	view
List of Sample Output	test interface ds0-bert-start on page 29
Output Fields	To display the results of the BERT, use the <code>show interfaces extensive</code> command.
test interface ds0-bert-start	user@host> test interface ds0-bert-start ds-1/0/0

test interface ds0-bert-stop

Syntax	test interface ds0-bert-stop <i>ds-fpc/pic/port</i>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Stop a bit error rate test (BERT) on a DS0 interface.
Options	<i>ds-fpc/pic/port</i> —DS0 interface name.
Required Privilege Level	view
List of Sample Output	test interface ds0-bert-stop on page 30
Output Fields	To display the results of the BERT, use the show interfaces extensive command.
test interface ds0-bert-stop	user@host> test interface ds0-bert-stop ds-1/0/0

test interface e1-bert-start

Syntax	test interface e1-bert-start <i>interface-name</i>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Start a bit error rate test (BERT) on an E1 interface.
Options	<i>interface-name</i> —Interface name: <i>e1-fpc/pic/port</i> or <i>ce1-fpc/pic/port<:channel></i>
Additional Information	Before starting a BERT, you must disable the interface. To do this, include the <code>disable</code> statement at the <code>[edit interfaces <i>interface-name</i>]</code> hierarchy level. You can run a BERT on only one interface per PIC at a time.
Required Privilege Level	view
List of Sample Output	test interface e1-bert-start on page 31
Output Fields	To display the results of the BERT, use the <code>show interfaces extensive</code> command.
test interface e1-bert-start	<pre>user@host> test interface e1-bert-start e1-1/0/0</pre>

test interface e1-bert-stop

Syntax	test interface e1-bert-stop <i>interface-name</i>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Stop a bit error rate test (BERT) on an E1 interface.
Options	<i>interface-name</i> —Interface name: <i>e1-fpc/pic/port</i> or <i>ce1-fpc/pic/port<:channel></i> .
Required Privilege Level	view
List of Sample Output	test interface e1-bert-stop on page 32
Output Fields	To display the results of the BERT, use the show interfaces extensive command.
test interface e1-bert-stop	user@host> test interface e1-bert-stop e1-1/0/0

test interface e3-bert-start

Syntax	test interface e3-bert-start <i>e3-fpc/pic/port</i>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Start a bit error rate test (BERT) on an E3 interface.
Options	<i>e3-fpc/pic/port</i> —E3 interface name.
Additional Information	Before starting a BERT, you must disable the interface. To do so, include the <code>disable</code> statement at the <code>[edit interfaces <i>interface-name</i>]</code> hierarchy level. You can run a BERT on only one interface per PIC at a time.
Required Privilege Level	view
List of Sample Output	test interface e3-bert-start on page 33
Output Fields	To display the results of the BERT, use the <code>show interfaces extensive</code> command.
test interface e3-bert-start	<pre>user@host> test interface e3-bert-start e3-1/0/0</pre>

test interface e3-bert-stop

Syntax	test interface e3-bert-stop <i>e3-fpc/pic/port</i>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Stop a bit error rate test (BERT) on an E3 interface.
Options	<i>e3-fpc/pic/port</i> —E3 interface name.
Required Privilege Level	view
List of Sample Output	test interface e3-bert-stop on page 34
Output Fields	To display the results of the BERT, use the show interfaces extensive command.
test interface e3-bert-stop	user@host> test interface e3-bert-stop e3-1/0/0

test interface fdl-line-loop

Syntax test interface fdl-line-loop (ansi (initiate | terminate) | bellcore (initiate | terminate))
t1-fpc/pic/port<:channel>

Release Information Command introduced before JUNOS Release 7.4.

Description Send commands over the facilities data link (FDL) on a T1 interface to initiate or terminate a far-end line loopback using either an ANSI or Bellcore FDL command code. If the far end of the connection is in C-bit parity mode and it has been configured to accept line loopback requests from the near end, the far end executes the request. See the ANSI T1.107 specification for more details.



NOTE: The following restrictions apply to this command:

- If you attach a SmartJack network interface unit (NIU) on the T1 connection between an M-series router with a channelized DS3 IQ, channelized OC3 IQ, or channelized OC12 IQ interface and a standard T1 interface, and you issue the **test interface fdl-line-loop bellcore initiate** command on the channelized T1 interface, the loopback test might not function correctly.
- On Channelized DS3-to-DS1 and Multichannel DS3 PICs, this command can only be initiated by T1 interfaces. These types of T1 interfaces cannot accept a request for this test sent by another router.
- This command is not supported on the 4-port T1 PIC.

Options ansi—ANSI FDL command code.

bellcore—Bellcore FDL command code.

initiate—Initiate the far-end line loopback.

terminate—Terminate the far-end line loopback.

t1-fpc/pic/port<:channel>—Name of a T1 interface. The channel number indicates a channelized interface.

Required Privilege Level view

List of Sample Output test interface fdl-line-loop on page 35

Output Fields To display the state and the number of times the interface has placed itself into remote loopback, use the **show interfaces extensive** command.

test interface fdl-line-loop user@host> test interface fdl-line-loop ansi initiate t1-1/0/0

test interface fdl-payload-loop

Syntax test interface fdl-payload-loop (ansi (initiate | terminate) | bellcore (initiate | terminate) t1-fpc/pic/port<:channel>)

Release Information Command introduced before JUNOS Release 7.4.

Description Send commands over the facilities data link (FDL) on a T1 interface to initiate or terminate a far-end payload loopback using either an ANSI or Bellcore FDL command code. If the far end of the connection is in C-bit parity mode and has been configured to accept payload loopback requests from the near end, the far end executes the request. See the ANSI T1.107 specification for more details.



NOTE: The following restrictions apply to this command:

- On Channelized DS3-to-DS1 and Multichannel DS3 PICs, this command can only be initiated by T1 interfaces. These types of T1 interfaces cannot accept a request for this test sent by another router.
 - This command is not supported on the 4-port T1 PIC.
-

Options ansi—ANSI FDL command code.

bellcore—Bellcore FDL command code.

initiate—Initiate the far-end payload loopback.

terminate—Terminate the far-end payload loopback.

t1-fpc/pic/port<:channel>—Name of a T1 interface. The channel number indicates a channelized interface.

Required Privilege Level view

List of Sample Output test interface fdl-payload-loop on page 36

Output Fields To display the state and the number of times the interface has placed itself into remote loopback, use the show interfaces extensive command.

test interface fdl-payload-loop user@host> test interface fdl-payload-loop ansi initiate t1-1/0/0

test interface feac-loop-initiate

Syntax `test interface t3-fpc/pic/port<:channel> feac-loop-initiate`

Release Information Command introduced before JUNOS Release 7.4.

Description Have the interface transmit the word sequence for the line loopback activate code on its far-end alarm and control (FEAC) channel. If the far end of the connection is in C-bit parity mode and has been configured to accept remote loopback requests from the near end, the far end places its interface into remote loopback. See the ANSI T1.107 specification for more details.



NOTE: This command is not supported for T3 interfaces configured on DS3 and Channelized OC12 PICs.

Options `t3-fpc/pic/port<:channel>`—Name of a T3 interface. The channel number indicates a channelized interface.

Required Privilege Level view

List of Sample Output test interface feac-loop-initiate on page 37

Output Fields To display the state and the number of times the interface has placed itself into remote loopback, use the `show interfaces extensive` command.

test interface feac-loop-initiate `user@host> test interface feac-loop-initiate t3-1/0/0`

test interface feac-loop-terminate

Syntax `test interface t3-fpc/pic/port <:channel> feac-loop-terminate`

Release Information Command introduced before JUNOS Release 7.4.

Description Have the interface transmit the line loopback deactivate code word sequence on its far-end alarm and control (FEAC) channel. If the far end of the connection is in C-bit parity mode and has been configured to accept remote loopback requests from the near end, the far end clears remote loopback on the interface. See the ANSI T1.107 specification for more details.



NOTE: This command is not supported for T3 interfaces configured on DS3 and Channelized OC12 PICs.

Options `t3-fpc/pic/port<:channel>`—Name of a T3 interface. The channel number indicates a channelized interface.

Required Privilege Level view

List of Sample Output test interface feac-loop-terminate on page 38

Output Fields To display the state and the number of times the interface has placed itself into remote loopback, use the `show interfaces extensive` command.

test interface feac-loop-terminate `user@host> test interface feac-loop-terminate t3-1/0/0`

test interface inband-line-loop

Syntax test interface inband-line-loop (ansi (initiate | terminate) | bellcore (initiate | terminate) t1-fpc/pic/port<:channel>)

Release Information Command introduced before JUNOS Release 7.4.

Description Send commands on a T1 interface to initiate or terminate a far-end line loopback using either an ANSI or Bellcore FDL command code. If the far end of the connection is in C-bit parity mode and it has been configured to accept line loopback requests from the near end, the far end executes the request.



NOTE: The following restrictions apply to this command:

- On Channelized DS3-to-DS1 and Multichannel DS3 PICs, this command can only be initiated by T1 interfaces. These types of T1 interfaces cannot accept a request for this test sent by another router.
 - This command is not supported on the 4-port T1 PIC.
-

Options ansi—ANSI FDL command code.

bellcore—Bellcore FDL command code.

initiate—Initiate the far-end payload loopback.

terminate—Terminate the far-end payload loopback.

t1-fpc/pic/port<:channel>—Name of a T1 interface. The channel number indicates a channelized interface.

Required Privilege Level view

List of Sample Output test interface inband-line-loop on page 39

Output Fields To display the state and the number of times the interface has placed itself into remote loopback, use the `show interfaces extensive` command.

test interface inband-line-loop user@host> test interface inband-line-loop ansi initiate t1-1/0/0

test interface inband-payload-loop

Syntax test interface inband-payload-loop (ansi (initiate | terminate) | bellcore (initiate | terminate) t1-fpc/pic/port<:channel>)

Release Information Command introduced before JUNOS Release 7.4.

Description Send commands on a T1 interface to initiate or terminate a far-end payload loopback using either an ANSI or Bellcore FDL command code. If the far end of the connection is in C-bit parity mode and has been configured to accept payload loopback requests from the near end, the far end executes the request.



NOTE: The following restrictions apply to this command:

- On Channelized DS3-to-DS1 and Multichannel DS3 PICs, this command can only be initiated by T1 interfaces. These types of T1 interfaces cannot accept a request for this test sent by another router.
 - This command is not supported on the 4-port T1 PIC.
-

Options ansi—ANSI FDL command code.

bellcore—Bellcore FDL command code.

initiate—Initiate the far-end payload loopback.

terminate—Terminate the far-end payload loopback.

t1-fpc/pic/port<:channel>—Name of a T1 interface. The channel number indicates a channelized interface.

Additional Information See the ANSI T1.107 specification for more details.

Required Privilege Level view

List of Sample Output test interface inband-payload-loop on page 40

Output Fields To display the state and the number of times the interface has placed itself into remote loopback, use the show interfaces extensive command.

test interface inband-payload-loop user@host> test interface inband-payload-loop ansi initiate t1-1/0/0

test interface restart-auto-negotiation

Syntax	test interface restart-auto-negotiation <i>interface-name</i>
Release Information	Command introduced in JUNOS Release 7.6.
Description	Restarts auto-negotiation on a Fast Ethernet or Gigabit Ethernet interface.
Options	<i>interface-name</i> —Interface name: <i>fe-fpc/pic/port</i> or <i>ge-fpc/pic/port</i> .
Required Privilege Level	view
List of Sample Output	test interface restart-auto-negotiation on page 41
Output Fields	Use the show interfaces extensive command to see the state for auto-negotiation.
test interface restart-auto-negotiation	user@host> test interface restart-auto-negotiation fe-1/0/0

test interface t1-bert-start

Syntax	test interface t1-bert-start <i>interface-name</i>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Start a bit error rate test (BERT) on a T1 interface.
Options	<i>interface-name</i> —Interface name: <i>t1-fpc/pic/port</i> or <i>ct1-fpc/pic/port<:channel></i> .
Additional Information	Before starting a BERT, you must disable the interface. To do so, include the disable statement at the [edit interfaces <i>interface-name</i>] hierarchy level. You can run a BERT on only one interface per PIC at a time.
Required Privilege Level	view
List of Sample Output	test interface t1-bert-start on page 42
Output Fields	To display the results of the BERT, use the show interfaces extensive command.
test interface t1-bert-start	<pre>user@host> test interface t1-bert-start t1-1/0/0</pre>

test interface t1-bert-stop

Syntax	test interface t1-bert-stop <i>interface-name</i>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Stop a bit error rate test (BERT) on a T1 interface.
Options	<i>interface-name</i> —Interface name: <i>t1-interface-name fpc/pic/port</i> or <i>ct1-fpc/pic/port<:channel></i> .
Required Privilege Level	view
List of Sample Output	test interface t1-bert-stop on page 43
Output Fields	To display the results of the BERT, use the show interfaces extensive command.
test interface t1-bert-stop	user@host> test interface t1-bert-stop t1-1/0/0

test interface t3-bert-start

Syntax	test interface t3-bert-start <i>interface-name</i>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Start a bit error rate test (BERT) on a T3 interface.
Options	<i>interface-name</i> —Interface name: <i>t3-fpc/pic/port</i> or <i>ct3-fpc/pic/port<:channel></i> .
Additional Information	Before starting a BERT, you must disable the interface. To do this, include the disable statement at the [edit interfaces <i>interface-name</i>] hierarchy level. You can run a BERT on only one interface per PIC at a time.
Required Privilege Level	view
List of Sample Output	test interface t3-bert-start on page 44
Output Fields	To display the results of the BERT, use the show interfaces extensive command.
test interface t3-bert-start	<pre>user@host> test interface t3-bert-start t3-1/0/0</pre>

test interface t3-bert-stop

Syntax	test interface t3-bert-stop <i>interface-name</i>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Stop a bit error rate test (BERT) on a T3 interface.
Options	<i>interface-name</i> —Interface name: <i>t3-fpc/pic/port</i> or <i>ct3-fpc/pic/port<:channel></i> .
Required Privilege Level	view
List of Sample Output	test interface t3-bert-stop on page 45
Output Fields	To display the results of the BERT, use the show interfaces extensive command.
test interface t3-bert-stop	user@host> test interface t3-bert-stop t3-1/0/0

Chapter 3

RADIUS Diagnostics Operational Mode Commands

Table 6 on page 47 summarizes RADIUS diagnostics commands that allow you to test RADIUS authentication by verifying a user, password, IP address, profile, and other RADIUS authentication attributes. Commands are listed in alphabetical order.

Table 6: RADIUS Operational Mode Commands

Task	Command
Test a RADIUS authentication profile	test access profile
Test RADIUS server authentication	test access radius-server

test access profile

Syntax	test access profile <i>profile-name</i> user <i>username</i> password <i>password</i> detail
Release Information	Command introduced in JUNOS Release 9.1.
Description	Specify a profile to use to get information from a RADIUS server, which includes all the information from the test access radius-server command.
Options	<p>detail—(Optional) Show the RADIUS attributes returned by the server.</p> <p>profile-name—Access profile name configured.</p> <p>password—Password for the username.</p> <p>username—User name to be authenticated to the RADIUS server.</p>
Required Privilege Level	view
List of Sample Output	<p>test access profile on page 49</p> <p>test access profile detail on page 49</p>
Output Fields	Table 7 on page 48 lists the output fields for the test access profile command. Output fields are listed in the approximate order in which they appear.

Table 7: test access profile Output Fields

Field Name	Field Description
Profile Name	Name of the configured access profile.
Client Username	The user name authenticated by the RADIUS server.
Client Password	The user password authenticated by the RADIUS server.
Num Servers	Number of RADIUS servers in the configured access profile.
Server List	List of RADIUS servers in the configure access profile.
IP Address	The IP address of the RADIUS server authenticated.
UDP Port	The RADIUS server port utilized during the authentication test.
Source Address	The source IP address of the client making the RADIUS request. If no address is shown, it defaults to the address of the outgoing interface.
Timeout	The RADIUS server timeout period.
Retry Count	The number of authentication attempts allowed by the RADIUS server.
Secret	The shared secret used for authentication with the RADIUS server.

Table 7: test access profile Output Fields (continued)

Field Name	Field Description
Status	The test result status (Accepted or Rejected) and the number of retransmits utilized during authentication.
Attempts	The number of authentication attempts on the RADIUS server.
Attribute List	The list of returned RADIUS attributes, sorted by the attribute name, and including parameter length and value. See your RADIUS server documentation for attribute descriptions.
(Attribute) Name	The name of the attribute.
(Attribute) Length	The attribute length in bytes.
(Attribute) Value	The attribute value.

test access profile The following example uses the **test access profile** command to access and display basic information about the RADIUS server(s) shown in the resulting output:

```

user@host> test access profile alpha user TEST password TEST
user@host> test access profile alpha user TEST password TEST
Test Radius Profile Access
  Profile Name      : alpha
  Client Username   : TEST
  Client Password   : TEST
  Num Servers       : 5
    Server List
      IP Address    UDP   Source   Retry   Status
      Attempts      Port   Address  Timeout Count Secret
1.1.1.1            1812  10.10.10.10  2       1    TEST    Timeout
2
1.2.3.4            1812  Default    1       2    TEST    Timeout
3
192.168.10.10     1812  Default    3       3    TEST    Accepted
1

```

test access profile detail The following example uses the **test access profile detail** command to access and display detailed information about the RADIUS server(s) shown in the resulting output:

```

user@host> test access profile alpha user TEST password TEST detail
user@host> test access profile alpha user TEST password TEST detail
Test Radius Profile Access Detailed
  Profile Name      : alpha
  Client Username   : TEST
  Client Password   : TEST
  Num Servers       : 5
    Radius Server List
      IP Address    : 1.2.3.4
      UDP Port      : 1812
      Source Address : 192.168.10.10
      Timeout       : 2
      Retry Count    : 1
      Secret        : TEST

```

```
Status      : Timeout
Attempts    : 2
```

```
IP Address   : 1.2.3.5
UDP Port     : 1812
Source Address : Default
Timeout      : 1
Retry Count  : 2
Secret       : TEST
Status      : Timeout
Attempts    : 3
```

```
IP Address   : 192.168.10.10
UDP Port     : 1812
Source Address : Default
Timeout      : 3
Retry Count  : 3
Secret       : TEST
Status      : Accepted
Attempts    : 1
```

Attribute List

Name	Length	Value
Class	52	SBR2CLÍ½%¿ð0%¿
Acct-Interim-Interval	4	5
Callback-Id	12	123-456-789
Callback-Number	13	555-555-1212
Class	15	Class information
Filter-Id	4	999
Filter-Id	6	12345
Framed-Compression	4	0
Framed-IP-Address	4	1:2:3:4
Framed-IP-Netmask	4	255:255:255:255
Framed-IPv6-Route	15	1:2:3:4:5:6:7:8
Framed-MTU	4	1024
Framed-Pool	9	pool sbr
Framed-Protocol	4	1
Framed-Route	8	iproute
Framed-Routing	4	0
Vendor-Specific	11	583
Idle-Timeout	4	3
Vendor-Specific	10	a4c
Vendor-Specific	14	a4c
Login-IP-Host	4	10:1:1:1
Login-LAT-Group	10	lat group
Login-LAT-Node	9	lat node
Login-LAT-Port	9	lat port
Login-LAT-Service	12	lat service
Login-Service	4	0
Login-TCP-Port	4	1812
Vendor-Specific	10	137
Vendor-Specific	38	137
Vendor-Specific	10	137
Vendor-Specific	9	137
Vendor-Specific	16	137
Vendor-Specific	10	137
Vendor-Specific	10	137
Vendor-Specific	10	137
Vendor-Specific	9	137
Vendor-Specific	10	137

Vendor-Specific	10	137
Vendor-Specific	10	137
Vendor-Specific	10	137
Password-Retry	4	3
Port-Limit	4	100
Prompt	4	
Reply-Message	18	Radius Server SB
Service-Type	4	2
Session-Timeout	4	10
Termination-Action	4	1
Tunnel-Assignment-ID	4	
Tunnel-Client-Auth-ID	6	
Tunnel-Client-Endpoint	4	
Tunnel-Password	19	
Tunnel-Type	4	12
MS BAP Usage	4	0
MS-CHAP MPPE-Keys	32	-1234567890
MS-CHAP2 Success	3	123456789
MS Filter	10	ms-filter
MS Link Drop Time Limit	4	5
MS Link Utilization Threshold	4	6
MS MPPE Encryption Policy	4	1
MS MPPE Encryption Types	3	-556677889
MS Primary DNS Server	4	1:1:1:1
MS Primary NBNS Server	4	2:2:2:2
MS Secondary DNS Server	4	3:3:3:3
MS Secondary NBNS Server	4	4:4:4:4

test access radius-server

Syntax test access radius-server *address* user *username* password *password* secret *secret*
 <authentication-port *port*>
 <retry *number*>
 <source-address *address*>
 <timeout *number*>

Release Information Command introduced in JUNOS Release 9.1.

Description Verify RADIUS server authentication parameters.

Options *address*—RADIUS server under test IP address.

authentication-port—(Optional) RADIUS server authentication port number (1..65535).

password—Password for the user.

retry—(Optional) Retry attempts (1..10).

secret—Shared secret with the RADIUS server.

source-address—(Optional) Use an alternate address as the source address.

timeout—(Optional) Request timeout period (1..90 seconds).

user—User name to be authenticated to the RADIUS server.

Required Privilege Level view

List of Sample Output test access radius-server user password secret on page 53

Output Fields Table 8 on page 52 lists the output fields for the test access radius-server command. Output fields are listed in the approximate order in which they appear.

Table 8: test access radius-server Output Fields

Field Name	Field Description
Server	The IP address of the RADIUS server authenticated.
UDP port	The RADIUS server port utilized during the authentication test.
Source IP Address	Default is shown if the same as the RADIUS server or alternately, an IP address specified for authentication.
Server timeout	The RADIUS server timeout period.
Sever retry count	The number of authentication attempts allowed by the RADIUS server.
Secret	The shared secret used for authentication with the RADIUS server.

Table 8: test access radius-server Output Fields *(continued)*

Field Name	Field Description
Client Username	The user name authenticated by the RADIUS server.
Client Password	The user password authenticated by the RADIUS server.
Status	The test result status (Accepted or Rejected) and the number of retransmits utilized during authentication

**test access
radius-server user
password secret**

The following example command tests RADIUS authentication with a specific server (172.28.30.95), user (JOHNDOE), secret (No1Knows), and password (JohnPass); and displays the resulting output:

```
user@host> test access radius-server 172.28.30.95 user JOHNDOE password JohnPass
secret No1Knows
Test Radius Server Access
  Server          : 172.28.30.95
  UDP port        : 1812
  Source IP Address : Default
  Server timeout   : 3
  Sever retry count : 3
  Secret           : No1Knows
  Client Username  : JOHNDOE
  Client Password  : JohnPass
  Status           : Accepted, retransmits: 0
```


Chapter 4

Real-Time Performance Monitoring Operational Mode Commands

Table 9 on page 55 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot real-time performance monitoring (RPM). Commands are listed in alphabetical order.

Table 9: RPM Operational Mode Commands

Task	Command
Clear Two-Way Active Measurement Protocol (TWAMP) connections and associated sessions.	<code>clear services rpm twamp server connection</code>
Show configured probe servers.	<code>show services rpm active-servers</code>
Show the results of the last 50 completed probes for each RPM instance.	<code>show services rpm history-results</code>
Show probe results.	<code>show services rpm probe-results</code>
Show TWAMP connections.	<code>show services rpm twamp server connection</code>
Show TWAMP sessions.	<code>show services rpm twamp server session</code>



NOTE: For information about how to configure RPM, see the *JUNOS Services Interfaces Configuration Guide*.

clear services rpm twamp server connection

Syntax	clear services rpm twamp server connection <i><connection-id></i>
Release Information	Command introduced in JUNOS Release 9.3.
Description	Clear connections established between the RPM Two—Way Active Measurement Protocol server and control clients. By default all established connections are cleared (along with the sessions on those connections). To clear only a specific connection, specify the connection ID when you issue the command.
Options	<i>connection-id</i> —(Optional) Clear only the specified connection.
Required Privilege Level	clear

show services rpm active-servers

Syntax	show services rpm active-servers
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display the protocols and corresponding ports for which a router is configured as a real-time performance monitoring (RPM) server.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show services rpm active-servers on page 57
Output Fields	Table 10 on page 57 lists the output fields for the show services rpm active-servers command. Output fields are listed in the approximate order in which they appear.

Table 10: show services rpm active-servers Output Fields

Field Name	Field Description
Protocol	Protocol configured on the receiving probe server. The protocol can be the User Datagram Protocol (UDP) or the Transmission Control Protocol (TCP).
Port	Port configured on the receiving probe server.
Destination interface name	Output interface name for the probes.

show services rpm active-servers user@host> **show services rpm active-servers**
 Protocol: TCP, Port: 50000, Destination interface name: lt-0/0/0.0
 Protocol: UDP, Port: 50001, Destination interface name: lt-0/0/0.0

show services rpm history-results

Syntax	show services rpm history-results <brief detail> <owner <i>owner</i> > <since <i>time</i> > <test <i>name</i> >
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display standard information about the results of the last 50 probes for each real-time performance monitoring (RPM) instance.
Options	<p>none—Display the results of the last 50 probes for all RPM instances.</p> <p>brief detail—(Optional) Display the specified level of output.</p> <p>owner <i>owner</i>—(Optional) Display information for the specified probe owner.</p> <p>since <i>time</i>—(Optional) Display information from the specified time. Specify time as <i>yyyy-mm-dd.hh:mm:ss</i>.</p> <p>test <i>name</i>—(Optional) Display information for the specified test.</p>
Required Privilege Level	view
List of Sample Output	<p>show services rpm history-results on page 59</p> <p>show services rpm history-results detail on page 60</p>
Output Fields	Table 11 on page 58 lists the output fields for the <code>show services rpm history-results</code> command. Output fields are listed in the approximate order in which they appear.

Table 11: show services rpm history-results Output Fields

Field Name	Field Description	Level of Output
Owner	Probe owner.	All levels
Test	Name of a test for a probe instance.	All levels
Probe received	Timestamp when the probe result was determined.	All levels
Round trip time	Average ping round-trip time (RTT), in microseconds.	All levels
Probe results	<p>Result of a particular probe performed by a remote host. The following information is contained in the results:</p> <ul style="list-style-type: none"> ■ Response received—Timestamp when the probe result was determined. ■ Rtt—Average ping round-trip time (RTT), in microseconds. 	detail
Results over current test	Displays the results for the current test by probe at the time each probe was completed, as well as the status of the current test at the time the probe was completed.	detail

Table 11: show services rpm history-results Output Fields (continued)

Field Name	Field Description	Level of Output
Probes sent	Number of probes sent with the current test.	detail
Probes received	Number of probe responses received within the current test.	detail
Loss percentage	Percentage of lost probes for the current test.	detail
Measurement	<p>Increment of measurement. Possible values are round-trip time delay and, for the probe type icmp-pin-timestamp, the egress and ingress delay:</p> <ul style="list-style-type: none"> ■ Minimum—Minimum RTT, ingress delay, or egress delay measured over the course of the current test. ■ Maximum—Maximum RTT, ingress delay, or egress delay measured over the course of the current test. ■ Average—Average RTT, ingress delay, or egress delay measured over the course of the current test. ■ Jitter—Difference, in microseconds, between the maximum and minimum RTT measured over the course of the current test. ■ Stddev—Standard deviation of the round-trip time, in microseconds, measured over the course of the current test. 	detail

```

show services rpm history-results user@host> show services rpm history-results
Owner, Test      Probe received      Round trip time
flintstone, 0    Tue Dec 28 15:56:22 2004    158 usec
flintstone, 0    Tue Dec 28 15:56:23 2004    218 usec
flintstone, 0    Tue Dec 28 15:56:24 2004    161 usec
flintstone, 0    Tue Dec 28 15:56:25 2004    184 usec
flintstone, 0    Tue Dec 28 15:56:30 2004    332 usec
flintstone, 0    Tue Dec 28 15:56:31 2004    132 usec
flintstone, 0    Tue Dec 28 15:56:32 2004    226 usec
flintstone, 0    Tue Dec 28 15:56:33 2004    191 usec
flintstone, 0    Tue Dec 28 15:56:34 2004    179 usec
flintstone, 0    Tue Dec 28 15:56:39 2004    217 usec
flintstone, 0    Tue Dec 28 15:56:40 2004    141 usec
flintstone, 0    Tue Dec 28 15:56:41 2004    230 usec
flintstone, 0    Tue Dec 28 15:56:42 2004    248 usec
flintstone, 0    Tue Dec 28 15:56:43 2004    234 usec
flintstone, 0    Tue Dec 28 15:56:48 2004    251 usec
flintstone, 0    Tue Dec 28 15:56:49 2004    134 usec
flintstone, 0    Tue Dec 28 15:56:50 2004    272 usec
flintstone, 0    Tue Dec 28 15:56:51 2004    181 usec
flintstone, 0    Tue Dec 28 15:56:52 2004    216 usec
flintstone, 0    Tue Dec 28 15:56:57 2004    227 usec
flintstone, 0    Tue Dec 28 15:56:58 2004    133 usec

```

```

show services rpm      user@host> show services rpm history-results detail
history-results detail Owner: flintstone, Test: 0
                          Probe results:
                            Response received, Tue Dec 28 15:56:39 2004
                            Rtt: 217 usec
                          Results over current test:
                            Probes sent: 1, Probes received: 1, Loss percentage: 0
                            Measurement: Round trip time
                              Minimum: 217 usec, Maximum: 217 usec, Average: 217 usec,
                              Jitter: 0 usec, Stddev: 0 usec

                          Owner: flintstone, Test: 0
                          Probe results:
                            Response received, Tue Dec 28 15:56:40 2004
                            Rtt: 141 usec
                          Results over current test:
                            Probes sent: 2, Probes received: 2, Loss percentage: 0
                            Measurement: Round trip time
                              Minimum: 141 usec, Maximum: 217 usec, Average: 179 usec,
                              Jitter: 76 usec, Stddev: 38 usec

                          Owner: flintstone, Test: 0
                          Probe results:
                            Response received, Tue Dec 28 15:56:41 2004
                            Rtt: 230 usec
                          Results over current test:
                            Probes sent: 3, Probes received: 3, Loss percentage: 0
                            Measurement: Round trip time
                              Minimum: 141 usec, Maximum: 230 usec, Average: 196 usec,
                              Jitter: 89 usec, Stddev: 39 usec

                          Owner: flintstone, Test: 0
                          Probe results:
                            Response received, Tue Dec 28 15:56:42 2004
                            Rtt: 248 usec
                          Results over current test:
                            Probes sent: 4, Probes received: 4, Loss percentage: 0
                            Measurement: Round trip time
                              Minimum: 141 usec, Maximum: 248 usec, Average: 209 usec,
                              Jitter: 107 usec, Stddev: 41 usec

```


show services rpm probe-results

Syntax	show services rpm probe-results <owner <i>owner</i> > <test <i>name</i> >
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display the results of the most recent real-time performance monitoring (RPM) probes.
Options	none—Display all results of the most recent RPM probes. owner <i>owner</i> —(Optional) Display information for the specified probe owner. test <i>name</i> —(Optional) Display information for the specified test.
Required Privilege Level	view
List of Sample Output	show services rpm probe-results on page 64 show services rpm probe-results (BGP Neighbor Discovery) on page 66
Output Fields	Table 12 on page 61 lists the output fields for the show services rpm probe-results command. Output fields are listed in the approximate order in which they appear.

Table 12: show services rpm probe-results Output Fields

Field Name	Field Description
Owner	Owner name. When you configure the probe owner statement at the [edit services rpm] hierarchy level, this field displays the configured owner name. When you configure BGP neighbor discovery through RPM, the output for this field is Rpm-Bgp-Owner.
Test	Name of a test representing a collection of probes. When you configure the test test-name statement at the [edit services rpm probe owner] hierarchy level, the field displays the configured test name. When you configure BGP neighbor discovery through RPM, the output for this field is Rpm-BGP-Test- <i>n</i> , where <i>n</i> is a cumulative number.
Target address	Destination address used for the probes.
Source address	Source address used for the probes.
Probe type	Reflects the protocol configured on the receiving probe server. The following protocol types can be configured: http-get, http-metadata-get, icmp-ping, icmp-ping-timestamp, tcp-ping, udp-ping, and udp-ping-timestamp.
Test size	Number of probes within a test.

Table 12: show services rpm probe-results Output Fields *(continued)*

Field Name	Field Description
Routing Instance Name	<p>(BGP neighbor discovery) Name of the configured (if any) routing instance, logical system name, or both, in which the probe is configured:</p> <ul style="list-style-type: none"> ■ When a routing instance is defined within a logical system, the logical system name is followed by the routing instance name. A slash (/) is used to separate the two entities. For example, if the routing instance called R1 is configured within the logical system called LS, the name in the output field is LS/R1. ■ When a routing instance is configured but the default logical system is used, the name in the output field is the name of the routing instance. ■ When a logical system is configured but the default routing instance is used, the name in the output field is the name of the logical system followed by default. A slash (/) is used to separate the two entities. For example, LS/default.
Probe results	<p>Raw measurement of a particular probe sample done by a remote host. This data is provided separately from the calculated results. The following information is contained in the raw measurement:</p> <ul style="list-style-type: none"> ■ Response received—Timestamp when the probe result was determined. ■ Client and server hardware timestamps—If timestamps are configured, an entry appears at this point. ■ Rtt—Average ping round-trip time (RTT), in microseconds. ■ Egress jitter—Egress jitter, in microseconds. ■ Ingress jitter—Ingress jitter, in microseconds. ■ Round trip jitter—Round-trip jitter, in microseconds. ■ Egress interarrival jitter—Egress interarrival jitter, in microseconds. ■ Ingress interarrival jitter—Ingress interarrival jitter, in microseconds. ■ Round trip interarrival jitter—Round-trip interarrival jitter, in microseconds.

Table 12: show services rpm probe-results Output Fields (continued)

Field Name	Field Description
Results over current test	<p>Probes are grouped into tests, and the statistics are calculated for each test. If a test contains 10 probes, the average, minimum, and maximum results are calculated from the results of those 10 probes. If the command is issued while the test is in progress, the statistics use information from the completed probes.</p> <ul style="list-style-type: none"> ■ Probes sent—Number of probes sent within the current test. ■ Probes received—Number of probe responses received within the current test. ■ Loss percentage—Percentage of lost probes for the current test. ■ Measurement—Measurement type. Possible values are round-trip time, positive round-trip jitter, negative round-trip jitter, egress time, positive egress jitter, negative egress jitter, ingress time, positive ingress jitter, negative ingress jitter, and, for the probe type <code>icmp-ping-timestamp</code>, the egress delay and ingress delay. <p>For each measurement type, the following individual calculated results are provided:</p> <ul style="list-style-type: none"> ■ Samples—Number of probes. ■ Minimum—Minimum RTT, ingress delay, or egress delay measured over the course of the current test. ■ Maximum—Maximum RTT, ingress delay, or egress delay measured over the course of the current test. ■ Average—Average RTT, ingress delay, or egress delay measured over the course of the current test. ■ Peak to peak—Peak-to-peak difference, in microseconds. ■ Stddev—Standard deviation, in microseconds. ■ Sum—Statistical sum.
Results over last test	<p>Results for the most recently completed test. If the command is issued while the first test is in progress, this information is not displayed</p> <ul style="list-style-type: none"> ■ Probes sent—Number of probes sent for the most recently completed test. ■ Probes received—Number of probe responses received for the most recently completed test. ■ Loss percentage—Percentage of lost probes for the most recently completed test. ■ Test completed—Time the most recent test was completed. ■ Measurement—Measurement type. Possible values are round-trip time, positive round-trip jitter, negative round-trip jitter, egress time, positive egress jitter, negative egress jitter, ingress time, positive ingress jitter, negative ingress jitter, and, for the probe type <code>icmp-ping-timestamp</code>, the egress delay and ingress delay. <p>For each measurement type, the following individual calculated results are provided:</p> <ul style="list-style-type: none"> ■ Samples—Number of probes. ■ Minimum—Minimum RTT, ingress delay, or egress delay measured for the most recently completed test. ■ Maximum—Maximum RTT, ingress delay, or egress delay measured for the most recently completed test. ■ Average—Average RTT, ingress delay, or egress delay measured for the most recently completed test. ■ Peak to peak—Peak-to-peak difference, in microseconds. ■ Stddev—Standard deviation, in microseconds. ■ Sum—Statistical sum.

Table 12: show services rpm probe-results Output Fields (continued)

Field Name	Field Description
Results over all tests	<p>Displays statistics made for all the probes, independently of the grouping into tests, as well as statistics for the current test.</p> <ul style="list-style-type: none"> ■ Probes sent—Number of probes sent in all tests. ■ Probes received—Number of probe responses received in all tests. ■ Loss percentage—Percentage of lost probes in all tests. ■ Measurement—Measurement type. Possible values are round-trip time, positive round-trip jitter, negative round-trip jitter, egress time, positive egress jitter, negative egress jitter, ingress time, positive ingress jitter, negative ingress jitter, and, for the probe types <code>icmp-ping-timestamp</code> and <code>udp-ping-timestamp</code>, the egress delay and ingress delay. <p>For each measurement type, the following individual calculated results are provided:</p> <ul style="list-style-type: none"> ■ Samples—Number of probes. ■ Minimum—Minimum RTT, ingress delay, or egress delay measured over the course of the current test. ■ Maximum—Maximum RTT, ingress delay, or egress delay measured over the course of the current test. ■ Average—Average RTT, ingress delay, or egress delay measured over the course of the current test. ■ Peak to peak—Peak-to-peak difference, in microseconds. ■ Stddev—Standard deviation, in microseconds. ■ Sum—Statistical sum.

```

show services rpm probe-results  user@host> show services rpm probe-results
Owner: ADSN-J4300.ADSN-J2300.D2, Test: 75300002
Target address: 172.16.54.172, Source address: 10.206.0.1,
Probe type: udp-ping-timestamp, Test size: 10 probes
Probe results:
  Response received, Tue Feb  6 14:53:15 2007,
  Client and server hardware timestamps
  Rtt: 575 usec, Egress jitter: 5 usec, Ingress jitter: 8 usec,
  Round trip jitter: 12 usec, Egress interarrival jitter: 8 usec,
  Ingress interarrival jitter: 7 usec, Round trip interarrival jitter: 7 usec,

  Round trip interarrival jitter: 669 usec
Results over current test:
  Probes sent: 10, Probes received: 10, Loss percentage: 0
  Measurement: Round trip time
    Samples: 10, Minimum: 805 usec, Maximum: 2859 usec, Average: 1644 usec,
    Peak to peak: 2054 usec, Stddev: 738 usec, Sum: xxxx usec
  Measurement: Positive round trip jitter
    Samples: 5, Minimum: 5 usec, Maximum: 2054 usec, Average: 876 usec,
    Peak to peak: 2049 usec, Stddev: 679 usec, Sum: xxxx usec
  Measurement: Negative round trip jitter
    Samples: 5, Minimum: 5 usec, Maximum: 1812 usec, Average: 926 usec,
    Peak to peak: 1807 usec, Stddev: 665 usec, Sum: xxxx usec
  Measurement: Egress time
    Samples: 10, Minimum: 805 usec, Maximum: 2859 usec, Average: 1644 usec,
    Peak to peak: 2054 usec, Stddev: 738 usec, Sum: xxxx usec
  Measurement: Positive Egress jitter
    Samples: 5, Minimum: 5 usec, Maximum: 2054 usec, Average: 876 usec,

```

```

    Peak to peak: 2049 usec, Stddev: 679 usec, Sum: xxxx usec
Measurement: Negative Egress jitter
    Samples: 5, Minimum: 5 usec, Maximum: 1812 usec, Average: 926 usec,
    Peak to peak: 1807 usec, Stddev: 665 usec, Sum: xxxx usec
Measurement: Ingress time
    Samples: 10, Minimum: 805 usec, Maximum: 2859 usec, Average: 1644 usec,
    Peak to peak: 2054 usec, Stddev: 738 usec, Sum: xxxx usec
Measurement: Positive Ingress jitter
    Samples: 5, Minimum: 5 usec, Maximum: 2054 usec, Average: 876 usec,
    Peak to peak: 2049 usec, Stddev: 679 usec, Sum: xxxx usec
Measurement: Negative Ingress jitter
    Samples: 5, Minimum: 5 usec, Maximum: 1812 usec, Average: 926 usec,
    Peak to peak: 1807 usec, Stddev: 665 usec, Sum: xxxx usec
Results over last test:
Probes sent: 10, Probes received: 10, Loss percentage: 0
Test completed on Tue Feb 6 14:53:16 2007
Measurement: Round trip time
    Samples: 10, Minimum: 805 usec, Maximum: 2859 usec, Average: 1644 usec,
    Peak to peak: 2054 usec, Stddev: 738 usec, Sum: xxxx usec
Measurement: Positive round trip jitter
    Samples: 5, Minimum: 5 usec, Maximum: 2054 usec, Average: 876 usec,
    Peak to peak: 2049 usec, Stddev: 679 usec, Sum: xxxx usec
Measurement: Negative round trip jitter
    Samples: 5, Minimum: 5 usec, Maximum: 1812 usec, Average: 926 usec,
    Peak to peak: 1807 usec, Stddev: 665 usec, Sum: xxxx usec
Measurement: Egress time
    Samples: 10, Minimum: 805 usec, Maximum: 2859 usec, Average: 1644 usec,
    Peak to peak: 2054 usec, Stddev: 738 usec, Sum: xxxx usec
Measurement: Positive Egress jitter
    Samples: 5, Minimum: 5 usec, Maximum: 2054 usec, Average: 876 usec,
    Peak to peak: 2049 usec, Stddev: 679 usec, Sum: xxxx usec
Measurement: Negative Egress jitter
    Samples: 5, Minimum: 5 usec, Maximum: 1812 usec, Average: 926 usec,
    Peak to peak: 1807 usec, Stddev: 665 usec, Sum: xxxx usec
Measurement: Ingress time
    Samples: 10, Minimum: 805 usec, Maximum: 2859 usec, Average: 1644 usec,
    Peak to peak: 2054 usec, Stddev: 738 usec, Sum: xxxx usec
Measurement: Positive Ingress jitter
    Samples: 5, Minimum: 5 usec, Maximum: 2054 usec, Average: 876 usec,
    Peak to peak: 2049 usec, Stddev: 679 usec, Sum: xxxx usec
Measurement: Negative Ingress jitter
    Samples: 5, Minimum: 5 usec, Maximum: 1812 usec, Average: 926 usec,
    Peak to peak: 1807 usec, Stddev: 665 usec, Sum: xxxx usec
Results over all tests:
Probes sent: 560, Probes received: 560, Loss percentage: 0
Measurement: Round trip time
    Samples: 560, Minimum: 805 usec, Maximum: 3114 usec, Average: 1756 usec,

    Peak to peak: 2309 usec, Stddev: 519 usec, Sum: xxxx usec
Measurement: Positive round trip jitter
    Samples: 257, Minimum: 0 usec, Maximum: 2054 usec, Average: 597 usec,
    Peak to peak: 2054 usec, Stddev: 427 usec, Sum: xxxx usec
Measurement: Negative round trip jitter
    Samples: 302, Minimum: 1 usec, Maximum: 1812 usec, Average: 511 usec,
    Peak to peak: 1811 usec, Stddev: 408 usec, Sum: xxxx usec
Measurement: Egress time
    Samples: 10, Minimum: 805 usec, Maximum: 2859 usec, Average: 1644 usec,
    Peak to peak: 2054 usec, Stddev: 738 usec, Sum: xxxx usec
Measurement: Positive Egress jitter
    Samples: 5, Minimum: 5 usec, Maximum: 2054 usec, Average: 876 usec,
    Peak to peak: 2049 usec, Stddev: 679 usec, Sum: xxxx usec

```

```

Measurement: Negative Egress jitter
  Samples: 5, Minimum: 5 usec, Maximum: 1812 usec, Average: 926 usec,
  Peak to peak: 1807 usec, Stddev: 665 usec, Sum: xxxx usec
Measurement: Ingress time
  Samples: 10, Minimum: 805 usec, Maximum: 2859 usec, Average: 1644 usec,
  Peak to peak: 2054 usec, Stddev: 738 usec, Sum: xxxx usec
Measurement: Positive Ingress jitter
  Samples: 5, Minimum: 5 usec, Maximum: 2054 usec, Average: 876 usec,
  Peak to peak: 2049 usec, Stddev: 679 usec, Sum: xxxx usec
Measurement: Negative Ingress jitter
  Samples: 5, Minimum: 5 usec, Maximum: 1812 usec, Average: 926 usec,
  Peak to peak: 1807 usec, Stddev: 665 usec, Sum: xxxx usec

```

**show services rpm
probe-results (BGP
Neighbor Discovery)**

```

user@host> show services rpm probe-results
Owner: Rpm-Bgp-Owner, Test: Rpm-Bgp-Test-1
Target address: 10.209.152.37, Probe type: icmp-ping, Test size: 5 probes
Routing Instance Name: LS1/RI1
Probe results:
  Response received, Fri Oct 28 05:20:23 2005
  Rtt: 662 usec
Results over current test:
  Probes sent: 5, Probes received: 5, Loss percentage: 0
  Measurement: Round trip time
    Minimum: 529 usec, Maximum: 662 usec, Average: 585 usec,
    Jitter: 133 usec, Stddev: 53 usec
Results over all tests:
  Probes sent: 5, Probes received: 5, Loss percentage: 0
  Measurement: Round trip time
    Minimum: 529 usec, Maximum: 662 usec, Average: 585 usec,
    Jitter: 133 usec, Stddev: 53 usec

```

show services rpm twamp server connection

Syntax	show services rpm twamp server connection <connection-id>
Release Information	Command introduced in JUNOS Release 9.3.
Description	Display information about the connections established between the RPM TWAMP server and control-clients. By default all established connections are displayed, unless you specify a connection ID when you issue the command.
Options	<i>connection-id</i> —(Optional) Display only information about the specified connection ID.
Required Privilege Level	view
List of Sample Output	show services rpm twamp server connection on page 67
Output Fields	Table 13 on page 67 lists the output fields for the show services rpm twamp server connection command. Output fields are listed in the approximate order in which they appear.

Table 13: show services rpm twamp server connection Output Fields

Field Name	Field Description
Connection ID	Connection ID that uniquely identifies the connection between the TWAMP server and a particular client.
Client address	Client IP address.
Client port	Client port number.
Server address	Server IP address.
Server port	Server port number.
Session count	Session count.
Auth mode	Authentication mode.

```

show services rpm twamp server connection
user@host> show services rpm twamp server connection
Connection ID      Client address      Client port  Server address      Server port  Session count  Auth mode
4      1.1.1.1      12345      192.168.219.203      890      16      none
78     3.22.1.55      345      22.2.2.2      89022      5      none
234    192.168.219.203      2345      2.2.22.2      3333      16      none
5      221.4.1.1      82345      2.2.2.2      45909      16      none

```

```
authenticated
1 192.168.1.1      645 32.2.2.23      2394      16
encrypted
```


show services rpm twamp server session

Syntax	show services rpm twamp server session <session-id>
Release Information	Command introduced in JUNOS Release 9.3.
Description	Display information about the sessions established between the RPM TWAMP server and control-clients. By default all established sessions are displayed, unless you specify a session ID when you issue the command.
Options	session-id—(Optional) Display only information about the specified session ID.
Required Privilege Level	view
List of Sample Output	show services rpm twamp server session on page 69
Output Fields	Table 14 on page 69 lists the output fields for the show services rpm twamp server session command. Output fields are listed in the approximate order in which they appear.

Table 14: show services rpm twamp server session Output Fields

Field Name	Field Description
Session ID	Session ID that uniquely identifies the session between the TWAMP server and a particular client.
Connection ID	Connection ID that uniquely identifies the connection between the TWAMP server and a particular client.
Sender address	Sender IP address.
Sender port	Sender port number.
Reflector address	Reflector IP address.
Reflector port	Reflector port number.

```

show services rpm twamp server session
user@host> show services rpm twamp server session
  Session  Connection  Sender      Sender  Reflector  Reflector
   ID      ID          address    port    address    port
    4        44      1.1.1.1     12345   192.168.219.203    890
    78        44      3.22.1.55     345    22.2.2.2          89022
   234       423    192.168.219.203    2345   2.2.22.2          3333
    5        423    221.4.1.1      82345   2.2.2.2          45909
    1        423    192.168.1.1      645    32.2.2.23         2394

```


Chapter 5

Real-Time Router Monitoring Operational Mode Commands

Table 15 on page 71 summarizes the command-line interface (CLI) commands you can use to monitor files, interfaces, and traffic in real time. Commands are listed in alphabetical order.

Table 15: Real-Time Router Monitoring Operational Mode Commands

Task	Command
Start an Ethernet frame delay monitoring (ETH-DM) session. (MX-series, Ethernet DPCs only)	monitor ethernet delay-measurement
Monitor statistics for a physical interface.	monitor interface
Monitor a Resource Reservation Protocol (RSVP) label-switched path (LSP).	monitor label-switched-path
Display the status of monitored log and trace files.	monitor list
Start displaying the system log or trace file and additional entries being added to those files.	monitor start
Stop displaying the system log or trace file.	monitor stop
Monitor packet headers transmitted through network interfaces sent from or received by the Routing Engine.	monitor traffic
Display trace information about an IP multicast path.	mtrace
Display trace information about a IP multicast path from a source to the router.	mtrace from-source
Listen passively for IP multicast responses.	mtrace monitor
Display trace information about an IP multicast path from the router to a gateway router.	mtrace to-gateway
Determine the route to a network system.	traceroute
Monitor the route to a network system.	traceroute monitor

Table 15: Real-Time Router Monitoring Operational Mode Commands *(continued)*

Task	Command
Monitor the route to a remote host for an MPLS label-switched path signaled by LDP.	<code>traceroute mpls ldp</code>
Monitor the route to a remote host for a MPLS label-switched path signaled by RSVP.	<code>traceroute mpls rsvp</code>



NOTE: For information about how to configure interface parameters, see the *JUNOS Network Interfaces Configuration Guide*.

For information about how to configure IP multicast parameters, see the *JUNOS Multicast Protocols Configuration Guide*.

For information about related tasks performed by network operations center (NOC) personnel, see the *JUNOS Baseline Network Operations Guide*.

monitor ethernet delay-measurement

Syntax monitor ethernet delay-measurement
 (one-way | two-way)
 maintenance-domain *md-name*
 maintenance-association *ma-name*
 (*remote-mac-address* | mep *remote-mep-id*)
 <count *frame-count*>
 <wait *interval-seconds*>

Release Information Command introduced in JUNOS Release 9.5.

Description (Interfaces on Ethernet DPCs in MX-series routers only) Start an ITU-T Y.1731 Ethernet frame delay measurement (ETH-DM) session between the specified local CFM maintenance association end point (MEP) and the specified remote MEP, and display a summary of the frames exchanged in the measurement session. Frame delay measurement statistics are stored at one of the MEPs for later retrieval.



NOTE: If you attempt to monitor delays to a non-existent MAC address, you must type **Ctrl + C** to explicitly quit the **monitor ethernet delay-measurement** command and return to the CLI command prompt.

To start an ETH-DM session, the router initiates an exchange of frames carrying one-way or two-way ETH-DM protocol data units (PDUs) between the local and remote MEPs. ETH-DM frame counts—the types of and number of ETH-DM PDU frames exchanged to measure frame delay times—are displayed as the run-time output of the **monitor ethernet delay-measurement** command and are also stored at both the initiator and receiver MEPs for later retrieval. ETH-DM statistics, described below, are measured and stored at only one of the MEPs:

Frame delay—The difference, in microseconds, between the time an ETH-DM frame is sent and received.

Frame delay variation—The difference, in microseconds, between consecutive frame delay values. Sometimes called “frame jitter”.

For one-way ETH-DM, only the receiver MEP (on the remote system) collects ETH-DM statistics. For two-way ETH-DM, only the initiator MEP (on the local system) collects ETH-DM statistics.

Options **one-way**—Perform one-way ETH-DM, which is based on the difference between the time at which the initiator MEP sends a one-way ETH-DM delay measurement request (**1DM**) frame and the time at which the receiver MEP receives the frame.

two-way—Perform two-way ETH-DM, which is based on the difference between the time at which the initiator MEP sends a two-way ETH-DM delay measurement message (**DDM**) frame and the time at which the initiator MEP receives an associated two-way ETH-DM delay measurement reply (**DMR**) frame from the responder MEP, subtracting the time elapsed at the responder MEP.

md-name—Name of an existing CFM maintenance domain.

ma-name—Name of an existing CFM maintenance association.

remote-mac-address—Unicast MAC address of the peer MEP with which to perform ETH-DM. Specify the MAC address as six hexadecimal bytes in one of the following formats: *nnnn.nnnn.nnnn* or *nn:nn:nn:nn:nn:nn*. For example, 0011.2233.4455 or 00:11:22:33:44:55. Multicast MAC addresses are not supported.

remote-mep-id—Numeric identifier of the peer MEP with which to perform ETH-DM. The discovered MAC address of the peer MEP is used. The range of values is 1 through 8192.

frame-count—(Optional) Number of ETH-DM frames to send to the specified peer MEP. The range of values is 1 through 65535 frames. The default value is 10 frames.

interval-seconds—(Optional) Number of seconds to wait between sending ETH-DM frames. The range of values is from 1 through 255 seconds. The default value is 1 second.

Additional Information To display the ETH-DM frame counts collected at an MEP as the result of this command, see the following command descriptions in the *JUNOS Interfaces Command Reference*:

- show oam ethernet connectivity-fault-management interfaces detail
- show oam ethernet connectivity-fault-management mep-database
- show oam ethernet connectivity-fault-management mep-statistics

To display the ETH-DM statistics collected at an MEP as the result of this command, see the following command descriptions in the *JUNOS Interfaces Command Reference*.

- show oam ethernet connectivity-fault-management delay-statistics
- show oam ethernet connectivity-fault-management mep-statistics

To clear both the ETH-DM frame counts and ETH-DM statistics collected for MEPs, use the `clear oam ethernet connectivity-fault-management statistics` command, described in the *JUNOS Interfaces Command Reference*.

For a complete description of ETH-DM, see the *ITU-T Y.1731 Ethernet Service OAM* topics in the *JUNOS Network Interfaces Configuration Guide*.

Required Privilege Level trace and maintenance

List of Sample Output monitor ethernet delay-measurement one-way on page 77
 monitor ethernet delay-measurement two-way on page 77
 monitor ethernet delay-measurement two-way (Invalid DMR Frames Received) on page 77

Output Fields The monitor ethernet delay-measurement command displays different output at the CLI, depending on whether you start a one-way or two-way frame delay measurement:

- Table 16 on page 75 lists the run-time output fields for the monitor ethernet delay-measurement one-way command.
- Table 17 on page 76 lists the run-time output fields for the monitor ethernet delay-measurement two-way command.

Output fields are listed in the approximate order in which they appear.

Table 16: monitor ethernet delay-measurement one-way Output Fields

Output Section	Output Field Name	Output Field Description
Session Description		
<i>When a one-way ETH-DM session begins, the following static information about the session displays at the CLI output:</i>		
	One-way ETH-DM request to	Unicast MAC address of the remote peer MEP.
	Interface	Name of the Ethernet physical, logical, or trunk interface to which the local MEP is attached
Session Status[†]		
<i>Each time the router transmits a 1DM frame from the local MEP to the remote MEP in this measurement session, the following information updates in the CLI output as a runtime display of the session status:</i>		
	1DM Frames sent	Running count of 1DM PDU frames sent to the remote MEP in this ETH-DM session.
Session Summary		
<i>After a one-way ETH-DM session completes, session summary information—from the perspective of the initiator MEP—displays at the CLI output. The following information displays below the “— — — Delay measurement statistics — — —” heading:</i>		
	Packets transmitted	Total number of 1DM PDU frames sent to the remote MEP during this measurement session.
	Average delay	NOTE: For one-way delay measurement, these CLI output fields display NA (“not applicable” at the initiator MEP) because one-way frame delay measurements occur at the receiver MEP. For the same reason, one-way ETH-DM statistics can be retrieved later (using show oam ethernet connectivity-fault-management commands) at the receiver MEP only.
	Average delay variation	
	Best case delay	
	Worst case delay	

[†]You can view the one-way frame delay statistics for an ETH-DM session at any time by displaying ETH-DM statistics collected at the remote router for the CFM session (pair of peer MEPs). Use the show oam ethernet connectivity-fault-management command to display delay-statistics or mep-statistics at the remote router, for the remote (receiver) MEP.

At either router, you can view ETH-DM frame counts—from the perspective of an MEP on that router—at any time. Use the show oam ethernet connectivity-fault-management mep-database command to display CFM database information for MEPs, or use the show oam ethernet connectivity-fault-management interfaces command in detail or extensive mode to display CFM database information for Ethernet interfaces attached to MEPs.

Table 17: monitor ethernet delay-measurement two-way Output Fields

Output Section	Output Field Name	Output Field Description
Session Description		
<i>When a two-way ETH-DM session begins, the following static information about the session displays at the CLI output:</i>		
	Two-way ETH-DM request to	Unicast MAC address of the remote peer MEP.
	Interface	Name of the Ethernet physical, logical, or trunk interface to which the local MEP is attached
Session Status[†]		
<i>Each time the router receives a DMR frame at the initiator MEP from the remote MEP in this measurement session, the following new frame delay statistics appear in the CLI output as a runtime display of the session status:</i>		
	DMR received from	Unicast MAC address of the remote MEP that transmitted this DMR frame in response to a DMM frame.
	Delay	Two-way delay, in microseconds, for the initiator-transmitted DMM frame.
	Delay variation	Difference, in microseconds, between the current and previous delay values. This is also known as “jitter”.
Session Summary		
<i>After a two-way ETH-DM session completes, session summary information—from the perspective of the initiator MEP—displays at the CLI output. The following information displays below the “— — — Delay measurement statistics — — —” heading:</i>		
	Packets transmitted	Total number of DMM PDU frames sent to the remote MEP in this measurement session.
	Valid packets received	Total number of DMR PDU frames received from the remote MEP in this measurement session.
	Average delay	Average two-way frame delay measured in this session.
	Average delay variation	Average frame jitter measured in this session.
	Best case delay	Lowest two-way frame delay measured in this session.
	Worst case delay	Highest two-way frame delay measured in this session.

[†]You can view two-way frame delay statistics for an ETH-DM session at any time by displaying ETH-DM statistics collected at the local router for the CFM session (pair of peer MEPs). Use the `show oam ethernet connectivity-fault-management` command to display `delay-statistics` or `mep-statistics` at the local router, for the local (initiator) MEP.

At either router, you can view ETH frame counts—from the perspective of an MEP on that router—at any time. Use the `show oam ethernet connectivity-fault-management mep-database` command to display CFM database information for MEPs, or use the `show oam ethernet connectivity-fault-management interfaces` command in `detail` or `extensive` mode to display CFM database information for Ethernet interfaces attached to MEPs.


```

monitor ethernet      user@host> monitor ethernet delay-measurement one-way 00:05:85:73:39:4a
delay-measurement    maintenance-domain md6 maintenance-association ma6 count 10
one-way              One-way ETH-DM request to 00:05:85:73:39:4a, Interface xe-5/0/0.0
                        1DM Frames sent : 10
                        --- Delay measurement statistics ---
                        Packets transmitted: 10
                        Average delay: NA, Average delay variation: NA
                        Best case delay: NA, Worst case delay: NA

monitor ethernet      user@host> monitor ethernet delay-measurement two-way 00:05:85:73:39:4a
delay-measurement    maintenance-domain md6 maintenance-association ma6 count 10
two-way              Two-way ETH-DM request to 00:05:85:73:39:4a, Interface xe-5/0/0.0
                        DMR received from 00:05:85:73:39:4a Delay: 100 usec Delay variation: 0 usec
                        DMR received from 00:05:85:73:39:4a Delay: 92 usec Delay variation: 8 usec
                        DMR received from 00:05:85:73:39:4a Delay: 92 usec Delay variation: 0 usec
                        DMR received from 00:05:85:73:39:4a Delay: 111 usec Delay variation: 19 usec
                        DMR received from 00:05:85:73:39:4a Delay: 110 usec Delay variation: 1 usec
                        DMR received from 00:05:85:73:39:4a Delay: 119 usec Delay variation: 9 usec
                        DMR received from 00:05:85:73:39:4a Delay: 122 usec Delay variation: 3 usec
                        DMR received from 00:05:85:73:39:4a Delay: 92 usec Delay variation: 30 usec
                        DMR received from 00:05:85:73:39:4a Delay: 92 usec Delay variation: 0 usec
                        DMR received from 00:05:85:73:39:4a Delay: 108 usec Delay variation: 16 usec

                        --- Delay measurement statistics ---
                        Packets transmitted: 10, Valid packets received: 10
                        Average delay: 103 usec, Average delay variation: 8 usec
                        Best case delay: 92 usec, Worst case delay: 122 usec

monitor ethernet      user@host> monitor ethernet delay-measurement two-way 00:05:85:73:39:4a
delay-measurement    maintenance-domain md6 maintenance-association ma6 count 10
two-way (Invalid DMR Two-way ETH-DM request to 00:05:85:73:39:4a, Interface xe-5/0/0.0
Frames Received)    DMR received from 00:05:85:73:39:4a Delay: 100 usec Delay variation: 0 usec
                        DMR received from 00:05:85:73:39:4a Delay: 92 usec Delay variation: 8 usec
                        DMR received from 00:05:85:73:39:4a Delay: 92 usec Delay variation: 0 usec
                        DMR received from 00:05:85:73:39:4a Delay: 111 usec Delay variation: 19 usec
                        DMR received from 00:05:85:73:39:4a Delay: 110 usec Delay variation: 1 usec
                        DMR received from 00:05:85:73:39:4a Delay: 119 usec Delay variation: 9 usec
                        DMR received from 00:05:85:73:39:4a Delay: 122 usec Delay variation: 3 usec
                        DMR received from 00:05:85:73:39:4a Delay: 92 usec Delay variation: 30 usec
                        DMR received from 00:05:85:73:39:4a with invalid timestamp(s).
                        DMR received from 00:05:85:73:39:4a Delay: 108 usec Delay variation: 16 usec

                        --- Delay measurement statistics ---
                        Packets transmitted: 10, Valid packets received: 9, Invalid packets received: 1
                        Average delay: 105 usec, Average delay variation: 9 usec
                        Best case delay: 92 usec, Worst case delay: 122 usec

```

monitor interface

Syntax	monitor interface <interface-name> traffic <detail>>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display real-time statistics about interfaces, updating the statistics every second. Check for and display common interface failures, such as SONET/SDH and T3 alarms, loopbacks detected, and increases in framing errors.
Options	<p>none—Display real-time statistics for all interfaces.</p> <p>interface-name—(Optional) Display real-time statistics for the specified interface.</p> <p>traffic—(Optional) Display traffic data for all active interfaces.</p> <p>detail—(Optional) With traffic option only, display detailed output.</p>
Additional Information	The output of this command shows how much each field has changed since you started the command or since you cleared the counters by using the c key. For a description of the statistical information provided in the output of this command, see the show interfaces extensive command for a particular interface type in the <i>JUNOS Interfaces Command Reference</i> . To control the output of the monitor interface interface-name command while it is running, use the keys listed in Table 18 on page 78. The keys are not case-sensitive.

Table 18: Output Control Keys for the monitor interface interface-name Command

Key	Action
c	Clears (returns to zero) the delta counters since monitor interface was started. This does not clear the accumulative counter. To clear the accumulative counter, use the clear interfaces interval command.
f	Freezes the display, halting the display of updated statistics and delta counters.
i	Displays information about a different interface. The command prompts you for the name of a specific interface.
n	Displays information about the next interface. The monitor interface command displays the physical or logical interfaces in the same order as the show interfaces terse command.
q or Esc	Quits the command and returns to the command prompt.
t	Thaws the display, resuming the update of the statistics and delta counters.

To control the output of the **monitor interface traffic** command while it is running, use the keys listed in Table 19 on page 79. The keys are not case-sensitive.

Table 19: Output Control Keys for the monitor interface traffic Command

Key	Action
b	Displays the statistics in units of bytes and bytes per second (bps).
c	Clears (return to 0) the delta counters in the Current Delta column. The statistics counters are not cleared.
d	Displays the Current Delta column (instead of the rate column) in bps or packets per second (pps).
p	Displays the statistics in units of packets and packets per second (pps).
q or Esc	Quits the command and returns to the command prompt.
r	Displays the rate column (instead of the Current Delta column) in bps and pps.

Required Privilege Level trace

List of Sample Output monitor interface (Physical) on page 80
 monitor interface (Logical) on page 81
 monitor interface traffic on page 81
 monitor interface traffic detail on page 81

Output Fields Table 20 on page 79 describes the output fields for the `monitor interface` command. Output fields are listed in the approximate order in which they appear.

Table 20: monitor interface Output Fields

Field Name	Field Description	Level of Output
router1	Hostname of the router.	All levels
Seconds	How long the monitor interface command has been running or how long since you last cleared the counters.	All levels
Time	Current time (UTC).	All levels
Delay x/y/z	Time difference between when the statistics were displayed and the actual clock time. <ul style="list-style-type: none"> ■ x—Time taken for the last polling (in milliseconds). ■ y—Minimum time taken across all pollings (in milliseconds). ■ z—Maximum time taken across all pollings (in milliseconds). 	All levels
Interface	Short description of the interface, including its name, status, and encapsulation.	All levels
Link	State of the link: Up, Down, or Test.	All levels
Current delta	Cumulative number for the counter in question since the time shown in the Seconds field, which is the time since you started the command or last cleared the counters.	All levels

Table 20: monitor interface Output Fields (continued)

Field Name	Field Description	Level of Output
Statistics	For an explanation of the interface statistics, see the description of the <code>show interfaces extensive</code> command for a particular interface type in the <i>JUNOS Interfaces Command Reference</i> .	All levels
Description	With the <code>traffic</code> option, displays the interface description configured at the <code>[edit interfaces interface-name]</code> hierarchy level.	detail

```

monitor interface user@host> monitor interface so-0/0/0
(Physical) router1 Seconds: 19 Time: 15:46:29

Interface: so-0/0/0, Enabled, Link is Up
Encapsulation: PPP, Keepalives, Speed: 0C48
Traffic statistics: Current Delta
  Input packets: 6045 (0 pps) [11]
  Input bytes: 6290065 (0 bps) [13882]
  Output packets: 10376 (0 pps) [10]
  Output bytes: 10365540 (0 bps) [9418]
Encapsulation statistics:
  Input keepalives: 1901 [2]
  Output keepalives: 1901 [2]
  NCP state: Opened
  LCP state: Opened
Error statistics:
  Input errors: 0 [0]
  Input drops: 0 [0]
  Input framing errors: 0 [0]
  Policed discards: 0 [0]
  L3 incompletes: 0 [0]
  L2 channel errors: 0 [0]
  L2 mismatch timeouts: 0 [0]
  Carrier transitions: 1 [0]
  Output errors: 0 [0]
  Output drops: 0 [0]
  Aged packets: 0 [0]
Active alarms : None
Active defects: None
SONET error counts/seconds:
  LOS count 1 [0]
  LOF count 1 [0]
  SEF count 1 [0]
  ES-S 0 [0]
  SES-S 0 [0]
SONET statistics:
  BIP-B1 458871 [0]
  BIP-B2 460072 [0]
  REI-L 465610 [0]
  BIP-B3 458978 [0]
  REI-P 458773 [0]

```

```

Received SONET overhead:
  F1      : 0x00  J0      : 0x00  K1      : 0x00
  K2      : 0x00  S1      : 0x00  C2      : 0x00
  C2(cmp) : 0x00  F2      : 0x00  Z3      : 0x00
  Z4      : 0x00  S1(cmp) : 0x00
Transmitted SONET overhead:
  F1      : 0x00  J0      : 0x01  K1      : 0x00
  K2      : 0x00  S1      : 0x00  C2      : 0xcf
  F2      : 0x00  Z3      : 0x00  Z4      : 0x00

```

Next='n', Quit='q' or ESC, Freeze='f', Thaw='t', Clear='c', Interface='i'

monitor interface (Logical)

```

user@host> monitor interface so-1/0/0.0
host name                Seconds: 16                Time: 15:33:39
                                           Delay: 0/0/1

Interface: so-1/0/0.0, Enabled, Link is Down
Flags: Hardware-Down Point-To-Point SNMP-Traps
Encapsulation: PPP
Local statistics:
  Input bytes:                0                [0]
  Output bytes:               0                [0]
  Input packets:              0                [0]
  Output packets:             0                [0]
Remote statistics:
  Input bytes:                0 (0 bps)         [0]
  Output bytes:               0 (0 bps)         [0]
  Input packets:              0 (0 pps)         [0]
  Output packets:             0 (0 pps)         [0]
Traffic statistics:
  Destination address: 192.168.8.193, Local: 192.168.8.21

Next='n', Quit='q' or ESC, Freeze='f', Thaw='t', Clear='c', Interface='i'

```

monitor interface traffic

```

user@host> monitor interface traffic
host name                Seconds: 15                Time: 12:31:09

Interface  Link  Input packets  (pps)  Output packets  (pps)
so-1/0/0   Down    0              (0)      0              (0)
so-1/1/0   Down    0              (0)      0              (0)
so-1/1/1   Down    0              (0)      0              (0)
so-1/1/2   Down    0              (0)      0              (0)
so-1/1/3   Down    0              (0)      0              (0)
t3-1/2/0   Down    0              (0)      0              (0)
t3-1/2/1   Down    0              (0)      0              (0)
t3-1/2/2   Down    0              (0)      0              (0)
t3-1/2/3   Down    0              (0)      0              (0)
so-2/0/0   Up      211035         (1)     36778          (0)
so-2/0/1   Up      192753         (1)     36782          (0)
so-2/0/2   Up      211020         (1)     36779          (0)
so-2/0/3   Up      211029         (1)     36776          (0)
so-2/1/0   Up      189378         (1)     36349          (0)
so-2/1/1   Down    0              (0)     18747          (0)
so-2/1/2   Down    0              (0)     16078          (0)
so-2/1/3   Up      0              (0)     80338          (0)
at-2/3/0   Up      0              (0)      0              (0)
at-2/3/1   Down    0              (0)      0              (0)

Bytes=b, Clear=c, Delta=d, Packets=p, Quit=q or ESC, Rate=r, Up=^U, Down=^D

```

monitor interface traffic detail

```

user@host> monitor interface traffic detail

```

```
host name                Seconds: 15                Time: 12:31:09
Interface    Link  Input packets  (pps)  Output packets  (pps)  Description
t1-0/1/1:0  Up    19769          (0)    0              (0)    To-OSAKA-1
...
Bytes=b, Clear=c, Delta=d, Packets=p, Quit=q or ESC, Rate=r, Up=^U, Down=^D
```

monitor label-switched-path

Syntax	monitor label-switched-path <i>lsp-name</i>																
Release Information	Command introduced before JUNOS Release 7.4.																
Description	Display the real-time status of the specified Resource Reservation Protocol (RSVP) label-switched path (LSP).																
Options	<i>lsp-name</i> —Name of the LSP.																
Additional Information	<p>You can track the amount of traffic traversing an RSVP LSP and observe its essential parameters, such as uptime, ingress and egress addresses, labels, routes, and ports. Values are typically sampled every second. The display also allows you to scroll to other currently running LSPs. You cannot use this command to display information about static LSPs or Label Distribution Protocol (LDP)-signaled LSPs.</p> <p>The output of this command shows how much each field has changed since you started the command or since you cleared the counters by using the c key. To control the output of the <code>monitor label-switched-path</code> command while it is running, use the keys listed in Table 21 on page 83. The keys are not case-sensitive.</p>																
<p>Table 21: Output Control Keys for the monitor label-switched-path Command</p> <table> <tr> <th>Key</th><th>Action</th></tr> <tr> <td>c</td><td>Clears the screen and refreshes the display for this LSP.</td></tr> <tr> <td>f</td><td>Freezes the display, preventing new information from being displayed.</td></tr> <tr> <td>l</td><td>Monitors a different LSP. After you type l, you can type the new LSP name.</td></tr> <tr> <td>n</td><td>Displays information about the next LSP (whose name is alphabetically higher than the current LSP name) configured on the router.</td></tr> <tr> <td>p</td><td>Goes to the previous LSP (whose name is alphabetically lower than the current LSP name) configured on the router.</td></tr> <tr> <td>q or Esc</td><td>Quits the command and returns to the command prompt.</td></tr> <tr> <td>t</td><td>Thaws, or restarts, the data display for this LSP.</td></tr> </table>		Key	Action	c	Clears the screen and refreshes the display for this LSP.	f	Freezes the display, preventing new information from being displayed.	l	Monitors a different LSP. After you type l, you can type the new LSP name.	n	Displays information about the next LSP (whose name is alphabetically higher than the current LSP name) configured on the router.	p	Goes to the previous LSP (whose name is alphabetically lower than the current LSP name) configured on the router.	q or Esc	Quits the command and returns to the command prompt.	t	Thaws, or restarts, the data display for this LSP.
Key	Action																
c	Clears the screen and refreshes the display for this LSP.																
f	Freezes the display, preventing new information from being displayed.																
l	Monitors a different LSP. After you type l, you can type the new LSP name.																
n	Displays information about the next LSP (whose name is alphabetically higher than the current LSP name) configured on the router.																
p	Goes to the previous LSP (whose name is alphabetically lower than the current LSP name) configured on the router.																
q or Esc	Quits the command and returns to the command prompt.																
t	Thaws, or restarts, the data display for this LSP.																
Required Privilege Level	trace																
List of Sample Output	monitor label-switched-path on page 84																
Output Fields	Table 22 on page 84 describes the output fields for the <code>monitor label-switched-path</code> command. Output fields are listed in the approximate order in which they appear.																

Table 22: monitor label-switched-path Output Fields

Field Name	Field Description
(1)	Displays the following information: <ul style="list-style-type: none"> ■ <i>hostname</i>—Name of the router. ■ <i>Seconds</i>—Time elapsed since this display was started. ■ <i>Time</i>—Current local time.
(2)	<i>Delay</i> —Length of the time delay, in milliseconds, required to obtain the information in the monitor display. The first number shows the current sampling delay. The second number shows the shortest delay recorded to date. The third number shows the worst delay recorded to date. This delay can vary substantially depending on the system load.
(3)	Displays the following: <ul style="list-style-type: none"> ■ <i>To</i>—Destination address of the LSP. ■ <i>From</i>—Originating address of the LSP. ■ <i>State</i>—Current state of the LSP: Up or Down.
(4)	Displays the following: <ul style="list-style-type: none"> ■ <i>LSPName</i>—Name of the LSP. ■ <i>Type</i>—Type of LSP: Ingress, Egress, or Transit.
(5)	Displays the following: <ul style="list-style-type: none"> ■ <i>Label in</i>—Incoming label of the LSP. ■ <i>Label out</i>—Outgoing label of the LSP.
(6)	<i>Port number</i> —Port number for the sending router, the port number for the receiving router, and the protocol ID. For Multiprotocol Label Switching (MPLS) traffic engineering applications, the protocol ID is always 0.
(7/8)	<i>Record route</i> —All intermediate and egress router addresses for this LSP.
(9/10/11)	Displays traffic statistics: <ul style="list-style-type: none"> ■ <i>Output packets</i>—Number of packets that have traversed this LSP, and the change (delta) in the number since the last sample, typically 1 second ago. ■ <i>Output bytes</i>—Number of bytes that have traversed this LSP, and the change (delta) in the number since the last sample, typically 1 second ago.
(12)	Displays any errors the router encountered while attempting to retrieve information on the LSP.
(13)	Lists the keyboard commands you can use to navigate to other LSPs. For a description of the keyboard commands, see Table 21 on page 83.

```

monitor user@host> monitor label-switched-path
label-switched-path (1) host                      Seconds: 112           Time: 15:32:22
(2)                                           Delay: 0/0/0
(3) To 10.10.10.16, From 10.10.10.17, state: Up
(4) LSPname: k, type: Ingress
(5) Label in: -, Label out: 126000
(6) Port number: sender 1, receiver 45583, protocol 0

```



```

(7) Record Route: <self> 192.168.224.196
(8) 192.168.224.202 192.168.224.179
(9) Traffic statistics: Current delta
(10) Output packets: 0 [0]
(11) Output bytes: 0 [0]
(12)
(13) Next='n', Prev='p', Quit='q' or ESC, Freeze='f', Thaw='t', Clear='c',
    LSP='l'

```

monitor list

Syntax	monitor list
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display the status of monitored log and trace files.
Options	This command has no options.
Additional Information	Log files are generated by the routing protocol process or by system logging. The log files generated by system logging are configured with the syslog statement at the [edit system] hierarchy level and the options statement at the [edit routing-options] hierarchy level. The trace files generated by the routing protocol process are those configured with traceoptions statements at the [edit routing-options], [edit interfaces], and [edit protocols <i>protocol</i>] hierarchy levels.
Required Privilege Level	trace
Related Topics	monitor start monitor stop
List of Sample Output	monitor list on page 86
Output Fields	Table 23 on page 86 describes the output fields for the monitor list command. Output fields are listed in the approximate order in which they appear.

Table 23: monitor list Output Fields

Field Name	Field Description
monitor start	Indicates the file is being monitored.
"filename"	Name of the file that is being monitored.
Last changed	Date and time at which the file was last modified.

```

monitor list  user@host> monitor list
                 monitor start "vrrpd" (Last changed Dec 03:11:06 20)
                 monitor start "cli-commands" (Last changed Nov 07:3)

```

monitor start

Syntax	<code>monitor start filename</code>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Start displaying the system log or trace file and additional entries being added to those files.
Options	<i>filename</i> —Specific log or trace file.
Additional Information	Log files are generated by the routing protocol process or by system logging. The log files generated by system logging are configured with the <code>syslog</code> statement at the <code>[edit system]</code> hierarchy level and the <code>options</code> statement at the <code>[edit routing-options]</code> hierarchy level. The trace files generated by the routing protocol process are configured with <code>traceoptions</code> statements at the <code>[edit routing-options]</code> , <code>[edit interfaces]</code> , and <code>[edit protocols protocol]</code> hierarchy levels.
Required Privilege Level	trace
Related Topics	monitor list monitor stop
List of Sample Output	monitor start on page 87
Output Fields	Table 24 on page 87 describes the output fields for the <code>monitor start</code> command. Output fields are listed in the approximate order in which they appear.

Table 24: monitor start Output Fields

Field Name	Field Description
<code>***filename***</code>	Name of the file from which entries are being displayed. This line is displayed initially and when the command switches between log files.
<i>Date and time</i>	Timestamp for the log entry.

```

monitor start user@host> monitor start system-log
*** system-log***
Jul 20 15:07:34 hang sshd[5845]: log: Generating 768 bit RSA key.
Jul 20 15:07:35 hang sshd[5845]: log: RSA key generation complete.
Jul 20 15:07:35 hang sshd[5845]: log: Connection from 204.69.248.180 port 912
Jul 20 15:07:37 hang sshd[5845]: log: RSA authentication for root accepted.
Jul 20 15:07:37 hang sshd[5845]: log: ROOT LOGIN as 'root' from trip.jcmax.com
Jul 20 15:07:37 hang sshd[5845]: log: Closing connection to 204.69.248.180

```

monitor stop

Syntax	<code>monitor stop <i>filename</i></code>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Stop displaying the system log or trace file.
Options	<i>filename</i> —Specific log or trace file.
Additional Information	Log files are generated by the routing protocol process or by system logging. The log files generated by system logging are those configured with the <code>syslog</code> statement at the <code>[edit system]</code> hierarchy level and the <code>options</code> statement at the <code>[edit routing-options]</code> hierarchy level. The trace files generated by the routing protocol process are those configured with <code>traceoptions</code> statements at the <code>[edit routing-options]</code> , <code>[edit interfaces]</code> , and <code>[edit protocols <i>protocol</i>]</code> hierarchy levels.
Required Privilege Level	trace
Related Topics	<p>monitor list</p> <p>monitor start</p>
List of Sample Output	monitor stop on page 88
Output Fields	This command produces no output.
monitor stop	<code>user@host> monitor stop</code>

monitor traffic

Syntax monitor traffic
 <brief | detail | extensive>
 <absolute-sequence>
 <count *count*>
 <interface *interface-name*>
 <layer2-headers>
 <matching *matching*>
 <no-domain-names>
 <no-promiscuous>
 <no-resolve>
 <no-timestamp>
 <print-ascii>
 <print-hex>
 <resolve-timeout>
 <size *size*>

Release Information Command introduced before JUNOS Release 7.4.

Description Display packet headers or packets received and sent from the Routing Engine.



NOTE: Using the **monitor traffic** command can degrade router performance

Delays from DNS resolution can be eliminated by using the **no-resolve** option.

Options none—(Optional) Display packet headers transmitted through fxp0.

brief | detail | extensive—(Optional) Display the specified level of output.

absolute-sequence—(Optional) Display absolute TCP sequence numbers.

count *count*—(Optional) Specify the number of packet headers to display (0 through 1,000,000). The monitor traffic command quits automatically after displaying the number of packets specified.

interface *interface-name*—(Optional) Specify the interface on which the **monitor traffic** command displays packet data. If no interface is specified, the **monitor traffic** command displays packet data arriving on the lowest-numbered interface.

layer2-headers—(Optional) Display the link-level header on each line.

matching *matching*—(Optional) Display packet headers that match a regular expression. Use matching expressions to define the level of detail with which the **monitor traffic** command filters and displays packet data.

no-domain-names—(Optional) Suppress the display of the domain portion of hostnames. With the **no-domain-names** option enabled, the **monitor traffic** command displays only team for the hostname **team.company.net**.

no-promiscuous—(Optional) Do not put the interface into promiscuous mode.

no-resolve—(Optional) Suppress reverse lookup of the IP addresses..

no-timestamp—(Optional) Suppress timestamps on displayed packets.

print-ascii—(Optional) Display each packet in ASCII format.

print-hex—(Optional) Display each packet, except the link-level header, in hexadecimal format.

resolve-timeout *timeout*—(Optional) Amount of time the router waits for each reverse lookup before timing out. The timeout can be set between 1 to 4,294,967,295 seconds. The default is 4 seconds. To display each packet, use the **print-ascii**, **print-hex**, or **extensive** option.

size *size*—(Optional) Read, but not display up to the specified number of bytes for each packet. When set to **brief** output, the default packet size is 96 bytes and is adequate for capturing IP, ICMP, UDP, and TCP packet data. When set to **detail** and **extensive** output, the default packet size is 1514. The **monitor traffic** command truncates displayed packets if the matched data exceeds the configured size.

Additional Information In the **monitor traffic** command, you can specify an expression to match by using the **matching** option and including the expression in quotation marks:

```
monitor traffic matching "expression"
```

Replace *expression* with one or more of the match conditions listed in Table 25 on page 90.

Table 25: Match Conditions for the monitor traffic Command

Match Type	Condition	Description
Entity	host { <i>address</i> <i>hostname</i> }	Matches packets that contain the specified address or hostname. The host match condition can be prepended with the protocol match conditions arp , ip , or rarp , or any of the directional match conditions.
	net <i>address</i>	Matches packets with source or destination addresses containing the specified network address.
	net <i>addressmask mask</i>	Matches packets containing the specified network address and subnet mask.
	port [<i>port-number</i> <i>port-name</i>]	Matches packets containing the specified source or destination TCP or UDP port number or port name.
		In place of the numeric port address, you can specify a text synonym, such as bgp (179), dhcp (67), or domain (53) (the port numbers are also listed).

Table 25: Match Conditions for the monitor traffic Command (continued)

Match Type	Condition	Description
Directional	dst	Matches packets going to the specified destination. This match condition can be prepended to any of the entity type match conditions.
	src	Matches packets from a specified source. This match condition can be prepended to any of the entity type match conditions.
	src and dst	Matches packets that contain the specified source and destination addresses. This match condition can be prepended to any of the entity type match conditions.
	src or dst	Matches packets containing either of the specified addresses. This match condition can be prepended to any of the entity type match conditions.
Packet Length	less <i>value</i>	Matches packets shorter than or equal to the specified value, in bytes.
	greater <i>value</i>	Matches packets longer than or equal to the specified value, in bytes.
Protocol	arp	Matches all ARP packets.
	ether	Matches all Ethernet packets.
	ether [broadcast multicast]	Matches broadcast or multicast Ethernet frames. This match condition can be prepended with src and dst .
	ether <i>protocol</i> [address (arp ip rarp)]	Matches packets with the specified Ethernet address or Ethernet packets of the specified protocol type. The ether protocol arguments arp , ip , and rarp are also independent match conditions, so they must be preceded by a backslash (\) when used in the ether protocol match condition.
	icmp	Matches all ICMP packets.
	ip	Matches all IP packets.
	ip [broadcast multicast]	Matches broadcast or multicast IP packets.
	ip protocol [address (icmp igrp tcp udp)]	Matches packets with the specified address or protocol type. The ip protocol arguments icmp , tcp , and udp are also independent match conditions, so they must be preceded by a backslash (\) when used in the ip protocol match condition.
	isis	Matches all IS-IS routing messages.
	rarp	Matches all RARP packets.
	tcp	Matches all TCP datagrams.
	udp	Matches all UDP datagrams.

To combine expressions, use the logical operators listed in Table 26 on page 92.

Table 26: Logical Operators for the monitor traffic Command

Logical Operator (Highest to Lowest Precedence)	Description
!	Logical NOT. If the first condition does not match, the next condition is evaluated.
&&	Logical AND. If the first condition matches, the next condition is evaluated. If the first condition does not match, the next condition is skipped.
	Logical OR. If the first condition matches, the next condition is skipped. If the first condition does not match, the next condition is evaluated.
()	Group operators to override default precedence order. Parentheses are special characters, each of which must be preceded by a backslash (\).

You can use relational operators to compare arithmetic expressions composed of integer constants, binary operators, a length operator, and special packet data accessors. The arithmetic expression matching condition uses the following syntax:

```
monitor traffic matching "ether[0] & 1 != 0" arithmetic_expression relational_operator arithmetic_expression
```

The packet data accessor uses the following syntax:

```
protocol [byte-offset <size>]
```

The optional *size* field represents the number of bytes examined in the packet header. The available values are 1, 2, or 4 bytes. The following sample command captures all multicast traffic:

```
user@host> monitor traffic matching "ether[0] & 1 != 0"
```

To specify match conditions that have a numeric value, use the arithmetic and relational operators listed in Table 27 on page 92.



NOTE: Because the Packet Forwarding Engine removes Layer 2 header information before sending packets to the Routing Engine, the **monitor traffic** command cannot apply match conditions to inbound traffic.

Table 27: Arithmetic and Relational Operators for the monitor traffic Command

Arithmetic or Relational Operator	Description
Arithmetic Operator	
+	Addition operator.
-	Subtraction operator.
/	Division operator.

Table 27: Arithmetic and Relational Operators for the monitor traffic Command *(continued)*

Arithmetic or Relational Operator	Description
&	Bitwise AND.
*	Bitwise exclusive OR.
	Bitwise inclusive OR.
Relational Operator (Highest to Lowest Precedence)	
< =	If the first expression is less than or equal to the second, the packet matches.
> =	If the first expression is greater than or equal to the second, the packet matches.
<	If the first expression is less than the second, the packet matches.
>	If the first expression is greater than the second, the packet matches.
=	If the compared expressions are equal, the packet matches.
!=	If the compared expressions are unequal, the packet matches.

Required Privilege Level trace and maintenance

List of Sample Output monitor traffic count on page 93
 monitor traffic detail count on page 93
 monitor traffic extensive (Absolute Sequence) on page 94
 monitor traffic extensive (Relative Sequence) on page 94
 monitor traffic extensive count on page 94
 monitor traffic interface on page 94
 monitor traffic matching on page 94

Output Fields When you enter this command, you are provided feedback on the status of your request.

monitor traffic count user@host> **monitor traffic count 2**
 listening on fxp0
 04:35:49.814125 In my-server.home.net.1295 > my-server.work.net.telnet: . ack
 4122529478 win 16798 (DF)
 04:35:49.814185 Out my-server.work.net.telnet > my-server.home.net.1295: P
 1:38(37) ack 0 win 17680 (DF) [tos 0x10]

monitor traffic detail count user@host> **monitor traffic detail count 2**
 listening on fxp0
 04:38:16.265864 In my-server.home.net.1295 > my-server.work.net.telnet: . ack
 4122529971 win 17678 (DF) (ttl 121, id 6812)
 04:38:16.265926 Out my-server.work.net.telnet > my-server.home.net.1295:
 P 1:38(37) ack 0 win 17680 (DF) [tos 0x10] (ttl 6)

monitor traffic extensive (Absolute Sequence) user@host> **monitor traffic extensive no-domain-names no-resolve no-timestamp count 20 matching "tcp" absolute-sequence**
 listening on fxp0
 In 207.17.136.193.179 > 192.168.4.227.1024: . 4042780859:4042780859(0) ack 1845421797 win 16384 <nop,nop,timestamp 4935628 965951> [tos 0xc0] (ttl)
 In 207.17.136.193.179 > 192.168.4.227.1024: P 4042780859:4042780912(53) ack 1845421797 win 16384 <nop,nop,timestamp 4935628 965951>: BGP [|BGP UPDAT)
 In 192.168.4.227.1024 > 207.17.136.193.179: P 1845421797:1845421852(55) ack 4042780912 win 16384 <nop,nop,timestamp 965951 4935628>: BGP [|BGP UPDAT)
 ...

monitor traffic extensive (Relative Sequence) user@host> **monitor traffic extensive no-domain-names no-resolve no-timestamp count 20 matching "tcp"**
 listening on fxp0
 In 172.24.248.221.1680 > 192.168.4.210.23: . 396159737:396159737(0) ack 1664980689 win 17574 (DF) (ttl 121, id 50003)
 Out 192.168.4.210.23 > 172.24.248.221.1680: P 1:40(39) ack 0 win 17680 (DF) [tos 0x10] (ttl 64, id 5394)
 In 207.17.136.193.179 > 192.168.4.227.1024: P 4042775817:4042775874(57) ack 1845416593 win 16384 <nop,nop,timestamp 4935379 965690>: BGP [|BGP UPDAT)
 ...

monitor traffic extensive count user@host> **monitor traffic extensive count 5 no-domain-names no-resolve**
 listening on fxp0
 13:18:17.406933 In 192.168.4.206.2723610880 > 172.17.28.8.2049: 40 null (ttl 64, id 38367)13:18:17.407577 In 172.17.28.8.2049 > 192.168.4.206.2723610880: reply ok 28 null (ttl 61, id 35495)13:18:17.541140 In 0:e0:1e:42:9c:e0 0:e0:1e:42:9c:e0 9000 60: 0000 0100
 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
 000013:18:17.591513 In 172.24.248.156.4139 > 192.168.4.210.23: . 3556964918:3556964918(0) ack 295526518 win 17601 (DF) (ttl 121, id 14)13:18:17.591568 Out 192.168.4.210.23 > 172.24.248.156.4139: P 1:40(39) ack 0 win 17680 (DF) [tos 0x10] (ttl 64, id 52376)

monitor traffic interface user@host> **monitor traffic interface fxp0**
 listening on fxp0.0
 18:17:28.800650 In server.home.net.723 > host1-0.lab.home.net.log
 18:17:28.800733 Out host2-0.lab.home.net.login > server.home.net.7
 18:17:28.817813 In host30.lab.home.net.syslog > host40.home0
 18:17:28.817846 In host30.lab.home.net.syslog > host40.home0
 ...

monitor traffic matching user@host> **monitor traffic matching "net 192.168.1.0/24"**
 verbose output suppressed, use <detail> or <extensive> for full protocol decode
 Address resolution is ON. Use <no-resolve> to avoid any reverse lookup delay.
 Address resolution timeout is 4s.
 Listening on fxp0, capture size 96 bytes

 Reverse lookup for 192.168.1.255 failed (check DNS reachability).
 Other reverse lookup failures will not be reported.
 Use no-resolve to avoid reverse lookups on IP addresses.

 21:55:54.003511 In IP truncated-ip - 18 bytes missing! 192.168.1.17.netbios-ns
 > 192.168.1.255.netbios-ns: UDP, length 50
 21:55:54.003585 Out IP truncated-ip - 18 bytes missing! 192.168.1.17.netbios-ns
 > 192.168.1.255.netbios-ns: UDP, length 50
 21:55:54.003864 In arp who-has 192.168.1.17 tell 192.168.1.9
 ...

mtrace

Syntax	<code>mtrace source</code> <code><routing-instance routing-instance-name></code>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display trace information about an IP multicast path.
Options	<code>source</code> —Source hostname or address. <code>routing-instance routing-instance-name</code> —(Optional) Trace a particular routing instance.
Additional Information	The <code>mtrace</code> command for multicast traffic is similar to the <code>traceroute</code> command used for unicast traffic. Unlike <code>traceroute</code> , <code>mtrace</code> traces traffic backwards, from the receiver to the source.
Required Privilege Level	view
List of Sample Output	<code>mtrace source</code> on page 96
Output Fields	Table 28 on page 95 describes the output fields for the <code>mtrace</code> command. Output fields are listed in the approximate order in which they appear.

Table 28: mtrace Output Fields

Field Name	Field Description
Mtrace from	IP address of the receiver.
to	IP address of the source.
via group	IP address of the multicast group (if any).
Querying full reverse path	Indicates the full reverse path query has begun.
<i>number-of-hops</i>	Number of hops from the source to the named router.
<i>router-name</i>	Name of the router for this hop.
<i>address</i>	Address of the router for this hop.
<i>protocol</i>	Protocol used (for example, PIM).
Round trip time	Average round-trip time, in milliseconds (ms).
total ttl of	Time-to-live (TTL) threshold.

```
mtrace source  user@host> mtrace 192.1.4.2
Mtrace from 192.1.4.2 to 192.1.1.2 via group 0.0.0.0
Querying full reverse path... * *
  0  routerA.lab.mycompany.net (192.1.1.2)
 -1  routerB.lab.mycompany.net (192.1.2.2)  PIM  thresh^ 1
 -2  routerC.lab.mycompany.net (192.1.3.2)  PIM  thresh^ 1
 -3  hostA.lab.mycompany.net (192.1.4.2)
Round trip time 2 ms; total ttl of 2 required.
```

mtrace from-source

Syntax mtrace from-source source *source*
 <brief | detail>
 <extra-hops *extra-hops*>
 <group *group*>
 <interval *interval*>
 <loop>
 <max-hops *max-hops*>
 <max-queries *max-queries*>
 <multicast-response | unicast-response>
 <no-resolve>
 <no-router-alert>
 <response *response*>
 <routing-instance *routing-instance-name*>
 <tll *tll*>
 <wait-time *wait-time*>

Release Information Command introduced before JUNOS Release 7.4.

Description Display trace information about an IP multicast path from a source to this router. If a group address is given, additional information, such as packet rates and losses, can be gathered.

Options source *source*—Source hostname or address.

brief | detail—(Optional) Display the specified level of output.

extra-hops *extra-hops*—(Optional) Number of hops to take after reaching a nonresponsive router. The range of values is 0 through 255.

group *group*—(Optional) Group address for which to trace the path. The default group address is 0.0.0.0.

interval *interval*—(Optional) Number of seconds to wait before gathering statistics again. The default value is 10 seconds.

loop—(Optional) Loop indefinitely, displaying rate and loss statistics.

max-hops *max-hops*—(Optional) Maximum hops to trace toward source. The range of values is 0 through 255. The default value is 32 hops.

max-queries *max-queries*—(Optional) Maximum number of query attempts for any hop. The range of values is 1 through 32. The default is 3.

multicast-response—(Optional) Always request the response using multicast.

no-resolve—(Optional) Do not attempt to display addresses symbolically.

no-router-alert—(Optional) Do not use the router-alert IP option.

response *response*—(Optional) Send trace response to a host or multicast address.

routing-instance *routing-instance-name*—(Optional) Trace a particular routing instance.

ttl *ttl*—(Optional) IP time-to-live (TTL) value. The range of values is 0 through 255. Local queries to the multicast group use a value of 1. Otherwise, the default value is 127.

unicast-response—(Optional) Always request the response using unicast.

wait-time *wait-time*—(Optional) Number of seconds to wait for a response. The default value is 3.

Required Privilege Level view

List of Sample Output mtrace from-source on page 99

Output Fields Table 29 on page 98 describes the output fields for the mtrace from-source command. Output fields are listed in the approximate order in which they appear.

Table 29: mtrace from-source Output Fields

Field Name	Field Description
Mtrace from	IP address of the receiver.
to	IP address of the source.
via group	IP address of the multicast group (if any).
Querying full reverse path	Indicates the full reverse path query has begun.
<i>number-of-hops</i>	Number of hops from the source to the named router.
<i>router-name</i>	Name of the router for this hop.
<i>address</i>	Address of the router for this hop.
<i>protocol</i>	Protocol used (for example, PIM).
Round trip time	Average round-trip time, in milliseconds (ms).
total ttl of	Time-to-live (TTL) threshold.
source	Source address.
Response Dest	Response destination address.
Overall	Average packet rate for all traffic at each hop.
Packet Statistics for Traffic From	Number of packets lost, number of packets sent, percentage of packets lost, and average packet rate at each hop.
Receiver	IP address receiving the multicast.
Query source	IP address sending the mtrace query.

```

mtrace from-source user@host> mtrace from-source source 192.1.4.2 group 225.1.1.1
Mtrace from 192.1.4.2 to 192.1.1.2 via group 225.1.1.1
Querying full reverse path... * *
  0 routerA.lab.mycompany.net (192.1.1.2)
 -1 routerB.lab.mycompany.net (192.1.2.2) PIM thresh^ 1
 -2 routerC.lab.mycompany.net (192.1.3.2) PIM thresh^ 1
 -3 hostA.lab.mycompany.net (192.1.4.2)
Round trip time 2 ms; total ttl of 2 required.

Waiting to accumulate statistics...Results after 10 seconds:

Source      Response Dest    Overall    Packet Statistics For Traffic From
192.1.4.2 192.1.1.2  Packet    192.1.4.2 To 225.1.1.1
      v    ___/ rtt    2 ms    Rate    Lost/Sent = Pct  Rate
192.1.2.1
192.1.3.2 routerC.lab.mycompany.net
      v    ^      ttl    2          0/0    = --    0 pps
192.1.4.1
192.1.2.2 routerB.lab.mycompany.net
      v    \___  ttl    3          ?/0          0 pps
192.1.1.2 192.1.1.2
Receiver      Query Source

```

mtrace monitor

Syntax	mtrace monitor
Release Information	Command introduced before JUNOS Release 7.4.
Description	Listen passively for IP multicast responses. To exit mtrace monitor, type Ctrl + c.
Options	none—Trace the master instance.
Required Privilege Level	view
List of Sample Output	mtrace monitor on page 101
Output Fields	Table 30 on page 100 describes the output fields for the mtrace monitor command. Output fields are listed in the approximate order in which they appear.

Table 30: mtrace monitor Output Fields

Field Name	Field Description
Mtrace query at	Date and time of the query.
by	Address of the host issuing the query.
resp to	Response destination.
qid	Query ID number.
packet from...to	IP address of the query source and default group destination.
from...to	IP address of the multicast source and the response address.
via group	IP address of the group to trace.
mxhop	Maximum hop setting.


```
mtrace monitor user@host> mtrace monitor  
Mtrace query at Oct 22 13:36:14 by 192.1.3.2, resp to 224.0.1.32, qid 74a5b8  
packet from 192.1.3.2 to 224.0.0.2  
from 192.1.3.2 to 192.1.3.38 via group 224.1.1.1 (mxhop=60)  
  
Mtrace query at Oct 22 13:36:17 by 192.1.3.2, resp to 224.0.1.32, qid 1d07ba  
packet from 192.1.3.2 to 224.0.0.2  
from 192.1.3.2 to 192.1.3.38 via group 224.1.1.1 (mxhop=60)  
  
Mtrace query at Oct 22 13:36:20 by 192.1.3.2, resp to same, qid 2fea1d  
packet from 192.1.3.2 to 224.0.0.2  
from 192.1.3.2 to 192.1.3.38 via group 224.1.1.1 (mxhop=60)  
  
Mtrace query at Oct 22 13:36:30 by 192.1.3.2, resp to same, qid 7c88ad  
packet from 192.1.3.2 to 224.0.0.2  
from 192.1.3.2 to 192.1.3.38 via group 224.1.1.1 (mxhop=60)
```

mtrace to-gateway

Syntax mtrace to-gateway gateway gateway
 <brief | detail>
 <extra-hops *extra-hops*>
 <group *group*>
 <interface *interface-name*>
 <interval *interval*>
 <loop>
 <max-hops *max-hops*>
 <max-queries *max-queries*>
 <multicast-response | unicast-response>
 <no-resolve>
 <no-router-alert>
 <response *response*>
 <routing-instance *routing-instance-name*>
 <ttl *ttl*>
 <unicast-response>
 <wait-time *wait-time*>

Release Information Command introduced before JUNOS Release 7.4.

Description Display trace information about a multicast path from this router to a gateway router.

Options gateway *gateway*—Send the trace query to a gateway multicast address.

brief | detail—(Optional) Display the specified level of output.

extra-hops *extra-hops*—(Optional) Number of hops to take after reaching a nonresponsive router. The range of values is 0 through 255.

group *group*—(Optional) Group address for which to trace the path. The default group address is 0.0.0.0.

interface *interface-name*—(Optional) Source address for sending the trace query.

interval *interval*—(Optional) Number of seconds to wait before gathering statistics again. The default value is 10.

loop—(Optional) Loop indefinitely, displaying rate and loss statistics.

max-hops *max-hops*—(Optional) Maximum hops to trace toward the source. The range of values is 0 through 255. The default value is 32 hops.

max-queries *max-queries*—(Optional) Maximum number of query attempts for any hop. The range of values is 1 through 32. The default value is 3.

multicast-response—(Optional) Always request the response using multicast.

no-resolve—(Optional) Do not attempt to display addresses symbolically.

no-router-alert—(Optional) Do not use the router-alert IP option.

response *response*—(Optional) Send trace response to a host or multicast address.

routing-instance *routing-instance-name*—(Optional) Trace a particular routing instance.

ttl *ttl*—(Optional) IP time-to-live value. The range of values is 0 through 255. Local queries to the multicast group use TTL 1. Otherwise, the default value is 127.

unicast-response—(Optional) Always request the response using unicast.

wait-time *wait-time*—(Optional) Number of seconds to wait for a response. The default value is 3.

Required Privilege Level view

List of Sample Output mtrace to-gateway on page 103

Output Fields Table 31 on page 103 describes the output fields for the **mtrace to-gateway** command. Output fields are listed in the approximate order in which they appear.

Table 31: mtrace to-gateway Output Fields

Field Name	Field Description
Mtrace from	IP address of the receiver.
to	IP address of the source.
via group	IP address of the multicast group (if any).
Querying full reverse path	Indicates the full reverse path query has begun.
<i>number-of-hops</i>	Number of hops from the source to the named router.
<i>router-name</i>	Name of the router for this hop.
<i>address</i>	Address of the router for this hop.
<i>protocol</i>	Protocol used (for example, PIM).
Round trip time	Average round-trip time, in milliseconds (ms).
total ttl of	Time-to-live (TTL) threshold.

mtrace to-gateway user@host> **mtrace to-gateway gateway 192.1.3.2 group 225.1.1.1 interface 192.1.1.73 brief**

```
Mtrace from 192.1.1.73 to 192.1.1.2 via group 225.1.1.1
Querying full reverse path... * *
 0 routerA.lab.mycompany.net (192.1.1.2)
-1 routerA.lab.mycompany.net (192.1.1.2) PIM thresh^ 1
-2 routerB.lab.mycompany.net (192.1.2.2) PIM thresh^ 1
-3 routerC.lab.mycompany.net (192.1.3.2) PIM thresh^ 1
Round trip time 2 ms; total ttl of 3 required.
```

traceroute

Syntax `traceroute host`
`<as-number-lookup>`
`<bypass-routing>`
`<clns>`
`<gateway address>`
`<inet | inet6>`
`<interface interface-name>`
`<logical system (all | logical-system-name)>`
`<mpls (ldp FEC address | rsvp label-switched-path-name)>`
`<no-resolve>`
`<routing-instance routing-instance-name>`
`<source source-address>`
`<tos value>`
`<ttl value>`
`<wait seconds>`

Release Information Command introduced before JUNOS Release 7.4. The `mpls` option was introduced in JUNOS Release 9.2.

Description Display the route 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 Connectionless Network Service (CLNS).

`gateway address`—(Optional) Address of a router 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 (all | logical-system-name)`—(Optional) Perform this operation on all logical systems or on a particular logical system.

`mpls (ldp FEC address | rsvp label-switched-path name)`—(Optional) Analyze the status of LDP-signalled or RSVP-signalled MPLS LSPs. You can optionally specify the FEC address for the LDP LSP or the LSP name for RSVP. You can also analyze a specific LSP by issuing the `traceroute mpls rsvp lsp-name` command. You can only analyze IPv4 point-to-point LSPs. IPv6 is not supported.

no-resolve—(Optional) Do not attempt to determine the hostname that corresponds to the IP address.

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

List of Sample Output traceroute on page 105
 traceroute as-number-lookup host on page 106
 traceroute noresolve on page 107
 traceroute (Between CE Routers, Layer 3 VPN) on page 107
 traceroute (Through an MPLS LSP) on page 107

Output Fields Table 32 on page 105 describes the output fields for the **traceroute** command. Output fields are listed in the approximate order in which they appear.

Table 32: 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.
<i>number-of-hops</i>	Number of hops from the source to the named router.
<i>router-name</i>	Name of the router for this hop.
<i>address</i>	Address of the router for this hop.
Round trip time	Average round-trip time, in milliseconds (ms).

```

traceroute user@host> traceroute santacruz
traceroute to green.company.net (10.156.169.254), 30 hops max, 40 byte packets
 1 blue23 (10.168.1.254)  2.370 ms  2.853 ms  0.367 ms
 2 red14 (10.168.255.250) 0.778 ms  2.937 ms  0.446 ms
 3 yellow (10.156.169.254) 7.737 ms  89.905 ms  0.834 ms

```

```
tracert user@host> tracert as-number-lookup 10.100.1.1
as-number-lookup host  tracert 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 noresolve

```

user@host> traceroute santacruz noresolve
traceroute to green.company.net (10.156.169.254), 30 hops max, 40 byte packets
 1  10.168.1.254  0.458 ms  0.370 ms  0.365 ms
 2  10.168.255.250  0.474 ms  0.450 ms  0.444 ms
 3  10.156.169.254  0.931 ms  0.876 ms  0.862 ms

```

traceroute (Between CE Routers, Layer 3 VPN)

```

user@host> traceroute vpn09
traceroute to vpn09.skybank.net (10.255.14.179), 30 hops max, 40
byte packets
 1  10.39.10.21 (10.39.10.21)  0.598 ms  0.500 ms  0.461 ms
 2  10.39.1.13 (10.39.1.13)  0.796 ms  0.775 ms  0.806 ms
    MPLS Label=100006 CoS=0 TTL=1 S=1
 3  vpn09.skybank.net (10.255.14.179)  0.783 ms  0.716 ms  0.686

```

traceroute (Through an MPLS LSP)

```

user@host> traceroute mpls1
traceroute to 10.168.1.224 (10.168.1.224), 30 hops max, 40 byte packets
 1  mpls1-sr0.company.net (10.168.200.101)  0.555 ms  0.393 ms  0.367 ms
    MPLS Label=1024 CoS=0 TTL=1
 2  mpls5-lo0.company.net (10.168.1.224)  0.420 ms  0.394 ms  0.401 ms

```

traceroute monitor

Syntax traceroute monitor *host*
 <count *value*>
 <inet | inet 6>
 <interval *seconds*>
 <no resolve>
 <size *value*>
 <source *source-address*>
 <summary>

Release Information Command introduced in JUNOS Release 8.0

Description Displays live monitoring of each hop in the route packets take to a specified network host. Use `traceroute monitor` 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—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 traceroute packets.

summary—Generate and display summary.

Required Privilege Level network

List of Sample Output traceroute monitor on page 109

Output Fields Table 33 on page 108 describes the output fields for the `traceroute monitor` command. Output fields are listed in the approximate order in which they appear.

Table 33: 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 router at this hop.

Table 33: traceroute monitor Output Fields *(continued)*

Field Name	Field Description
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.

traceroute monitor user@host> **traceroute monitor 10.16.0.1**

Host	Loss%	Snt	Last	Avg	Best	Wrst	StDev
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

traceroute mpls ldp

Syntax traceroute mpls <ldp> fec
 <destination>
 <detail>
 <exp>
 <fanout>
 <logical-system>
 <no-resolve>
 <paths>
 <retries>
 <routing-instance>
 <source>
 <ttl>
 <update>
 <wait>

Release Information Command introduced in JUNOS Release 8.4.

Description Trace route to a remote host for an MPLS label-switched path signaled by the LDP. Use **traceroute mpls ldp** as a debugging tool to locate MPLS label-switched path forwarding issues in a network. (Currently supported for IPv4 packets only.)

Options *fec*—Specify the IP address and optional prefix of FEC.

destination—(Optional) Specify the destination address to use when sending probes.

detail—(Optional) Display detailed output.

exp—(Optional) Specify the class-of-service to use when sending probes. The range of values is 0 through 7. The default value is 7.

fanout—(Optional) Specify the maximum number of nexthops to search per node. The range of values is 1 through 16. The default value is 16.

logical-system—Specify the name of the logical system for the traceroute attempt.

no-resolve—(Optional) Specify not to resolve the hostname that corresponds to the IP address.

paths—(Optional) Specify the number of paths to search. The range of values is 1 through 255. The default value is 16.

retries—(Optional) Specify the number of times to resend probe. values. The range of values is 1 through 9. The default value is 3.

routing-instance routing-instance-name—(Optional) Specify the name of the routing instance for the traceroute attempt.

source source-address—(Optional) Specify the source address of the outgoing traceroute packets.

ttl *value*—(Optional) Specify the maximum time-to-live value to include in the traceroute request. The range of values is 1 through 125. The default value is 64.

wait *seconds*—(Optional) Specify the number of seconds to wait before resending a probe. The range of values is 5 through 15 and the default value is 10 seconds.

Required Privilege Level network

List of Sample Output traceroute mpls ldp on page 112
traceroute mpls ldp detail on page 112

Output Fields Table 34 on page 111 describes the output fields for the `traceroute mpls ldp fec` command and the `traceroute mpls ldp fec detail` commands. Output fields are listed in the approximate order in which they appear.

Table 34: traceroute mpls ldp Output Fields

Field Name	Field Description	Level of Output
Probe options	Probe options specified in the <code>traceroute mpls ldp fec</code> command.	all levels
ttl	Time to live value of the labeled packet.	none specified
Label	Outgoing label used for forwarding the packet along the label-switched paths.	none specified
Protocol	Signaling protocol used. For this command, it is LDP.	non specified
Address	Address of the next hop.	none specified
Previous Hop	Address of the previous hop. Previous hop address of the first hop is null.	none specified
Probe status	Forwarding status from the first hop to the last-hop label-switching router (egress point in the label-switched paths).	none specified
Hop	Address of the hops in the label-switched path from the first hop to the last hop. Depth indicates the level of the hop.	detail
Parent	Address of the previous hop. Parent value for the first hop is null.	detail
Return Code	Return code for reporting the result of processing the echo request by the receiver.	detail
Response time	Time for the echo request to reach the receiver.	detail
Multipath type	Labels or addresses used by the specified multipath type. If multipaths are not used, the value is <i>none</i> .	detail
Label Stack	Label stack used to forward the packet.	detail

traceroute mpls ldp user@router> **traceroute mpls ldp 4.4.4.4**

```

Probe options: ttl 64, retries 3, wait 10, paths 16, exp 7, fanout 16
ttl  Label  Protocol  Address      Previous Hop  Probe Status
  1   100016  LDP          24.24.24.1   (null)       Success
  2   100000  LDP          20.20.20.2   24.24.24.1   Success
  3     3     LDP          22.22.22.4   20.20.20.2   Egress

```

Path 1 via fe-0/3/3.101 destination 127.0.0.64

traceroute mpls ldp detail user@router> **traceroute mpls ldp 4.4.4.4 detail**

```

Probe Options: ttl 64, retries 3, wait 10, paths 3, exp 7
Hop 24.24.24.1 Depth 1
  Parent (null)
  Return code: Label switched at stack-depth 1
  Response time 165.93 msec
  Multipath type: IP bitmask
  Address Range 1: 127.0.0.0 ~ 127.0.3.255
  Label Stack:
    Label 1 Value 100032 Protocol LDP

```

```

Hop 20.20.20.2 Depth 2
  Parent 24.24.24.1
  Return code: Upstream interface index unknown label-switched at stack-depth
1
  Response time 19.05 msec
  Multipath type: IP bitmask
  Address Range 1: 127.0.0.0 ~ 127.0.3.255
  Label Stack:
    Label 1 Value 100000 Protocol LDP

```

```

Hop 22.22.22.4 Depth 3
  Parent 20.20.20.2
  Return code: Egress-ok at stack-depth 1
  Response time 0.79 msec
  Multipath type: None
  Label Stack:
    Label 1 Value 3 Protocol LDP

```

traceroute mpls rsvp

Syntax traceroute mpls <rsvp> *lsp-name*
 <detail>
 <exp>
 <logical-system>
 <no-resolve>
 <retries>
 <source>

Release Information Command introduced in JUNOS Release 9.2.

Description Trace route to a remote host for an MPLS label-switched path signaled by RSVP. Use `traceroute mpls rsvp` as a debugging tool to locate MPLS label-switched path forwarding issues in a network. (Currently supported for IPv4 packets only.)

Options *lsp-name*—Specify the name of the LSP to be traced.

detail—(Optional) Display detailed output.

exp—(Optional) Specify the class-of-service to use when sending probes. The range of values is 0 through 7. The default value is 7.

logical-system—Specify the name of the logical system for the traceroute attempt.

no-resolve—(Optional) Specify not to resolve the hostname that corresponds to the IP address.

retries—(Optional) Specify the number of times to resend probe. The range of values is 1 through 9. The default value is 3.

source source-address—(Optional) Specify the source address of the outgoing traceroute packets.

Required Privilege Level network

List of Sample Output traceroute mpls rsvp on page 114
 traceroute mpls rsvp detail on page 115

Output Fields Table 35 on page 113 describes the output fields for the `traceroute mpls rsvp lsp-name` and `traceroute mpls rsvp lsp-name detail` commands. Output fields are listed in the approximate order in which they appear.

Table 35: traceroute mpls rsvp Output Fields

Field Name	Field Description	Level of output
Probe options	Probe options specified in the <code>traceroute mpls rsvp <i>lsp-name</i></code> command.	all levels
ttl	Time to live value of the labeled packet.	none specified

Table 35: traceroute mpls rsvp Output Fields (*continued*)

Field Name	Field Description	Level of output
Label	MPLS label used to forward the packets along the LSP.	none specified
Protocol	Signaling protocol used. For this command, it is RSVP-TE.	none specified
Address	Address of the next hop.	none specified
Previous Hop	Address of the previous hop. Previous hop address of the first hop is null.	none specified
Probe status	Forwarding status from the first hop to the last-hop label-switching router (egress point in the label-switched paths).	none specified
Hop	Address of the hops in the label-switched path from the first hop to the last hop. Depth indicates the level of the hop.	detail
Parent	Address of the previous hop. Parent value for the first hop is null.	detail
Return Code	Return code for reporting the result of processing the echo request by the receiver.	detail
Sender timestamp	Display the timestamp when the MPLS echo request is sent to the next hop.	detail
Receiver timestamp	Timestamp when the echo request from the previous hop is received and acknowledged with an echo response by the next hop.	detail
Response time	Time for the echo request to reach the receiver.	detail
MTU	Size of the largest packet that includes the label stack forwarded to the next hop.	detail
Multipath type	Labels or addresses used by the specified multipath type. If multipaths are not used, the value is none.	detail
Label stack	Label stack used to forward the packet.	detail

traceroute mpls rsvp user@host> **traceroute mpls rsvp lsp-chicago-atlanta**

Probe options: retries 3, exp 7

ttl	Label	Protocol	Address	Previous Hop	Probe Status
1	299792	RSVP-TE	192.168.1.2	(null)	Success
2	299803	RSVP-TE	192.168.2.3	192.168.1.2	Success
3	3	RSVP-TE	192.168.3.4	192.168.2.3	Egress

Path 1 via ge-0/0/0.1 destination 127.0.0.64

```

traceroute mpls rsvp user@host> traceroute mpls rsvp lsp-chicago-atlanta detail
detail Probe options: retries 3, exp 7

Hop 192.168.1.2 Depth 1
  Probe status: Success
  Parent: (null)
  Return code: Label-switched at stack-depth 1
  Sender timestamp: 2008-04-17 09:35:27 EDT 400.88 msec
  Receiver timestamp: 2008-04-17 09:35:27 EDT 427.87 msec
  Response time: 26.99 msec
  MTU: Unknown
  Multipath type: IP bitmask
    Address Range 1: 127.0.0.64 ~ 127.0.0.127
  Label Stack:
    Label 1 Value 299792 Protocol RSVP-TE

Hop 192.168.2.3 Depth 2
  Probe status: Success
  Parent: 192.168.1.2
  Return code: Upstream interface index unknown label-switched at stack-depth
1
  Sender timestamp: 2008-04-17 09:35:27 EDT 522.13 msec
  Receiver timestamp: 2008-04-17 09:35:27 EDT 548.69 msec
  Response time: 26.55 msec
  MTU: 1518
  Multipath type: IP bitmask
    Address Range 1: 127.0.0.64 ~ 127.0.0.127
  Label Stack:
    Label 1 Value 299803 Protocol RSVP-TE

```


Part 2

System Management

- Accounting Operational Mode Commands on page 119
- Chassis Operational Mode Commands on page 127
- Command-Line Interface Operational Mode Commands on page 335
- File Management Operational Mode Commands on page 355
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Chapter 6

Accounting Operational Mode Commands

Table 36 on page 119 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot accounting options. Commands are listed in alphabetical order.

Table 36: Accounting Operational Mode Commands

Task or Information to Monitor	Command
Display accounting statistics.	show accounting profile
Display records.	show accounting records

An accounting profile requires a collection interval, specific fields and counter names on which to collect statistics, and a file to contain the data. You can configure the following types of accounting profiles:

- Interface—Collects error and statistic information for input and output packets on a particular physical or logical interface.
- Filter—Collects count statistics for firewall filters.
- Routing Engine—Collects Routing Engine statistics, including uptime and CPU load.
- Class usage—Collects statistics for particular source and destination classes, maintaining packet counts based on the entry and exit points for traffic passing through the network:
 - Source class usage (SCU) tracks traffic originating from specific prefixes on the provider core and destined for specific prefixes on the customer edge.
 - Destination class usage (DCU) tracks traffic originating from the customer edge and destined for specific prefixes on the provider core router.



NOTE: For information about configuring accounting profiles, see the *JUNOS Network Management Configuration Guide*.

show accounting profile

Syntax	show accounting profile <i>profile-name</i>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display accounting profile information.
Options	<i>profile-name</i> —Name of the accounting profile.
Required Privilege Level	view
List of Sample Output	show accounting profile (Interface) on page 121 show accounting profile (Filter) on page 122 show accounting profile (Destination Class) on page 122 show accounting profile (Routing Engine) on page 123
Output Fields	Table 37 on page 120 lists the output fields for the show accounting profile command. Output fields are listed in the approximate order in which they appear.

Table 37: show accounting profile Output Fields

Field Name	Field Description
Profile	Name of the accounting profile.
Sampling interval	Configured interval, in minutes, for statistic collection.
Profile Usage Count	Number of items configured for collecting accounting statistics.
<i>file information</i>	Information about the accounting profile log, including: <ul style="list-style-type: none"> ■ File—Name of accounting profile log. If no name is explicitly provided, the name of the accounting profile is used. All statistics files are placed in the <code>/var/log</code> directory. ■ maximum size—Configured size. When the size is exceeded, the log file closes and a new log file opens. ■ maximum number—Configured maximum number of log files. ■ bytes written—Number of bytes written to the log file.
Transfer Interval	Length of time (in minutes) the file remains open, receiving statistics before it is closed, transferred, and rotated. When either the time or the file size is exceeded, the file is closed and a new one opened, whether or not a transfer site is specified.
Next Scheduled Transfer	Time at which the next transfer occurs.

Table 37: show accounting profile Output Fields (continued)

Field Name	Field Description
Column Labels	<p>Names of sampled statistics. This list varies depending on the configuration:</p> <ul style="list-style-type: none"> ■ profile-layout—List of data fields reported, in the order they appear in the output. ■ epoch-timestamp—Number of seconds since the epoch. ■ interfaces—(For interface, filter, and destination class profiles) Name of the interfaces on which the filter is applied. ■ filter-name—(For filter profiles) Name of the filter. ■ counter-name—(For filter profiles) Name of the counter. ■ packet-count—(For filter and destination class profiles) Number of packets for the counter. ■ byte-count—(For filter and destination class profiles) Number of bytes for the counter. ■ input-bytes—(For interface profiles) Input bytes. ■ input-errors—(For interface profiles) Generic input error packets. ■ input-multicast—(For interface profiles) Input packets arriving by multicast. ■ input-packets—(For interface profiles) Input packets. ■ input-unicast—(For interface profiles) Input unicast packets. ■ output-bytes—(For interface profiles) Output bytes. ■ output-errors—(For interface profiles) Generic output error packets. ■ output-multicast—(For interface profiles) Output packets sent by multicast. ■ output-packets—(For interface profiles) Output packets. ■ output-unicast—(For interface profiles) Output unicast packets. ■ no-proto—(For interface profiles) Packets for unsupported protocol. ■ snmp-index—(For interface profiles) SNMP index. ■ destination-class-name—(For destination class profiles) Configured destination class name. ■ host name—(For Routing Engine profiles) Hostname for the router. ■ date-yyyyymmdd—(For Routing Engine profiles) Date. ■ timeofday-hhmmss—(For Routing Engine profiles) Time of day. ■ uptime—(For Routing Engine profiles) Time since the last reboot, in seconds. ■ cpu1min—(For Routing Engine profiles) Average system load over the last 1 minute. ■ cpu5min—(For Routing Engine profiles) Average system load over the last 5 minutes. ■ cpu15min—(For Routing Engine profiles) Average system load over the last 15 minutes.
Interface name	Name of the interface configured for this accounting profile.
Filter name	Name of the filter configured for this accounting profile.
routing-engine-stats	Routing Engine accounting profile.
Next Scheduled Collection	Time for next collection of statistics for the named interface.

```

show accounting profile (Interface)  user@host> show accounting profile if_prof
                                         Profile if_prof
                                         Sampling interval: 1 minute(s), Profile Usage Count: 2
                                         File accounting_profile_stats: maximum size 1048576, maximum number 5, bytes
                                         written 2196
                                         Transfer Interval: 15 minute(s), Next Scheduled Transfer: 2001-06-17-18:00:45

```

Column Labels:
 profile-layout
 epoch-timestamp
 interface-name
 snmp-index
 input-bytes
 output-bytes
 input-packets
 output-packets
 input-unicast
 output-unicast
 input-multicast
 output-multicast
 no-proto
 input-errors
 output-errors

Interface Name	Next Scheduled Collection
fxp0.0	2001-06-18-18:00:30
fxp0	2001-06-18-18:01:00

**show accounting profile
 (Filter)**

```
user@host> show accounting profile filter_profile
Profile filter_profile
Sampling interval: 1 minute(s), Profile Usage Count: 0
File accounting_profile_stats: maximum size 1048576, maximum number 5, bytes
written 822
Transfer Interval: 15 minute(s), Next Scheduled Transfer: 2001-06-17-18:00:46
Column Labels:
  profile-layout
  epoch-timestamp
  interfaces
  filter-name
  counter-name
  packet-count
  byte-count
```

Filter Name	Next Scheduled Collection
myfiltero	2001-06-03-04:32:59

**show accounting profile
 (Destination Class)**

```
user@host> show accounting profile dcu1
Profile dcu1
Sampling interval: 1 minute(s), Profile Usage Count: 0
File accounting_profile_stats: maximum size 1048576, maximum number 5, bytes
written 901
Transfer Interval: 15 minute(s), Next Scheduled Transfer: 2001-06-17-18:00:46
Column Labels:
  profile-layout
  epoch-timestamp
  interface-name
  destination-class-name
  packet-count
  byte-count
```

Interface Name	Next Scheduled Collection
so-0/3/3	2001-06-03-04:34:00

```

show accounting profile      user@host> show accounting profile repl
(Routing Engine)           Profile repl
                               Sampling interval: 1 minute(s), Profile Usage Count: 1
                               File accounting_profile_stats: maximum size 1048576, maximum number 5, bytes
                               written 901
                               Transfer Interval: 15 minute(s), Next Scheduled Transfer: 2001-06-17-18:00:46
                               Column Labels:
                               profile-layout
                               epoch-timestamp
                               hostname
                               date-yyyyymmdd
                               timeofday-hhmmss
                               uptime
                               cpu1min
                               cpu5min
                               cpu15min

                               Interface Name           Next Scheduled Collection
                               routing-engine-stats      2001-06-18-18:02:31

```

show accounting records

Syntax	show accounting records <i>profile-name</i> <since <i>time</i> > <utc_timestamp>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display accounting records for the specified accounting profile.
Options	<p><i>profile-name</i>—Name of the accounting profile.</p> <p>since <i>time</i>—(Optional) Display accounting statistics since the specified time (YYYY-MM-DD-HH:MM:SS)</p> <p>utc_timestamp—(Optional) Display the timestamp in Coordinated Universal Time (UTC) format.</p>
Required Privilege Level	view
List of Sample Output	<p>show accounting records on page 125</p> <p>show accounting records utc-timestamp on page 126</p> <p>show accounting records (Since Time) on page 126</p> <p>show accounting records (Filter Profile) on page 126</p> <p>show accounting records (Destination Class Profile) on page 126</p> <p>show accounting records (Routing Engine Profile) on page 126</p>
Output Fields	Table 38 on page 124 lists the output fields for the show accounting records command. Output fields are listed in the approximate order in which they appear.

Table 38: show accounting records Output Fields

Field Name	Field Description
Timestamp	Date and time of sample.
Interface Name	(For interface profiles) Name and SNMP index of the interface for the accounting profile.
Filter name	(For filter profiles) Name of the filter.
Interfaces	(For filter profiles) Name of the interfaces for the accounting profile.
Counter name	(For filter profiles) Name of the counter.
Destination Class	(For destination class profiles) Name of the destination class.
Input Bytes	(For interface profiles) Input bytes.
Output Bytes	(For interface profiles) Output bytes.
Input Packets	(For interface profiles) Input packets.
Output Packets	(For interface profiles) Output packets.

Table 38: show accounting records Output Fields *(continued)*

Field Name	Field Description
Input Unicast Packets	(For interface profiles) Input unicast packets.
Output Unicast Packets	(For interface profiles) Output unicast packets
Input Multicast Packets	(For interface profiles) Input packets arriving by multicast.
Output Multicast Packets	(For interface profiles) Output packets sent by multicast.
Unsupported Protocol Packets	(For interface profiles) Packets for unsupported protocols.
Input Errors	(For interface profiles) Generic input error packets.
Output Errors	(For interface profiles) Generic output error packets.
Host Name	(For Routing Engine profiles) Hostname for the router.
Date	(For Routing Engine profiles) Date, in YYYYMMDD format.
Time of Day	(For Routing Engine profiles) Time of day, in HHMMSS format.
Uptime	(For Routing Engine profiles) Time since the last reboot, in seconds.
Average CPU Load (1 min)	(For Routing Engine profiles) Average system load over the last 1 minute.
Average CPU Load (5 min)	(For Routing Engine profiles) Average system load over the last 5 minutes.
Average CPU Load (15 min)	(For Routing Engine profiles) Average system load over the last 15 minutes.

```

show accounting records user@host> show accounting records if_prof
Timestamp: 2000-10-03-00:30:41, Interface Name: fxp0 (SNMP Index 1)
32663634 Input Bytes
3487515 Output Bytes
158000 Input Packets
33296 Output Packets
158000 Input Unicast Packets
33296 Output Unicast Packets
0 Input Multicast Packets
0 Output Multicast Packets
0 Unsupported Protocol Packets
0 Input Errors
0 Output Errors

```

```

show accounting      user@host> show accounting records if_prof utc_timestamp
records utc-timestamp  Timestamp: 2001-06-18-18:01:00, Interface Name: fxp0 (SNMP Index 1)
                        32663634  Input Bytes
                        3487515   Output Bytes
                        158000    Input Packets
                        33296     Output Packets
                        158000    Input Unicast Packets
                        33296     Output Unicast Packets
                        0         Input Multicast Packets
                        0         Output Multicast Packets
                        0         Unsupported Protocol Packets
                        0         Input Errors
                        0         Output Errors

show accounting      user@host> show accounting records if_prof since 2000-10-03-00:10:41
records (Since Time)  Timestamp: 2000-10-03-00:30:41, Interface Name: fxp0 (SNMP Index 1)
                        32663634  Input Bytes
                        3487515   Output Bytes
                        158000    Input Packets
                        33296     Output Packets
                        158000    Input Unicast Packets
                        33296     Output Unicast Packets
                        0         Input Multicast Packets
                        0         Output Multicast Packets
                        0         Unsupported Protocol Packets
                        0         Input Errors
                        0         Output Errors

show accounting      user@host> show accounting records filter_profile
records (Filter Profile) Timestamp: 2000-10-03-00:30:41, Filter Name: ap_filter, Interfaces: fxp0.0
                        Counter Name: c1
                        2440      Packets
                        223509    Bytes

show accounting      user@host> show accounting records dcu1
records (Destination  Timestamp: 2000-10-03-00:30:41, Interface: so-2/0/0.0, Destination Class: gold
Class Profile)       0        Packets
                        0        Bytes

show accounting      user@host> show accounting records repl
records (Routing Engine
Profile)             Timestamp: 2000-10-03-00:30:41
                        Host Name:      andro
                        Date:           20010618
                        Time of Day:    183130
                        Uptime:        88260
                        Average CPU Load (1 min): 0.000000
                        Average CPU Load (5 min): 0.000000
                        Average CPU Load (15 min): 0.000000

```

Chapter 7

Chassis Operational Mode Commands

Table 39 on page 127 summarizes the command-line interface (CLI) commands you can use to monitor the router chassis. Commands are listed in alphabetical order.

Table 39: Chassis Operational Mode Commands

Task	CLI Command
(T-series and M320 routers only) Clear or stop a text message on the craft interface.	clear chassis display message
(T-series, M120, M320, and MX-series routers only) Change Control Board (CB) status information.	request chassis cb
(M7i and M10i routers only) Control the operation of the Compact Forwarding Engine Board (CFEB).	request chassis cfeb
(M120 and MX-series routers only) Control the operation of the specified fabric plane.	request chassis fabric plane
(M120 router only) Control the operation of the specified Forwarding Engine Board (FEB).	request chassis feb
(M20, M40, M40e, M120 M160, M320, and MX-series routers, and T-series routing platforms only) Control the operation of the Flexible PIC Concentrator (FPC).	request chassis fpc
(M40e, M120, M160, M320, and MX-series routers, and T-series routing platforms only) Resynchronize the Front Panel Module (FPM) craft interface status	request chassis fpm resync
(Routing matrix only) Control the operation of a T640 routing node (or line-card chassis) that is connected to a TX matrix platform.	request chassis lcc
(M40e and M160 routers only) Control the operation of the Miscellaneous Control Subsystem (MCS).	request chassis mcs
(M40e and M160 routers only) Control the operation of the Packet Forwarding Engine (PFE) clock generator (PCG).	request chassis pcg
Control the operation of a Physical Interface Card (PIC).	request chassis pic
(M120 routers only) Control the operation of a Forwarding Engine Board (FEB) in a redundancy group .	request chassis redundancy feb slot

Table 39: Chassis Operational Mode Commands *(continued)*

Task	CLI Command
For routers with multiple Routing Engines, control which Routing Engine is the master.	<code>request chassis routing-engine master</code>
(T-series routing platforms only) Control the operation of the specified SONET Clock Generator (SCG).	<code>request chassis scg</code>
(M40e and M160 routers only) Control which Switching and Forwarding Module (SFM) is master.	<code>request chassis sfm master switch</code>
(M40e and M160 routers only) Control the operation of the specified SFM .	<code>request chassis sfm</code>
(M320 routers and T-series routing platforms only) Control the operation of the specified Switch Interface Board (SIB).	<code>request chassis sib</code>
(T-series routing platforms only) Restart the specified Switch Processor Mezzanine Board (SPMB) on the Control Board (CB).	<code>request chassis spmb restart</code>
(M320 routers only) Change the external clock source used for chassis synchronization.	<code>request chassis synchronization switch</code>
Send a message to the router's craft interface.	<code>set chassis display message</code>
Display chassis alarm status.	<code>show chassis alarms</code>
(M7i and M10i routers only) Change and display CFEB status information.	<code>show chassis cfeb</code>
View information that is currently displayed on the craft interface.	<code>show chassis craft-interface</code>
Display environmental information about the routing platform chassis, including the temperature and information about the fans, power supplies, and Routing Engine.	<code>show chassis environment</code>
(T-series, M120, M320, and MX-series routers only) Display CB environmental information.	<code>show chassis environment cb</code>
(M20, M40, M40e, M120, M160, M320, and MX-series routers, and T-series routing platforms only) Display FPC environmental status information.	<code>show chassis environment fpc</code>
(M20, M40, M40e, M120, M160, M320, and MX-series routers, and T-series routing platforms only) Change and display FPM status information.	<code>show chassis environment fpm</code>
(M40e and M160 routers only) Display MCS environmental status information.	<code>show chassis environment mcs</code>
Display generic environmental information.	<code>show chassis environment</code>
(M40e and M160 routers only) Display PCG environmental status information.	<code>show chassis environment pcg</code>

Table 39: Chassis Operational Mode Commands *(continued)*

Task	CLI Command
(M40e, M120, M160, M320, and MX-series routers, and T-series routing platforms only) Display Power Entry Module (PEM) environmental status information.	<code>show chassis environment pem</code>
Display Routing Engine environmental status information.	<code>show chassis environment routing-engine</code>
(T-series routing platforms only) Display SCG environmental information.	<code>show chassis environment scg</code>
(M40e and M160 routers only) Display SFM environmental information.	<code>show chassis environment sfm</code>
(M320 routers and T-series routing platform only) Display SIB environmental information.	<code>show chassis environment sib</code>
(M10i, M40e, M120, M160, M320, and MX-series routers, and T-series routing platforms only) Display information about the ports on the Control Board (CB) Ethernet switch.	<code>show chassis ethernet-switch</code>
(M120 router only) Display the state of the electrical and optical switching fabric link between the Forwarding Engine Boards (FEBs) and the fabric planes, as interpreted by the FEB.	<code>show chassis fabric feb</code>
(M320 and MX-series routers and T-series routing platform only) Display the state of the electrical and optical switch fabric links between the FPCs and the SIBs.	<code>show chassis fabric fpcs</code>
(M120 and MX-series routers only) Display the state of the switching fabric map for connections from the FEBs to the ports on the fabric planes, as interpreted by the fabric plane.	<code>show chassis fabric map</code>
(M120 and MX-series routers only) Display the state of all fabric plane connections to the FEBs.	<code>show chassis fabric plane</code>
(M120 and MX-series routers only) Display the CB location of each plane.	<code>show chassis fabric plane-location</code>
(T-series routing platforms only) Display the state of the electrical and optical switch fabric links: <ul style="list-style-type: none"> ■ Between the SIBs in the TX Matrix platform and the SIBs in the T640 routing nodes. ■ Between the T640 SIBs and the FPCs in a T640 routing node. 	<code>show chassis fabric sibs</code>
(T-series routing platforms only) Display the state of the switching fabric topology for the SIB connection between the TX Matrix platform and the T640 routing nodes.	<code>show chassis fabric topology</code>
(M5, M10, and M120 routers only). Display FEB status information.	<code>show chassis feb</code>
Display the version levels of the firmware running on the SCB, SFM, SSB, FEB, and FPCs.	<code>show chassis firmware</code>

Table 39: Chassis Operational Mode Commands *(continued)*

Task	CLI Command
(J-series Services Routers only) Display status of the forwarding process (fwdd).	<code>show chassis forwarding</code>
(M20, M40, M40e, M160, and M320 routers, MX-series routers and T-series routing platforms only) Display FPC status information.	<code>show chassis fpc</code>
(M120 router only) Display the FPC and FEB mapping and their respective states.	<code>show chassis fpc-feb-connectivity</code>
Display hardware inventory.	<code>show chassis hardware</code>
Display the status of the most recent unified in-service software upgrade (ISSU).	<code>show chassis in-service-upgrade</code>
(Routing matrix only) Display the status of all T640 routing nodes (or line-card chassis) connected to the TX Matrix platform.	<code>show chassis lccs</code>
Display chassis location information.	<code>show chassis location</code>
Display MAC address information.	<code>show chassis mac-addresses</code>
Display the network services mode.	<code>show chassis network services</code>
Display PIC status information.	<code>show chassis pic</code>
(J-series routers only) Display PIM power ratings.	<code>show chassis power-ratings</code>
(Root System Domain [RSD] only) Display information about Protected System Domains (PSDs).	<code>show chassis psd</code>
(M120 routers only) Display status information about configured Forwarding Engine Board (FEB) redundancy groups.	<code>show chassis redundancy feb</code>
Display the information about one or more Routing Engines.	<code>show chassis routing-engine</code>
(M40 router only) Display System Control Board (SCB) status information.	<code>show chassis scb</code>
(M40e and M160 routers only) Change and display SFM status information.	<code>show chassis sfm</code>
(M320 routers and T-series routing platforms only) Display SIB status information.	<code>show chassis sibs</code>
(T-series routing platforms only) Display SPMB status information.	<code>show chassis spmb</code>
(T-series routing platforms only) Display SPMB Switch Interface Board (SIB) status information.	<code>show chassis spmb sibs</code>
(M320 routers only) Display information about the external clock source currently used for chassis synchronization.	<code>show chassis synchronization</code>

Table 39: Chassis Operational Mode Commands *(continued)*

Task	CLI Command
(M120 and MX-series routers only) Display chassis temperature threshold settings, in degrees Celsius.	<code>show chassis temperature-thresholds</code>



NOTE: For information about how to configure chassis parameters, such as conditions that activate the alarm LEDs on the router's craft interface, properties for specific Physical Interface Cards (PICs), and redundancy, see the *JUNOS System Basics Configuration Guide*.

For information about related tasks performed by Network Operations Center (NOC) personnel, see the *JUNOS Hardware Network Operations Guide*.

clear chassis display message

Syntax	clear chassis display message
Release Information	Command introduced in JUNOS Release 7.5.
Description	(M40e, M160, and M320 routers and the T-series routing platforms only) Clear or stop a text message on the craft interface display, which is on the front of the router. The craft interface alternates the display of text messages with standard craft interface messages, switching between messages every 2 seconds. By default, the text message is displayed for 5 minutes. The craft interface display has four 20-character lines.
Required Privilege Level	clear
Related Topics	set chassis display message show chassis craft-interface
List of Sample Output	clear chassis display message on page 132
Output Fields	See show chassis craft-interface for an explanation of output fields.

clear chassis display message The following example displays and then clears the text message on the craft interface display:

```

user@host> show chassis craft-interface
Red alarm:      LED off, relay off
Yellow alarm:   LED off, relay off
Host OK LED:    On
Host fail LED:  Off
FPCs           0  1  2  3  4  5  6  7
-----
Green  ..  *..  *  *.
Red    .....
LCD screen:
+-----+
|NOC contact Dusty |
|(888) 526-1234    |
+-----+

user@host> clear chassis display message
user@host> show chassis craft-interface
Red alarm:      LED off, relay off
Yellow alarm:   LED off, relay off
Host OK LED:    On
Host fail LED:  Off
FPCs           0  1  2  3  4  5  6  7
-----
Green  ..  *..  *  *.
Red    .....
LCD screen:
+-----+
|host              |
|Up: 0+17:05:47    |
|                  |
|Temperature OK    |
+-----+

```


request chassis cb

Syntax	request chassis cb (offline online) slot <i>slot-number</i>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M120, M320, and MX-series routers and T-series routing platforms only) Control the operation of the Control Board (CB).
Options	<p>offline—Take the CB offline.</p> <p>online—Bring the CB online.</p> <p>slot <i>slot-number</i>—CB slot number:</p> <ul style="list-style-type: none"> ■ Routing Matrix only—If you specify the number of the T640 routing node by using the <i>lcc number</i> option (the recommended method), replace <i>slot-number</i> with a value from 0 through 7. Otherwise, replace <i>slot-number</i> with a value from 0 through 31. For example, the following commands have the same result: <pre> user@host> request chassis cb lcc 1 slot 1 offline user@host> request chassis cb slot 9 offline </pre> ■ M320 router—Replace <i>slot-number</i> with a value from 0 through 1. ■ MX480/MX240 routers—Replace <i>slot-number</i> with a value from 0 through 1. ■ MX960 router—Replace <i>slot-number</i> with a value from 0 through 2.
Required Privilege Level	maintenance
List of Sample Output	request chassis cb on page 133
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request chassis cb	<pre> user@host> request chassis cb offline slot 1 Backup CB 1 cannot be set offline, backup RE is online </pre>

request chassis cfep

Syntax	request chassis cfep (offline online restart)
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M7i and M10i routers only) Control the operation of the Compact Forwarding Engine Board (CFEB).
Options	offline—Take the CFEB offline. online—Bring the CFEB online. restart—Restart the CFEB.
Required Privilege Level	maintenance
Related Topics	show chassis cfep
List of Sample Output	request chassis cfep on page 134
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request chassis cfep	user@host> request chassis cfep offline CFEB Offlined

request chassis fabric plane

Syntax	request chassis fabric plane <i>plane-number</i> (offline online)
Release Information	Command introduced in JUNOS Release 8.0.
Description	(M120 and MX-series routers only) Control the operation of the specified fabric plane.
Options	<p>offline—Take the fabric plane offline. Use the <code>request chassis fabric plane <i>plane-number</i> offline</code> command to clear a FAULT state on a fabric plane. To bring the fabric plane back online, use the <code>request chassis fabric plane <i>plane-number</i> online</code> command.</p> <p>online—Bring the fabric plane online.</p> <p><i>plane plane-number</i>—Fabric plane slot number. For the M120 router, replace <i>plane-number</i> with a value from 0 through 3. For the MX480 and MX240 routers, replace <i>plane-number</i> with a value from 0 through 7. For the MX960 router, replace <i>plane-number</i> with a value from 0 through 5.</p>
Required Privilege Level	maintenance
List of Sample Output	<p>request chassis fabric plane 0 online on page 135</p> <p>request chassis fabric plane 0 offline on page 135</p>
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request chassis fabric plane 0 online	<pre>user@host> request chassis fabric plane 0 online</pre> <p>Online initiated, use "show chassis fabric plane" to verify</p>
request chassis fabric plane 0 offline	<pre>user@host> request chassis fabric plane 0 offline</pre> <p>Offline initiated, use "show chassis fabric plane" to verify</p>

request chassis feb

Syntax	request chassis feb (offline online restart) slot <i>slot-number</i>
Release Information	Command introduced in JUNOS Release 8.0.
Description	(M120 router only) Control the operation of the specified Forwarding Engine Board (FEB).
Options	<p>offline—Take the specified FEB offline.</p> <p>online—Bring the specified FEB online.</p> <p>restart—Restart the specified FEB.</p> <p>slot <i>slot-number</i>—FEB slot number. Replace <i>slot-number</i> with a value from 0 through 5.</p>
Required Privilege Level	maintenance
List of Sample Output	<p>request chassis feb offline slot 0 on page 136</p> <p>request chassis feb online slot 0 on page 136</p> <p>request chassis feb restart slot 0 on page 136</p>
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request chassis feb offline slot 0	<pre>user@host> request chassis feb offline slot 0</pre> <p>Offline initiated, use "show chassis feb" to verify</p>
request chassis feb online slot 0	<pre>user@host> request chassis feb online slot 0</pre> <p>Online initiated, use "show chassis feb" to verify</p>
request chassis feb restart slot 0	<pre>user@host> request chassis feb restart slot 0</pre> <p>Restart initiated, use "show chassis feb" to verify</p>

request chassis fpc

Syntax	request chassis fpc (offline online restart) slot <i>slot-number</i>
Syntax (Routing Matrix)	request chassis fpc (offline online restart) slot <i>slot-number</i> <fcc number>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M20, M40, M40e, M120, M160, M320, and MX-series routers, and T-series routing platforms only) Control the operation of the Flexible PIC Concentrator (FPC).
Options	<p>offline—Take the FPC offline.</p> <p>online—Bring the FPC online.</p> <p>restart—Restart the FPC.</p> <p>slot <i>slot-number</i>—FPC slot number:</p> <ul style="list-style-type: none"> ■ M20 router—0 through 3. ■ M120 router—0 through 5. ■ MX240 router—0 through 2. On the MX240 router, <i>slot-number</i> corresponds to the Dense Port Concentrator (DPC) slot number. ■ MX480 router—0 through 5. On the MX480 router, <i>slot-number</i> corresponds to the Dense Port Concentrator (DPC) slot number. ■ MX960 router—0 through 11. On the MX960 router, <i>slot-number</i> corresponds to the Dense Port Concentrator (DPC) slot number. ■ Routing matrix only—If you specify the number of the T640 routing node by using the fcc <i>number</i> option (the recommended method), replace <i>slot-number</i> with a value from 0 through 7. Otherwise, replace <i>slot-number</i> with a value from 0 through 31. For example, the following commands have the same result: <pre> user@host> request chassis fpc fcc 1 slot 1 offline user@host> request chassis fpc slot 9 offline </pre> ■ Other routing platforms—0 through 7. <p>fcc <i>number</i>—(Routing matrix only) (Optional) Control the FPC in a specified T640 routing node that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p>
Required Privilege Level	maintenance
Related Topics	show chassis fpc
List of Sample Output	request chassis fpc on page 138

Output Fields When you enter this command, you are provided feedback on the status of your request.

request chassis fpc user@host> **request chassis fpc online slot 0**
FPC 0 already online

request chassis fpm resync

Syntax	request chassis fpm resync
Syntax (Routing Matrix)	request chassis fpm resync (lcc <i>number</i> scc)
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M40e, M120, M160, M320, and MX-series routers, and T-series routing platforms only) Resynchronize the Front Panel Module (FPM) craft interface status.
Options	<p>lcc <i>number</i>—(Routing matrix only) Resynchronize the craft interface status on a specified T640 routing node that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) Resynchronize the craft interface status on the TX Matrix platform (or switch-card chassis).</p>
Required Privilege Level	maintenance
List of Sample Output	request chassis fpm resync on page 139
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request chassis fpm resync	<pre>user@host> request chassis fpm resync Front Panel resynced</pre>

request chassis lcc

Syntax (Routing Matrix) `request chassis lcc (offline | online) slot slot-number`

Release Information Command introduced before JUNOS Release 7.4.

Description (Routing matrix only) Control the operation of a T640 routing node (or line-card chassis) that is connected to a TX matrix platform.

Options `offline`—Take the T640 routing node offline.

`online`—Bring the T640 routing node online.

`slot slot-number`—Slot number of a T640 routing node that is connected to a TX Matrix platform. Replace *slot-number* with a value from 0 through 3.

Required Privilege Level maintenance

Related Topics `show chassis lccs`

List of Sample Output `request chassis lcc` on page 140

Output Fields When you enter this command, you are provided feedback on the status of your request.

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

request chassis mcs

Syntax	<code>request chassis mcs (offline online restart) slot <i>slot-number</i></code>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M40e and M160 routers only) Control the operation of the Miscellaneous Control Subsystem (MCS).
Options	<p><code>offline</code>—Take the MCS offline.</p> <p><code>online</code>—Bring the MCS online.</p> <p><code>restart</code>—Restart the MCS.</p> <p><code>slot <i>slot-number</i></code>—MCS slot number. Replace <i>slot-number</i> with 0 or 1.</p>
Required Privilege Level	maintenance
List of Sample Output	request chassis mcs on page 141
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request chassis mcs	<pre>user@host> request chassis mcs online slot 0 MCS 0 appears to be online already</pre>

request chassis pcg

Syntax	<code>request chassis pcg (offline online) slot <i>slot-number</i></code>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M40e and M160 routers) Control the operation of the Packet Forwarding Engine (PFE) clock generator (PCG).
Options	<p><code>offline</code>—Take the PCG offline.</p> <p><code>online</code>—Bring the PCG online.</p> <p><code>slot <i>slot-number</i></code>—PCG slot number. Replace <i>slot-number</i> with 0 or 1.</p>
Required Privilege Level	maintenance
List of Sample Output	request chassis pcg on page 142
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request chassis pcg	<pre>user@host> request chassis pcg online slot 0 PCG 1 appears to be already online</pre>

request chassis pic

Syntax request chassis pic (offline | online) fpc-slot *slot-number* pic-slot *slot-number*

Syntax (Routing Matrix) request chassis pic (offline | online) fpc-slot *slot-number* pic-slot *slot-number* <fcc *number*>

Release Information Command introduced before JUNOS Release 7.4.

Description Control the operation of the Physical Interface Card (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 chassis, use the show chassis hardware command.

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 routing platform:

- M5, M7i, M10, and M10i routers—0 or 1.
- M20 routers—0 through 3.
- M120 routers—0 through 5.
- MX960 routers—0 through 11.
- M40, M40e, M160, M320, T320 routers, and T640 nodes—0 through 7.
- Routing matrix only—If you specify the number of the T640 routing node by using the fcc *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> request chassis pic fpc-slot 1 fcc 1 pic-slot 0 offline
user@host> request chassis pic fpc-slot 9 pic-slot 0 offline
```

pic-slot *slot-number*—PIC slot number. For the M-series routing platform, the T640 routing node, and the routing matrix, it can be 0, 1, 2, or 3. On the MX960 router, *slot-number* corresponds to the slot number of the Packet Forwarding Engine. For the T320 router, it can be 0 or 1.

lcc *number*—(Routing matrix only) (Optional) Control the PIC in a specified T640 routing node that is connected to a TX Matrix platform. Replace *number* with a value from 0 through 3.

Required Privilege Level maintenance

Related Topics show chassis hardware and show chassis pic

List of Sample Output request chassis pic on page 144

Output Fields When you enter this command, you are provided feedback on the status of your request.

request chassis pic user@host> **request chassis pic pic-slot 0 online fpc-slot 0**
FPC 0, PIC 0 is already online

request chassis redundancy feb slot

Syntax	<code>request chassis redundancy feb slot <i>slot-number</i> (switch-to-backup revert-from-backup)</code>
Release Information	Command introduced in JUNOS Release 8.2.
Description	(M120 routers only) Control the operation of the specified Forwarding Engine Board (FEB) in a redundancy group.
Options	<p><i>slot-number</i>—FEB slot number. Replace <i>slot-number</i> with a value from 0 through 5.</p> <p><i>switch-to-backup</i>—Initiate a switchover from the specified active FEB to the backup FEB for the redundancy group.</p> <p><i>revert-from-backup</i>—Initiate a revert to the specified FEB following a switchover to the backup FEB for a redundancy group.</p>
Required Privilege Level	maintenance
List of Sample Output	<p><code>request chassis redundancy feb slot 2 switch-to-backup</code> on page 145</p> <p><code>request chassis redundancy feb slot 3 revert-to-backup</code> on page 145</p>
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request chassis redundancy feb slot 2 switch-to-backup	<pre>user@host> request chassis redundancy feb slot 2 switch-to-backup</pre> <p>Switch initiated, use “show chassis redundancy febs” to verify</p>
request chassis redundancy feb slot 3 revert-to-backup	<pre>user@host> request chassis redundancy feb slot 3 revert-to-backup</pre> <p>Revert initiated, use “show chassis redundancy febs” to verify</p>

request chassis routing-engine master

Syntax	request chassis routing-engine master (acquire release switch) <force> <no-confirm>
Syntax (Routing Matrix)	request chassis routing-engine master (acquire release switch) (lcc <i>number</i> scc all-chassis) <force> <no-confirm>
Release Information	Command introduced before JUNOS Release 7.4. all-chassis option added in JUNOS Release 8.0.
Description	For routers with multiple Routing Engines, control which Routing Engine is the master.



CAUTION: (Routing matrix only) Within the routing matrix, we recommend that all Routing Engines run the same JUNOS software release. If you run different JUNOS releases on the Routing Engines and a change in mastership occurs on any backup Routing Engine in the routing matrix, one or all T640 routing nodes might become logically disconnected from the TX Matrix platform and cause data loss. For more information, see the *TX Matrix Platform Hardware Guide* or the *JUNOS High Availability Configuration Guide*.



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 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 FPCs should spontaneously restart. We recommend that you wait until the warning no longer appears and then proceed with the switchover.

Options	<p>acquire—Attempt to become the master Routing Engine.</p> <p>release—Request that the other Routing Engine become the master.</p> <p>switch—Toggle mastership between Routing Engines.</p> <p>lcc <i>number</i>—(Routing matrix only) T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) TX Matrix platform (or switch-card chassis).</p>
----------------	--

all-chassis—(Routing matrix only) Switch mastership on all Routing Engines in a TX Matrix platform.

force—(Optional) Available only with the **acquire** option. Force the change to a new master Routing Engine.

no-confirm—(Optional) Do not request confirmation for the switch.

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 Physical Interface Cards (PICs). Interior Gateway Protocol (IGP) and Border Gateway Protocol (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 System Basics Configuration Guide*.

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 Topics show chassis routing-engine

List of Sample Output request chassis routing-engine master acquire on page 148
request chassis routing-engine master switch on page 148

Output Fields When you enter this command, you are provided feedback on the status of your request.

```
request chassis routing-engine master acquire
user@host> request chassis routing-engine master acquire
warning: Traffic will be interrupted while the PFE is re-initialized
warning: The other routing engine's file system could be corrupted
Reset other routing engine and become master ? [yes,no] (no)
```

```
request chassis routing-engine master switch
user@host> request chassis routing-engine master switch
warning: Traffic will be interrupted while the PFE is re-initialized
Toggle mastership between Routing Engines ? [yes,no] (no) yes

Resolving mastership...
Complete. The other Routing Engine becomes the master.
```

Switch mastership back to the local Routing Engine:

```
user@host> request chassis routing-engine master switch
warning: Traffic will be interrupted while the PFE is re-initialized
Toggle mastership between routing engines ? [yes,no] (no) yes
```



```
Resolving mastership...  
Complete. The local routing engine becomes the master.
```

request chassis scg

Syntax	<code>request chassis scg (offline online) slot <i>slot-number</i></code>
Syntax (Routing Matrix)	<code>request chassis scg lcc <i>number</i> (offline online) slot <i>slot-number</i></code>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(T-series routing platforms only) Control the operation of the specified SONET Clock Generator (SCG).
Options	<p><i>lcc number</i>—(Routing matrix only) Change the SCG status on a specified T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p><i>offline</i>—Take the SCG offline. When you change the SCG status to offline, the unit is not powered down.</p> <p><i>online</i>—Bring the SCG online.</p> <p><i>slot slot-number</i>—SCG slot number. Replace <i>slot-number</i> with 0 or 1.</p>
Required Privilege Level	maintenance
Related Topics	<code>show chassis environment scg</code>
List of Sample Output	<code>request chassis scg</code> on page 150
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request chassis scg	<pre>user@host> request chassis scg online slot 0 Online initiated, use "show chassis environment scg" to verify</pre>

request chassis sfm

Syntax	<code>request chassis sfm (offline online restart) slot <i>slot-number</i></code>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M40e and M160 routers only) Control the operation of the specified Switching and Forwarding Module (SFM).
Options	<p><code>offline</code>—Take the SFM offline.</p> <p><code>online</code>—Bring the SFM online.</p> <p><code>restart</code>—Restart the SFM.</p> <p><code>slot <i>slot-number</i></code>—SFM slot number. Replace <i>slot-number</i> with a value from 0 through 3.</p>
Required Privilege Level	maintenance
Related Topics	show chassis sfm
List of Sample Output	<p>request chassis sfm (M40e) on page 151</p> <p>request chassis sfm (M160) on page 151</p>
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request chassis sfm (M40e)	<pre>user@host> request chassis sfm slot 1 restart M40e router: error: SFM 0 is transitioning to online state.</pre>
request chassis sfm (M160)	<pre>user@host> request chassis sfm slot 1 restart M160 router: Restart initiated, use "show chassis sfm" to verify</pre>

request chassis sfm master switch

Syntax	request chassis sfm master switch <no-confirm>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M40e and M160 routers only) Control which Switching and Forwarding Module (SFM) is master.
Options	no-confirm—(Optional) Do not display a switch warning or query.
Additional Information	<p>By default, the SFM in slot 0 (SFM0) is the master and the SFM in slot 1 (SFM1) is the backup. If you use this command to change the master, and then restart the chassis software for any reason, the master reverts to the default setting. To change the default master SFM, include the sfm statement at the [edit chassis redundancy] hierarchy level in the configuration. For more information, see the <i>JUNOS System Basics Configuration Guide</i>.</p> <p>All installed SFMs are always working together to forward packets. If an SFM fails, the other SFMs take over and traffic continues to flow uninterrupted.</p>
Required Privilege Level	maintenance
Related Topics	show chassis sfm
List of Sample Output	<p>request chassis sfm master switch on page 152</p> <p>request chassis sfm master switch no-confirm on page 152</p>
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request chassis sfm master switch	<pre>user@host> request chassis sfm master switch warning: Traffic will be interrupted while the PFE is re-initialized Toggle mastership between system forwarding module? [yes,no] (no) yes Switch initiated, use "show chassis sfm" to verify</pre>
request chassis sfm master switch no-confirm	<pre>user@host> request chassis sfm master switch no-confirm Switch initiated, use "show chassis sfm" to verify</pre>

request chassis sib

Syntax	request chassis sib (offline online) slot <i>slot-number</i>
Syntax (Routing Matrix)	request chassis sib (all-chassis lcc <i>number</i> scc) (offline online) slot <i>slot-number</i> (start-receiver <i>number</i> stop-receiver <i>number</i>)
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M320 routers and T-series routing platforms only) Control the operation of the specified Switch Interface Board (SIB).
Options	<p>all-chassis—(Routing matrix only) Controls the operation of the SIB in the specified slot on the TX Matrix platform and on all T640 routing nodes.</p> <p>lcc <i>number</i>—(Routing matrix only) T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) TX Matrix platform (or switch-card chassis).</p> <p>offline—Take the SIB offline.</p> <p>online—Bring the SIB online.</p> <p>slot <i>slot-number</i>—SIB slot number. For the T640 routing node and a routing matrix, replace <i>slot-number</i> with a value from 0 through 4. For the T320 router, replace <i>slot-number</i> with a value from 0 through 2.</p> <p>start-receiver <i>number</i>—(Routing matrix only) Start the SIB optical receiver. Replace <i>number</i> with a value from 0 through 3.</p> <p>stop-receiver <i>number</i>—(Routing matrix only) Stop the SIB optical receiver. Replace <i>number</i> with a value from 0 through 3.</p>
Required Privilege Level	maintenance
Related Topics	show chassis sibs
List of Sample Output	request chassis sib on page 153
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request chassis sib	<pre>user@host> request chassis sib slot 0 online</pre> <p>Online initiated, use "show chassis sibs" to verify</p>

request chassis spmb restart

Syntax	request chassis spmb restart slot <i>slot-number</i>
Syntax (Routing Matrix)	request chassis spmb restart (lcc <i>number</i> scc) slot <i>slot-number</i>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(T-series routing platforms only) Restart the specified Switch Processor Mezzanine Board (SPMB) on the Control Board (CB).
Options	<p>lcc <i>number</i>—(Routing matrix only) T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) TX Matrix platform (or switch-card chassis).</p> <p>slot <i>slot-number</i>—CB slot number. Replace <i>slot-number</i> with 0 or 1.</p>
Required Privilege Level	maintenance
Related Topics	<p>show chassis spmb</p> <p>show chassis spmb sibs</p>
List of Sample Output	request chassis spmb restart on page 154
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request chassis spmb restart	user@host> request chassis spmb restart slot 0

request chassis ssb master switch

Syntax	request chassis ssb master switch <no-confirm>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M20 router only) Control which System and Switch Board (SSB) is master.
Options	no-confirm—(Optional) Do not request confirmation for the switch.
Additional Information	<p>By default, the SSB in slot 0 (SSB0) is the master and the SSB in slot 1 (SSB1) is the backup. If you use this command to change the master, and then restart the chassis software for any reason, the master reverts to the default setting. To change the default master SSB, include the ssb statement at the [edit chassis redundancy] hierarchy level in the configuration. For more information, see the <i>JUNOS System Basics Configuration Guide</i>.</p> <p>The configurations on the two SSBs do not have to be the same, and they are not automatically synchronized. If you configure both SSBs as masters, when the chassis software restarts for any reason, the SSB in slot 0 becomes the master and the one in slot 1 becomes the backup.</p> <p>The switchover from the primary SSB to the backup SSB is immediate. The SSB takes several seconds to reinitialize the Flexible PIC Concentrators (FPCs) and restart the Physical Interface Cards (PICs). The Interior Gateway Protocol (IGP) and Border Gateway Protocol (BGP) convergence times depend on the specific network environment.</p>
Required Privilege Level	maintenance
Related Topics	show chassis ssb
List of Sample Output	request chassis ssb master switch on page 155 request chassis ssb master switch no-confirm on page 155
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request chassis ssb master switch	<pre>user@host> request chassis ssb master switch warning: Traffic will be interrupted while the PFE is re-initialized Toggle mastership between system switch boards ? [yes,no] (no) yes Switch initiated, use "show chassis ssb" to verify</pre>
request chassis ssb master switch no-confirm	<pre>user@host> request chassis ssb master switch no-confirm Switch initiated, use "show chassis ssb" to verify</pre>

request chassis synchronization switch

Syntax	request chassis synchronization switch (external-a external-b)
Release Information	Command introduced in JUNOS Release 7.6. Command introduced in JUNOS Release 8.3 for M40e routers. Command introduced in JUNOS Release 9.3 for M120 routers.
Description	(M320, M40e, and M120 routers only) Change the external clock source used for chassis synchronization.
Options	<p>external-a—(Routing matrix only) Change the synchronization source to external source A.</p> <p>external-b—(Routing matrix only) Change the synchronization source to external source B.</p>
Required Privilege Level	maintenance
Related Topics	show chassis synchronization
List of Sample Output	request chassis synchronization switch external-a on page 156
Output Fields	When you enter this command, you are provided feedback on the status of your request. Not configured indicates that the source is not configured. Present indicates that the source is configured and present. Qualified indicates that the source is being used for synchronization.
request chassis synchronization switch external-a	<pre>user@host> request chassis synchronization switch external-a switching to external-a, status: qualified</pre>

set chassis display message

Syntax	set chassis display message " <i>message</i> " <permanent>
Syntax (Routing Matrix)	set chassis display message " <i>message</i> " (<i>lcc number</i> <i>scc</i>) <permanent>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display or stop a text message on the craft interface display, which is on the front of the router. The craft interface alternates the display of text messages with standard craft interface messages, switching between messages every 2 seconds. By default, the text message is displayed for 5 minutes. The craft interface display has four 20-character lines.
Options	<p>"message"—Message to display on the craft interface display. If the message is longer than 20 characters, it wraps onto the next line. If a word does not fit on one line, the entire word moves down to the next line. Any portion of the message that does not fit on the display is truncated. An empty pair of quotation marks (" ") deletes the text message from the craft interface display.</p> <p><i>lcc number</i>—(Routing matrix only) Display the text message on the craft interface display of a specified T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p><i>scc</i>—(Routing matrix only) Display the text message on the craft interface display of the TX Matrix platform (or switch-card chassis).</p> <p>permanent—(Optional) Display a text message on the craft interface display permanently.</p>
Required Privilege Level	clear
Related Topics	<p>clear chassis display message</p> <p>show chassis craft-interface</p>
List of Sample Output	<p>set chassis display message (Creating) on page 157</p> <p>set chassis display message (Deleting) on page 158</p>
Output Fields	See show chassis craft-interface for an explanation of output fields.
set chassis display message (Creating)	<p>The following example shows how to set the display message and verify the result:</p> <pre> user@host> set chassis display message "NOC contact Dusty (888) 555-1234" message sent user@host> show chassis craft-interface Red alarm: LED off, relay off Yellow alarm: LED off, relay off Host OK LED: On Host fail LED: Off FPCs 0 1 2 3 4 5 6 7 ----- </pre>

```

Green .. *.. * *.
Red .....
LCD screen:
+-----+
|NOC contact Dusty |
|(888) 555-1234    |
+-----+

```

**set chassis display
message (Deleting)**

The following example shows how to delete the display message and verify that the message is removed:

```

user@host> set chassis display message ""
message sent

```

```

user@host> show chassis craft-interface

```

```

Red alarm:      LED off, relay off

```

```

Yellow alarm:   LED off, relay off

```

```

Host OK LED:    On

```

```

Host fail LED:  Off

```

```

FPCs      0  1  2  3  4  5  6  7

```

```

-----
Green .. *.. * *.

```

```

Red .....

```

```

LCD screen:

```

```

+-----+
|host    |
|Up: 0+17:05:47|
|        |
|Temperature OK|
+-----+

```

show chassis alarms

Syntax	show chassis alarms
Syntax (Routing Matrix)	show chassis alarms <fcc number scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display information about the conditions that have been configured to trigger alarms.
Options	<p>none—(Routing matrix only) Display information about the conditions that have been configured to trigger alarms on the TX Matrix platform and its attached T640 routing nodes.</p> <p>fcc <i>number</i> — (Routing matrix only) (Optional) Show information about a specified T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Show information about the TX Matrix platform (or switch-card chassis).</p>
Additional Information	<p>You cannot clear the alarms for chassis components. Instead, you must remedy the cause of the alarm. When a chassis alarm is lit, it indicates that you are running the router in a manner that we do not recommend.</p> <p>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.</p>
Required Privilege Level	view
List of Sample Output	<p>show chassis alarms (Alarms Active) on page 160</p> <p>show chassis alarms (No Alarms Active) on page 160</p> <p>show chassis alarms (Alarms Active on a Routing Matrix) on page 160</p> <p>show chassis alarms (Backup Routing Engine) on page 160</p>
Output Fields	Table 40 on page 159 lists the output fields for the show chassis alarms command. Output fields are listed in the approximate order in which they appear.

Table 40: 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.

**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
(Alarms Active on a
Routing Matrix)**

```
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
(Backup Routing
Engine)**

```
user@host> show chassis alarms
2 alarms are currently active
Alarm time      Class  Description
2005-04-07 10:12:22 PDT Minor Host 1 Boot from alternate media
2005-04-07 10:11:54 PDT Major Host 1 compact-flash missing in Boot List
```

show chassis cfeb

Syntax	show chassis cfeb
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M7i and M10i routers only) Display status information about the Compact Forwarding Engine Board (CFEB).
Options	This command has no options.
Required Privilege Level	view
Related Topics	request chassis cfeb
List of Sample Output	show chassis cfeb (M7i) on page 162 show chassis cfeb (M10i) on page 162
Output Fields	Table 41 on page 161 lists the output fields for the show chassis cfeb command. Output fields are listed in the approximate order in which they appear.

Table 41: show chassis cfeb Output Fields

Field Name	Field Description
State	Status of the CFEB: Online or Offline.
Intake Temperature	Temperature of the air before flowing past the CFEB.
Exhaust Temperature	Temperature of the air after flowing past the CFEB.
CPU utilization	Percentage of CPU being used by the CFEB processor.
Interrupt utilization	Of the total CPU being used by the CFEB processor, the percentage being used for interrupts
Heap Utilization	Percentage of heap space (dynamic memory) being used by the CFEB processor. If this number exceeds 80 percent, there may be a software problem (memory leak).
Buffer Utilization	Percentage of buffer space being used by the CFEB processor for buffering internal messages
Total CPU DRAM	Amount of DRAM available to the CFEB CPU.
Internet Processor II	Information about the CFEB processor.
Start time	Time when the Routing Engine detected that the CFEB was running.
Uptime	How long the Routing Engine has been connected to the CFEB and, therefore, how long the Flexible PIC Concentrator (FPC) has been up and running.

```

show chassis cfeb (M7i) user@host> show chassis cfeb
CFEB status:
  State                               Online
  Intake Temperature                 27 degrees C / 80 degrees F
  Exhaust Temperature               33 degrees C / 91 degrees F
  CPU utilization                     3 percent
  Interrupt utilization              0 percent
  Heap utilization                   8 percent
  Buffer utilization                  21 percent
  Total CPU DRAM                     128 MB
  Internet Processor II              Version 1, Foundry IBM, Part number 164
  Start time:                       2003-06-11 11:41:22 PDT
  Uptime:                           1 hour, 39 minutes, 31 seconds

show chassis cfeb (M10i) user@host> show chassis cfeb
CFEB status:
Slot 0 information:
  StateMaster
  Intake temperature                 35 degrees C / 95 degrees F
  Exhaust temperature               43 degrees C / 109 degrees F
  CPU utilization                     3 percent
  Interrupt utilization              0 percent
  Heap utilization                   10 percent
  Buffer utilization                  22 percent
  Total CPU DRAM                     128 MB
  Internet Processor II              Version 1, Foundry IBM, Part number 164
  Start time:                       2004-11-01 03:24:15 PST
  Uptime:                           12 hours, 56 minutes, 18 seconds
Slot 1 information:
  State                             Backup

```

show chassis craft-interface

Syntax	show chassis craft-interface
Syntax (Routing Matrix)	show chassis craft-interface <fcc number scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	For routers that have a display on the craft interface, show the messages that are currently displayed. On all routers, except for the M20, you must enter this command on the master Routing Engine.
Options	<p>none—(Routing matrix only) Show messages that are currently displayed on the craft interface on the TX Matrix platform and its attached T640 routing nodes.</p> <p>fcc number (Routing matrix only)—(Optional) Show messages for a specified T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Show messages for the TX Matrix platform (or switch-card chassis).</p>
Required Privilege Level	view
Related Topics	<p>clear chassis display message</p> <p>set chassis display message</p>
List of Sample Output	<p>show chassis craft-interface (M20) on page 164</p> <p>show chassis craft-interface (M40) on page 165</p> <p>show chassis craft-interface (M120) on page 165</p> <p>show chassis craft-interface (M160) on page 166</p> <p>show chassis craft-interface (Routing Matrix) on page 166</p>
Output Fields	Table 42 on page 163 lists the output fields for the show chassis craft-interface command. Output fields are listed in the approximate order in which they appear.

Table 42: show chassis craft-interface Output Fields

Field Name	Field Description
LCD screen or FPM Display Contents	<p>Contents of the Front Panel Module display:</p> <ul style="list-style-type: none"> ■ <i>router-name</i>—Name of the router. ■ Up—How long the router has been operational, in days, hours, minutes, and seconds. ■ <i>message</i>—Information about the router traffic load, the power supply status, the fan status, and the temperature status. The display of this information changes every 2 seconds. If a text message has been created with the set chassis display command, this message appears on all four lines of the craft interface display. The display alternates between the text message and the standard system status messages every 2 seconds.

Table 42: show chassis craft-interface Output Fields (continued)

Field Name	Field Description
Front Panel System LEDs	Status of the Front Panel System LEDs. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit.
Front Panel Alarm Indicators	Status of the Front Panel Alarm Indicators. A dot (.) indicates the relay is off. An asterisk (*) indicates the relay is active.
Front Panel FPC LEDs	Status of the Front Panel Flexible PIC Concentrator (FPC) LEDs. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit.
CB LEDs	Status of the Control Board (CB) LEDs. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit.
MCS and SFM LEDs	Status of the Miscellaneous Control Subsystem (MCS) and Switching and Forwarding Module (SFM) LEDs. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit. When neither a dot nor an asterisk is displayed, there is no board in that slot.
SIB LEDs	Status of the Switch Interface Board (SIB) LEDs. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit.
SCG LEDs	Status of the SONET Clock Generator (SCG) LEDs. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit.

show chassis craft-interface (M20)

```

user@host> show chassis craft-interface
Red alarm:      LED off, relay off
Yellow alarm:   LED on, relay on
Host OK LED:    On
Host fail LED:  Off
FPCs           0  1  2  3
-----
Green  .  *  *.
Red    ....
LCD screen:
+-----+
|host   |
|1 Alarm active|
|Y: FERF|
|       |
+-----+

```


show chassis craft-interface (M40)

```
user@host> show chassis craft-interface
Front Panel LCD Display: enabled
Red alarm:      LED off, relay off
Yellow alarm:   LED off, relay off
Host OK LED:    On
Host Fail LED:  Off
NICs    0  1  2  3  4  5  6  7
-----
Green   *.  *.  *.  *.
Red     .....
LCD Screen:
+-----+
|host   |
|Up: 27+18:52:37|
|       |
|52.649kpps Load|
+-----+
```

show chassis craft-interface (M120)

```
user@host> show chassis craft-interface
Front Panel System LEDs:
Routing Engine    0    1
-----
OK                *    .
Fail              .    .
Master           *    .

Front Panel Alarm Indicators:
-----
Red LED          *
Yellow LED       .
Major relay      *
Minor relay      .

Front Panel FPC LEDs:
FPC    0    1    2    3    4    5
-----
Red     .    .    .    .    .    .
Green   .    *    .    *    *    *

CB LEDs:
CB      0    1
-----
Amber   .    .
Green   *    *

PS LEDs:
PS      0    1
-----
Red     .    .
Green   *    *

FEB LEDs:
FEB    0    1    2    3    4    5
-----
Red     .    .    .    .    .    .
Green   .    .    .    *    *    *
Active  .    .    .    *    *    *
```

show chassis craft-interface (M160) user@host> **show chassis craft-interface**
FPM Display contents:

```
+-----+
|hosts      |
|Up: 1+16:46|
|           |
|Fans OK    |
+-----+
```

Front Panel System LEDs:

Host 0 1

```
-----
OK      .      *
Fail    .      .
Master  .      *
```

Front Panel Alarm Indicators:

```
-----
Red LED   .
Yellow LED .
Major relay.
Minor relay.
```

Front Panel FPC LEDs:

FPC 0 1 2 3 4 5 6 7

```
-----
Red      . . . . .
Green    *  * . . . .
```

MCS and SFM LEDs:

MCS 0 1 SFM 0 1 2 3

```
-----
Amber     .              . .
Green     .              . .
Blue      *              *  *
```

show chassis craft-interface (Routing Matrix) user@host> **show chassis craft-interface**
scc-re0:

FPM Display contents:

```
+-----+
|bradley    |
|8 Alarms active|
|R: SIB 2 Absent|
|R: SIB 1 Absent|
+-----+
```

Front Panel System LEDs:

Routing Engine 0 1

```
-----
OK              *  .
Fail            .  .
Master          *  .
```

Front Panel Alarm Indicators:

```
-----
Red LED        *
Yellow LED     *
Major relay    *
Minor relay    *
```

```

CB LEDs:
  CB  0  1
-----
Amber. .
Green * .
Blue  * .

SIB LEDs:
  SIB 0  1  2  3  4
-----
Fail . . . . .
OK   . . . . *
Active . . . . *

lcc0-re0:
-----
FPM Display contents:
+-----+
|hybrid          |
|5 Alarms active |
|R: SIB 2 Absent |
|R: SIB 1 Absent |
+-----+
Front Panel System LEDs:
Routing Engine  0  1
-----
OK              * .
Fail            . .
Master          * .

Front Panel Alarm Indicators:
-----
Red LED        *
Yellow LED     *
Major relay    *
Minor relay    *

Front Panel FPC LEDs:
FPC  0  1  2  3  4  5  6  7
-----
Red   . . . . .
Green *  *  . . . .

CB LEDs:
  CB  0  1
-----
Amber. .
Green * .
Blue  * .

SCG LEDs:
  SCG 0  1
-----
Amber. .
Green * .
Blue  * .

SIB LEDs:
  SIB 0  1  2  3  4
-----
Red   . . . . .

```

Green. . . . *

lcc2-re0:

FPM Display contents:

```
+-----+
| prius          |
| 5 Alarms active |
| R: SIB 2 Absent |
| R: SIB 1 Absent |
+-----+
```

Front Panel System LEDs:

Routing Engine 0 1

```
-----
OK                *   .
Fail              .   .
Master            *   .
```

Front Panel Alarm Indicators:

```
-----
Red LED          *
Yellow LED       *
Major relay      *
Minor relay      *
```

Front Panel FPC LEDs:

FPC 0 1 2 3 4 5 6 7

```
-----
Red   .   .   .   .   .   .   .
Green *   *   *   .   .   .   .
```

CB LEDs:

CB 0 1

```
-----
Amber. .
Green * .
Blue  * .
```

SCG LEDs:

SCG 0 1

```
-----
Amber. .
Green * .
Blue  * .
```

SIB LEDs:

SIB 0 1 2 3 4

```
-----
Red   .   .   .   .
Green .   .   .   *
```

show chassis environment

Syntax	show chassis environment
Syntax (Routing Matrix)	show chassis environment <fcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display environmental information about the routing platform chassis, including the temperature and information about the fans, power supplies, and Routing Engine.
Options	<p>none—Display environmental information about the routing platform chassis. For the Routing matrix only, display environmental information about the TX Matrix platform and its attached T640 routing nodes.</p> <p>fcc <i>number</i>—(Routing matrix only) (Optional) Display chassis environmental information for a specified T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display chassis environmental information about the TX Matrix platform (or switch-card chassis).</p>
Required Privilege Level	view
List of Sample Output	<p>show chassis environment (J2300) on page 170</p> <p>show chassis environment (J4300 or J6300) on page 170</p> <p>show chassis environment (M5) on page 170</p> <p>show chassis environment (M7i) on page 170</p> <p>show chassis environment (M10) on page 171</p> <p>show chassis environment (M10i) on page 171</p> <p>show chassis environment (M20) on page 172</p> <p>show chassis environment (M40) on page 172</p> <p>show chassis environment (M40e) on page 172</p> <p>show chassis environment (M120) on page 173</p> <p>show chassis environment (M160) on page 174</p> <p>show chassis environment (M320) on page 174</p> <p>show chassis environment (MX240) on page 175</p> <p>show chassis environment (MX480) on page 176</p> <p>show chassis environment (MX960) on page 177</p> <p>show chassis environment (T320) on page 177</p> <p>show chassis environment (T640) on page 178</p> <p>show chassis environment (Routing Matrix) on page 179</p>
Output Fields	Table 43 on page 170 lists the output fields for the show chassis environment command. Output fields are listed in the approximate order in which they appear.

Table 43: show chassis environment Output Fields

Field Name	Field Description
Class	Item, Status, Measurement
Power	Power information: <ul style="list-style-type: none"> ■ (M5, M10, M20, and M40 routers only) Information about each power supply. Status can be OK, Testing (during initial power-on), Failed, or Absent. ■ (M7i, M10i, M40e, M120, M160, and M320 routers, and T-series routing platforms only) Information about the Power Entry Modules. Status can be OK, Testing (during initial power-on), Check, Failed, or Absent.
Temp	Temperature of air flowing through the chassis. Measurement indicates degrees in Centigrade (C) and Farenheit (F).
Fan	Information about the fans. Status can be OK , Testing (during initial power-on), Failed , or Absent . Measurement indicates if fans are spinning at normal or high speed.
Misc	Information about other components of the chassis: <ul style="list-style-type: none"> ■ On some routing platforms, it indicates the status of one or more additional components. ■ On the M160 router, Misc includes CIP (Connector Interface Panel). OK indicates the CIP is present. ■ On the T640 routing node, Misc includes CIP and SPMB (Switch Processor Mezzanine Board). OK indicates the item is present.

show chassis environment (J2300)

```
user@host> show chassis environment
Class Item          Status      Measurement
Temp  Routing Engine    OK          40 degrees C / 104 degrees F
Fan   Fan              OK
```

show chassis environment (J4300 or J6300)

```
user@host> show chassis environment
Class Item          Status      Measurement
Temp  Routing Engine    OK          41 degrees C / 105 degrees F
Fan   Fan 0             OK
      Fan 1          OK
```

show chassis environment (M5)

```
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)

```
user@host> show chassis environment
```

Class	Item	Status	Measurement
Power	Power Supply 0	OK	
	Power Supply 1	Absent	
Temp	Intake	OK	22 degrees C / 71 degrees F
	FPC 0	OK	23 degrees C / 73 degrees F
	Power Supplies	OK	23 degrees C / 73 degrees F
	CFEB Intake	OK	24 degrees C / 75 degrees F
	CFEB Exhaust	OK	29 degrees C / 84 degrees F
	Routing Engine	OK	26 degrees C / 78 degrees F
Fans	Fan 1	OK	Spinning at normal speed
	Fan 2	OK	Spinning at normal speed
	Fan 3	OK	Spinning at normal speed
	Fan 4	OK	Spinning at normal speed

show chassis environment (M10)

```
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)

```
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) user@host> show chassis environment
Class Item              Status      Measurement
Power Power Supply A    OK
Power 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) user@host> show chassis environment
Class Item              Status      Measurement
Power Power Supply A    OK
Power 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) user@host> show chassis environment
Class Item              Status      Measurement
Power PEM 0              OK
Power PEM 1              Absent
Temp  PCG 0              OK          44 degrees C / 111 degrees F
      PCG 1              OK          47 degrees C / 116 degrees F
      Routing Engine 0   OK          40 degrees C / 104 degrees F
      Routing Engine 1   OK          37 degrees C / 98 degrees F
      MCS 0              OK          45 degrees C / 113 degrees F
      MCS 1              OK          42 degrees C / 107 degrees F
      SFM 0 SPP          OK          40 degrees C / 104 degrees F
      SFM 0 SPR          OK          44 degrees C / 111 degrees F
      SFM 1 SPP          OK          43 degrees C / 109 degrees F
      SFM 1 SPR          OK          45 degrees C / 113 degrees F
      FPC 0              OK          38 degrees C / 100 degrees F
      FPC 1              OK          40 degrees C / 104 degrees F
      FPC 2              OK          38 degrees C / 100 degrees F
      FPC 4              OK          34 degrees C / 93 degrees F
      FPC 5              OK          43 degrees C / 109 degrees F
      FPC 6              OK          41 degrees C / 105 degrees F

```


	FPC 7	OK	43 degrees C / 109 degrees F
	FPM CMB	OK	28 degrees C / 82 degrees F
	FPM Display	OK	28 degrees C / 82 degrees F
Fans	Rear Bottom Blower	OK	Spinning at normal speed
	Rear Top Blower	OK	Spinning at normal speed
	Front Top Blower	OK	Spinning at normal speed
	Fan Tray Rear Left	OK	Spinning at normal speed
	Fan Tray Rear Right	OK	Spinning at normal speed
	Fan Tray Front Left	OK	Spinning at normal speed
	Fan Tray Front Right	OK	Spinning at normal speed
Misc	CIP	OK	

**show chassis
environment (M120)**

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) 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) user@host> show chassis environment
Class Item Status Measurement
Temp PEM 0 Absent
PEM 1 Absent
PEM 2 OK
PEM 3 OK
Routing Engine 0 OK 33 degrees C / 91 degrees F
Routing Engine 1 OK 32 degrees C / 89 degrees F
CB 0 OK 36 degrees C / 96 degrees F
CB 1 OK 36 degrees C / 96 degrees F
SIB 0 OK 38 degrees C / 100 degrees F
SIB 1 OK 29 degrees C / 84 degrees F
SIB 2 OK 38 degrees C / 100 degrees F
SIB 3 OK 41 degrees C / 105 degrees F
FPC 0 Intake OK 28 degrees C / 82 degrees F
FPC 0 Exhaust OK 40 degrees C / 104 degrees F
FPC 1 Intake OK 29 degrees C / 84 degrees F
FPC 1 Exhaust OK 39 degrees C / 102 degrees F
FPC 2 Intake OK 28 degrees C / 82 degrees F
FPC 2 Exhaust OK 38 degrees C / 100 degrees F
FPC 3 Intake OK 28 degrees C / 82 degrees F
FPC 3 Exhaust OK 39 degrees C / 102 degrees F

```

	FPC 6 Intake	OK	27 degrees C / 80 degrees F
	FPC 6 Exhaust	OK	39 degrees C / 102 degrees F
	FPC 7 Intake	OK	27 degrees C / 80 degrees F
	FPC 7 Exhaust	OK	42 degrees C / 107 degrees F
	FPM GBUS	OK	30 degrees C / 86 degrees F
Fan	Top Left Front fan	OK	Spinning at normal speed
	Top Right Rear fan	OK	Spinning at normal speed
	Top Right Front fan	OK	Spinning at normal speed
	Top Left Rear fan	OK	Spinning at normal speed
	Bottom Left Front fan	OK	Spinning at normal speed
	Bottom Right Rear fan	OK	Spinning at normal speed
	Bottom Right Front fan	OK	Spinning at normal speed
	Bottom Left Rear fan	OK	Spinning at normal speed
	Rear Fan 1 (TOP)	OK	Spinning at normal speed
	Rear Fan 2	OK	Spinning at normal speed
	Rear Fan 3	OK	Spinning at normal speed
	Rear Fan 4	OK	Spinning at normal speed
	Rear Fan 5	OK	Spinning at normal speed
	Rear Fan 6	OK	Spinning at normal speed
	Rear Fan 7 (Bottom)	OK	Spinning at normal speed
Misc	CIP	OK	

**show chassis
environment (MX240)**

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 (MX480) 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 (MX960)**

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 (T320)**

user@host> show chassis environment

Class	Item	Status	Measurement
Power	PEM 0	OK	
	PEM 1	Absent	
Temp	SCG 0	OK	28 degrees C / 82 degrees F

	SCG 1	OK	28 degrees C / 82 degrees F
	Routing Engine 0	OK	31 degrees C / 87 degrees F
	Routing Engine 1	OK	30 degrees C / 86 degrees F
	CB 0	OK	32 degrees C / 89 degrees F
	CB 1	OK	32 degrees C / 89 degrees F
	SIB 0	OK	33 degrees C / 91 degrees F
	SIB 1	OK	33 degrees C / 91 degrees F
	SIB 2	OK	34 degrees C / 93 degrees F
	FPC 0 Top	OK	38 degrees C / 100 degrees F
	FPC 0 Bottom	OK	32 degrees C / 89 degrees F
	FPC 1 Top	OK	38 degrees C / 100 degrees F
	FPC 1 Bottom	OK	33 degrees C / 91 degrees F
	FPC 2 Top	OK	36 degrees C / 96 degrees F
	FPC 2 Bottom	OK	31 degrees C / 87 degrees F
	FPM GBUS	OK	26 degrees C / 78 degrees F
	FPM Display	OK	29 degrees C / 84 degrees F
Fans	Top Left Front fan	OK	Spinning at normal speed
	Top Left Middle fan	OK	Spinning at normal speed
	Top Left Rear fan	OK	Spinning at normal speed
	Top Right Front fan	OK	Spinning at normal speed
	Top Right Middle fan	OK	Spinning at normal speed
	Top Right Rear fan	OK	Spinning at normal speed
	Bottom Left Front fan	OK	Spinning at normal speed
	Bottom Left Middle fan	OK	Spinning at normal speed
	Bottom Left Rear fan	OK	Spinning at normal speed
	Bottom Right Front fan	OK	Spinning at normal speed
	Bottom Right Middle fan	OK	Spinning at normal speed
	Bottom Right Rear fan	OK	Spinning at normal speed
	Rear Tray Top fan	OK	Spinning at normal speed
	Rear Tray Second fan	OK	Spinning at normal speed
	Rear Tray Middle fan	OK	Spinning at normal speed
	Rear Tray Fourth fan	OK	Spinning at normal speed
Misc	Rear Tray Bottom fan	OK	Spinning at normal speed
	CIP	OK	
	SPMB 0	OK	
	SPMB 1	OK	

**show chassis
environment (T640)**

```

user@host> show chassis environment
Class Item                Status      Measurement
Temp  PEM 0                  Absent
      PEM 1                  OK          22 degrees C / 71 degrees F
      SCG 0                  OK          30 degrees C / 86 degrees F
      SCG 1                  OK          30 degrees C / 86 degrees F
      Routing Engine 0      Present
      Routing Engine 1      OK          27 degrees C / 80 degrees F
      CB 0                  Present
      CB 1                  OK          33 degrees C / 91 degrees F
      SIB 0                  Absent
      SIB 1                  Absent
      SIB 2                  Absent
      SIB 3                  Absent
      SIB 4                  Absent
      FPC 4 Top              Testing
      FPC 4 Bottom          Testing
      FPC 5 Top              Testing
      FPC 5 Bottom          Testing
      FPC 6 Top              Testing
      FPC 6 Bottom          Testing
      FPM GBUS               OK          23 degrees C / 73 degrees F
      FPM Display           Absent

```

```

Fans  Top Left Front fan    OK      Spinning at normal speed
      Top Left Middle fan   OK      Spinning at normal speed
      Top Left Rear fan     OK      Spinning at normal speed
      Top Right Front fan   OK      Spinning at normal speed
      Top Right Middle fan  OK      Spinning at normal speed
      Top Right Rear fan    OK      Spinning at normal speed
      Bottom Left Front fan OK      Spinning at normal speed
      Bottom Left Middle fan OK     Spinning at normal speed
      Bottom Left Rear fan  OK      Spinning at normal speed
      Bottom Right Front fan OK     Spinning at normal speed
      Bottom Right Middle fan OK    Spinning at normal speed
      Bottom Right Rear fan OK     Spinning at normal speed
      Fourth Blower from top OK     Spinning at normal speed
      Bottom Blower         OK      Spinning at normal speed
      Middle Blower         OK      Spinning at normal speed
      Top Blower            OK      Spinning at normal speed
      Second Blower from top OK     Spinning at normal speed

Misc  CIP                   OK
      SPMB 0                OK
      SPMB 1                OK

```

show chassis environment (Routing Matrix)

```

user@host> show chassis environment
scc-re0:

```

```

-----
Class Item              Status      Measurement
Temp  PEM 0              Absent
      PEM 1              OK          29 degrees C / 84 degrees F
      Routing Engine 0    OK          34 degrees C / 93 degrees F
      Routing Engine 1    OK          34 degrees C / 93 degrees F
      CB 0                OK          32 degrees C / 89 degrees F
      CB 1                OK          32 degrees C / 89 degrees F
      SIB 0               OK          44 degrees C / 111 degrees F
      SIB 0 (B)           OK          44 degrees C / 111 degrees F
      FPM GBUS            OK          27 degrees C / 80 degrees F
      FPM Display         OK          32 degrees C / 89 degrees F
Fans  Top Left Front fan  OK          Spinning at normal speed
      Top Left Middle fan OK          Spinning at normal speed
      Top Left Rear fan   OK          Spinning at normal speed
      Top Right Front fan OK          Spinning at normal speed
      Top Right Middle fan OK         Spinning at normal speed
      Top Right Rear fan  OK          Spinning at normal speed
      Bottom Left Front fan OK        Spinning at normal speed
      Bottom Left Middle fan OK       Spinning at normal speed
      Bottom Left Rear fan OK        Spinning at normal speed
      Bottom Right Front fan OK       Spinning at normal speed
      Bottom Right Middle fan OK      Spinning at normal speed
      Bottom Right Rear fan OK       Spinning at normal speed
      Rear Tray Top fan    OK          Spinning at normal speed
      Rear Tray Second fan OK         Spinning at normal speed
      Rear Tray Third fan  OK          Spinning at normal speed
      Rear Tray Fourth fan OK         Spinning at normal speed
      Rear Tray Fifth fan  OK          Spinning at normal speed
      Rear Tray Sixth fan  OK          Spinning at normal speed
      Rear Tray Seventh fan OK        Spinning at normal speed
      Rear Tray Bottom fan OK         Spinning at normal speed
Misc  CIP 0              OK
      CIP 1              OK
      SPMB 0             OK
      SPMB 1             OK

```

1cc0-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	

1cc2-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 cb

Syntax	show chassis environment cb <slot>
Syntax (Routing Matrix)	show chassis environment cb <lcc number scc> <slot>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M120, M320, and MX-series routers and T-series routing platforms only) Display environmental information about the Control Boards (CBs).
Options	<p>none—Display environmental information about all CBs. For the routing matrix only, display environmental information about all CBs on the TX Matrix platform and its attached T640 routing nodes.</p> <p>lcc number—(Routing matrix only) (Optional) Display environmental information about the CBs in a specified T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display environmental information about the CBs in the TX Matrix platform (or switch-card chassis).</p> <p>slot—(Optional) Display environmental information about the specified CB. Replace <i>slot</i> with 0 or 1.</p>
Required Privilege Level	view
List of Sample Output	show chassis environment cb (M120) on page 183 show chassis environment cb (M320) on page 183 show chassis environment cb (MX240) on page 184 show chassis environment cb (MX480) on page 184 show chassis environment cb (MX960) on page 184 show chassis environment cb (Routing Matrix) on page 185
Output Fields	Table 44 on page 182 lists the output fields for the show chassis environment cb command. Output fields are listed in the approximate order in which they appear.

Table 44: show chassis environment cb Output Fields

Field Name	Field Description
State	Status of the CB: Online or Offline . If two CBs are installed and online, one is functioning as the master, and the other is the standby.
Temperature	Temperature of the air flowing past the CB.
Power	Power required and measured on the CB. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.

Table 44: show chassis environment cb Output Fields (continued)

Field Name	Field Description
BUS Revision	Revision level of the generic bus device.
FPGA Revision	Revision level of the field-programmable gate array (FPGA).

```

show chassis environment cb (M120) user@host> show chassis environment cb
CB 0 status:
  State                Online Master
  Temperature          33 degrees C / 91 degrees F
  Power
    1.2 V              1214 mV
    1.5 V              1495 mV
    2.5 V              2494 mV
    3.3 V              3319 mV
    5.0 V              5085 mV
    3.3 V bias         3296 mV
  Bus Revision         12
  FPGA Revision        17
CB 1 status:
  State                Online Standby
  Temperature          34 degrees C / 93 degrees F
  Power
    1.2 V              1195 mV
    1.5 V              1495 mV
    2.5 V              2504 mV
    3.3 V              3312 mV
    5.0 V              5111 mV
    3.3 V bias         3296 mV
  Bus Revision         12
  FPGA Revision        17

show chassis environment cb (M320) user@host> show chassis environment cb
CB 0 status:
  State                Online Master
  Temperature          29 degrees C / 84 degrees F
  Power:
    1.8 V              1805 mV
    2.5 V              2501 mV
    3.3 V              3293 mV
    4.6 V              4725 mV
    5.0 V              5032 mV
    12.0 V             11975 mV
    3.3 V bias         3286 mV
    8.0 V bias         7589 mV
  BUS Revision         40
  FPGA Revision        7
CB 1 status:
  State                Online Standby
  Temperature          32 degrees C / 89 degrees F
  Power:
    1.8 V              1802 mV
    2.5 V              2482 mV
    3.3 V              3289 mV
    4.6 V              4720 mV
    5.0 V              5001 mV

```

```

12.0 V          11946 mV
3.3 V bias      3274 mV
8.0 V bias      7562 mV
BUS Revision    40
FPGA Revision   7

```

```

show chassis user@host> show chassis environment cb
environment cb CB 0 status:
(MX240)      State          Online Standby
                Temperature    37 degrees C / 98 degrees F
                Power 1
                1.2 V          1208 mV
                1.5 V          1521 mV
                1.8 V          1811 mV
                2.5 V          2513 mV
                3.3 V          3332 mV
                5.0 V          5059 mV
                12.0 V         12162 mV
                1.25 V         1260 mV
                3.3 V SM3      3306 mV
                5.0 V RE       5085 mV
                12.0 V RE     11872 mV
                Power 2
                11.3 V bias PEM 11272 mV
                4.6 V bias MidPlane 4827 mV
                11.3 V bias FPD 11272 mV
                11.3 V bias POE 0 11292 mV
                11.3 V bias POE 1 11253 mV
                Bus Revision    42
                FPGA Revision   1

```

```

show chassis user@host> show chassis environment cb
environment cb CB 0 status:
(MX480)      State          Online Master
                Temperature    41 degrees C / 105 degrees F
                Power 1
                1.2 V          1202 mV
                1.5 V          1511 mV
                1.8 V          1798 mV
                2.5 V          2507 mV
                3.3 V          3312 mV
                5.0 V          5027 mV
                12.0 V         12200 mV
                1.25 V         1260 mV
                3.3 V SM3      3293 mV
                5 V RE         5040 mV
                12 V RE        11910 mV
                Power 2
                11.3 V bias PEM 11156 mV
                4.6 V bias MidPlane 4801 mV
                11.3 V bias FPD 11214 mV
                11.3 V bias POE 0 11098 mV
                11.3 V bias POE 1 11330 mV
                Bus Revision    42
                FPGA Revision   1

```

```

show chassis user@host> show chassis environment cb
environment cb CB 0 status:
(MX960)      State          Online Master
                Temperature    24 degrees C / 75 degrees F
                Power 1

```

1.2 V	1965 mV
1.5 V	2465 mV
1.8 V	2990 mV
2.5 V	3296 mV
3.3 V	3296 mV
5.0 V	6593 mV
12.0 V	13187 mV
3.3 V bias	3296 mV
1.25 V	1994 mV
3.3 V SM3	3296 mV
5 V RE	6593 mV
12 V RE	13174 mV
Power 2	Sensor failure
Bus Revision	4
FPGA Revision	3

**show chassis
environment cb (Routing
Matrix)**

```
user@host> show chassis environment cb
```

```
-----
CB 0 status:
  State                Online Master
  Temperature          32 degrees C / 89 degrees F
  Power:
    1.8 V              1797 mV
    2.5 V              2477 mV
    3.3 V              3311 mV
    4.6 V              4727 mV
    5.0 V              5015 mV
    12.0 V             12185 mV
    3.3 V bias         3304 mV
    8.0 V bias         7870 mV
  BUS Revision         40
  FPGA Revision        1
CB 1 status:
  State                Online Standby
...
```

```
lcc0-re0:
```

```
-----
CB 0 status:
  State                Online Master
  Temperature          32 degrees C / 89 degrees F
  Power:
    1.8 V              1787 mV
    2.5 V              2473 mV
    3.3 V              3306 mV
    4.6 V              4793 mV
    5.0 V              5025 mV
    12.0 V             12156 mV
    3.3 V bias         3289 mV
    8.0 V bias         7609 mV
  BUS Revision         40
  FPGA Revision        5
CB 1 status:
  State                Online Standby
....
  BUS Revision         40
  FPGA Revision        5
```

```
lcc2-re0:
```

```
-----
CB 0 status:
```

```
State
...
CB 1 status:
State
...
Online Master
Online Standby
```

show chassis environment fpc

Syntax	show chassis environment fpc <slot>
Syntax (Routing Matrix)	show chassis environment fpc <fcc number> <slot>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M40e, M120, M160, M320, and MX-series routers and T-series routing platforms only) Display about Flexible PIC Concentrator (FPC) environmental information.
Options	<p>none—Display environmental information about all FPCs. For the routing matrix only, display environmental information about all FPCs on the TX Matrix platform and its attached T640 routing nodes.</p> <p>fcc number—(Routing matrix only) (Optional) Display environmental information about the FPC in a T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>slot—(Optional) Display environmental information about an individual FPC:</p> <ul style="list-style-type: none"> ■ Routing matrix only—If you specify the number of the T640 routing node by using only the fcc number option (the recommended method), replace <i>slot</i> with a value from 0 through 7. Otherwise, replace <i>slot</i> with a value from 0 through 31. For example, the following commands have the same result: <pre> user@host> show chassis environment fpc 1 fcc 1 user@host> show chassis environment fpc 9 </pre> ■ M120 router—Replace <i>slot</i> with a value from 0 through 5. ■ MX240 router—Replace <i>slot</i> with a value from 0 through 2. ■ MX480 router—Replace <i>slot</i> with a value from 0 through 5. ■ MX960 router—Replace <i>slot</i> with a value from 0 through 11. ■ Other routing platforms—Replace <i>slot</i> with a value from 0 through 7.
Required Privilege Level	view
List of Sample Output	<p>show chassis environment fpc (M120) on page 188</p> <p>show chassis environment fpc (M160) on page 189</p> <p>show chassis environment fpc (M320) on page 189</p> <p>show chassis environmnet fpc (MX240) on page 190</p> <p>show chassis environmnet fpc (MX480) on page 191</p> <p>show chassis environmnet fpc (MX960) on page 192</p> <p>show chassis environment fpc (T-series) on page 193</p> <p>show chassis environment fpc fcc (Routing Matrix) on page 194</p>

Output Fields Table 45 on page 188 lists the output fields for the `show chassis environment fpc` command. Output fields are listed in the approximate order in which they appear.

Table 45: show chassis environment fpc Output Fields

Field Name	Field Description
State	Status of the FPC: Unknown, Empty, Present, Ready, Announce online, Online, Offline, or Diagnostics .
Temperature	(M40e and M160 routers only) Temperature of the air flowing past the FPC.
Temperature Intake	(M320 routers only) Temperature of the air flowing into the chassis.
Temperature Top	(T-series routing platforms only) Temperature of the air flowing past the top of the FPC.
Temperature Exhaust	(M120 and M320 routers only) Temperature of the air flowing out of the chassis.
Temperature Bottom	(T-series routing platforms only) Temperature of the air flowing past the bottom of the FPC.
Temperature MMBO	(T640 routing node only) Temperature of the air flowing past the type 3 FPC.
Temperature MMB1	(M320 routers and T-series routing platforms 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 RevisionorBUS revision	Revision level of the chassis management bus device (M-series routing platform) or bus (T-series routing platforms).

```

show chassis environment fpc (M120) user@host> show chassis environment fpc
FPC 2 status:
  State                               Online
  Temperature Exhaust A               32 degrees C / 89 degrees F
  Temperature Exhaust B               31 degrees C / 87 degrees F
  Power A-Board
    1.2 V                             1202 mV
    1.5 V                             1508 mV
    1.8 V                             1798 mV
    2.5 V                             2507 mV
    3.3 V                             3351 mV
    5.0 V                             4995 mV
    3.3 V bias                         3296 mV
    1.2 V Rocket IO                   1205 mV
    1.5 V Rocket IO                   1501 mV
  I2C Slave Revision                 12
FPC 3 status:
  State                               Online
  Temperature Exhaust A               31 degrees C / 87 degrees F
  Temperature Exhaust B               33 degrees C / 91 degrees F
  Power A-Board
    1.2 V                             1211 mV
    1.5 V                             1501 mV
    1.8 V                             1798 mV
    2.5 V                             2471 mV
    3.3 V                             3293 mV

```



```

5.0 V                4930 mV
3.3 V bias           3296 mV
1.2 V Rocket IO      1205 mV
1.5 V Rocket IO      1501 mV
Power B-Board
1.2 V                1214 mV
1.5 V                1501 mV
2.5 V                2471 mV
3.3 V                3300 mV
5.0 V                4943 mV
3.3 V bias           3296 mV
1.2 V Rocket IO      1205 mV
1.5 V Rocket IO      1501 mV
I2C Slave Revision   12
FPC 4 status:
State                Online
Temperature Exhaust A 32 degrees C / 89 degrees F
Temperature Exhaust B 30 degrees C / 86 degrees F
Power A-Board
1.2 V                1195 mV
1.5 V                1504 mV
1.8 V                1801 mV
2.5 V                2504 mV
3.3 V                3293 mV
5.0 V                4917 mV
3.3 V bias           3296 mV
1.2 V Rocket IO      1202 mV
1.5 V Rocket IO      1492 mV
I2C Slave Revision   12

```

**show chassis
environment fpc (M160)**

```

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)**

```

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
(MX240)**

```

user@host> show chassis environment fpc
FPC 1 status:
State          Online
Temperature Intake      34 degrees C / 93 degrees F
Temperature Exhaust A   39 degrees C / 102 degrees F
Temperature Exhaust B   53 degrees C / 127 degrees F
Temperature I3 0 TSensor 51 degrees C / 123 degrees F
Temperature I3 0 Chip    54 degrees C / 129 degrees F
Temperature I3 1 TSensor 50 degrees C / 122 degrees F
Temperature I3 1 Chip    53 degrees C / 127 degrees F
Temperature I3 2 TSensor 48 degrees C / 118 degrees F
Temperature I3 2 Chip    51 degrees C / 123 degrees F
Temperature I3 3 TSensor 45 degrees C / 113 degrees F
Temperature I3 3 Chip    48 degrees C / 118 degrees F
Temperature IA 0 TSensor 45 degrees C / 113 degrees F
Temperature IA 0 Chip    45 degrees C / 113 degrees F
Temperature IA 1 TSensor 45 degrees C / 113 degrees F
Temperature IA 1 Chip    49 degrees C / 120 degrees F
Power

```

```

1.5 V          1492 mV
2.5 V          2507 mV
3.3 V          3306 mV
1.8 V PFE 0    1801 mV
1.8 V PFE 1    1804 mV
1.8 V PFE 2    1798 mV
1.8 V PFE 3    1798 mV
1.2 V PFE 0    1169 mV
1.2 V PFE 1    1189 mV
1.2 V PFE 2    1182 mV
1.2 V PFE 3    1176 mV
I2C Slave Revision 42
FPC 2 status:
State          Online
Temperature Intake      33 degrees C / 91 degrees F
Temperature Exhaust A   41 degrees C / 105 degrees F
Temperature Exhaust B   53 degrees C / 127 degrees F
Temperature I3 0 TSensor 53 degrees C / 127 degrees F
Temperature I3 0 Chip    58 degrees C / 136 degrees F
Temperature I3 1 TSensor 52 degrees C / 125 degrees F
Temperature I3 1 Chip    56 degrees C / 132 degrees F
Temperature I3 2 TSensor 50 degrees C / 122 degrees F
Temperature I3 2 Chip    52 degrees C / 125 degrees F
Temperature I3 3 TSensor 46 degrees C / 114 degrees F
Temperature I3 3 Chip    49 degrees C / 120 degrees F
Temperature IA 0 TSensor 51 degrees C / 123 degrees F
Temperature IA 0 Chip    49 degrees C / 120 degrees F
Temperature IA 1 TSensor 48 degrees C / 118 degrees F
Temperature IA 1 Chip    53 degrees C / 127 degrees F
Power
1.5 V          1492 mV
2.5 V          2445 mV
3.3 V          3293 mV
1.8 V PFE 0    1827 mV
1.8 V PFE 1    1775 mV
1.8 V PFE 2    1788 mV
1.8 V PFE 3    1798 mV
1.2 V PFE 0    1250 mV
1.2 V PFE 1    1234 mV
1.2 V PFE 2    1231 mV
1.2 V PFE 3    1192 mV
I2C Slave Revision 42

```

**show chassis
environmnet fpc
(MX480)**

```

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)**

```
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
(T-series)**

```

user@host> show chassis environment fpc
FPC 0 status:
  State                      Online
  Temperature Top             42 degrees C / 107 degrees F
  Temperature Bottom          36 degrees C / 96 degrees F
  Temperature MMB1            39 degrees C / 102 degrees F
  Power:
    1.8 V                     1959 mV
    2.5 V                     2495 mV
    3.3 V                     3344 mV
    5.0 V                     5047 mV
    1.8 V bias                1787 mV
    3.3 V bias                3291 mV
    5.0 V bias                4998 mV
    8.0 V bias                7343 mV
  BUS Revision                40
FPC 1 status:
  State                      Online
  Temperature Top             42 degrees C / 107 degrees F
  Temperature Bottom          39 degrees C / 102 degrees F
  Temperature MMB1            40 degrees C / 104 degrees F
  Power:
    1.8 V                     1956 mV
    2.5 V                     2498 mV
    3.3 V                     3340 mV
    5.0 V                     5023 mV
    1.8 V bias                1782 mV
    3.3 V bias                3277 mV
    5.0 V bias                4989 mV
    8.0 V bias                7289 mV
  BUS Revision                40
FPC 2 status:
  State                      Online
  Temperature Top             43 degrees C / 109 degrees F
  Temperature Bottom          39 degrees C / 102 degrees F
  Temperature MMB1            41 degrees C / 105 degrees F
  Power:
    1.8 V                     1963 mV
    2.5 V                     2503 mV
    3.3 V                     3340 mV
    5.0 V                     5042 mV
    1.8 V bias                1797 mV
    3.3 V bias                3311 mV
    5.0 V bias                5013 mV
    8.0 V bias                7221 mV
  BUS Revision                40

```

```

show chassis      user@host> show chassis environment fpc lcc 0
environment fpc lcc  lcc0-re0:
(Routing Matrix) -----
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 fpm

Syntax	show chassis environment fpm
Syntax (Routing Matrix)	show chassis environment fpm <fcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M40e, M120, M160, M320, and MX-series routers, and T-series routing platforms only) Display environmental information about the front panel module in the router.
Options	<p>none—(Routing matrix only) Display environmental information about the front panel modules (craft interfaces) on the TX Matrix platform and its attached T640 routing nodes.</p> <p>fcc <i>number</i>—(Routing matrix only) (Optional) Display environmental information about the front panel module (craft interface) on a specified T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display environmental information about the front panel module (craft interface) on the TX Matrix platform (or switch-card chassis).</p>
Required Privilege Level	view
List of Sample Output	<p>show chassis environment fpm (M40e and M160) on page 196</p> <p>show chassis environment fpm (M320) on page 196</p> <p>show chassis environment fpm (MX240) on page 196</p> <p>show chassis environment fpm (MX480) on page 196</p> <p>show chassis environment fpm (T-series) on page 196</p> <p>show chassis environment fpm fcc (Routing Matrix) on page 197</p> <p>show chassis environment fpm scc (Routing Matrix) on page 197</p>
Output Fields	Table 46 on page 195 lists the output fields for the show chassis environment fpm command. Output fields are listed in the approximate order in which they appear.

Table 46: show chassis environment fpm Output Fields

Field Name	Field Description
State	FPM status: Online or Offline.
FPM CMB Voltage	(M40e and M160 routers only) Information about the voltage supplied to the FPM chassis management bus (CMB) device. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.
FPM GBUS Voltage	(M320 routers and T-series routing platforms only) Information about the voltage supplied to the FPM generic bus (GBUS) device. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.

Table 46: show chassis environment fpm Output Fields (continued)

Field Name	Field Description
FPM Display Voltage	Information about the voltage supplied to the FPM display. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.
FPM CMB Temperature	(M40e and M160 routers only) Temperature of the air flowing past the FPM CMB device
FPM GBUS Temperature	(M320 routers and T-series routing platforms only) Temperature of the air flowing past the FPM GBUS device.
FPM Display Temperature	Temperature of the air flowing past the FPM display.
CMB Revision	(M40e and M160 routers only) Revision level of the CMB device.
GBUS Revision	(M320 routers and T-series routing platforms only) Revision level of the GBUS device.

**show chassis
environment fpm (M40e
and M160)**

```
user@host> show chassis environment fpm
FPM status:
  State                               Online
  FPM CMB Voltage:
    5.0 V bias                        5030 mV
    8.0 V bias                        8083 mV
  FPM Display Voltage:
    5.0 V bias                        4998 mV
  FPM CMB temperature                 34 degrees C / 93 degrees F
  FPM Display temperature             35 degrees C / 95 degrees F
  CMB Revision                        12
```

**show chassis
environment fpm
(M320)**

```
user@host> show chassis environment fpm
FPM status:
  State                               Online
  FPM GBUS Voltage:
    5.0 V                             5006 mV
    1.8 V bias                        1799 mV
    3.3 V bias                        3294 mV
    5.0 V bias                        4998 mV
    8.0 V bias                        7682 mV
  FPM GBUS temperature                 30 degrees C / 86 degrees F
  GBUS Revision                        51
```

**show chassis
environment fpm
(MX240)**

```
user@host> show chassis environment fpm
FPM status:
  State                               Online
  I2CS Revision                       41
```

**show chassis
environment fpm
(MX480)**

```
user@host> show chassis environment fpm
FPM status:
  State                               Online
  I2CS Revision                       41
```

**show chassis
environment fpm
(T-series)**

```
user@host> show chassis environment fpm
FPM status:
  State                               Online
  FPM GBUS Voltage:
```



```

1.8 V bias      1787 mV
3.3 V bias      3286 mV
5.0 V bias      4991 mV
8.0 V bias      7162 mV
FPM Display Voltage:
5.0 V           4996 mV
FPM GBUS temperature  29 degrees C / 84 degrees F
FPM Display temperature 26 degrees C / 78 degrees F
GBUS Revision        37

```

show chassis environment fpm lcc
(Routing Matrix)

```

user@host> show chassis environment fpm lcc 0
lcc0-re0:

```

```

-----
FPM status:
State                               Online
FPM GBUS Voltage:
1.8 V bias      1797 mV
3.3 V bias      3294 mV
5.0 V bias      5015 mV
8.0 V bias      7470 mV
FPM Display Voltage:
5.0 V           5018 mV
FPM GBUS temperature  25 degrees C / 77 degrees F
FPM Display temperature 29 degrees C / 84 degrees F
GBUS Revision        37

```

show chassis environment fpm scc
(Routing Matrix)

```

user@host> show chassis environment fpm scc
scc-re0:

```

```

-----
FPM status:
State                               Online
FPM GBUS Voltage:
1.8 V bias      1789 mV
3.3 V bias      3296 mV
5.0 V bias      5003 mV
8.0 V bias      7592 mV
FPM Display Voltage:
5.0 V           5010 mV
FPM GBUS temperature  22 degrees C / 71 degrees F
FPM Display temperature 27 degrees C / 80 degrees F
GBUS Revision        37

```

show chassis environment mcs

Syntax	show chassis environment mcs <slot>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M40e and M160 routers only) Display environmental information about the Miscellaneous Control Subsystems (MCSs).
Options	none—Display environmental information about both MCSs. slot —(Optional) Display environmental information about an individual MCS. Replace slot with 0 or 1
Required Privilege Level	view
List of Sample Output	show chassis environment mcs (M40e) on page 199 show chassis environment mcs (M160) on page 199
Output Fields	Table 47 on page 198 lists the output fields for the show chassis environment mcs command. Output fields are listed in the approximate order in which they appear.

Table 47: show chassis environment mcs Output Fields

Field Name	Field Description
State	Status of the MCS: Present, Online, Offline, or Empty. Also indicates Master or Standby.
Temperature	Temperature of the air flowing past the MCS.
Power	Information about the voltage supplied to the MCS. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.
BUS Revision	Revision level of the generic bus device.
FPGA Revision	Revision level of the field-programmable gate array (FPGA) revision.

```

show chassis      user@host> show chassis environment mcs
environment mcs   MCS 0 status:
(M40e)             State                      Online Master
                    Temperature                45 degrees C / 113 degrees F
                    Power:
                      3.3 V                    3283 mV
                      5.0 V                    5013 mV
                      12.0 V                   11721 mV
                      5.0 V bias               5025 mV
                      8.0 V bias               8229 mV
                    BUS Revision               12
                    FPGA Revision             13
                    MCS 1 status:
                    State                      Online Standby
                    Temperature                42 degrees C / 107 degrees F
                    Power:
                      3.3 V                    3296 mV
                      5.0 V                    4971 mV
                      12.0 V                   11814 mV
                      5.0 V bias               4976 mV
                      8.0 V bias               8241 mV
                    BUS Revision               12
                    FPGA Revision             13

```

```

show chassis      user@host> show chassis environment mcs
environment mcs   MCS 0 status:
(M160)             State                      Online Master
                    Temperature                50 degrees C / 122 degrees F
                    Power:
                      3.3 V                    3306 mV
                      5.0 V                    4993 mV
                      12.0 V                   11799 mV
                      5.0 V bias               4993 mV
                      8.0 V bias               8288 mV
                    BUS Revision               12
                    FPGA Revision             13

```

show chassis environment pcg

Syntax	show chassis environment pcg <slot>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M40e and M160 routers only) Display environmental information about the Packet Forwarding Engine clock generators (PCGs).
Options	none—Display environmental information about both PCGs. slot —(Optional) Display environmental information about an individual PCG. Replace slot with 0 or 1.
Required Privilege Level	view
List of Sample Output	show chassis environment pcg (M40e) on page 201 show chassis environment pcg (M160) on page 201
Output Fields	Table 48 on page 200 lists the output fields for the show chassis environment pcg command. Output fields are listed in the approximate order in which they appear.

Table 48: show chassis environment pcg Output Fields

Field Name	Field Description
PCG slot status	Slot number: 0 or 1.
State	Status of PCG: Present, Online, Offline, or Empty. If Online, it can be the Master clock or the Standby clock.
Temperature	Temperature of the air flowing past the PCG.
Frequency	Frequency setting and measurement for the PCG.
Power	Information about the voltage supplied to the PCG. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.
BUS Revision	Revision level of the generic bus device.

```

show chassis      user@host> show chassis environment pcg
environment pcg (M40e)
PCG 0 status:
  State                Online - Master clock
  Temperature          44 degrees C / 111 degrees F
  Frequency:
    Setting            125.00 MHz
    Measurement        124.95 MHz
  Power:
    3.3 V              3266 mV
    5.0 V bias         4964 mV
    8.0 V bias         8112 mV
  BUS Revision         12
PCG 1 status:
  State                Online - Standby
  Temperature          47 degrees C / 116 degrees F
  Frequency:
    Setting            125.00 MHz
    Measurement        124.96 MHz
  Power:
    3.3 V              3271 mV
    5.0 V bias         4979 mV
    8.0 V bias         8117 mV
  BUS Revision         12

```

```

show chassis      user@host> show chassis environment pcg
environment pcg    (M160)
PCG 0 status:
  State                Online - Master clock
  Temperature          41 degrees C / 105 degrees F
  Frequency:
    Setting            125.00 MHz
    Measurement        125.03 MHz
  Power:
    3.3 V              3286 mV
    5.0 V bias         5010 mV
    8.0 V bias         8183 mV
  BUS Revision         12
PCG 1 status:
  State                Online - Standby
  Temperature          43 degrees C / 109 degrees F
  Frequency:
    Setting            125.00 MHz
    Measurement        125.01 MHz
  Power:
    3.3 V              3288 mV
    5.0 V bias         4993 mV
    8.0 V bias         8197 mV
  BUS Revision         12

```

show chassis environment pem

Syntax	show chassis environment pem <slot>
Syntax (Routing Matrix)	show chassis environment pem <fcc number scc> <slot>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M40e, M120, M160, M320, and MX-series routers, and T-series routing platforms only) Display Power Entry Module (PEM) environmental status information.
Options	<p>none—Display environmental information about both PEMs. For the routing matrix only, display environmental information about the PEMs, the TX Matrix platform, and its attached T640 routing nodes.</p> <p>fcc number—(Routing matrix only) (Optional) Display environmental information about the PEM in a specified T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display environmental information about the PEM in the TX Matrix platform (or switch-card chassis).</p> <p>slot —(Optional) Display environmental information about an individual PEM. Replace <i>slot</i> with 0 or 1.</p>
Required Privilege Level	view
List of Sample Output	<p>show chassis environment pem (M40e) on page 203</p> <p>show chassis environment pem (M120) on page 203</p> <p>show chassis environment pem (M160) on page 204</p> <p>show chassis environment pem (M320) on page 204</p> <p>show chassis environment pem (MX240) on page 204</p> <p>show chassis environment pem (MX480) on page 204</p> <p>show chassis environment pem (MX960) on page 204</p> <p>show chassis environment pem (T320) on page 205</p> <p>show chassis environment pem (T640) on page 205</p> <p>show chassis environment pem fcc (Routing Matrix) on page 205</p> <p>show chassis environment pem scc (Routing Matrix) on page 205</p>
Output Fields	Table 49 on page 202 lists the output fields for the show chassis environment pem command. Output fields are listed in the approximate order in which they appear.

Table 49: show chassis environment pem Output Fields

Field Name	Field Description
PEM <i>slot</i> status	Number of the PEM slot.

Table 49: show chassis environment pem Output Fields (continued)

Field Name	Field Description
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 routers, and T640 routing nodes, and TX Matrix platform only) Information about voltage supplied to the PEM.
Current	(T640 routing nodes and TX Matrix platform only) Information about the PEM current.
Power	(T640 routing nodes and TX Matrix platform only) Information about the PEM power.
SCG/CB/SIB	(T640 routing nodes and TX Matrix platform only) SONET Clock Generator/Control Board/Switch Interface Board.

```

show chassis user@host> show chassis environment pem
environment pem PEM 0 status:
(M40e)      State           Online
            Temperature      OK
            AC input          OK
            DC output         OK

```

```

show chassis user@host> show chassis environment pem
environment pem PEM 0 status:
(M120)      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)
user@host> show chassis environment pem
PEM 0 status:
  State                Online
  Temperature           OK
  DC input              OK
  DC output             OK
  Load                 Less than 20 percent
  Voltage:
    48.0 V input        54833 mV
    48.0 V fan supply   50549 mV
    8.0 V bias          8239 mV
    5.0 V bias          5006 mV

```

```

show chassis environment pem (M320)
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 (MX240)
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)
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)
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) user@host> show chassis environment pem
PEM 0 status:
State                               Online
Temperature                         OK
DC input:                          OK

show chassis environment pem (T640) user@host> show chassis environment pem
PEM 0 status:
State                               Online
Temperature                         22 degrees C / 71 degrees F
DC 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 lcc (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 (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 routing-engine

Syntax	show chassis environment routing-engine <slot>
Syntax (Routing Matrix)	show chassis environment routing-engine <fcc number scc> <slot>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display Routing Engine environmental status information.
Options	<p>none—Display environmental information about all Routing Engines. For the routing matrix only, display environmental information about all Routing Engines on the TX Matrix platform and its attached T640 routing nodes.</p> <p>fcc number—(Routing matrix only) (Optional) Display environmental information about the Routing Engine in a specified T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display environmental information about the Routing Engine in the TX Matrix platform (or switch-card chassis).</p> <p>slot—(Optional) Display environmental information about an individual Routing Engine. On M10i, M20, M40e, M120, M160, M320, and MX-series routers, and the T-series routing platforms, replace <i>slot</i> with 0 or 1. On M5, M7i, M10, and M40 routers and on the J-series routing platform, replace <i>slot</i> with 0.</p>
Required Privilege Level	view
List of Sample Output	<p>show chassis environment routing-engine (Nonredundant) on page 207</p> <p>show chassis environment routing-engine (Redundant) on page 207</p>
Output Fields	Table 50 on page 206 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 50: 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 or Online Standby.
Temperature	Temperature of the air flowing past the Routing Engine.

```

show chassis      user@host> show chassis environment routing-engine
environment      Routing Engine 0 status:
routing-engine    State                      Online Master
(Nonredundant)    Temperature                27 degrees C / 80 degrees

```

```

show chassis      user@host> show chassis environment routing-engine
environment      Route Engine 0 status:
routing-engine    State                      Online Master
(Redundant)       Temperature                26 degrees C / 78 degrees F
                   Route Engine 1 status:
                   State                      Online Standby
                   Temperature                26 degrees C / 78 degrees F

```

show chassis environment scg

Syntax	show chassis environment scg <slot>
Syntax (Routing Matrix)	show chassis environment scg <fcc number> <slot>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display SONET Clock Generator (SCG) environmental information.
Options	<p>none—Display environmental information about all SCGs. For the routing matrix only, display environmental information about all SCGs on the TX Matrix platform and its attached T640 routing nodes.</p> <p>fcc number—(Routing matrix only) (Optional) Display environmental information about the SCG in a specified T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>slot—(Optional) Display environmental information about the SCG. Replace <i>slot</i> with 0 or 1.</p>
Required Privilege Level	view
List of Sample Output	<p>show chassis environment scg (T-series) on page 209</p> <p>show chassis environment scg fcc (Routing Matrix) on page 209</p>
Output Fields	Table 51 on page 208 lists the output fields for the <code>show chassis environment scg</code> command. Output fields are listed in the approximate order in which they appear.

Table 51: show chassis environment scg Output Fields

Field Name	Field Description
SCG slot status	Number of the SCG slot: 0 or 1.
State	Status of the SCG: Online or Offline . If two SCGs are installed and online, one is functioning as the master, and the other is the standby.
Temperature	Temperature of the air flowing past the SCG.
Power	Power on the SCG. The left column displays required power, in volts. The right column displays measured power, in millivolts.
BUS Revision	Revision level of the generic bus device.

```

show chassis      user@host> show chassis environment scg
environment scg   SCG 0 status:
(T-series)        State                Online - Master clock
                    Temperature          29 degrees C / 84 degrees F
                    Power:
                      GROUND              0 mV
                      3.3 V               3297 mV
                      5.0 V               5050 mV
                      5.6 V               5682 mV
                      1.8 V bias          1787 mV
                      3.3 V bias          3277 mV
                      5.0 V bias          4984 mV
                      8.0 V bias          8400 mV
                    BUS Revision          40
SCG 1 status:
                    State                Online - Standby
                    Temperature          28 degrees C / 82 degrees F
                    Power:
                      GROUND              0 mV
                      3.3 V               3317 mV
                      5.0 V               5057 mV
                      5.6 V               5689 mV
                      1.8 V bias          1794 mV
                      3.3 V bias          3296 mV
                      5.0 V bias          4991 mV
                      8.0 V bias          8410 mV
                    BUS Revision          40

show chassis      user@host> show chassis environment scg lcc 0 0
environment scg lcc lcc0-re0:
(Routing Matrix) -----
SCG 0 status:
                    State                Online - Master clock
                    Temperature          30 degrees C / 86 degrees F
                    Power:
                      GROUND              0 mV
                      3.3 V               3321 mV
                      5.0 V               5062 mV
                      5.6 V               5682 mV
                      1.8 V bias          1789 mV
                      3.3 V bias          3289 mV
                      5.0 V bias          4993 mV
                      8.0 V bias          7807 mV
                    BUS Revision          40

```

show chassis environment sfm

Syntax	show chassis environment sfm <slot>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M40e and M160 routers only) Display Switching and Forwarding Module (SFM) environmental information.
Options	none—Display environmental information about all SFMs. slot—(Optional) Display environmental information about an individual SFM. Replace <i>slot</i> with a value from 0 through 3.
Required Privilege Level	view
List of Sample Output	show chassis environment sfm (M40e) on page 211 show chassis environment sfm (M160) on page 211
Output Fields	Table 52 on page 210 lists the output fields for the show chassis environment sfm command. Output fields are listed in the approximate order in which they appear.

Table 52: show chassis environment sfm Output Fields

Field Name	Field Description
SFM <i>slot</i> status	SFM slot number: 0 or 1 on an M40e router, or 0, 1, 2, or 3 on an M160 router.
State	Status of the SFM: Online or Offline . If two SFMs are installed and online, one is functioning as the master, and the other is marked as the standby .
SPP Temperature	Temperature of the air flowing past the Switch Plane Processor card.
SPR Temperature	Temperature of the air flowing past the Switch Plane Router card.
SPP Power	Information about the voltage supplied to the Switch Plane Processor card. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.
SPR Power	Information about the voltage supplied to the Switch Plane Router. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.
CMB Revision	Revision level of the Chassis Management Bus (CMB) device.

```

show chassis environment sfm (M40e) user@host> show chassis environment sfm
SFM 0 status:
  State                               Online
  SPP temperature                     40 degrees C / 104 degrees F
  SPR temperature                     44 degrees C / 111 degrees F
  SPP Power:
    1.5 V                             1501 mV
    2.5 V                             2472 mV
    3.3 V                             3293 mV
    5.0 V                             5028 mV
    5.0 V bias                         4964 mV
  SPR Power:
    1.5 V                             1501 mV
    2.5 V                             2483 mV
    3.3 V                             3308 mV
    5.0 V                             5035 mV
    5.0 V bias                         4981 mV
    8.0 V bias                         8239 mV
  CMB Revision                         12
SFM 1 status:
  State                               Online - Standby
  SPP temperature                     43 degrees C / 109 degrees F
  SPR temperature                     45 degrees C / 113 degrees F
  SPP Power:
    1.5 V                             1503 mV
    2.5 V                             2483 mV
    3.3 V                             3284 mV
    5.0 V                             5045 mV
    5.0 V bias                         4993 mV
  SPR Power:
    1.5 V                             1498 mV
    2.5 V                             2472 mV
    3.3 V                             3284 mV
    5.0 V                             5035 mV
    5.0 V bias                         4991 mV
    8.0 V bias                         8231 mV
  CMB Revision                         12

```

```

show chassis environment sfm (M160) user@host> show chassis environment sfm
SFM 0 status:
  State                               Online
  SPP temperature                     43 degrees C / 109 degrees F
  SPR temperature                     44 degrees C / 111 degrees F
  SPP Power:
    1.5 V                             1504 mV
    2.5 V                             2474 mV
    3.3 V                             3290 mV
    5.0 V                             5015 mV
    5.0 V bias                         4962 mV
  SPR Power:
    1.5 V                             1498 mV
    2.5 V                             2482 mV
    3.3 V                             3299 mV
    5.0 V                             5020 mV
    5.0 V bias                         4971 mV
    8.0 V bias                         8229 mV
  CMB Revision                         12
SFM 1 status:
  State                               Online
  SPP temperature                     47 degrees C / 116 degrees F
  SPR temperature                     50 degrees C / 122 degrees F

```

```

SPP Power:
  1.5 V      1499 mV
  2.5 V      2466 mV
  3.3 V      3274 mV
  5.0 V      5025 mV
  5.0 V bias 4984 mV
SPR Power:
  1.5 V      1496 mV
  2.5 V      2470 mV
  3.3 V      3279 mV
  5.0 V      5020 mV
  5.0 V bias 4993 mV
  8.0 V bias 8222 mV
CMB Revision      12
SFM 2 status:
  State           Online
  SPP temperature 50 degrees C / 122 degrees F
  SPR temperature 52 degrees C / 125 degrees F
SPP Power:
  1.5 V      1504 mV
  2.5 V      2471 mV
  3.3 V      3294 mV
  5.0 V      5045 mV
  5.0 V bias 4981 mV
SPR Power:
  1.5 V      1496 mV
  2.5 V      2470 mV
  3.3 V      3293 mV
  5.0 V      5028 mV
  5.0 V bias 4971 mV
  8.0 V bias 8214 mV
CMB Revision      12
SFM 3 status:
  State           Online
  SPP temperature 49 degrees C / 120 degrees F
  SPR temperature 48 degrees C / 118 degrees F
SPP Power:
  1.5 V      1505 mV
  2.5 V      2484 mV
  3.3 V      3296 mV
  5.0 V      5040 mV
  5.0 V bias 4984 mV
SPR Power:
  1.5 V      1503 mV
  2.5 V      2488 mV
  3.3 V      3302 mV
  5.0 V      5037 mV
  5.0 V bias 4993 mV
  8.0 V bias 8249 mV
CMB Revision      12

```


show chassis environment sib

Syntax	show chassis environment sib <slot>
Syntax (Routing Matrix)	show chassis environment sib <lcc number scc> <slot>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M320 routers and T-series routing platforms only) Display Switch Interface Boards (SIB) environmental information.
Options	<p>none—Display environmental information about all SIBs. For the routing matrix only, display environmental information about all SIBs on the TX Matrix platform and its attached T640 routing nodes.</p> <p>lcc number—(Routing matrix only) (Optional) Display environmental information about the SIB in a specified T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display environmental information about the SIB in the TX Matrix platform (or switch-card chassis).</p> <p>slot—(Optional) Display environmental information about the specified SIB. For the M320 router, replace <i>slot</i> with a value from 0 through 3. For the T640 routing node and routing matrix, replace <i>slot</i> with a value from 0 through 4. For the T320 router, replace <i>slot</i> with a value from 0 through 2.</p>
Required Privilege Level	view
List of Sample Output	<p>show chassis environment sib (M320) on page 214</p> <p>show chassis environment sib 1 (T640) on page 215</p> <p>show chassis environment sib scc (Routing Matrix) on page 215</p>
Output Fields	Table 53 on page 213 lists the output fields for the <code>show chassis environment sib</code> command. Output fields are listed in the approximate order in which they appear.

Table 53: show chassis environment sib Output Fields

Field Name	Field Description
SIB slot status	<p>SIB slot number:</p> <ul style="list-style-type: none"> ■ 0 through 3 on an M320 router. ■ 0 or 2 on a T320 router. ■ 0 through 4 on a T640 routing node.
State	Status of the SIB: Online , Offline , or Spare (T640 routing node only). Only four of the five T640 routing node SIBs are active at any time. The fifth one is marked Spare . It is activated if there is a fault on one of the active SIBs.

Table 53: show chassis environment sib Output Fields (continued)

Field Name	Field Description
Temperature	Temperature of the air flowing past the SIB.
Power	Information about the voltage supplied to the SIB. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.

```

show chassis environment sib (M320) user@host> show chassis environment sib
SIB 0 status:
  State                               Online
  Temperature                         34 degrees C / 93 degrees F
  Power:
    GROUND                            0 mV
    1.8 V                             1805 mV
    2.5 V                             2498 mV
    3.3 V                             3306 mV
    1.8 V bias                        1789 mV
    3.3 V bias                        3299 mV
    5.0 V bias                        5003 mV
    8.0 V bias                        7374 mV
SIB 1 status:
  State                               Online
  Temperature                         35 degrees C / 95 degrees F
  Power:
    GROUND                            0 mV
    1.8 V                             1814 mV
    2.5 V                             2477 mV
    3.3 V                             3319 mV
    1.8 V bias                        1792 mV
    3.3 V bias                        3291 mV
    5.0 V bias                        4981 mV
    8.0 V bias                        7335 mV
SIB 2 status:
  State                               Online
  Temperature                         33 degrees C / 91 degrees F
  Power:
    GROUND                            0 mV
    1.8 V                             1811 mV
    2.5 V                             2489 mV
    3.3 V                             3330 mV
    1.8 V bias                        1797 mV
    3.3 V bias                        3304 mV
    5.0 V bias                        5025 mV
    8.0 V bias                        7330 mV
SIB 3 status:
  State                               Online
  Temperature                         37 degrees C / 98 degrees F
  Power:
    GROUND                            0 mV
    1.8 V                             1798 mV
    2.5 V                             2481 mV
    3.3 V                             3328 mV
    1.8 V bias                        1792 mV
    3.3 V bias                        3313 mV
    5.0 V bias                        5013 mV
    8.0 V bias                        7467 mV

```

**show chassis
environment sib 1
(T640)**

```
user@host> show chassis environment sib 1
SIB 1 status:
State                               Online
Temperature                         39 degrees C / 102 degrees F
Power:
  GROUND                            0 mV
  1.8 V                             1809 mV
  2.5 V                             2478 mV
  3.3 V                             3308 mV
  1.8 V bias                         1794 mV
  3.3 V bias                         3274 mV
  5.0 V bias                         4996 mV
  8.0 V bias                         7247 mV
```

**show chassis
environment sib scc
(Routing Matrix)**

```
user@host> show chassis environment sib scc
scc-re0:
-----
SIB 3 status:
State                               Offline
Reason                             Offlined by button press
Temperature                         0 degrees C / 32 degrees F
Power:
  GROUND                            0 mV
  1.8 V                             0 mV
  2.5 V                             0 mV
  3.3 V                             0 mV
  1.8 V bias                         0 mV
  3.3 V bias                         0 mV
  5.0 V bias                         0 mV
  8.0 V bias                         0 mV
SIB 4 status:
State                               Online
Temperature                         42 degrees C / 107 degrees F
Temperature (B)                     41 degrees C / 105 degrees F
Power:
  GROUND                            0 mV
  1.8 V                             1787 mV
  2.5 V                             2488 mV
  3.3 V                             3294 mV
  1.8 V bias                         1787 mV
  3.3 V bias                         3306 mV
  5.0 V bias                         5010 mV
  8.0 V bias                         7418 mV
Power (B):
  GROUND                            0 mV
  1.8 V                             1785 mV
  2.5 V                             2485 mV
  3.3 V                             3289 mV
  1.8 V bias                         1799 mV
  3.3 V bias                         3284 mV
  5.0 V bias                         4979 mV
  8.0 V bias                         7882 mV
```

show chassis ethernet-switch

Syntax	show chassis ethernet-switch <errors <port>>
Syntax (Routing Matrix)	show chassis ethernet-switch <errors <port> statistics <port>> <lcc number scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M10i, M40e, M120, M160, M320, and MX-series routers, and T-series routing platforms only) Display information about the ports on the Control Board (CB) Ethernet switch.
Options	<p>none—Display information about each connected port on the Ethernet switch. For the routing matrix only, display information about each connected port on the Ethernet switch on the TX Matrix platform and its attached T640 routing nodes.</p> <p>errors—(Optional) Display the numbers and types of errors accumulated on all ports of the Ethernet switch.</p> <p>errors port—(Optional) Display the numbers and types of errors accumulated on the specified port (0 through 15) of the Ethernet switch.</p> <p>statistics—(Optional) Display traffic statistics for each connected port on the Ethernet switch.</p> <p>statistics port—(Optional) Display traffic statistics for the specified port on the Ethernet switch.</p> <p>lcc number—(Routing matrix only) (Optional) Display information about the ports on the CB's Ethernet switch on a specified T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display information about the ports on the CB's Ethernet switch on the TX Matrix platform (or switch-card chassis).</p>
Required Privilege Level	view
List of Sample Output	<p>show chassis ethernet-switch on page 218</p> <p>show chassis ethernet-switch (Routing Matrix) on page 218</p> <p>show chassis ethernet-switch errors on page 219</p> <p>show chassis ethernet-switch statistics on page 220</p>
Output Fields	Table 54 on page 217 lists the output fields for the show chassis ethernet-switch command. Output fields are listed in the approximate order in which they appear.

Table 54: show chassis ethernet-switch Output Fields

Field Name	Field Description
Link is good on port n connected to device	Information about the link between each port on the CB's Ethernet switch and one of the following devices:
or	<ul style="list-style-type: none"> ■ FPC0 (Flexible PIC Concentrator 0) through FPC7 ■ Local controller
Link is good on FE port n connected to device	<ul style="list-style-type: none"> ■ Other RE (on a system with two Routing Engines) ■ SPMB (Switch Processor Mezzanine Board) ■ (TX Matrix platform only) LCC0 (line-card chassis 0) through LCC3
Speed is	Speed at which the Ethernet link is running: 10 Mb or 100 Mb. When the device is Other RE on the TX Matrix platform, the speed is 1000 Mb.
Duplex is	Duplex type of the Ethernet link: full or half.
Auto-negotiate is enabled	By default, both of the built-in Fast Ethernet ports on the M7i router Physical Interface Card (PIC) autonegotiate whether to operate at 10 Mbps or 100 Mbps. All other interfaces automatically choose the correct speed based on the PIC type and whether the PIC is configured to operate in multiplexed mode (using the <code>no-concatenate</code> statement at the <code>[edit chassis]</code> hierarchy level, as described in the <i>JUNOS System Basics Configuration Guide</i>).
MLT3	Number of multilevel threshold-3 (MLT-3) Fast Ethernet errors detected.
Accumulated error counts for port n connected to device FPCn: (error output only)	
Lock	Number of lock errors detected.
Xmit	Number of transmission errors detected.
ESD	Number of electrostatic discharge (ESD) errors detected.
False Carrier	Number of false carrier errors detected.
Disconnects	Number of disconnect errors detected.
FX mode	Number of errors detected on an Ethernet link over optical fiber.
Statistics for port n connected to device FPCn (statistics output only)	
TX Unicast packets	Number of unicast packets sent.
TX Multicast packets	Number of multicast packets sent.
TX Broadcast packets	Number of broadcast packets sent.
TX Late collisions	Number of packets aborted during sending because of collisions after 64 bytes.
TX Excessive collisions	Number of packets not sent because of too many collisions.
TX Dropped packets	Number of transmitted packets that were dropped.
RX Unicast packets	Number of unicast packets received.
RX Multicast packets	Number of multicast packets received.

Table 54: show chassis ethernet-switch Output Fields (continued)

Field Name	Field Description
RX Broadcast packets	Number of broadcast packets received.
RX FCS Errors	Number of packets discarded because of frame check sequence errors.
RX Alignment Errors	Number of incomplete octets received.
RX Dropped Packets	Number of incoming packets that were dropped.
RX Fragments	Number of fragmented packets received.
RX Symbol Errors	Number of symbols received that the router did not correctly decode.

```

show chassis ethernet-switch user@host> show chassis ethernet-switch
Link is good on port 0 connected to device: FPC0
Speed is 100Mb
Duplex is full

Link is good on port 1 connected to device: FPC1
Speed is 100Mb
Duplex is full

Link is good on port 2 connected to device: FPC2
Speed is 100Mb
Duplex is full

Link is good on port 3 connected to device: FPC3
Speed is 100Mb
Duplex is full

Link is good on port 7 connected to device: Local controller
Speed is 100Mb
Duplex is full

Link is good on port 9 connected to device: SPMB
Speed is 100Mb
Duplex is full

Link is good on port 13 connected to device: FPC5
Speed is 100Mb
Duplex is full

show chassis ethernet-switch (Routing Matrix) user@host> show chassis ethernet-switch
scc-re0:
-----
Link is good on FE port 4 connected to device: LCC0
Speed is 100Mb
Duplex is full
Autonegotiate is Enabled

Link is good on FE port 6 connected to device: LCC2
Speed is 100Mb
Duplex is full
Autonegotiate is Enabled

```

```

Link is good on FE port 8 connected to device: SPMB
Speed is 100Mb
Duplex is full
Autonegotiate is Enabled

```

```

1cc0-re0:
-----

```

```

Link is good on FE port 1 connected to device: FPC1
Speed is 100Mb
Duplex is full
Autonegotiate is Enabled

```

```

Link is good on FE port 2 connected to device: FPC2
Speed is 100Mb
Duplex is full
Autonegotiate is Enabled

```

```

Link is good on FE port 8 connected to device: SPMB
Speed is 100Mb
Duplex is full
Autonegotiate is Enabled

```

```

Link is good on FE port 10 connected to device: SCC
Speed is 100Mb
Duplex is full
Autonegotiate is Enabled

```

```

1cc2-re0:
-----

```

```

Link is good on FE port 0 connected to device: FPC0
Speed is 100Mb
Duplex is full
Autonegotiate is Enabled

```

```

Link is good on FE port 1 connected to device: FPC1
Speed is 100Mb
Duplex is full
Autonegotiate is Enabled

```

```

Link is good on FE port 2 connected to device: FPC2
Speed is 100Mb
Duplex is full
Autonegotiate is Enabled

```

```

Link is good on FE port 8 connected to device: SPMB
Speed is 100Mb
Duplex is full
Autonegotiate is Enabled

```

```

Link is good on FE port 10 connected to device: SCC
Speed is 100Mb
Duplex is full
Autonegotiate is Enabled

```

**show chassis
ethernet-switch errors**

```

user@host> show chassis ethernet-switch errors
Accumulated error counts for port 0 connected to device FPC0:
MLT3          2
Lock          0
Xmit          0
ESD           0

```

```

False carrier 2
Disconnects 0
FX mode 0
Accumulated error counts for port 1 connected to device FPC1:
MLT3 2
Lock 0
Xmit 0
ESD 0
False carrier 2
Disconnects 0
FX mode 0
Accumulated error counts for port 2 connected to device FPC2:
MLT3 2
Lock 0
Xmit 0
ESD 0
False carrier 3
Disconnects 0
FX mode 0
Accumulated error counts for port 3 connected to device FPC3:
MLT3 0
Lock 0
Xmit 0
ESD 0
False carrier 0
Disconnects 0
Accumulated error counts for port 4 connected to device Nothing:
MLT3 0
Lock 0
Xmit 0
ESD 0
False carrier 0
Disconnects 0
FX mode 0
...

```

```

show chassis user@host> show chassis ethernet-switch statistics
ethernet-switch
statistics

```

```

Statistics for port 0 connected to device FPC0:

```

```

TX Unicast packets 68113
TX Multicast packets 0
TX Broadcast packets 20851
TX Late collisions 0
TX Excessive collisions 0
TX Dropped packets 0

RX Unicast packets 67410
RX Multicast packets 0
RX Broadcast packets 20852
RX FCS Errors 0
RX Alignment Errors 0
RX Dropped Packets 0
RX Fragments 0
RX Symbol Errors 0

```

```

Statistics for port 1 connected to device FPC1:

```

```

TX Unicast packets 66496
TX Multicast packets 0
TX Broadcast packets 20080
TX Late collisions 0
TX Excessive collisions 0
TX Dropped packets 0

```


RX Unicast packets	66037
RX Multicast packets	0
RX Broadcast packets	20080
RX FCS Errors	0
RX Alignment Errors	0
RX Dropped Packets	0
RX Fragments	0
RX Symbol Errors	0

Statistics for port 2 connected to device FPC2:

TX Unicast packets	64206
TX Multicast packets	0
TX Broadcast packets	21183
TX Late collisions	0
TX Excessive collisions	0
TX Dropped packets	0

RX Unicast packets	63671
RX Multicast packets	0
RX Broadcast packets	21183
RX FCS Errors	0
RX Alignment Errors	0
RX Dropped Packets	0
RX Fragments	0
RX Symbol Errors	0

Statistics for port 3 connected to device FPC3:

...

show chassis fabric feb

Syntax	show chassis fabric feb
Release Information	Command introduced in JUNOS Release 8.0.
Description	(M120 router only) Display the state of the electrical and optical switching fabric links between the Forwarding Engine Boards (FEBs) and the fabric planes, as interpreted by the FEB.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show chassis fabric feb on page 222
Output Fields	Table 55 on page 222 lists the output fields for the show chassis fabric feb command.

Table 55: show chassis fabric feb Output Fields

Field Name	Field Description
Fabric management FEB state	State of the switching fabric link between each FEB and fabric plane: desalination error, disabled, enabled, link error, link ok, or unused.

```

show chassis fabric feb  user@host> show chassis fabric feb
Fabric management          FEB state
FEB 0                      Plane 0: Plane enabled
                           Plane 1: Plane enabled
                           Plane 2: Plane enabled
                           Plane 3: Plane enabled

FEB 4                      Plane 0: Plane enabled
                           Plane 1: Plane enabled
                           Plane 2: Plane enabled
                           Plane 3: Plane enabled

```

show chassis fabric fpcs

Syntax	show chassis fabric fpcs <fcc number>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M320 and MX-series routers and T-series routing platforms only) Display the state of the electrical and optical switch fabric links between the Flexible PIC Concentrators (FPCs) and the Switch Interface Boards (SIBs).
Options	<p>none—Display the switch fabric link state. On a TX Matrix platform, display the switching fabric link states for the FPCs in all T640 routing nodes connected to a TX Matrix platform.</p> <p>fcc <i>number</i> —(Routing matrix only) (Optional) Display the switch fabric link state for the FPCs in the specified T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p>
Required Privilege Level	view
List of Sample Output	<p>show chassis fabric fpcs (M320 Router) on page 223</p> <p>show chassis fabric fpcs (MX240 Router) on page 223</p> <p>show chassis fabric fpcs (MX480 Router) on page 224</p> <p>show chassis fabric fpcs (MX960 Router) on page 225</p> <p>show chassis fabric fpcs (T320 Router) on page 226</p> <p>show chassis fabric fpcs (T640 Router) on page 226</p> <p>show chassis fabric fpcs (Routing Matrix) on page 227</p>
Output Fields	Table 56 on page 223 lists the output fields for the <code>show chassis fabric fpcs</code> command. Output fields are listed in the approximate order in which they appear.

Table 56: show chassis fabric fpcs Output Fields

Field Name	Field Description
Fabric management FPC state	Switching fabric link state for each FPC: Unused, Links ok, Link error, or Plane enabled.

show chassis fabric fpcs (M320 Router)	<pre>user@host> show chassis fabric fpcs Fabric management FPC state: FPC #2 PFE #1 SIB #0 Plane enabled SIB #1 Plane enabled SIB #2 Plane enabled SIB #3 Plane enabled</pre>
show chassis fabric fpcs (MX240 Router)	<pre>user@host> show chassis fabric fpcs Fabric management FPC state FPC 1</pre>

```

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

show chassis fabric fpcs user@host> **show chassis fabric fpcs**
(MX480 Router) Fabric management FPC state

```

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

```

Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Links ok
Plane 5: Links ok
Plane 6: Links ok
Plane 7: Links ok
PFE #3
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Links ok
Plane 5: Links ok
Plane 6: Links ok
Plane 7: Links ok
...

```

show chassis fabric fpcs
(MX960 Router)

```

user@host> show chassis fabric fpcs
Fabric management FPC state
FPC 5
PFE #0
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Unused
Plane 3: Unused
Plane 4: Unused
Plane 5: Unused
PFE #1
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Unused
Plane 3: Unused
Plane 4: Unused
Plane 5: Unused
PFE #2
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Unused
Plane 3: Unused
Plane 4: Unused
Plane 5: Unused
PFE #3
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Unused
Plane 3: Unused
Plane 4: Unused
Plane 5: Unused
FPC 6
PFE #0
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Unused
Plane 3: Unused
Plane 4: Unused
Plane 5: Unused
PFE #1
Plane 0: Plane enabled
Plane 1: Plane enabled

```

```

Plane 2: Unused
Plane 3: Unused
Plane 4: Unused
Plane 5: Unused
PFE #2
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Unused
Plane 3: Unused
Plane 4: Unused
Plane 5: Unused
...

```

show chassis fabric fpcs
(T320 Router)

```

user@host> show chassis fabric fpcs
Fabric management FPC state:
FPC #0
  PFE #1
    SIB #0 Links ok
    SIB #1 Plane enabled
    SIB #2 Plane enabled
    SIB #3 Plane enabled
    SIB #4 Plane enabled
FPC #1
  PFE #1
    SIB #0 Links ok
    SIB #1 Plane enabled
    SIB #2 Plane enabled
    SIB #3 Plane enabled
    SIB #4 Plane enabled
FPC #2
  PFE #1
    SIB #0 Links ok
    SIB #1 Plane enabled
    SIB #2 Plane enabled
    SIB #3 Plane enabled
    SIB #4 Plane enabled
FPC #3
  PFE #1
    SIB #0 Links ok
    SIB #1 Plane enabled
    SIB #2 Plane enabled
    SIB #3 Plane enabled
    SIB #4 Plane enabled
...

```

```

FPC #7
  PFE #1
    SIB #0 Links ok
    SIB #1 Plane enabled
    SIB #2 Plane enabled
    SIB #3 Plane enabled
    SIB #4 Plane enabled

```

show chassis fabric fpcs
(T640 Router)

```

user@host> show chassis fabric fpcs
Fabric management FPC state:
FPC #0
  PFE #0
    SIB #0 Links ok
    SIB #1 Plane enabled
    SIB #2 Plane enabled

```

```

        SIB #3 Plane enabled
        SIB #4 Plane enabled
    PFE #1
        SIB #0 Links ok
        SIB #1 Plane enabled
        SIB #2 Plane enabled
        SIB #3 Plane enabled
        SIB #4 Plane enabled
FPC #2
    PFE #0
        SIB #0 Links ok
        SIB #1 Plane enabled
        SIB #2 Plane enabled
        SIB #3 Plane enabled
        SIB #4 Plane enabled
    PFE #1
        SIB #0 Links ok
        SIB #1 Plane enabled
        SIB #2 Plane enabled
        SIB #3 Plane enabled
        SIB #4 Plane enabled

```

...

show chassis fabric fpcs
(Routing Matrix)

```

user@host> show chassis fabric fpcs
lcc0-re0:

```

Fabric management FPC state:

```

FPC #1
    PFE #1
        SIB #4 Links ok
FPC #2
    PFE #0
        SIB #4 Links ok
    PFE #1
        SIB #4 Links ok
FPC #3
    PFE #0
        SIB #4 Links ok
    PFE #1
        SIB #4 Links ok
FPC #4
    PFE #0
        SIB #4 Links ok
    PFE #1
        SIB #4 Links ok
FPC #5
    PFE #1
        SIB #4 Links ok
FPC #6
    PFE #1
        SIB #4 Links ok

```

lcc2-re0:

Fabric management FPC state:

```

FPC #0
    PFE #1
        SIB #4 Links ok
FPC #1
    PFE #1

```

```
        SIB #4 Links ok
FPC #2
  PFE #0
    SIB #4 Links ok
  PFE #1
    SIB #4 Links ok
FPC #4
  PFE #0
    SIB #4 Links ok
  PFE #1
    SIB #4 Links ok
FPC #5
  PFE #1
    SIB #4 Links ok
```


show chassis fabric map

Syntax	show chassis fabric map plane <plane-number>
Release Information	Command introduced in JUNOS Release 8.0.
Description	(M120 and MX-series routers only) On the M120 router, display the state of the switching fabric map for connections from the Forwarding Engine Boards (FPCs) to the ports on the fabric planes, as interpreted by the fabric plane. On the MX-series router, display the state of the switching fabric map for connections from each Packet Forwarding Engine on the Dense Port Concentrators (DPCs) to the ports on the fabric planes, as interpreted by the fabric plane.
Options	none—Display the switching fabric map state for the M120 or MX-series router. plane <i>plane-number</i> —(Optional) Display the state of the fabric link for the specified plane number. On the M120 router, replace <i>plane-number</i> with a value from 0 through 3. On the MX240 and MX480 routers, replace <i>plane-number</i> with a value from 0 through 7. On the MX960 router, replace <i>plane-number</i> with a value from 0 through 5.
Required Privilege Level	view
List of Sample Output	show chassis fabric map (M120) on page 229 show chassis fabric map (MX-series) on page 230
Output Fields	Table 57 on page 229 lists the output fields for the show chassis fabric map command. Output fields are listed in the approximate order in which they appear.

Table 57: show chassis fabric map Output Fields

Field Name	Field Description
in-links	Fabric map for receive side links.
out-links	Fabric map for transmit side links.
state	State of the fabric link: RESET, UP, DOWN, or FAULT.

show chassis fabric map (M120)

```

user@host> show chassis fabric map
FEB0->CB0F0_00 up CB0F0_08->FEB7 Down

FEB1->CB0F0_01 Down CB0F0_09->FEB6 Down

FEB6->CB0F0_02 Down CB0F0_10->FEB1 Down

FEB2->CB0F0_03 Down CB0F0_11->FEB0 up

FEB3->CB0F0_04 Down CB0F0_12->FEB3 Down

FEB4->CB0F0_05 up CB0F0_13->FEB2 Down

```

FEB7->CB0F0_06 Down CB0F0_14->FEB5 Down

FEB5->CB0F0_07 Down CB0F0_15->FEB4 up:

**show chassis fabric map
(MX-series)**

user@host> **show chassis fabric map**

DPC4PFE0->CB0F0_00_0	up	CB0F0_00_0->DPC4PFE0	up
DPC4PFE1->CB0F0_00_1	up	CB0F0_00_1->DPC4PFE1	up
DPC4PFE2->CB0F0_00_2	up	CB0F0_00_2->DPC4PFE2	up
DPC4PFE3->CB0F0_00_3	up	CB0F0_00_3->DPC4PFE3	up
DPC7PFE0->CB0F0_01_0	Down	CB0F0_01_0->DPC7PFE0	Down
DPC7PFE1->CB0F0_01_1	Down	CB0F0_01_1->DPC7PFE1	Down
DPC7PFE2->CB0F0_01_2	Down	CB0F0_01_2->DPC7PFE2	Down
DPC7PFE3->CB0F0_01_3	Down	CB0F0_01_3->DPC7PFE3	Down
DPC3PFE0->CB0F0_03_0	Down	CB0F0_03_0->DPC3PFE0	Down
DPC3PFE1->CB0F0_03_1	Down	CB0F0_03_1->DPC3PFE1	Down
DPC3PFE2->CB0F0_03_2	Down	CB0F0_03_2->DPC3PFE2	Down
DPC3PFE3->CB0F0_03_3	Down	CB0F0_03_3->DPC3PFE3	Down
DPC8PFE0->CB0F0_05_0	Down	CB0F0_05_0->DPC8PFE0	Down
DPC8PFE1->CB0F0_05_1	Down	CB0F0_05_1->DPC8PFE1	Down
DPC8PFE2->CB0F0_05_2	Down	CB0F0_05_2->DPC8PFE2	Down
DPC8PFE3->CB0F0_05_3	Down	CB0F0_05_3->DPC8PFE3	Down
DPC1PFE0->CB0F0_06_0	Down	CB0F0_06_0->DPC1PFE0	Down
DPC1PFE1->CB0F0_06_1	Down	CB0F0_06_1->DPC1PFE1	Down
DPC1PFE2->CB0F0_06_2	Down	CB0F0_06_2->DPC1PFE2	Down
DPC1PFE3->CB0F0_06_3	Down	CB0F0_06_3->DPC1PFE3	Down
DPC10PFE0->CB0F0_07_0	Down	CB0F0_07_0->DPC10PFE0	Down
DPC10PFE1->CB0F0_07_1	Down	CB0F0_07_1->DPC10PFE1	Down
DPC10PFE2->CB0F0_07_2	Down	CB0F0_07_2->DPC10PFE2	Down
DPC10PFE3->CB0F0_07_3	Down	CB0F0_07_3->DPC10PFE3	Down
DPC11PFE0->CB0F0_08_0	Down	CB0F0_08_0->DPC11PFE0	Down
DPC11PFE1->CB0F0_08_1	Down	CB0F0_08_1->DPC11PFE1	Down
DPC11PFE2->CB0F0_08_2	Down	CB0F0_08_2->DPC11PFE2	Down
DPC11PFE3->CB0F0_08_3	Down	CB0F0_08_3->DPC11PFE3	Down
DPC0PFE0->CB0F0_09_0	Down	CB0F0_09_0->DPC0PFE0	Down
DPC0PFE1->CB0F0_09_1	Down	CB0F0_09_1->DPC0PFE1	Down
DPC0PFE2->CB0F0_09_2	Down	CB0F0_09_2->DPC0PFE2	Down
DPC0PFE3->CB0F0_09_3	Down	CB0F0_09_3->DPC0PFE3	Down
DPC9PFE0->CB0F0_11_0	Down	CB0F0_11_0->DPC9PFE0	Down
DPC9PFE1->CB0F0_11_1	Down	CB0F0_11_1->DPC9PFE1	Down
DPC9PFE2->CB0F0_11_2	Down	CB0F0_11_2->DPC9PFE2	Down
DPC9PFE3->CB0F0_11_3	Down	CB0F0_11_3->DPC9PFE3	Down
DPC2PFE0->CB0F0_13_0	up	CB0F0_13_0->DPC2PFE0	up
DPC2PFE1->CB0F0_13_1	up	CB0F0_13_1->DPC2PFE1	up
DPC2PFE2->CB0F0_13_2	up	CB0F0_13_2->DPC2PFE2	up
DPC2PFE3->CB0F0_13_3	up	CB0F0_13_3->DPC2PFE3	up
DPC6PFE0->CB0F0_14_0	Down	CB0F0_14_0->DPC6PFE0	Down
DPC6PFE1->CB0F0_14_1	Down	CB0F0_14_1->DPC6PFE1	Down
DPC6PFE2->CB0F0_14_2	Down	CB0F0_14_2->DPC6PFE2	Down
DPC6PFE3->CB0F0_14_3	Down	CB0F0_14_3->DPC6PFE3	Down
DPC5PFE0->CB0F0_15_0	Down	CB0F0_15_0->DPC5PFE0	Down
DPC5PFE1->CB0F0_15_1	Down	CB0F0_15_1->DPC5PFE1	Down
DPC5PFE2->CB0F0_15_2	Down	CB0F0_15_2->DPC5PFE2	Down
DPC5PFE3->CB0F0_15_3	Down	CB0F0_15_3->DPC5PFE3	Down
DPC4PFE0->CB0F1_00_0	up	CB0F1_00_0->DPC4PFE0	up
DPC4PFE1->CB0F1_00_1	up	CB0F1_00_1->DPC4PFE1	up
DPC4PFE2->CB0F1_00_2	up	CB0F1_00_2->DPC4PFE2	up
DPC4PFE3->CB0F1_00_3	up	CB0F1_00_3->DPC4PFE3	up
DPC7PFE0->CB0F1_01_0	Down	CB0F1_01_0->DPC7PFE0	Down
DPC7PFE1->CB0F1_01_1	Down	CB0F1_01_1->DPC7PFE1	Down
DPC7PFE2->CB0F1_01_2	Down	CB0F1_01_2->DPC7PFE2	Down

DPC7PFE3->CB0F1_01_3	Down	CB0F1_01_3->DPC7PFE3	Down
DPC3PFE0->CB0F1_03_0	Down	CB0F1_03_0->DPC3PFE0	Down
DPC3PFE1->CB0F1_03_1	Down	CB0F1_03_1->DPC3PFE1	Down
DPC3PFE2->CB0F1_03_2	Down	CB0F1_03_2->DPC3PFE2	Down
DPC3PFE3->CB0F1_03_3	Down	CB0F1_03_3->DPC3PFE3	Down
DPC8PFE0->CB0F1_05_0	Down	CB0F1_05_0->DPC8PFE0	Down
DPC8PFE1->CB0F1_05_1	Down	CB0F1_05_1->DPC8PFE1	Down
DPC8PFE2->CB0F1_05_2	Down	CB0F1_05_2->DPC8PFE2	Down
DPC8PFE3->CB0F1_05_3	Down	CB0F1_05_3->DPC8PFE3	Down
DPC1PFE0->CB0F1_06_0	Down	CB0F1_06_0->DPC1PFE0	Down
DPC1PFE1->CB0F1_06_1	Down	CB0F1_06_1->DPC1PFE1	Down
DPC1PFE2->CB0F1_06_2	Down	CB0F1_06_2->DPC1PFE2	Down
DPC1PFE3->CB0F1_06_3	Down	CB0F1_06_3->DPC1PFE3	Down
DPC10PFE0->CB0F1_07_0	Down	CB0F1_07_0->DPC10PFE0	Down
DPC10PFE1->CB0F1_07_1	Down	CB0F1_07_1->DPC10PFE1	Down
DPC10PFE2->CB0F1_07_2	Down	CB0F1_07_2->DPC10PFE2	Down
DPC10PFE3->CB0F1_07_3	Down	CB0F1_07_3->DPC10PFE3	Down
DPC11PFE0->CB0F1_08_0	Down	CB0F1_08_0->DPC11PFE0	Down
DPC11PFE1->CB0F1_08_1	Down	CB0F1_08_1->DPC11PFE1	Down
DPC11PFE2->CB0F1_08_2	Down	CB0F1_08_2->DPC11PFE2	Down
DPC11PFE3->CB0F1_08_3	Down	CB0F1_08_3->DPC11PFE3	Down
DPC0PFE0->CB0F1_09_0	Down	CB0F1_09_0->DPC0PFE0	Down
DPC0PFE1->CB0F1_09_1	Down	CB0F1_09_1->DPC0PFE1	Down
DPC0PFE2->CB0F1_09_2	Down	CB0F1_09_2->DPC0PFE2	Down
DPC0PFE3->CB0F1_09_3	Down	CB0F1_09_3->DPC0PFE3	Down
DPC9PFE0->CB0F1_11_0	Down	CB0F1_11_0->DPC9PFE0	Down
DPC9PFE1->CB0F1_11_1	Down	CB0F1_11_1->DPC9PFE1	Down
DPC9PFE2->CB0F1_11_2	Down	CB0F1_11_2->DPC9PFE2	Down
DPC9PFE3->CB0F1_11_3	Down	CB0F1_11_3->DPC9PFE3	Down
DPC2PFE0->CB0F1_13_0	up	CB0F1_13_0->DPC2PFE0	up
DPC2PFE1->CB0F1_13_1	up	CB0F1_13_1->DPC2PFE1	up
DPC2PFE2->CB0F1_13_2	up	CB0F1_13_2->DPC2PFE2	up
DPC2PFE3->CB0F1_13_3	up	CB0F1_13_3->DPC2PFE3	up
DPC6PFE0->CB0F1_14_0	Down	CB0F1_14_0->DPC6PFE0	Down
DPC6PFE1->CB0F1_14_1	Down	CB0F1_14_1->DPC6PFE1	Down
DPC6PFE2->CB0F1_14_2	Down	CB0F1_14_2->DPC6PFE2	Down
DPC6PFE3->CB0F1_14_3	Down	CB0F1_14_3->DPC6PFE3	Down
DPC5PFE0->CB0F1_15_0	Down	CB0F1_15_0->DPC5PFE0	Down
DPC5PFE1->CB0F1_15_1	Down	CB0F1_15_1->DPC5PFE1	Down
DPC5PFE2->CB0F1_15_2	Down	CB0F1_15_2->DPC5PFE2	Down
DPC5PFE3->CB0F1_15_3	Down	CB0F1_15_3->DPC5PFE3	Down
DPC4PFE0->CB1F0_00_0	up	CB1F0_00_0->DPC4PFE0	up
DPC4PFE1->CB1F0_00_1	up	CB1F0_00_1->DPC4PFE1	up
DPC4PFE2->CB1F0_00_2	up	CB1F0_00_2->DPC4PFE2	up
DPC4PFE3->CB1F0_00_3	up	CB1F0_00_3->DPC4PFE3	up
DPC7PFE0->CB1F0_01_0	Down	CB1F0_01_0->DPC7PFE0	Down
DPC7PFE1->CB1F0_01_1	Down	CB1F0_01_1->DPC7PFE1	Down
DPC7PFE2->CB1F0_01_2	Down	CB1F0_01_2->DPC7PFE2	Down
DPC7PFE3->CB1F0_01_3	Down	CB1F0_01_3->DPC7PFE3	Down
DPC3PFE0->CB1F0_03_0	Down	CB1F0_03_0->DPC3PFE0	Down
DPC3PFE1->CB1F0_03_1	Down	CB1F0_03_1->DPC3PFE1	Down
DPC3PFE2->CB1F0_03_2	Down	CB1F0_03_2->DPC3PFE2	Down
DPC3PFE3->CB1F0_03_3	Down	CB1F0_03_3->DPC3PFE3	Down
DPC8PFE0->CB1F0_05_0	Down	CB1F0_05_0->DPC8PFE0	Down
DPC8PFE1->CB1F0_05_1	Down	CB1F0_05_1->DPC8PFE1	Down
DPC8PFE2->CB1F0_05_2	Down	CB1F0_05_2->DPC8PFE2	Down
DPC8PFE3->CB1F0_05_3	Down	CB1F0_05_3->DPC8PFE3	Down
DPC1PFE0->CB1F0_06_0	Down	CB1F0_06_0->DPC1PFE0	Down
DPC1PFE1->CB1F0_06_1	Down	CB1F0_06_1->DPC1PFE1	Down
DPC1PFE2->CB1F0_06_2	Down	CB1F0_06_2->DPC1PFE2	Down
DPC1PFE3->CB1F0_06_3	Down	CB1F0_06_3->DPC1PFE3	Down

DPC10PFE0->CB1F0_07_0	Down	CB1F0_07_0->DPC10PFE0	Down
DPC10PFE1->CB1F0_07_1	Down	CB1F0_07_1->DPC10PFE1	Down
DPC10PFE2->CB1F0_07_2	Down	CB1F0_07_2->DPC10PFE2	Down
DPC10PFE3->CB1F0_07_3	Down	CB1F0_07_3->DPC10PFE3	Down
DPC11PFE0->CB1F0_08_0	Down	CB1F0_08_0->DPC11PFE0	Down
DPC11PFE1->CB1F0_08_1	Down	CB1F0_08_1->DPC11PFE1	Down
DPC11PFE2->CB1F0_08_2	Down	CB1F0_08_2->DPC11PFE2	Down
DPC11PFE3->CB1F0_08_3	Down	CB1F0_08_3->DPC11PFE3	Down
DPC0PFE0->CB1F0_09_0	Down	CB1F0_09_0->DPC0PFE0	Down
DPC0PFE1->CB1F0_09_1	Down	CB1F0_09_1->DPC0PFE1	Down
DPC0PFE2->CB1F0_09_2	Down	CB1F0_09_2->DPC0PFE2	Down
DPC0PFE3->CB1F0_09_3	Down	CB1F0_09_3->DPC0PFE3	Down
DPC9PFE0->CB1F0_11_0	Down	CB1F0_11_0->DPC9PFE0	Down
DPC9PFE1->CB1F0_11_1	Down	CB1F0_11_1->DPC9PFE1	Down
DPC9PFE2->CB1F0_11_2	Down	CB1F0_11_2->DPC9PFE2	Down
DPC9PFE3->CB1F0_11_3	Down	CB1F0_11_3->DPC9PFE3	Down
DPC2PFE0->CB1F0_13_0	up	CB1F0_13_0->DPC2PFE0	up
DPC2PFE1->CB1F0_13_1	up	CB1F0_13_1->DPC2PFE1	up
DPC2PFE2->CB1F0_13_2	up	CB1F0_13_2->DPC2PFE2	up
DPC2PFE3->CB1F0_13_3	up	CB1F0_13_3->DPC2PFE3	up
DPC6PFE0->CB1F0_14_0	Down	CB1F0_14_0->DPC6PFE0	Down
DPC6PFE1->CB1F0_14_1	Down	CB1F0_14_1->DPC6PFE1	Down
DPC6PFE2->CB1F0_14_2	Down	CB1F0_14_2->DPC6PFE2	Down
DPC6PFE3->CB1F0_14_3	Down	CB1F0_14_3->DPC6PFE3	Down
DPC5PFE0->CB1F0_15_0	Down	CB1F0_15_0->DPC5PFE0	Down
DPC5PFE1->CB1F0_15_1	Down	CB1F0_15_1->DPC5PFE1	Down
DPC5PFE2->CB1F0_15_2	Down	CB1F0_15_2->DPC5PFE2	Down
DPC5PFE3->CB1F0_15_3	Down	CB1F0_15_3->DPC5PFE3	Down
DPC4PFE0->CB1F1_00_0	up	CB1F1_00_0->DPC4PFE0	up
DPC4PFE1->CB1F1_00_1	up	CB1F1_00_1->DPC4PFE1	up
DPC4PFE2->CB1F1_00_2	up	CB1F1_00_2->DPC4PFE2	up
DPC4PFE3->CB1F1_00_3	up	CB1F1_00_3->DPC4PFE3	up
DPC7PFE0->CB1F1_01_0	Down	CB1F1_01_0->DPC7PFE0	Down
DPC7PFE1->CB1F1_01_1	Down	CB1F1_01_1->DPC7PFE1	Down
DPC7PFE2->CB1F1_01_2	Down	CB1F1_01_2->DPC7PFE2	Down
DPC7PFE3->CB1F1_01_3	Down	CB1F1_01_3->DPC7PFE3	Down
DPC3PFE0->CB1F1_03_0	Down	CB1F1_03_0->DPC3PFE0	Down
DPC3PFE1->CB1F1_03_1	Down	CB1F1_03_1->DPC3PFE1	Down
DPC3PFE2->CB1F1_03_2	Down	CB1F1_03_2->DPC3PFE2	Down
DPC3PFE3->CB1F1_03_3	Down	CB1F1_03_3->DPC3PFE3	Down
DPC8PFE0->CB1F1_05_0	Down	CB1F1_05_0->DPC8PFE0	Down
DPC8PFE1->CB1F1_05_1	Down	CB1F1_05_1->DPC8PFE1	Down
DPC8PFE2->CB1F1_05_2	Down	CB1F1_05_2->DPC8PFE2	Down
DPC8PFE3->CB1F1_05_3	Down	CB1F1_05_3->DPC8PFE3	Down
DPC1PFE0->CB1F1_06_0	Down	CB1F1_06_0->DPC1PFE0	Down
DPC1PFE1->CB1F1_06_1	Down	CB1F1_06_1->DPC1PFE1	Down
DPC1PFE2->CB1F1_06_2	Down	CB1F1_06_2->DPC1PFE2	Down
DPC1PFE3->CB1F1_06_3	Down	CB1F1_06_3->DPC1PFE3	Down
DPC10PFE0->CB1F1_07_0	Down	CB1F1_07_0->DPC10PFE0	Down
DPC10PFE1->CB1F1_07_1	Down	CB1F1_07_1->DPC10PFE1	Down
DPC10PFE2->CB1F1_07_2	Down	CB1F1_07_2->DPC10PFE2	Down
DPC10PFE3->CB1F1_07_3	Down	CB1F1_07_3->DPC10PFE3	Down
DPC11PFE0->CB1F1_08_0	Down	CB1F1_08_0->DPC11PFE0	Down
DPC11PFE1->CB1F1_08_1	Down	CB1F1_08_1->DPC11PFE1	Down
DPC11PFE2->CB1F1_08_2	Down	CB1F1_08_2->DPC11PFE2	Down
DPC11PFE3->CB1F1_08_3	Down	CB1F1_08_3->DPC11PFE3	Down
DPC0PFE0->CB1F1_09_0	Down	CB1F1_09_0->DPC0PFE0	Down
DPC0PFE1->CB1F1_09_1	Down	CB1F1_09_1->DPC0PFE1	Down
DPC0PFE2->CB1F1_09_2	Down	CB1F1_09_2->DPC0PFE2	Down
DPC0PFE3->CB1F1_09_3	Down	CB1F1_09_3->DPC0PFE3	Down
DPC9PFE0->CB1F1_11_0	Down	CB1F1_11_0->DPC9PFE0	Down

DPC9PFE1->CB1F1_11_1	Down	CB1F1_11_1->DPC9PFE1	Down
DPC9PFE2->CB1F1_11_2	Down	CB1F1_11_2->DPC9PFE2	Down
DPC9PFE3->CB1F1_11_3	Down	CB1F1_11_3->DPC9PFE3	Down
DPC2PFE0->CB1F1_13_0	up	CB1F1_13_0->DPC2PFE0	up
DPC2PFE1->CB1F1_13_1	up	CB1F1_13_1->DPC2PFE1	up
DPC2PFE2->CB1F1_13_2	up	CB1F1_13_2->DPC2PFE2	up
DPC2PFE3->CB1F1_13_3	up	CB1F1_13_3->DPC2PFE3	up
DPC6PFE0->CB1F1_14_0	Down	CB1F1_14_0->DPC6PFE0	Down
DPC6PFE1->CB1F1_14_1	Down	CB1F1_14_1->DPC6PFE1	Down
DPC6PFE2->CB1F1_14_2	Down	CB1F1_14_2->DPC6PFE2	Down
DPC6PFE3->CB1F1_14_3	Down	CB1F1_14_3->DPC6PFE3	Down
DPC5PFE0->CB1F1_15_0	Down	CB1F1_15_0->DPC5PFE0	Down
DPC5PFE1->CB1F1_15_1	Down	CB1F1_15_1->DPC5PFE1	Down
DPC5PFE2->CB1F1_15_2	Down	CB1F1_15_2->DPC5PFE2	Down
DPC5PFE3->CB1F1_15_3	Down	CB1F1_15_3->DPC5PFE3	Down
plane 4 is not up			
plane 5 is not up			

show chassis fabric plane

Syntax	show chassis fabric plane
Release Information	Command introduced in JUNOS Release 8.0.
Description	(M120 and MX-series routers only) On the M120 router, display the state of all fabric plane connections to the Forwarding Engine Boards (FEBs). On the MX-series router, display the state of all fabric plane connections to the Dense Port Concentrators (DPCs) and Packet Forwarding Engines.
Required Privilege Level	view
List of Sample Output	show chassis fabric plane (M120) on page 234 show chassis fabric plane (MX240) on page 235 show chassis fabric plane (MX480) on page 236 show chassis fabric plane (MX960) on page 237
Output Fields	Table 58 on page 234 lists the output fields for the show chassis fabric plane command. Output fields are listed in the approximate order in which they appear.

Table 58: show chassis fabric plane Output Fields

Field Name	Field Description
FEB	FEB number and state of links to each FEB: Link error, Links ok, or Unused.
Plane state	State of each plane: ACTIVE, OFFLINE, or FAULTY.
FPC	Slot number of each Dense Port Concentrator (DPC). The MX960 router uses DPCs hardwired with Ethernet ports.
PFE	Slot number of each Packet Forwarding Engine and the state of the links to the Dense Port Concentrator: Links ok, Link error, or Unused. Each DPC includes four Packet Forwarding Engines.

```

show chassis fabric plane (M120)
user@host> show chassis fabric plane
Fabric management PLANE state
Plane 0
Plane state: ACTIVE
FEB 0: Links ok
FEB 1: Links ok
FEB 2: Links ok
FEB 3: Links ok
FEB 4: Links ok
FEB 5: Links ok
Plane 1
Plane state: ACTIVE
FEB 0: Links ok
FEB 1: Links ok
FEB 2: Links ok
FEB 3: Links ok

```

```

FEB 4: Links ok
FEB 5: Links ok
Plane 2
Plane state: ACTIVE
FEB 0: Links ok
FEB 1: Links ok
FEB 2: Links ok
FEB 3: Links ok
FEB 4: Links ok
FEB 5: Links ok
Plane 3
Plane state: ACTIVE
FEB 0: Links ok
FEB 1: Links ok
FEB 2: Links ok
FEB 3: Links ok
FEB 4: Links ok
FEB 5: Links ok

```

**show chassis fabric
plane (MX240)**

```

user@host> show chassis fabric plane
Plane 0
  Plane state: ACTIVE
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 2
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 1
  Plane state: ACTIVE
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 2
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 2
  Plane state: ACTIVE
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 2
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 3
  Plane state: ACTIVE
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok

```

```

        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 2
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
Plane 4
  Plane state: SPARE
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 2
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
Plane 5
  Plane state: SPARE
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 2
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
Plane 6
  Plane state: SPARE
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 2
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
Plane 7
  Plane state: SPARE
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 2
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok

```

show chassis fabric plane (MX480) user@host> **show chassis fabric plane**
 Fabric management PLANE state

```

Plane 0
  Plane state: ACTIVE
    FPC 1

```



```

        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
Plane 1
  Plane state: ACTIVE
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 2
  Plane state: ACTIVE
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 3
  Plane state: ACTIVE
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 4
  Plane state: SPARE
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 5
  Plane state: SPARE
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 6
  Plane state: SPARE
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 7
  Plane state: SPARE
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok

```

```

show chassis fabric user@host> show chassis fabric plane
plane (MX960)      Plane 0
                      Plane state: ACTIVE
                      FPC 5
                        PFE 0 :Links ok
                        PFE 1 :Links ok
                        PFE 2 :Links ok

```

```
    PFE 3 :Links ok
  FPC 6
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
Plane 1
  Plane state: ACTIVE
  FPC 5
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
  FPC 6
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
Plane 2
  Plane state: OFFLINE
Plane 3
  Plane state: OFFLINE
Plane 4
  Plane state: OFFLINE
Plane 5
  Plane state: OFFLINE
```

show chassis fabric plane-location

Syntax	show chassis fabric plane-location
Release Information	Command introduced in JUNOS Release 8.0.
Description	(M120 and MX-series routers only) Display the Control Board (CB) location of each plane. This command can be used on the master Routing Engine or the backup Routing Engine.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show chassis fabric plane-location (M120) on page 239 show chassis fabric plane-location (MX240 and MX480) on page 239 show chassis fabric plane-location (MX960) on page 239
Output Fields	Table 59 on page 239 lists the output fields for the show chassis fabric plane location command. Output fields are listed in the approximate order in which they appear.

Table 59: show chassis fabric plane location Output Fields

Field Name	Field Description
Plane <i>n</i>	Plane number.
Control Board <i>n</i>	Control board number.

```

show chassis fabric      user@host> show chassis fabric plane-location
plane-location (M120)  -----Fabric Plane Locations-----
Plane 0                  Control Board 0
Plane 1                  Control Board 0
Plane 2                  Control Board 1
Plane 3                  Control Board 1

```

```

show chassis fabric      user@host> show chassis fabric plane-location
plane-location (MX240  -----Fabric Plane Locations-----
and MX480)             Plane 0                  Control Board 0
Plane 1                  Control Board 0
Plane 2                  Control Board 0
Plane 3                  Control Board 0
Plane 4                  Control Board 1
Plane 5                  Control Board 1
Plane 6                  Control Board 1
Plane 7                  Control Board 1

```

```

show chassis fabric      user@host> show chassis fabric plane-location
plane-location (MX960)  -----Fabric Plane Locations-----
Plane 0                  Control Board 0
Plane 1                  Control Board 0
Plane 2                  Control Board 1
Plane 3                  Control Board 1

```

Plane 4
Plane 5

Control Board 2
Control Board 2

show chassis fabric sibs

Syntax	show chassis fabric sibs <lcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	<p>(T-series routing platforms only) Display the state of the electrical and optical switch fabric links:</p> <ul style="list-style-type: none"> Between the Switch Interface Boards (SIBs) in the TX Matrix platform (TX SIBs) and the SIBs in the T640 routing nodes (T640 SIBs). Between the T640 SIBs and the Flexible PIC Concentrators (FPCs) in a T640 routing node.
Options	<p>none—Display the switching fabric link state for the TX SIBs in the TX Matrix platform and for the T640 SIBs in all the T640 routing nodes connected to a TX Matrix platform.</p> <p>lcc <i>number</i>—(Optional) Display the switching fabric link state for the T640 SIBs in a specified T640 routing node (or line-card chassis) connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Optional) Display the switching fabric link state for the TX SIBs on the TX Matrix platform (or switch-card chassis).</p>
Required Privilege Level	view
List of Sample Output	<p>show chassis fabric sibs on page 241</p> <p>show chassis fabric sibs lcc on page 243</p> <p>show chassis fabric sibs scc on page 243</p>
Output Fields	Table 60 on page 241 lists the output fields for the <code>show chassis fabric sibs</code> command. Output fields are listed in the approximate order in which they appear.

Table 60: show chassis fabric sibs Output Fields

Field Name	Field Description
Fabric management SIB state	Switching fabric link state for each SIB: Unused, Links ok, or Link error.
Plane state	State of the TX SIB or T640 SIB: S_ACTIVE or S_SPARE.

show chassis fabric sibs user@host> show chassis fabric sibs
scc-re0:

```
-----
Fabric management SIB state:
SIB #0
  plane state: S_ACTIVE
  LCC #0      : Unused
```

```

        LCC #2      : Unused
SIB #1
    plane state: S_ACTIVE
        LCC #0      : Unused
        LCC #2      : Unused
SIB #2
    plane state: S_SPARE
        LCC #0      : Links ok
        LCC #2      : Links ok
SIB #3
    plane state: S_ACTIVE
        LCC #0      : Unused
        LCC #2      : Unused
SIB #4
    plane state: S_ACTIVE
        LCC #0      : Links ok
        LCC #2      : Links ok

```

```
1cc0-re0:
```

```
-----
Fabric management SIB state:
```

```

SIB #2
    plane state: S_SPARE
    FPC #0
        PFE #1      : Links ok
    FPC #6
        PFE #1      : Links ok
    SCC          : Links ok
SIB #4
    plane state: S_ACTIVE
    FPC #0
        PFE #1      : Links ok
    FPC #6
        PFE #1      : Links ok
    SCC          : Links ok

```

```
1cc2-re0:
```

```
-----
Fabric management SIB state:
```

```

SIB #2
    plane state: S_SPARE
    FPC #0
        PFE #1      : Links ok
    FPC #1
        PFE #1      : Links ok
    FPC #2
        PFE #0      : Links ok
        PFE #1      : Links ok
    FPC #3
        PFE #1      : Links ok
    SCC          : Links ok
SIB #4
    plane state: S_ACTIVE
    FPC #0
        PFE #1      : Links ok
    FPC #1
        PFE #1      : Links ok
    FPC #2
        PFE #0      : Links ok
        PFE #1      : Links ok
    FPC #3

```

```

        PFE #1 : Links ok
    SCC      : Links ok

```

```

show chassis fabric sibs user@host> show chassis fabric sibs lcc 0
lcc lcc0-re0:

```

```

-----
Fabric management SIB state:

```

```

SIB #2
    plane state: S_SPARE
    FPC #0
        PFE #1 : Links ok
    FPC #6
        PFE #1 : Links ok
    SCC      : Links ok
SIB #4
    plane state: S_ACTIVE
    FPC #0
        PFE #1 : Links ok
    FPC #6
        PFE #1 : Links ok
    SCC      : Links ok

```

```

show chassis fabric sibs user@host> show chassis fabric sibs scc
scc scc-re0:

```

```

-----
Fabric management SIB state:

```

```

SIB #0
    plane state: S_ACTIVE
    LCC #0      : Unused
    LCC #2      : Unused
SIB #1
    plane state: S_ACTIVE
    LCC #0      : Unused
    LCC #2      : Unused
SIB #2
    plane state: S_SPARE
    LCC #0      : Links ok
    LCC #2      : Links ok
SIB #3
    plane state: S_ACTIVE
    LCC #0      : Unused
    LCC #2      : Unused
SIB #4
    plane state: S_ACTIVE
    LCC #0      : Links ok
    LCC #2      : Links ok

```

show chassis fabric summary

Syntax	show chassis fabric summary
Release Information	Command introduced in JUNOS Release 8.4.
Description	(MX-series routers only) Display the state of all fabric planes and the elapsed uptime.
Required Privilege Level	view
List of Sample Output	show chassis fabric summary (MX240) on page 244 show chassis fabric summary (MX480) on page 244 show chassis fabric summary (MX960) on page 244
Output Fields	Table 61 on page 244 lists the output fields for the show chassis fabric summary command. Output fields are listed in the approximate order in which they appear.

Table 61: show chassis fabric summary Output Fields

Field Name	Field Description
Plane	Plane number.
State	State of each plane: Online, Offline or Spare.
Uptime	Elapsed time the plane has been online.

```

show chassis fabric summary (MX240) user@host> show chassis fabric summary
Plane  State  Uptime
0      Online 23 hours, 26 minutes, 54 seconds
1      Online 23 hours, 26 minutes, 54 seconds
2      Online 23 hours, 26 minutes, 54 seconds
3      Online 23 hours, 26 minutes, 54 seconds
4      Spare  23 hours, 26 minutes, 54 seconds
5      Spare  23 hours, 26 minutes, 54 seconds
6      Spare  23 hours, 26 minutes, 54 seconds
7      Spare  23 hours, 26 minutes, 54 seconds

```

```

show chassis fabric summary (MX480) user@host> show chassis fabric summary
Plane  State  Uptime
0      Online 8 hours, 45 minutes, 29 seconds
1      Online 8 hours, 45 minutes, 28 seconds
2      Online 8 hours, 45 minutes, 28 seconds
3      Online 8 hours, 45 minutes, 28 seconds
4      Spare  8 hours, 45 minutes, 28 seconds
5      Spare  8 hours, 45 minutes, 28 seconds
6      Spare  8 hours, 45 minutes, 28 seconds
7      Spare  8 hours, 45 minutes, 28 seconds

```

```

show chassis fabric summary (MX960) user@host> show chassis fabric summary
Plane  State  Uptime
0      Online 16 hours, 41 minutes, 48 seconds
1      Online 16 hours, 41 minutes, 47 seconds

```


2	Online	16 hours, 41 minutes, 47 seconds
3	Online	16 hours, 41 minutes, 46 seconds
4	Spare	16 hours, 41 minutes, 46 seconds
5	Spare	16 hours, 41 minutes, 45 seconds

show chassis fabric topology

Syntax	show chassis fabric topology <fcc number scc> <sib-slot-number>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(T-series routing platforms only) Display the state of the switching fabric topology for the Switch Interface Board (SIB) connection between the TX Matrix platform and the T640 routing nodes.
Options	<p>none—Display the fabric topology state for the TX Matrix platform and for all the T640 routing nodes connected to it.</p> <p>fcc number—(Optional) Display the fabric topology state for a specified T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Optional) Display the fabric topology state for the TX Matrix platform (or switch-card chassis).</p> <p>sib-slot-number—(Optional) Display the fabric topology state for a specified SIB slot. Replace <i>sib-slot-number</i> with a value from 0 through 4.</p>
Required Privilege Level	view
List of Sample Output	<p>show chassis fabric topology scc on page 246</p> <p>show chassis fabric topology fcc on page 249</p>
Output Fields	Table 62 on page 246 lists the output fields for the show chassis fabric topology command. Output fields are listed in the approximate order in which they appear.

Table 62: show chassis fabric topology Output Fields

Field Name	Field Description
in-links	Fabric topology for receive side links.
out-links	Fabric topology for transmit side links.
state	State of the link: RESET, UP, DOWN, or FAULT.

show chassis fabric topology scc user@host> show chassis fabric topology scc
scc-rel:

```
-----
fchip (mode)
in-links      state  out-links      state
-----
```

Sib #0 :

SIB0_F0 (F2):

LCC0_SIB-L0_F0,03->SIB-S0_F0,00 UP
 LCC1_SIB-L0_F0,03->SIB-S0_F0,01 UP
 LCC2_SIB-L0_F0,03->SIB-S0_F0,02 RESET
 LCC3_SIB-L0_F0,03->SIB-S0_F0,03 RESET
 LCC0_SIB-L0_F0,02->SIB-S0_F0,04 UP
 LCC1_SIB-L0_F0,02->SIB-S0_F0,05 UP
 LCC2_SIB-L0_F0,02->SIB-S0_F0,06 RESET
 LCC3_SIB-L0_F0,02->SIB-S0_F0,07 RESET
 LCC0_SIB-L0_F0,07->SIB-S0_F0,08 UP
 LCC1_SIB-L0_F0,07->SIB-S0_F0,09 UP
 LCC2_SIB-L0_F0,07->SIB-S0_F0,10 RESET
 LCC3_SIB-L0_F0,07->SIB-S0_F0,11 RESET
 LCC0_SIB-L0_F0,06->SIB-S0_F0,12 UP
 LCC1_SIB-L0_F0,06->SIB-S0_F0,13 UP
 LCC2_SIB-L0_F0,06->SIB-S0_F0,14 RESET
 LCC3_SIB-L0_F0,06->SIB-S0_F0,15 RESET

SIB0_F1 (F2):

LCC0_SIB-L0_F0,11->SIB-S0_F1,00 UP
 LCC1_SIB-L0_F0,11->SIB-S0_F1,01 UP
 LCC2_SIB-L0_F0,11->SIB-S0_F1,02 RESET
 LCC3_SIB-L0_F0,11->SIB-S0_F1,03 RESET
 LCC0_SIB-L0_F0,10->SIB-S0_F1,04 UP
 LCC1_SIB-L0_F0,10->SIB-S0_F1,05 UP
 LCC2_SIB-L0_F0,10->SIB-S0_F1,06 RESET
 LCC3_SIB-L0_F0,10->SIB-S0_F1,07 RESET
 LCC0_SIB-L0_F0,15->SIB-S0_F1,08 UP
 LCC1_SIB-L0_F0,15->SIB-S0_F1,09 UP
 LCC2_SIB-L0_F0,15->SIB-S0_F1,10 RESET
 LCC3_SIB-L0_F0,15->SIB-S0_F1,11 RESET
 LCC0_SIB-L0_F0,14->SIB-S0_F1,12 UP
 LCC1_SIB-L0_F0,14->SIB-S0_F1,13 UP
 LCC2_SIB-L0_F0,14->SIB-S0_F1,14 RESET
 UP
 LCC3_SIB-L0_F0,14->SIB-S0_F1,15 RESET
 UP

SIB0_F2 (F2):

LCC3_SIB-L0_F0,13->SIB-S0_F2,00 RESET
 LCC2_SIB-L0_F0,13->SIB-S0_F2,01 RESET
 UP
 LCC1_SIB-L0_F0,13->SIB-S0_F2,02 UP
 LCC0_SIB-L0_F0,13->SIB-S0_F2,03 UP
 LCC3_SIB-L0_F0,12->SIB-S0_F2,04 RESET
 UP
 LCC2_SIB-L0_F0,12->SIB-S0_F2,05 RESET
 LCC1_SIB-L0_F0,12->SIB-S0_F2,06 UP
 LCC0_SIB-L0_F0,12->SIB-S0_F2,07 UP
 LCC3_SIB-L0_F0,09->SIB-S0_F2,08 RESET
 UP
 LCC2_SIB-L0_F0,09->SIB-S0_F2,09 RESET
 UP
 LCC1_SIB-L0_F0,09->SIB-S0_F2,10 UP
 LCC0_SIB-L0_F0,09->SIB-S0_F2,11 UP
 LCC3_SIB-L0_F0,08->SIB-S0_F2,12 RESET
 UP
 LCC2_SIB-L0_F0,08->SIB-S0_F2,13 RESET
 UP
 LCC1_SIB-L0_F0,08->SIB-S0_F2,14 UP
 LCC0_SIB-L0_F0,08->SIB-S0_F2,15 UP

SIB0_F3 (F2):

SIB-S0_F0,00->LCC0_SIB-L0_F1,00 UP
 SIB-S0_F0,01->LCC1_SIB-L0_F1,08 UP
 SIB-S0_F0,02->LCC2_SIB-L0_F1,08 UP
 SIB-S0_F0,03->LCC3_SIB-L0_F1,00 UP
 SIB-S0_F0,04->LCC0_SIB-L0_F1,01 UP
 SIB-S0_F0,05->LCC1_SIB-L0_F1,09 UP
 SIB-S0_F0,06->LCC2_SIB-L0_F1,09 UP
 SIB-S0_F0,07->LCC3_SIB-L0_F1,01 UP
 SIB-S0_F0,08->LCC0_SIB-L0_F1,04 UP
 SIB-S0_F0,09->LCC1_SIB-L0_F1,12 UP
 SIB-S0_F0,10->LCC2_SIB-L0_F1,12 UP
 SIB-S0_F0,11->LCC3_SIB-L0_F1,04 UP
 SIB-S0_F0,12->LCC0_SIB-L0_F1,05 UP
 SIB-S0_F0,13->LCC1_SIB-L0_F1,13 UP
 SIB-S0_F0,14->LCC2_SIB-L0_F1,13 UP
 SIB-S0_F0,15->LCC3_SIB-L0_F1,05 UP

SIB-S0_F1,00->LCC0_SIB-L0_F1,08 UP
 SIB-S0_F1,01->LCC1_SIB-L0_F1,00 UP
 SIB-S0_F1,02->LCC2_SIB-L0_F1,00 UP
 SIB-S0_F1,03->LCC3_SIB-L0_F1,08 UP
 SIB-S0_F1,04->LCC0_SIB-L0_F1,09 UP
 SIB-S0_F1,05->LCC1_SIB-L0_F1,01 UP
 SIB-S0_F1,06->LCC2_SIB-L0_F1,01 UP
 SIB-S0_F1,07->LCC3_SIB-L0_F1,09 UP
 SIB-S0_F1,08->LCC0_SIB-L0_F1,12 UP
 SIB-S0_F1,09->LCC1_SIB-L0_F1,04 UP
 SIB-S0_F1,10->LCC2_SIB-L0_F1,04 UP
 SIB-S0_F1,11->LCC3_SIB-L0_F1,12 UP
 SIB-S0_F1,12->LCC0_SIB-L0_F1,13 UP
 SIB-S0_F1,13->LCC1_SIB-L0_F1,05 UP
 SIB-S0_F1,14->LCC2_SIB-L0_F1,05

SIB-S0_F1,15->LCC3_SIB-L0_F1,13

SIB-S0_F2,00->LCC3_SIB-L0_F1,14 UP
 SIB-S0_F2,01->LCC2_SIB-L0_F1,06

SIB-S0_F2,02->LCC1_SIB-L0_F1,06 UP
 SIB-S0_F2,03->LCC0_SIB-L0_F1,14 UP
 SIB-S0_F2,04->LCC3_SIB-L0_F1,15

SIB-S0_F2,05->LCC2_SIB-L0_F1,07 UP
 SIB-S0_F2,06->LCC1_SIB-L0_F1,07 UP
 SIB-S0_F2,07->LCC0_SIB-L0_F1,15 UP
 SIB-S0_F2,08->LCC3_SIB-L0_F1,10

SIB-S0_F2,09->LCC2_SIB-L0_F1,02

SIB-S0_F2,10->LCC1_SIB-L0_F1,02 UP
 SIB-S0_F2,11->LCC0_SIB-L0_F1,10 UP
 SIB-S0_F2,12->LCC3_SIB-L0_F1,11

SIB-S0_F2,13->LCC2_SIB-L0_F1,03

SIB-S0_F2,14->LCC1_SIB-L0_F1,03 UP
 SIB-S0_F2,15->LCC0_SIB-L0_F1,11 UP

```

LCC3_SIB-L0_F0,05->SIB-S0_F3,00  RESET      SIB-S0_F3,00->LCC3_SIB-L0_F1,06
UP
LCC2_SIB-L0_F0,05->SIB-S0_F3,01  RESET      SIB-S0_F3,01->LCC2_SIB-L0_F1,14
UP
LCC1_SIB-L0_F0,05->SIB-S0_F3,02  UP          SIB-S0_F3,02->LCC1_SIB-L0_F1,14  UP
LCC0_SIB-L0_F0,05->SIB-S0_F3,03  UP          SIB-S0_F3,03->LCC0_SIB-L0_F1,06  UP
LCC3_SIB-L0_F0,04->SIB-S0_F3,04  RESET      SIB-S0_F3,04->LCC3_SIB-L0_F1,07
UP
LCC2_SIB-L0_F0,04->SIB-S0_F3,05  RESET      SIB-S0_F3,05->LCC2_SIB-L0_F1,15
UP
LCC1_SIB-L0_F0,04->SIB-S0_F3,06  UP          SIB-S0_F3,06->LCC1_SIB-L0_F1,15  UP
LCC0_SIB-L0_F0,04->SIB-S0_F3,07  UP          SIB-S0_F3,07->LCC0_SIB-L0_F1,07  UP
LCC3_SIB-L0_F0,01->SIB-S0_F3,08  RESET      SIB-S0_F3,08->LCC3_SIB-L0_F1,02
UP
LCC2_SIB-L0_F0,01->SIB-S0_F3,09  RESET      SIB-S0_F3,09->LCC2_SIB-L0_F1,10
UP
LCC1_SIB-L0_F0,01->SIB-S0_F3,10  UP          SIB-S0_F3,10->LCC1_SIB-L0_F1,10  UP
LCC0_SIB-L0_F0,01->SIB-S0_F3,11  UP          SIB-S0_F3,11->LCC0_SIB-L0_F1,02  UP
LCC3_SIB-L0_F0,00->SIB-S0_F3,12  RESET      SIB-S0_F3,12->LCC3_SIB-L0_F1,03
UP
LCC2_SIB-L0_F0,00->SIB-S0_F3,13  RESET      SIB-S0_F3,13->LCC2_SIB-L0_F1,11
UP
LCC1_SIB-L0_F0,00->SIB-S0_F3,14  UP          SIB-S0_F3,14->LCC1_SIB-L0_F1,11  UP
LCC0_SIB-L0_F0,00->SIB-S0_F3,15  UP          SIB-S0_F3,15->LCC0_SIB-L0_F1,03  UP
Sib #1 :
-----
SIB1_F0 (F2 ):
LCC0_SIB-L1_F0,03->SIB-S1_F0,00  RESET      SIB-S1_F0,00->LCC0_SIB-L1_F1,00  UP
LCC1_SIB-L1_F0,03->SIB-S1_F0,01  RESET      SIB-S1_F0,01->LCC1_SIB-L1_F1,08  UP
LCC2_SIB-L1_F0,03->SIB-S1_F0,02  RESET      SIB-S1_F0,02->LCC2_SIB-L1_F1,08  UP
LCC3_SIB-L1_F0,03->SIB-S1_F0,03  RESET      SIB-S1_F0,03->LCC3_SIB-L1_F1,00  UP
LCC0_SIB-L1_F0,02->SIB-S1_F0,04  RESET      SIB-S1_F0,04->LCC0_SIB-L1_F1,01  UP
LCC1_SIB-L1_F0,02->SIB-S1_F0,05  RESET      SIB-S1_F0,05->LCC1_SIB-L1_F1,09  UP
LCC2_SIB-L1_F0,02->SIB-S1_F0,06  RESET      SIB-S1_F0,06->LCC2_SIB-L1_F1,09  UP
LCC3_SIB-L1_F0,02->SIB-S1_F0,07  RESET      SIB-S1_F0,07->LCC3_SIB-L1_F1,01  UP
LCC0_SIB-L1_F0,07->SIB-S1_F0,08  RESET      SIB-S1_F0,08->LCC0_SIB-L1_F1,04  UP
LCC1_SIB-L1_F0,07->SIB-S1_F0,09  RESET      SIB-S1_F0,09->LCC1_SIB-L1_F1,12  UP
LCC2_SIB-L1_F0,07->SIB-S1_F0,10  RESET      SIB-S1_F0,10->LCC2_SIB-L1_F1,12  UP
LCC3_SIB-L1_F0,07->SIB-S1_F0,11  RESET      SIB-S1_F0,11->LCC3_SIB-L1_F1,04  UP
LCC0_SIB-L1_F0,06->SIB-S1_F0,12  RESET      SIB-S1_F0,12->LCC0_SIB-L1_F1,05  UP
LCC1_SIB-L1_F0,06->SIB-S1_F0,13  RESET      SIB-S1_F0,13->LCC1_SIB-L1_F1,13  UP
LCC2_SIB-L1_F0,06->SIB-S1_F0,14  RESET      SIB-S1_F0,14->LCC2_SIB-L1_F1,13  UP
LCC3_SIB-L1_F0,06->SIB-S1_F0,15  RESET      SIB-S1_F0,15->LCC3_SIB-L1_F1,05  UP
SIB1_F1 (F2 ):
LCC0_SIB-L1_F0,11->SIB-S1_F1,00  RESET      SIB-S1_F1,00->LCC0_SIB-L1_F1,08  UP
LCC1_SIB-L1_F0,11->SIB-S1_F1,01  RESET      SIB-S1_F1,01->LCC1_SIB-L1_F1,00  UP
LCC2_SIB-L1_F0,11->SIB-S1_F1,02  RESET      SIB-S1_F1,02->LCC2_SIB-L1_F1,00  UP
LCC3_SIB-L1_F0,11->SIB-S1_F1,03  RESET      SIB-S1_F1,03->LCC3_SIB-L1_F1,08  UP
LCC0_SIB-L1_F0,10->SIB-S1_F1,04  RESET      SIB-S1_F1,04->LCC0_SIB-L1_F1,09  UP
LCC1_SIB-L1_F0,10->SIB-S1_F1,05  RESET      SIB-S1_F1,05->LCC1_SIB-L1_F1,01  UP
LCC2_SIB-L1_F0,10->SIB-S1_F1,06  RESET      SIB-S1_F1,06->LCC2_SIB-L1_F1,01  UP
LCC3_SIB-L1_F0,10->SIB-S1_F1,07  RESET      SIB-S1_F1,07->LCC3_SIB-L1_F1,09  UP
LCC0_SIB-L1_F0,15->SIB-S1_F1,08  RESET      SIB-S1_F1,08->LCC0_SIB-L1_F1,12  UP
LCC1_SIB-L1_F0,15->SIB-S1_F1,09  RESET      SIB-S1_F1,09->LCC1_SIB-L1_F1,04  UP
LCC2_SIB-L1_F0,15->SIB-S1_F1,10  RESET      SIB-S1_F1,10->LCC2_SIB-L1_F1,04  UP
LCC3_SIB-L1_F0,15->SIB-S1_F1,11  RESET      -S1_F1,11->LCC3_SIB-L1_F1,12,05  UP
LCC0_SIB-L1_F0,14->SIB-S1_F1,12  RESET      SIB-S1_F1,12->LCC0_SIB-L1_F1,13  UP
LCC1_SIB-L1_F0,14->SIB-S1_F1,13  RESET      SIB-S1_F1,13->LCC1_SIB-L1_F1,05  UP
LCC2_SIB-L1_F0,14->SIB-S1_F1,14  RESET      SIB-S1_F1,14->LCC2_SIB-L1_F1,05  UP

```

**show chassis fabric
topology lcc**

user@host> **show chassis fabric topology lcc 0**
lcc0-re0:

```
-----
      fchip (mode)
in-links          state          out-links          state
-----
Sib #2 :
-----
SIB2_F0 (F1 ):
FPC0_T->SIB-L2_F0,00 DOWN      SIB-L2_F0,00->SIB-S2_F3,15 DOWN
FPC0_B->SIB-L2_F0,01 UP        SIB-L2_F0,01->SIB-S2_F3,11 DOWN
FPC1_T->SIB-L2_F0,02 DOWN      SIB-L2_F0,02->SIB-S2_F0,04 DOWN
FPC1_B->SIB-L2_F0,03 DOWN      SIB-L2_F0,03->SIB-S2_F0,00 DOWN
FPC2_T->SIB-L2_F0,04 DOWN      SIB-L2_F0,04->SIB-S2_F3,07 DOWN
FPC2_B->SIB-L2_F0,05 DOWN      SIB-L2_F0,05->SIB-S2_F3,03 DOWN
FPC3_T->SIB-L2_F0,06 DOWN      SIB-L2_F0,06->SIB-S2_F0,12 DOWN
FPC3_B->SIB-L2_F0,07 DOWN      SIB-L2_F0,07->SIB-S2_F0,08 DOWN
FPC4_T->SIB-L2_F0,08 DOWN      SIB-L2_F0,08->SIB-S2_F2,15 DOWN
FPC4_B->SIB-L2_F0,09 DOWN      SIB-L2_F0,09->SIB-S2_F2,11 DOWN
FPC5_T->SIB-L2_F0,10 DOWN      SIB-L2_F0,10->SIB-S2_F1,04 DOWN
FPC5_B->SIB-L2_F0,11 DOWN      SIB-L2_F0,11->SIB-S2_F1,00 DOWN
FPC6_T->SIB-L2_F0,12 DOWN      SIB-L2_F0,12->SIB-S2_F2,07 DOWN
FPC6_B->SIB-L2_F0,13 UP        SIB-L2_F0,13->SIB-S2_F2,03 DOWN
FPC7_T->SIB-L2_F0,14 DOWN      SIB-L2_F0,14->SIB-S2_F1,12 DOWN
FPC7_B->SIB-L2_F0,15 DOWN      SIB-L2_F0,15->SIB-S2_F1,08 DOWN
SIB2_F1 (F3 ):
SIB-S2_F0,00->SIB-L2_F1,00 UP   SIB-L2_F1,00->FPC7_B DOWN
SIB-S2_F0,04->SIB-L2_F1,01 UP   SIB-L2_F1,01->FPC7_T DOWN
SIB-S2_F3,11->SIB-L2_F1,02 UP   SIB-L2_F1,02->FPC6_B DOWN
SIB-S2_F3,15->SIB-L2_F1,03 UP   SIB-L2_F1,03->FPC6_T DOWN
SIB-S2_F0,08->SIB-L2_F1,04 UP   SIB-L2_F1,04->FPC5_B DOWN
SIB-S2_F0,12->SIB-L2_F1,05 UP   SIB-L2_F1,05->FPC5_T DOWN
SIB-S2_F3,03->SIB-L2_F1,06 UP   SIB-L2_F1,06->FPC4_B DOWN
SIB-S2_F3,07->SIB-L2_F1,07 UP   SIB-L2_F1,07->FPC4_T DOWN
SIB-S2_F1,00->SIB-L2_F1,08 UP   SIB-L2_F1,08->FPC3_B DOWN
SIB-S2_F1,04->SIB-L2_F1,09 UP   SIB-L2_F1,09->FPC3_T DOWN
SIB-S2_F2,11->SIB-L2_F1,10 UP   SIB-L2_F1,10->FPC2_B DOWN
SIB-S2_F2,15->SIB-L2_F1,11 UP   SIB-L2_F1,11->FPC2_T DOWN
SIB-S2_F1,08->SIB-L2_F1,12 UP   SIB-L2_F1,12->FPC1_B DOWN
SIB-S2_F1,12->SIB-L2_F1,13 UP   SIB-L2_F1,13->FPC1_T DOWN
SIB-S2_F2,03->SIB-L2_F1,14 UP   SIB-L2_F1,14->FPC0_B DOWN
SIB-S2_F2,07->SIB-L2_F1,15 UP   SIB-L2_F1,15->FPC0_T DOWN
Sib #4 :
-----
SIB4_F0 (F1 ):
FPC0_T->SIB-L4_F0,00 RESET      SIB-L4_F0,00->SIB-S4_F3,15 UP
FPC0_B->SIB-L4_F0,01 UP        SIB-L4_F0,01->SIB-S4_F3,11 UP
FPC1_T->SIB-L4_F0,02 RESET      SIB-L4_F0,02->SIB-S4_F0,04 UP
FPC1_B->SIB-L4_F0,03 RESET      SIB-L4_F0,03->SIB-S4_F0,00 UP
FPC2_T->SIB-L4_F0,04 RESET      SIB-L4_F0,04->SIB-S4_F3,07 UP
FPC2_B->SIB-L4_F0,05 RESET      SIB-L4_F0,05->SIB-S4_F3,03 UP
FPC3_T->SIB-L4_F0,06 RESET      SIB-L4_F0,06->SIB-S4_F0,12 UP
FPC3_B->SIB-L4_F0,07 RESET      SIB-L4_F0,07->SIB-S4_F0,08 UP
FPC4_T->SIB-L4_F0,08 RESET      SIB-L4_F0,08->SIB-S4_F2,15 UP
FPC4_B->SIB-L4_F0,09 RESET      SIB-L4_F0,09->SIB-S4_F2,11 UP
FPC5_T->SIB-L4_F0,10 RESET      SIB-L4_F0,10->SIB-S4_F1,04 UP
FPC5_B->SIB-L4_F0,11 RESET      SIB-L4_F0,11->SIB-S4_F1,00 UP
FPC6_T->SIB-L4_F0,12 RESET      SIB-L4_F0,12->SIB-S4_F2,07 UP
FPC6_B->SIB-L4_F0,13 UP        SIB-L4_F0,13->SIB-S4_F2,03 UP
FPC7_T->SIB-L4_F0,14 RESET      SIB-L4_F0,14->SIB-S4_F1,12 UP
FPC7_B->SIB-L4_F0,15 RESET      SIB-L4_F0,15->SIB-S4_F1,08 UP
```

SIB4_F1 (F3):

SIB-S4_F0,00->SIB-L4_F1,00	UP	SIB-L4_F1,00->FPC7_B	UP
SIB-S4_F0,04->SIB-L4_F1,01	UP	SIB-L4_F1,01->FPC7_T	UP
SIB-S4_F3,11->SIB-L4_F1,02	UP	SIB-L4_F1,02->FPC6_B	UP
SIB-S4_F3,15->SIB-L4_F1,03	UP	SIB-L4_F1,03->FPC6_T	UP
SIB-S4_F0,08->SIB-L4_F1,04	UP	SIB-L4_F1,04->FPC5_B	UP
SIB-S4_F0,12->SIB-L4_F1,05	UP	SIB-L4_F1,05->FPC5_T	UP
SIB-S4_F3,03->SIB-L4_F1,06	UP	SIB-L4_F1,06->FPC4_B	UP
SIB-S4_F3,07->SIB-L4_F1,07	UP	SIB-L4_F1,07->FPC4_T	UP
SIB-S4_F1,00->SIB-L4_F1,08	UP	SIB-L4_F1,08->FPC3_B	UP
SIB-S4_F1,04->SIB-L4_F1,09	UP	SIB-L4_F1,09->FPC3_T	UP
SIB-S4_F2,11->SIB-L4_F1,10	UP	SIB-L4_F1,10->FPC2_B	UP
SIB-S4_F2,15->SIB-L4_F1,11	UP	SIB-L4_F1,11->FPC2_T	UP
SIB-S4_F1,08->SIB-L4_F1,12	UP	SIB-L4_F1,12->FPC1_B	UP
SIB-S4_F1,12->SIB-L4_F1,13	UP	SIB-L4_F1,13->FPC1_T	UP
SIB-S4_F2,03->SIB-L4_F1,14	UP	SIB-L4_F1,14->FPC0_B	UP
SIB-S4_F2,07->SIB-L4_F1,15	UP	SIB-L4_F1,15->FPC0_T	UP

show chassis feb

Syntax	show chassis feb
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M5, M10, and M120 routers only) Display Forwarding Engine Board (FEB) status information.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show chassis feb (M10i) on page 252 show chassis feb (M120) on page 252 show chassis feb detail (M120) on page 252
Output Fields	Table 63 on page 251 lists the output fields for the show chassis feb command. Output fields are listed in the approximate order in which they appear.

Table 63: show chassis feb

Field Name	Field Description
State	State of the FEB: Offline, Online, or Check.
Temp (C) or Intake temperature	Temperature of the air passing by the FEB, in degrees Celsius or in both degrees Celsius and degrees Fahrenheit.
CPU Utilization (%)	Percentage of CPU being used: <ul style="list-style-type: none"> ■ Total—Total percentage of CPU being used by the FEB processor. ■ Interrupt—Of the total CPU being used by the FEB processor, the percentage being used for interrupts.
Memory DRAM (MB)	Total DRAM, in megabytes, available to the FEB processor.
Utilization (%)	Percentage of memory utilization: <ul style="list-style-type: none"> ■ Heap—Percentage of heap space (dynamic memory) being used by the FEB processor. If this number exceeds 80 percent, you might experience a software problem (memory leak). ■ Buffer—Percentage of buffer space being used by the FPC processor for buffering internal messages.
Exhaust A temperature	Temperature of the air flowing past Exhaust A.
Exhaust B temperature	Temperature of the air flowing past Exhaust B.
Total DDR DRAM	Amount of double data rate dynamic random access memory (DDR DRAM) available to the FEB CPU.
Total RLDRAM	Amount of reduced latency dynamic random access memory (RLDRAM) available to the FEB CPU.

Table 63: show chassis feb (continued)

Field Name	Field Description
Start time (Detail output only)	Time when the Routing Engine detected that the FEB was running.
Uptime (Detail output only)	How long the Routing Engine has been connected to the FEB, and therefore, how long the Flexible PIC Concentrator (PIC) has been up and running.

```

show chassis feb (M10I) user@host> show chassis feb
FEB status:
  Temperature           37 Centigrade
  CPU utilization        0 percent
  Interrupt utilization  0 percent
  Heap utilization       16 percent
  Buffer utilization      43 percent
  DRAM                   64 Mbytes
  Internet Processor II  Version 1, Foundry IBM, Part number 9
  Start time             1999-01-24 16:24:42 UTC
  Uptime                 2 hours, 21 minutes, 28 seconds

show chassis feb (M120) user@host> show chassis feb
Temp CPU Utilization (%) Memory Utilization (%)
Slot State (C) Total Interrupt DRAM (MB) Heap Buffer
0 Online 47 4 0 512 7 60
1 Online 54 3 0 512 7 59
2 Online 50 4 0 512 7 59
3 Online 49 4 0 512 7 59
4 Online 46 3 0 512 7 59
5 Online 35 3 0 512 7 59

show chassis feb detail (M120) user@host> show chassis feb detail
Slot 0 information:
  State Online
  Intake temperature 48 degrees C / 118 degrees F
  Exhaust A temperature 51 degrees C / 123 degrees F
  Exhaust B temperature 52 degrees C / 125 degrees F
  Total DDR DRAM 512 MB
  Total RLDRAM 32 MB
  Start time: 2006-06-28 15:00:40 PDT
  Uptime: 10 minutes, 21 seconds
Slot 1 information:
  State Online
  Intake temperature 55 degrees C / 131 degrees F
  Exhaust A temperature 46 degrees C / 114 degrees F
  Exhaust B temperature 45 degrees C / 113 degrees F
  Total DDR DRAM 512 MB
  Total RLDRAM 32 MB
  Start time: 2006-06-28 15:00:33 PDT
  Uptime: 10 minutes, 28 seconds
Slot 2 information:
  State Online
  Intake temperature 50 degrees C / 122 degrees F
  Exhaust A temperature 47 degrees C / 116 degrees F
  Exhaust B temperature 47 degrees C / 116 degrees F
  Total DDR DRAM 512 MB
  Total RLDRAM 32 MB

```



```

Start time:                2006-06-28 15:00:35 PDT
Uptime:                    10 minutes, 26 seconds
Slot 3 information:
  State                     Online
  Intake temperature        49 degrees C / 120 degrees F
  Exhaust A temperature     47 degrees C / 116 degrees F
  Exhaust B temperature     49 degrees C / 120 degrees F
  Total DDR DRAM            512 MB
  Total RLDRAM              32 MB
  Start time:               2006-06-28 15:00:43 PDT
  Uptime:                   10 minutes, 18 seconds
Slot 4 information:
  State                     Online
  Intake temperature        45 degrees C / 113 degrees F
  Exhaust A temperature     42 degrees C / 107 degrees F
  Exhaust B temperature     42 degrees C / 107 degrees F
  Total DDR DRAM            512 MB
  Total RLDRAM              32 MB
  Start time:               2006-06-28 15:00:29 PDT
  Uptime:                   10 minutes, 32 seconds
Slot 5 information:
  State                     Online
  Intake temperature        35 degrees C / 95 degrees F
  Exhaust A temperature     33 degrees C / 91 degrees F
  Exhaust B temperature     40 degrees C / 104 degrees F
  Total DDR DRAM            512 MB
  Total RLDRAM              32 MB
  Start time:               2006-06-28 15:00:27 PDT
  Uptime:                   10 minutes, 34 seconds

```

show chassis firmware

Syntax	show chassis firmware
Syntax (Routing Matrix)	show chassis firmware <fcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	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), and Flexible PIC Concentrators (FPCs).
Options	<p>none—(Routing matrix only) Display version levels for the firmware on the TX Matrix platform and on all the T640 routing nodes connected to it.</p> <p>fcc <i>number</i>—(Routing matrix only) (Optional) Display version levels for the firmware on a specified T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display version levels for the firmware on the TX Matrix platform (or switch-card chassis).</p>
Required Privilege Level	view
List of Sample Output	show chassis firmware (M10) on page 255 show chassis firmware (M20) on page 255 show chassis firmware (M40) on page 255 show chassis firmware (M120) on page 255 show chassis firmware (M160) on page 255 show chassis firmware (MX240) on page 255 show chassis firmware (MX480) on page 255 show chassis firmware (MX960) on page 255 show chassis firmware fcc (Routing Matrix) on page 257 show chassis firmware scc (Routing Matrix) on page 257
Output Fields	Table 64 on page 254 lists the output fields for the show chassis firmware command. Output fields are listed in the approximate order in which they appear.

Table 64: show chassis firmware Output Fields

Field Name	Field Description
Part	Chassis part name.
Type	Type of firmware: ROM or O/S.
Version	Version of firmware running on the chassis part.

```

show chassis firmware (M10) user@host> show chassis firmware
Part                               Type      Version
Forwarding engine board          ROM       Juniper ROM Monitor Version 4.1b2
O/S                               O/S       Version 4.1I1 by tlim on 2000-04-24 11:27

show chassis firmware (M20) user@host> show chassis firmware
Part                               Type      Version
System switch board              ROM       Juniper ROM Monitor Version 3.4b26
O/S                               O/S       Version 3.4I16 by smackie on 2000-02-29 2
FPC 1                             ROM       Juniper ROM Monitor Version 3.0b1
O/S                               O/S       Version 3.4I4 by smackie on 2000-02-25 21
FPC 2                             ROM       Juniper ROM Monitor Version 3.0b1
O/S                               O/S       Version 3.4I4 by smackie on 2000-02-25 21

show chassis firmware (M40) user@host> show chassis firmware
Part                               Type      Version
System control board              ROM       Juniper ROM Monitor Version 2.0i126Copyri
O/S                               O/S       Version 2.0i1 by root on Thu Jul 23 00:51
FPC 5                             ROM       Juniper ROM Monitor Version 2.0i49Copyrig
O/S                               O/S       Version 2.0i1 by root on Thu Jul 23 00:59

show chassis firmware (M120) user@host> show chassis firmware
FPC 2                             ROM       Juniper ROM Monitor Version 8.0b29
O/S                               O/S       Version 8.2B1 by builder on 2006-10-18 16:2
FPC 3                             ROM       Juniper ROM Monitor Version 8.0b29
O/S                               O/S       Version 8.2B1 by builder on 2006-10-18 16:2
FPC 4                             ROM       Juniper ROM Monitor Version 8.0b29
O/S                               O/S       Version 8.2B1 by builder on 2006-10-18 16:2
FEB 3                             ROM       Juniper ROM Monitor Version 8.0b29
O/S                               O/S       Version 8.2B1 by builder on 2006-10-18 16:1
FEB 4                             ROM       Juniper ROM Monitor Version 8.0b29
O/S                               O/S       Version 8.2B1 by builder on 2006-10-18 16:1

show chassis firmware (M160) user@host> show chassis firmware
Part                               Type      Version
SFM 0                             ROM       Juniper ROM Monitor Version 4.0b2
O/S                               O/S       Version 4.0I1 by tlim on 2000-02-29 11:50
SFM 1                             ROM       Juniper ROM Monitor Version 4.0b2
O/S                               O/S       Version 4.0I1 by tlim on 2000-02-29 11:50
FPC 0                             ROM       Juniper ROM Monitor Version 4.0b2
O/S                               O/S       Version 4.0I1 by tlim on 2000-02-29 11:56
FPC 1                             ROM       Juniper ROM Monitor Version 4.0b2
O/S                               O/S       Version 4.0I1 by tlim on 2000-02-29 11:56
FPC 2                             ROM       Juniper ROM Monitor Version 4.0b3
O/S                               O/S       Version 4.0I1 by tlim on 2000-02-29 11:56

show chassis firmware (MX240) user@host> show chassis firmware
Part                               Type      Version
FPC 1                             ROM       Juniper ROM Monitor Version 8.3b1
O/S                               O/S       Version 9.0-20080103.0 by builder on 2008-0
FPC 2                             ROM       Juniper ROM Monitor Version 8.3b1
O/S                               O/S       Version 9.0-20080103.0 by builder on 2008-0

show chassis firmware (MX480) user@host> show chassis firmware
Part                               Type      Version
FPC 1                             ROM       Juniper ROM Monitor Version 8.3b1
O/S                               O/S       Version 9.0-20070916.3 by builder on 2007-0

show chassis firmware (MX960) user@host> show chassis firmware

```

Part	Type	Version
FPC 4	ROM	Juniper ROM Monitor Version 8.0b8
	O/S	Version 8.2I59 by artem on 2006-10-31 19:22
FPC 7	ROM	Juniper ROM Monitor Version 8.2b1
	O/S	Version 8.2-20061026.1 by builder on 2006-1

show chassis firmware user@host> **show chassis firmware lcc 0**
lcc (Routing Matrix) lcc0-re0:

```
-----
Part                Type      Version
FPC 1               ROM      Juniper ROM Monitor Version 6.4b18
                   O/S      Version 7.0-20040804.0 by builder on 2004-0
FPC 2               ROM      Juniper ROM Monitor Version 6.4b20
                   O/S      Version 7.0-20040804.0 by builder on 2004-0
SPMB 0              ROM      Juniper ROM Monitor Version 6.4b18
                   O/S      Version 7.0-20040804.0 by builder on 2004-0
```

show chassis firmware user@host> **show chassis firmware scc**
scc (Routing Matrix) scc-re0:

```
-----
Part                Type      Version
SPMB 0              ROM      Juniper ROM Monitor Version 6.4b18
                   O/S      Version 7.0-20040804.0 by builder on 2004-0
```

show chassis forwarding

Syntax	show chassis forwarding
Release Information	Command introduced before JUNOS Release 7.4.
Description	(J-series routing platform only) Display status of the forwarding process (fwdd).
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show chassis forwarding on page 258
Output Fields	Table 65 on page 258 lists the output fields for the <code>show chassis forwarding</code> command. Output fields are listed in the approximate order in which they appear.

Table 65: show chassis forwarding Output Fields

Field Name	Field Description
FWWD status	<p>Forwarding status:</p> <ul style="list-style-type: none"> ■ State—Online or Offline ■ Microkernel CPU utilization—Percentage of microkernel CPU being used by the forwarding process. ■ Real-time threads CPU utilization—Percentage of CPU being used by the forwarding process. ■ Heap utilization—Percentage of heap space (dynamic memory) being used by the forwarding process. If this number exceeds 80 percent, there may be a software problem (memory leak). ■ Buffer utilization—Percentage of buffer space being used by the forwarding process for buffering internal messages. ■ Uptime—How long the forwarding process has been up and running.

```

show chassis forwarding  user@host> show chassis forwarding
FWDD status:
  State                               Online
  Microkernel CPU utilization         10 percent
  Real-time threads CPU utilization    4 percent
  Heap utilization                     26 percent
  Buffer utilization                   0 percent
  Uptime:                             1 day, 1 hour, 30 minutes, 11 seconds

```

show chassis fpc

Syntax	show chassis fpc <detail <fpc-slot>> <pic-status <fpc-slot>
Syntax (Routing Matrix)	show chassis fpc <detail <fpc-slot>> <pic-status <fpc-slot> <lcc number>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display status information about the installed Flexible PIC Concentrators (FPCs) and Physical Interface Cards (PICs).
Options	<p>none—Display status information for all FPCs. For the routing matrix only, display status information for all FPCs on the TX Matrix platform and its attached T640 routing nodes.</p> <p>detail—(Optional) Display detailed status information for all FPCs or for the FPC in the specified slot (see <i>fpc-slot</i>).</p> <p>fpc-slot—(Optional) FPC slot number:</p> <ul style="list-style-type: none"> ■ Routing matrix only—If you specify the number of the T640 routing node by using the <i>lcc number</i> option (the recommended method), replace <i>fpc-slot</i> with a value from 0 through 7. Otherwise, replace <i>fpc-slot</i> with a value from 0 through 31. For example, the following commands have the same result: <pre> user@host> show chassis fpc detail 1 lcc 1 user@host> show chassis fpc detail 9 </pre> <ul style="list-style-type: none"> ■ M120 router—Replace <i>fpc-slot</i> with a value from 0 through 5. ■ MX240 router—Replace <i>fpc-slot</i> with a value from 0 through 2. ■ MX480 router—Replace <i>fpc-slot</i> with a value from 0 through 5. ■ MX-960 router—Replace <i>fpc-slot</i> with a value from 0 through 11. ■ Other routing platforms—Replace <i>fpc-slot</i> with a value from 0 through 7. <p>pic-status—(Optional) Display status information for all PICs or for the PIC in the specified slot (see <i>fpc-slot</i>).</p> <p>lcc number—(Routing matrix only) (Optional) Display status information for a T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p>
Required Privilege Level	view
Related Topics	request chassis fpc
List of Sample Output	show chassis fpc (M10) on page 261 show chassis fpc (M20) on page 261

show chassis fpc detail (M-series) on page 261
 show chassis fpc (MX240) on page 261
 show chassis fpc (MX480) on page 262
 show chassis fpc (MX960) on page 262
 show chassis fpc detail (MX-series) on page 262
 show chassis fpc (Hardware Not Supported) on page 262
 show chassis fpc detail (Hardware Not Supported) on page 262
 show chassis fpc pic-status on page 263
 show chassis fpc pic-status (M-series) on page 263
 show chassis fpc pic-status (M120) on page 263
 show chassis fpc lcc (Routing Matrix) on page 264
 show chassis fpc pic-status (Routing Matrix) on page 264
 show chassis fpc pic-status lcc (Routing Matrix) on page 264

Output Fields Table 66 on page 260 lists the output fields for the `show chassis fpc` command. Output fields are listed in the approximate order in which they appear.

Table 66: show chassis fpc Output Fields

Field Name	Field Description	Level of Output
Slot or Slot State	Slot number and state. The state can be one of the following conditions: <ul style="list-style-type: none"> ■ Dead—Held in reset because of errors. ■ Diag—Slot is being ignored while the FPC is running diagnostics. ■ Dormant—Held in reset. ■ Empty—No FPC is present. ■ Online—FPC is online and running. ■ Present—FPC is detected by the chassis daemon but is either not supported by the current version of JUNOS or inserted in the wrong slot. The output also states either Hardware Not Supported or Hardware Not In Right Slot. FPC is coming up but not yet online. ■ Probed—Probe is complete; awaiting restart of the Packet Forwarding Engine (PFE). ■ Probe-wait—Waiting to be probed. 	all levels
Logical slot	Slot number.	all levels
Temp (C) or Temperature	Temperature of the air passing by the FPC, in degrees Celsius or in both Celsius and Fahrenheit.	all levels
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
Memory DRAM (MB)	Total DRAM, in megabytes, available to the FPC's processor.	none specified
Heap Utilization (%)	Percentage of heap space (dynamic memory) being used by the FPC's processor. If this number exceeds 80 percent, there may be a software problem (memory leak).	none specified
Buffer Utilization (%)	Percentage of buffer space being used by the FPC's processor for buffering internal messages.	none specified

Table 66: show chassis fpc Output Fields (continued)

Field Name	Field Description	Level of Output
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

show chassis fpc (M10) user@host> **show chassis fpc**
FPC status:

Slot	State	Temp (C)
0	Online	27
1	Online	28

show chassis fpc (M20) user@host> **show chassis fpc**
FPC status:

Slot	State	Temp (C)	CPU Utilization (%)	Memory Utilization (%)			
			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) user@host> **show chassis fpc detail 1**
Slot 1 information:

State	Online
Temperature	48 degrees C
Total CPU DRAM	32 Mbytes
Total SRAM	4 Mbytes
Total SDRAM	256 Mbytes
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 (MX240) user@host> **show chassis fpc**

Slot	State	Temp (C)	CPU Utilization (%)	Memory Utilization (%)			
			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) user@host> **show chassis fpc**

Slot	State	Temp (C)	CPU Utilization (%) Total	Interrupt	Memory DRAM (MB)	Utilization (%) Heap	Buffer
0	Empty						
1	Online	36	9	0	1024	17	57
2	Empty						
3	Empty						
4	Empty						
5	Empty						

show chassis fpc (MX960) user@host> **show chassis fpc**

Slot	State	Temp (C)	CPU Utilization (%) Total	Interrupt	Memory DRAM (MB)	Utilization (%) Heap	Buffer
0	Empty						
1	Empty						
2	Empty						
3	Online	25	19	0	1024	15	57
4	Empty						
5	Online	26	27	0	1024	15	57
6	Empty						
7	Empty						
8	Empty						
9	Empty						
10	Empty						
11	Empty						

show chassis fpc detail (MX-series) user@host> **show chassis fpc detail 2**

```

Slot 2 information:
State                Online
Temperature          30 degrees C / 86 degrees F
Total CPU DRAM       1024 Mbytes
Total RDRAM          256 Mbytes
Total DDR DRAM       4096 Mbytes
Start time           2007-09-08 02:18:49 UTC
Uptime               14 hours, 41 minutes, 41 seconds

```

show chassis fpc (Hardware Not Supported) user@host> **show chassis fpc**

```

show chassis fpc

```

Slot	State	Temp (C)	CPU Utilization (%) Total	Interrupt	Memory DRAM (MB)	Utilization (%) Heap	Buffer
0	Online						
1	Present						
2	Online						
3	Present						
4	Empty						
5	Empty						
6	Online						

show chassis fpc detail (Hardware Not Supported) user@host> **show chassis fpc detail**

```

Slot 0 information:
State                Online
Total CPU DRAM       ---- CPU less FPC ----
Start time           2006-07-07 03:21:00 UTC
Uptime               27 minutes, 51 seconds
Slot 1 information:
State                Present
Reason               --- Hardware Not In Right Slot ---

```

```

Slot 2 information:
  State                Online
  Total CPU DRAM       32 MB
  Start time           2006-07-07 03:20:59 UTC
  Uptime               27 minutes, 52 seconds
Slot 3 information:
  State                Present
  Reason               --- Hardware Not Supported ---
  Total CPU DRAM       0 MB
Slot 6 information:
  State                Online
  Total CPU DRAM       32 MB
  Start time           2006-07-07 03:21:01 UTC
  Uptime               27 minutes, 50 seconds

```

show chassis fpc pic-status user@host> **show chassis fpc pic-status**

```

Slot 0 Online
  PIC 1   1x OC-12 ATM, MM
  PIC 2   1x OC-12 ATM, MM
  PIC 3   1x OC-12 ATM, MM
Slot 1 Online
  PIC 0   1x OC-48 SONET, SMIR
Slot 2 Online
  PIC 0   1x OC-192 SONET, SMSR

```

show chassis fpc pic-status (M-series) user@host> **show chassis fpc pic-status**

```

Slot 1 Online      FPC Type 1
  PIC 0 Present    2x OC-3 ATM, MM- Hardware Error
  PIC 1 Online     4x OC-3 SONET, SMIR
Slot 2 Online      E-FPC Type 2
  PIC 0 Online     4x G/E, 1000 BASE-SX
  PIC 1 Online     2x G/E SFP, 1000 BASE
  PIC 3 Online     1x Tunnel
Slot 3 Online      E-FPC Type 1
  PIC 0 Online     1x G/E IQ, 1000 BASE
  PIC 2 Online     1x G/E SFP, 1000 BASE
Slot 4 Online      E-FPC Type 2
  PIC 0 Online     4x G/E SFP, 1000 BASE
  PIC 1 Online     4x G/E SFP, 1000 BASE
  PIC 2 Online     4x G/E SFP, 1000 BASE
  PIC 3 Online     4x G/E SFP, 1000 BASE
Slot 5 Online      FPC Type 2
...

```

show chassis fpc pic-status (M120) 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 lcc
(Routing Matrix)**

```
user@host> show chassis fpc lcc 0
lcc0-re0:
```

Slot	State	Temp (C)	CPU Total	Interrupt	Utilization (%)	Memory Heap	Utilization (%)
					DRAM (MB)		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
(Routing Matrix)**

```
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
(Routing Matrix)**

```
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-feb-connectivity

Syntax	show chassis fpc-feb-connectivity
Release Information	Command introduced in JUNOS Release 8.0.
Description	(M120 router only) Display the FPC and FEB mapping and their respective states.
Required Privilege Level	view
List of Sample Output	show chassis fpc-feb-connectivity on page 266
Output Fields	Table 67 on page 265 lists the output fields for the show chassis fpc-feb-connectivity command. Output fields are listed in the approximate order in which they appear.

Table 67: show chassis fpc-feb-connectivity Output Fields

Field Name	Field Description
FPC	Slot number of the FPC
FPC type	Type of FPC: Type 1, Type 2, Type 3, or cFPC.
FPC state	State of the FPC: Announce offline, Announce online, Empty, Offline, Online, Present, or Ready.
Connected FEB	Slot number of the FEB connected to the FPC or None if the FPC is not connected to a FEB.
FEB state	State of the FEB: Announce offline, Announce online, Empty, Offline, Online, Present, or Ready.
Link status	Status of the link connecting the R-FEB and R-FPC: <ul style="list-style-type: none"> ■ Error ■ Misconfiguration—Configuration between the R-FEB and the F-FPC is incorrect. ■ OK

**show chassis
fpc-feb-connectivity**

user@host> **show chassis fpc-feb-connectivity**

FPC	FPC type	FPC state	Connected FEB	FEB state	Link status
0	cFPC	Online	0	Empty	
1	cFPC	Online	1	Online	OK
2	Type 3	Online	3	Online	OK
3	Type 2	Online	None		
4	Type 1	Online	4	Online	OK
5	Type 3	Online	None		

FIFO errors: 0, HS link CRC errors: 0, MTU errors: 0, Resource errors: 0
 Egress queues: 8 supported, 8 in use

Queue counters:	Queued packets	Transmitted packets	Dropped packets
0 best-effort	0	0	0
1 expedited-fo	0	0	0
2 assured-forw	0	0	0
3 network-cont	0	0	0

Active alarms : PLL, LOS, LINK
 Active defects : PLL, LOF, LOS, SEF, LOP, BERR-SF, PLM-P, LINK

PCS statistics	Seconds
Bit errors	0
Errored blocks	3

MAC statistics:	Receive	Transmit
Total octets	0	0
Total packets	0	0

show chassis hardware

Syntax	show chassis hardware <clei-models detail extensive models>
Syntax (Routing Matrix)	show chassis hardware <detail extensive models> <lcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4. models option introduced in JUNOS Release 8.2.
Description	Display a list of all Flexible Physical Interface Card (PIC) Concentrators (FPCs) and PICs installed in the router chassis, including the hardware version level and serial number.
Options	<p>none—Display information about hardware. For the routing matrix only, display information about the TX Matrix platform and its attached T640 routing nodes.</p> <p>clei-models—(M-series and T-series only) (Optional) Display Common Language Equipment Identifier Code (CLEI) barcode and model number for orderable field-replaceable units (FRUs).</p> <p>detail—(Optional) Include RAM and disk information in output.</p> <p>extensive—(Optional) Display ID EEPROM information.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Display hardware information for a specified T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>models—(M-series and T-series only) (Optional) Display model numbers and part numbers for orderable FRUs and, for components that use ID EEPROM format v2, the CLEI code.</p> <p>scc—(Routing matrix only) (Optional) Display hardware information for the TX Matrix platform (or switch-card chassis).</p>
Required Privilege Level	view
List of Sample Output	<p>show chassis hardware (J6350 Router) on page 271</p> <p>show chassis hardware (J6300 Router) on page 271</p> <p>show chassis hardware (M7i Router) on page 271</p> <p>show chassis hardware (M10 Router) on page 272</p> <p>show chassis hardware models (M10 Router) on page 272</p> <p>show chassis hardware (M20 Router) on page 272</p> <p>show chassis hardware models (M20 Router) on page 273</p> <p>show chassis hardware (M40 Router) on page 273</p> <p>show chassis hardware (M40e Router) on page 274</p> <p>show chassis hardware (M120 Router) on page 275</p> <p>show chassis hardware detail (M120 Router) on page 275</p>

show chassis hardware models (M120 Router) on page 276
 show chassis hardware (M160 Router) on page 277
 show chassis hardware models (M160 Router) on page 277
 show chassis hardware detail (M160 Router) on page 278
 show chassis hardware (M320 Router) on page 279
 show chassis hardware models (M320 Router) on page 280
 show chassis hardware (MX240 Router) on page 280
 show chassis hardware (MX480 Router) on page 281
 show chassis hardware (MX960 Router) on page 282
 show chassis hardware (MX960 Router with Bidirectional Optics) on page 282
 show chassis hardware detail (MX960 Router) on page 283
 show chassis hardware (T320 Router) on page 283
 show chassis hardware (T640 Router) on page 284
 show chassis hardware models (T640 Router) on page 285
 show chassis hardware extensive (T640 Router) on page 285
 show chassis hardware lcc (Routing Matrix) on page 286
 show chassis hardware scc (Routing Matrix) on page 287

Output Fields Table 68 on page 268 lists the output fields for the `show chassis hardware` command. Output fields are listed in the approximate order in which they appear.

Table 68: show chassis hardware Output Fields

Field Name	Field Description	Level of Output
Item	Chassis component: <ul style="list-style-type: none"> ■ (M-series routing platform, 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 and M320 routers and T-series routing platforms)—Information about the backplane, power supplies, fan trays, midplane, FPM (craft interface), CIP, PEM, SCG, CB, FPC, PIC, SFP, SPMB, and SIB. 	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 chassis.	All levels
Assb ID or Assembly ID	(extensive output only) Identification number that describes the FRU hardware.	All levels
FRU model number	(models keyword only) Model number of FRU hardware component.	none specified
CLEI code	(models 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

Table 68: show chassis hardware Output Fields (*continued*)

Field Name	Field Description	Level of Output
EEPROM Version	ID EEPROM version used by hardware component: 0x01 (version 1) or 0x02 (version 2).	extensive

Table 68: show chassis hardware Output Fields (continued)

Field Name	Field Description	Level of Output
Description	<p>Brief description of the hardware item:</p> <ul style="list-style-type: none"> ■ Type of power supply. ■ Type of PIC. If the PIC type is not supported on the current software release, the output states Hardware Not Supported ■ Type of FPC: FPC Type 1, FPC Type 2, FPC Type 3, FPC Type 4 , or FPC Type OC192. <p>On the J-series routers, the FPC type corresponds to the Physical Interface Module (PIM). The following list shows the PIM abbreviation in the output and the corresponding PIM name.</p> <ul style="list-style-type: none"> ■ 2x FE—Either two built-in Fast Ethernet interfaces (fixed PIM) or dual-port Fast Ethernet PIM ■ 4x FE—4-port Fast Ethernet ePIM ■ 1x GE Copper—Copper Gigabit Ethernet ePIM (one 10-Mbps, 100-Mbps, or 1000-Mbps port) ■ 1x GE SFP—SFP Gigabit Ethernet ePIM (one fiber port) ■ 4x GE Base PIC—Four built-in Gigabit Ethernet ports on a J4350 or J6350 chassis (fixed PIM) ■ 2x Serial—Dual-port serial PIM ■ 2x T1—Dual-port T1 PIM ■ 2x E1—Dual-port E1 PIM ■ 2x CT1E1—Dual-port channelized T1/E1 PIM ■ 1x T3—T3 PIM (one port) ■ 1x E3—E3 PIM (one port) ■ 4x BRI S/T—4-port ISDN BRI S/T PIM ■ 4x BRI U—4-port ISDN BRI U PIM ■ 1x ADSL Annex A—ADSL 2/2 + Annex A PIM (one port, for POTS) ■ 1x ADSL Annex B—ADSL 2/2 + Annex B PIM (one port, for ISDN) ■ 2x SHDSL (ATM)—G SHDSL PIM (2-port two-wire module or 1-port four-wire module) ■ 1x TGM550—TGM550 Telephony Gateway Module (Avaya VoIP Gateway Module with one console port, two analog LINE ports, and two analog TRUNK ports) ■ 1x DS1 TIM510—TIM510 E1/T1 Telephony Interface Module (Avaya VoIP media module with one E1 or T1 trunk termination port and ISDN PRI backup) ■ 4x FXS, 4x FXO, TIM514—TIM514 Analog Telephony Interface Module (Avaya VoIP media module with four analog LINE ports and four analog TRUNK ports) ■ 4x BRI TIM521—TIM521 BRI Telephony Interface Module (Avaya VoIP media module with four ISDN BRI ports) ■ Crypto Accelerator Module—For enhanced performance of cryptographic algorithms used in IP Security (IPSec) services ■ For hosts, the Routing Engine type. ■ For small form-factor pluggable transceiver (SFP) modules, the type of fiber: LX, SX, LH, or T. 	All levels

**show chassis hardware
(J6350 Router)**

user@host> show chassis hardware

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN1090E07ADB	JSR6350
Midplane	REV 03	710-014593	NP1265	
System IO	REV 01	710-016210	NN9950	JX350 System IO
Crypto Module				Crypto Acceleration
Routing Engine	REV 08	710-015273	NM6509	RE-J6350-3400
ad0	248 MB	256MB	CKS	00102006C24A00000039 Compact
Flash				
FPC 0				FPC
PIC 0				4x GE Base PIC
FPC 1	REV 06	750-010355	AI07030023	FPC
PIC 0				2x T1
FPC 3	REV 06	750-011148	AJ06520151	FPC
PIC 0				2x E1
FPC 6	REV 06	750-013492	NC4170	FPC
PIC 0				4x FE
Power Supply 0				

**show chassis hardware
(J6300 Router)**

user@host> show chassis hardware

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN000164AB	J6300
Midplane	REV 02.04	710-010001	CORE99570	
System IO	REV 02.00	710-010003	CORE100848	System IO board
Routing Engine	RevX2.6	750-010006	IWGS40735390	RE-J.3
FPC 0				FPC
PIC 0				2x FE
FPC 1	RevX2.0	750-011380	N3960005	FPC
PIC 0				1xADSL pic Annex A
FPC 2	RevX2.0	750-011380	N3960002	FPC
PIC 0				1xADSL pic Annex B
FPC 3	REV 03	750-010354	N0780028	FPC
PIC 0				1x T3

**show chassis hardware
(M7i Router)**

user@host> show chassis hardware

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			31959	M7i
Midplane	REV 02	710-008761	CA0209	M7i Midplane
Power Supply 0	Rev 04	740-008537	PD10272	AC Power Supply
Routing Engine	REV 01	740-008846	1000396803	RE-5.0
CFEB	REV 02	750-009492	CA0166	Internet Processor Iiv1
FPC 0				E-FPC
PIC 0	REV 04	750-003163	HJ6416	1x G/E, 1000 BASE-SX
PIC 1	REV 04	750-003163	HJ6423	1x G/E, 1000 BASE-SX
PIC 2	REV 04	750-003163	HJ6421	1x G/E, 1000 BASE-SX
PIC 3	REV 02	750-003163	HJ0425	1x G/E, 1000 BASE-SX
FPC 1				E-FPC
PIC 2	REV 01	750-009487	HM2275	ASP - Integrated
PIC 3	REV 01	750-009098	CA0142	2x F/E, 100 BASE-TX

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	UNKNOWN
Xcvr 2	REV 01	740-011614	PD94THU	SFP-LX10
Xcvr 3		NON-JNPR	PDC2E7A	SFP-LX10
PIC 1	REV 03	750-023116	JT0203	4x CHOC3 SONET 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	UNKNOWN
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-40C3-SON-MM
PIC 1	REV 11	750-002992		PE-4FE-TX
PIC 2	REV 03	750-002977		PE-20C3-ATM-MM
PIC 3	REV 08	750-005724		PE-20C3-ATM2-MM
FPC 1				
PIC 2	REV 12	750-008425		PE-AS
PIC 3	REV 13	750-005636		PE-4CHDS3-QPP
Fan Tray 0				FANTRAY-M10I-S
Fan Tray 1				FANTRAY-M10I-S

show chassis hardware
(M20 Router)

```
user@host> show chassis hardware
Hardware inventory:
```

Item	Version	Part number	Serial number	Description
Chassis			20033	M20
Backplane	REV 07	710-001517	S/N AA7940	
Power supply B	Rev 01	740-001465	S/N 000001	AC
Display	REV 02	710-001519	S/N AA9704	

```

Host 0
SSB slot 0      REV 01  710-001951  S/N AD5905  98000004f8f27501  teknor
                SSRAM bank 0  REV 01  710-001385  S00480      Internet Processor II
                SSRAM bank 1  REV 01  710-001385  S00490      2 Mbytes
                SSRAM bank 2  REV 01  710-001385  S001:?      2 Mbytes
                SSRAM bank 3  REV 01  710-001385  S00483      2 Mbytes
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 Mbyte
                SDRAM bank 0  REV 01  710-000099  S/N 000603  64 Mbytes
                SDRAM bank 1  REV 01  710-000099  S/N 000414  64 Mbytes
                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 Mbyte
                SDRAM bank 0  REV 01  710-000099  S/N 306835  64 Mbytes
                SDRAM bank 1  REV 01  710-000099  S/N 306832  64 Mbytes
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
Power Supply A REV 06  740-001465  PWR-M20-AC-S
Display       REV 04  710-001519  CRAFT-M20-S
Routing Engine 0 REV 06  740-003239  RE-333-768-S
Routing Engine 1 REV 06  740-003239  RE-333-768-S
SSB 0         REV 02  710-001951  SSB-E-M20
SSB 1         N/A      N/A
FPC 0         REV 03  710-003308  FPC-E
PIC 0         REV 08  750-002303  P-4FE-TX
PIC 1         REV 07  750-004745  P-2MCDS3
PIC 2         REV 03  750-002965  PE-4CHDS3
FPC 1         REV 03  710-003308  FPC-E
PIC 0         REV 03  750-002914  P-20C3-ATM-MM
Fan Tray 0    FANTRAY-F-M20-S
Fan Tray 1    FANTRAY-F-M20-S
Fan Tray 2    FANTRAY-F-M20-S
Fan Tray 3    FANTRAY-R-M20-S

```

show chassis hardware (M40 Router)

```

user@host> show chassis hardware
Hardware inventory:
Item          Version  Part number  Serial number  Description
Backplane     REV 02  710-000073  S/N AA0053
Power supply A Rev 2    740-000235  S/N 000042    DC
Maxicab       REV X1  710-000229  S/N AA0139
Minicab       REV X1  710-000482  S/N AA0201
Display       REV 06  710-000150  S/N AA0905
Host          cpv5000
SCB           REV X1  710-000075  S/N AA0158    Internet Processor I
SSRAM bank 0  REV 02  710-000077  S/N AA2267    1 Mbyte
SSRAM bank 1  REV 02  710-000077  S/N AA2270    1 Mbyte
SSRAM bank 2  REV 02  710-000077  S/N AA2269    1 Mbyte
SSRAM bank 3  REV 02  710-000077  S/N AA2268    1 Mbyte
FPC 0         REV 01  710-000175  S/N AA0048
SSRAM         REV 01  710-000077  S/N AA2333    1 Mbyte

```

SDRAM bank 0	REV 01	710-000099	S/N AA2332	64 Mbytes
SDRAM bank 1	REV X1	710-000099	S/N AA2337	64 Mbytes
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 Mbyte
SDRAM bank 0	REV 01	710-000099	S/N AA2331	64 Mbytes
SDRAM bank 1	REV 01	710-000099	S/N AA2330	64 Mbytes
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 Mbyte
SDRAM bank 0	REV 01	710-000099	S/N AA2329	64 Mbytes
SDRAM bank 1	REV 01	710-000099	S/N AA2328	64 Mbytes
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 Mbyte
SDRAM bank 0	REV 01	710-000099	S/N 300949	64 Mbytes
SDRAM bank 1	REV 01	710-000099	S/N 300868	64 Mbytes
PIC 1	REV 01	750-001323	S/N AB1670	1x Tunnel

show chassis hardware
(M40e Router)

user@host> **show chassis hardware**

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis				m40e
Midplane	REV 01	710-005071	AX3671	
FPM CMB	REV 03	710-001642	AR9074	
FPM Display	REV 03	710-001647	AR7331	
CIP	REV 04	710-002649	BB4449	
PEM 0	Rev 01	740-003787	MC12364	Power Entry Module
PEM 1	Rev 01	740-003787	MC12383	Power Entry Module
PCG 0	REV 07	710-001568	AG1332	
PCG 1	REV 07	710-001568	AR3789	
Host 0			3e000007c8176601	Present
MCS 0	REV 11	710-001226	AN5813	
SFM 0 SPP	REV 07	710-001228	AG4676	
SFM 0 SPR	REV 05	710-002189	AE4735	Internet Processor II
SFM 1 SPP	REV 07	710-001228	AP1347	
SFM 1 SPR	REV 05	710-002189	BE0063	Internet Processor II
FPC 0	REV 01	710-011725	BE0669	M40e-EP-FPC Type 1
CPU	REV 01	710-004600	BD9504	
PIC 0	REV 03	750-003737	AY3991	4x G/E, 1000 BASE-SX
FPC 1	REV 01	710-005197	BD9842	M40e-FPC Type 2
CPU	REV 01	710-004600	BB4869	
PIC 0	REV 07	750-001900	AR8278	1x OC-48 SONET, SMSR
FPC 2	REV 02	710-005197	BD9824	M40e-FPC Type 2
CPU	REV 01	710-004600	BD9531	
PIC 0	REV 03	750-003737	AY3986	4x G/E, 1000 BASE-SX
FPC 4	REV 02	710-005078	BE0664	M40e-FPC Type 1
CPU	REV 01	710-004600	BD9559	
PIC 0	REV 03	750-001894	AG7963	1x G/E, 1000 BASE-SX
PIC 2	REV 01	750-002575	AF2472	4x OC-3 SONET, SMIR
FPC 6	REV 02	710-005078	BE0652	M40e-FPC Type 1
CPU	REV 01	710-004600	BD9607	

PIC 0	REV 02	750-002911	AN2286	4x F/E, 100 BASE-TX
PIC 2	REV 01	750-002577	AP6345	4x OC-3 SONET, MM

**show chassis hardware
(M120 Router)**

user@host> **show chassis hardware**

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN000054AC	M120
Midplane	REV 01	710-013667	RB4170	M120 Midplane
FPM Board	REV 02	710-011407	CJ9186	M120 FPM Board
FPM Display	REV 02	710-011405	CJ9173	M120 FPM Display
FPM CIP	REV 02	710-011410	CJ9221	M120 FPM CIP
PEM 0	Rev 05	740-011936	RM28320	AC Power Entry Module
PEM 1	Rev 05	740-011936	RM28321	AC Power Entry Module
Routing Engine 0	REV 03	740-014080	1000642883	RE-A-1000
CB 0	REV 03	710-011403	CM8346	M120 Control Board
CB 1	REV 06	710-011403	CP6728	M120 Control Board
FPC 1	REV 02	710-015908	CP6925	M120 CFPC 10GE
PIC 0		BUILTIN	BUILTIN	1x 10GE(LAN/WAN) XFP
Xcvr 0	REV 01	740-014279	62E204N00007	XFP-10G-LR
FPC 3	REV 03	710-011393	CJ9234	M120 FPC Type 2
PIC 0	REV 16	750-008155	NB5229	2x G/E IQ, 1000 BASE
Xcvr 0	REV 01	740-011613	P9F15JB	SFP-SX
Xcvr 1	REV 01	740-007326	P4Q0R9G	SFP-SX
PIC 1	REV 09	750-007745	CG4360	4x OC-3 SONET, SMIR
PIC 2	REV 16	750-008155	ND7787	2x G/E IQ, 1000 BASE
Xcvr 0	REV 01	740-011613	P9F12AS	SFP-SX
Xcvr 1	REV 01	740-011613	P9F1ALU	SFP-SX
PIC 3	REV 07	750-011800	JW1284	8x 1GE(LAN), IQ2
Xcvr 0	REV 01	740-011613	P9F1AM6	SFP-SX
Xcvr 6	REV 01	740-011613	P9F16NN	SFP-SX
Xcvr 7	REV 01	740-011782	P8C29Y7	SFP-SX
Board B	REV 02	710-011395	CN3754	M120 FPC Mezz
FPC 4	REV 02	710-011398	CP6741	M120 FPC Type 3
PIC 0	REV 16	750-007141	NB2855	10x 1GE(LAN), 1000 BASE
Xcvr 0	REV 01	740-011782	P922A1F	SFP-SX
Xcvr 1	REV 01	740-011782	P922A16	SFP-SX
Xcvr 2	REV 01	740-011782	P922A0U	SFP-SX
Xcvr 3	REV 01	740-011782	P9229UZ	SFP-SX
Xcvr 4	REV 01	740-009029	P11JXWP	SFP-LX
Xcvr 6	REV 01	740-011613	P9F1ALW	SFP-SX
FPC 5	REV 01	710-011388	CJ9088	M120 FPC Type 1
PIC 0	*** Hardware Not Supported ***			
PIC 1	REV 05	750-012052	NB0410	1x CHOC3 IQ SONET, SMLR
PIC 2	REV 01	750-013167	CM3824	4x CHDS3 IQ
PIC 3	REV 01	750-010240	CB5366	1x G/E SFP, 1000 BASE
Board B	REV 01	710-011390	CJ9103	M120 FPC Mezz Board
FEB 3	REV 04	710-011663	CP6673	M120 FEB
FEB 4	REV 04	710-011663	CJ9368	M120 FEB
FEB 5	REV 04	710-011663	CJ9386	M120 FEB
Fan Tray 0				Front Top Fan Tray
Fan Tray 1				Front Bottom Fan Tray
Fan Tray 2				Rear Top Fan Tray
Fan Tray 3				Rear Bottom Fan Tray

**show chassis hardware
detail (M120 Router)**

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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	MPBBTOX2HS2E3M		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-40C3-SON-SMIR
PIC 2	REV 16	750-008155		PB-2GE-SFP-QPP
PIC 3	REV 07	750-011800		PB-8GE-TYPE2-SFP-IQ2
FPC 4				
PIC 0	REV 16	750-007141		PC-10GE-SFP
FPC 5				
PIC 1	REV 05	750-012052		PB-1CHOC3-SMIR-QPP
PIC 2	REV 01	750-013167		PE-4CHDS3-QPP
PIC 3	REV 01	750-010240		PB-1GE-SFP
Fan Tray 0				FFANTRAY-M120-S
Fan Tray 1				FFANTRAY-M120-S
Fan Tray 2				RFANTRAY-M120-S
Fan Tray 3				RFANTRAY-M120-S

show chassis hardware (M160 Router)

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user@host> show chassis hardware
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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)

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user@host> show chassis hardware models
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Hardware inventory:

Item	Version	Part number	CLEI code	FRU model number
Midplane	REV 03	710-009120		CHAS-BP-M320-S
FPM Display	REV 02	710-009351		CRAFT-M320-S
CIP	REV 03	710-005926		CIP-M320-S
PEM 2	Rev X4	740-009148		PWR-M-DC-S
PEM 3	Rev X4	740-009148		PWR-M-DC-S
Routing Engine 0	REV 02	740-008883		RE-1600-2048-S
Routing Engine 1	REV 02	740-008883		RE-1600-2048-S
FPC 0	REV 02	710-010419		M320-FPC1

PIC 0	REV 01	750-001323	P-TUNNEL
PIC 1	REV 02	750-002987	PE-10C12-SON-SMIR
PIC 2	REV 04	750-001894	PB-1GE-SX
PIC 3	REV 04	750-001896	PB-10C12-SON-SMIR
FPC 1	REV 02	710-010419	M320-FPC1
PIC 0	REV 04	750-001894	PB-1GE-SX
PIC 1	REV 04	750-001894	PB-1GE-SX
PIC 3	REV 03	750-001894	PB-1GE-SX
FPC 2	REV 02	710-010419	M320-FPC1
PIC 0	REV 10	750-005634	PB-1CHOC12SMIR-QPP
PIC 1	REV 10	750-005634	PB-1CHOC12SMIR-QPP
PIC 2	REV 07	750-005634	PB-1CHOC12SMIR-QPP
PIC 3	REV 07	750-005634	PB-1CHOC12SMIR-QPP
PIC 1	REV 10	750-005634	PB-1CHOC12SMIR-QPP
PIC 2	REV 07	750-005634	PB-1CHOC12SMIR-QPP
PIC 3	REV 07	750-005634	PB-1CHOC12SMIR-QPP
FPC 3			
PIC 0	REV 03	750-001895	PB-10C12-SON-MM
PIC 1	REV 04	750-001894	PB-1GE-SX
PIC 3	REV 04	750-003141	PB-1GE-SX-B
FPC 4	REV 02	710-010419	M320-FPC1
FPC 5	REV 02	710-010419	M320-FPC1
FPC 6	REV 02	710-010419	M320-FPC1
FPC 7			
PIC 0	REV 15	750-001901	PB-40C12-SON-SMIR
PIC 1	REV 06	750-001900	PB-10C48-SON-SMSR
PIC 2	REV 07	750-001900	PB-10C48-SON-SMSR
PIC 3	REV 05	750-003737	PB-4GE-SX
SIB 0	REV 03	710-009184	SIB-M-S
SIB 1	REV 03	710-009184	SIB-M-S
SIB 2	REV 03	710-009184	SIB-M-S
SIB 3	REV 03	710-009184	SIB-M-S
Fan Tray 0			FFANTRAY-M320-S
Fan Tray 1			FFANTRAY-M320-S
Fan Tray 2			RFANTRAY-M320-S

**show chassis hardware
detail (M160 Router)**

user@host> **show chassis hardware detail**

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			101	M160
Midplane	REV 02	710-001245	S/N AB4107	
FPM CMB	REV 01	710-001642	S/N AA2911	
FPM Display	REV 01	710-001647	S/N AA2999	
CIP	REV 02	710-001593	S/N AA9563	
PEM 0	Rev 01	740-001243	S/N KJ35769	DC
PEM 1	Rev 01	740-001243	S/N KJ35765	DC
PCG 0	REV 01	710-001568	S/N AA9794	
PCG 1	REV 01	710-001568	S/N AA9804	
Host 1			da000004f8d57001	teknor
MCS 1	REV 03	710-001226	S/N AA9777	
SFM 0 SPP	REV 04	710-001228	S/N AA2975	
SFM 0 SPR	REV 02	710-001224	S/N AA9838	Internet Processor I
SSRAM bank 0	REV 01	710-000077	S/N 306456	1 Mbyte
SSRAM bank 1	REV 01	710-000077	S/N 306474	1 Mbyte
SSRAM bank 2	REV 01	710-000077	S/N 306388	1 Mbyte
SSRAM bank 3	REV 01	710-000077	S/N 306392	1 Mbyte
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 Mbyte
SSRAM bank 1	REV 01	710-000077	S/N 302662	1 Mbyte
SSRAM bank 2	REV 01	710-000077	S/N 302593	1 Mbyte

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SSRAM bank 3  REV 01  710-000077  S/N 100160  1 Mbyte
FPC 0          REV 03  710-001255  S/N AA9806  FPC Type 1
CPU           REV 02  710-001217  S/N AA9590
SSRAM         REV 01  710-000077  S/N 302836  1 Mbyte
SDRAM 0       REV 01  710-001196  S00141      32 Mbytes
SDRAM 1       REV 01  710-001196  S0010;      32 Mbytes
SSRAM         REV 01  710-000077  S/N 302633  1 Mbyte
SDRAM 0       REV 01  710-001196  S00143      32 Mbytes
SDRAM 1       REV 01  710-001196  S00115      32 Mbytes
SSRAM         REV 01  710-000077  S/N 302952  1 Mbyte
SDRAM 0       REV 01  710-001196  S00135      32 Mbytes
SDRAM 1       REV 01  710-001196  S001=3      32 Mbytes
SSRAM         REV 01  710-000077  S/N 302892  1 Mbyte
SDRAM 0       REV 01  710-001196  S000?6      32 Mbytes
SDRAM 1       REV 01  710-001196  S001=5      32 Mbytes
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 Mbyte
SDRAM 0       REV 01  710-001196  S00012      32 Mbytes
SDRAM 1       REV 01  710-001196  S0001?     32 Mbytes
SSRAM         REV 01  710-000077  S/N 306454  1 Mbyte
SDRAM 0       REV 01  710-001196  S00028      32 Mbytes
SDRAM 1       REV 01  710-001196  S0002?     32 Mbytes
SSRAM         REV 01  710-000077  S/N 306492  1 Mbyte
SDRAM 0       REV 01  710-001196  S00015      32 Mbytes
SDRAM 1       REV 01  710-001196  S00031      32 Mbytes
SSRAM         REV 01  710-000077  S/N 306363  1 Mbyte
SDRAM 0       REV 01  710-001196  S00013      32 Mbytes
SDRAM 1       REV 01  710-001196  S00032      32 Mbytes
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
... SSRAM     REV 01  710-000077  S/N 306466  1 Mbyte

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**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)**

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user@host> show chassis hardware models
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Hardware inventory:
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Item	Version	Part number	CLEI code	FRU model number
Midplane	REV 03	710-009120		CHAS-BP-M320-S
FPM Display	REV 02	710-009351		CRAFT-M320-S
CIP	REV 03	710-005926		CIP-M320-S
PEM 2	Rev X4	740-009148		PWR-M-DC-S
PEM 3	Rev X4	740-009148		PWR-M-DC-S
Routing Engine 0	REV 02	740-008883		RE-1600-2048-S
Routing Engine 1	REV 02	740-008883		RE-1600-2048-S
FPC 0	REV 02	710-010419		M320-FPC1
PIC 0	REV 01	750-001323		P-TUNNEL
PIC 1	REV 02	750-002987		PE-10C12-SON-SMIR
PIC 2	REV 04	750-001894		PB-1GE-SX
PIC 3	REV 04	750-001896		PB-10C12-SON-SMIR
FPC 1	REV 02	710-010419		M320-FPC1
PIC 0	REV 04	750-001894		PB-1GE-SX
PIC 1	REV 04	750-001894		PB-1GE-SX
PIC 3	REV 03	750-001894		PB-1GE-SX
FPC 2	REV 02	710-010419		M320-FPC1
PIC 0	REV 10	750-005634		PB-1CHOC12SMIR-QPP
PIC 1	REV 10	750-005634		PB-1CHOC12SMIR-QPP
PIC 2	REV 07	750-005634		PB-1CHOC12SMIR-QPP
PIC 3	REV 07	750-005634		PB-1CHOC12SMIR-QPP
PIC 1	REV 10	750-005634		PB-1CHOC12SMIR-QPP
PIC 2	REV 07	750-005634		PB-1CHOC12SMIR-QPP
PIC 3	REV 07	750-005634		PB-1CHOC12SMIR-QPP
FPC 3				
PIC 0	REV 03	750-001895		PB-10C12-SON-MM
PIC 1	REV 04	750-001894		PB-1GE-SX
PIC 3	REV 04	750-003141		PB-1GE-SX-B
FPC 4	REV 02	710-010419		M320-FPC1
FPC 5	REV 02	710-010419		M320-FPC1
FPC 6	REV 02	710-010419		M320-FPC1
FPC 7				
PIC 0	REV 15	750-001901		PB-40C12-SON-SMIR
PIC 1	REV 06	750-001900		PB-10C48-SON-SMSR
PIC 2	REV 07	750-001900		PB-10C48-SON-SMSR
PIC 3	REV 05	750-003737		PB-4GE-SX
SIB 0	REV 03	710-009184		SIB-M-S
SIB 1	REV 03	710-009184		SIB-M-S
SIB 2	REV 03	710-009184		SIB-M-S
SIB 3	REV 03	710-009184		SIB-M-S
Fan Tray 0				FFANTRAY-M320-S
Fan Tray 1				FFANTRAY-M320-S
Fan Tray 2				RFANTRAY-M320-S

**show chassis hardware
(MX240 Router)**

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user@host> show chassis hardware
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Hardware inventory:
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Item	Version	Part number	Serial number	Description
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Chassis			JN10C7F7EAFB	MX240
Midplane	REV 01	710-021041	TR1502	MX240 Backplane
FPM Board	REV 01	710-017254	KD4017	Front Panel Display
PEM 0	Rev 02	740-017330	000332	PS 1.2-1.7kW; 100-240V
AC in				
PEM 1	Rev 02	740-017330	000226	PS 1.2-1.7kW; 100-240V
AC in				
Routing Engine 0	REV 06	740-013063	1000703522	RE-S-2000
Routing Engine 1	REV 06	740-015113	1000687625	RE-S-1300
CB 0	REV 07	710-013385	KC9057	MX SCB
CB 1	REV 05	710-013385	JY4760	MX SCB
FPC 1	REV 01	750-021679	KC7340	DPCE 40x 1GE R
CPU	REV 06	710-013713	KD4078	DPC PMB
PIC 0		BUILTIN	BUILTIN	10x 1GE(LAN)
Xcvr 0	REV 01	740-011613	P9F18ME	SFP-SX
PIC 1		BUILTIN	BUILTIN	10x 1GE(LAN)
PIC 2		BUILTIN	BUILTIN	10x 1GE(LAN)
PIC 3		BUILTIN	BUILTIN	10x 1GE(LAN)
FPC 2	REV 04	710-016669	JS4529	DPCE 40x 1GE R EQ
CPU	REV 06	710-013713	KB3969	DPC PMB
PIC 0		BUILTIN	BUILTIN	10x 1GE(LAN) EQ
Xcvr 0	REV 01	740-011613	PBG3Y79	SFP-SX
Xcvr 1	REV 01	740-011613	PBG3XU8	SFP-SX
Xcvr 2	REV 01	740-011613	PBG3YG6	SFP-SX
Xcvr 3	REV 01	740-011613	PBG3XUG	SFP-SX
Xcvr 4	REV 01	740-011613	PBG3XTJ	SFP-SX
PIC 1		BUILTIN	BUILTIN	10x 1GE(LAN) EQ
Xcvr 0	REV 01	740-011613	PBG3ZUM	SFP-SX
Xcvr 1	REV 01	740-011613	PBG3Y5H	SFP-SX
Xcvr 2	REV 01	740-011613	PBG3UZT	SFP-SX
Xcvr 3	REV 01	740-011613	PBG3US1	SFP-SX
PIC 2		BUILTIN	BUILTIN	10x 1GE(LAN) EQ
Xcvr 0	REV 01	740-011613	PBG3YG7	SFP-SX
Xcvr 1	REV 01	740-011613	PBG3XZ9	SFP-SX
Xcvr 2	REV 01	740-011613	PBG3XTY	SFP-SX
Xcvr 3	REV 01	740-011613	PBG3UZG	SFP-SX
PIC 3		BUILTIN	BUILTIN	10x 1GE(LAN) EQ
Xcvr 0	REV 01	740-011613	PBG3Y8W	SFP-SX
Xcvr 1	REV 01	740-011613	PBG3YVX	SFP-SX
Xcvr 2	REV 01	740-011613	PBG3YB3	SFP-SX
Xcvr 3	REV 01	740-011613	PBG43VQ	SFP-SX
Fan Tray 0	REV 01	710-021113	JS4642	MX240 Fan Tray

**show chassis hardware
(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
(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-LH
Xcvr 1	REV 01	740-017726	4814061	SFP-LH
Xcvr 5	REV 01	740-017726	6ZS184H31108	SFP-LH
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 detail (MX960 Router)

```

user@host> show chassis hardware detail
Hardware inventory:
Item          Version  Part number  Serial number  Description
Chassis                               MX960
Midplane      REV 01    710-013698   AA6082         MX960 Midplane
PIM           Rev 01    740-013110   000008         Power Inlet Module
PEM 2
PEM 3         Rev 01    740-013682   000038         PS 1.7kW; 200-240VAC in
Routing Engine 0 REV 00    740-015113   1000617944     RE-S-1300
  ad0         245 MB   SanDisk     SDCFB-256      111419E1805T1141 Compact Flash
  ad2         38154 MB FUJITSU     MHT2040BH      NROWT5925N77    Hard Disk
CB 0          REV 05    710-013725   JK6947         MX960 Test SCB
FPC 4         REV 01    710-013305   JM7617         MX960 Test DPC
CPU
PIC 0                               BUILTIN        BUILTIN        1x 10GE(LAN/WAN)
PIC 1                               BUILTIN        BUILTIN        10x 1GE
FPC 7         REV 01    710-013305   JL9634         MX960 Test DPC
CPU
PIC 0                               BUILTIN        BUILTIN        1x 10GE(LAN/WAN)
Xcvr 0                               NON-JNPR        MYBG65I82C     XFP-10G-SR
PIC 1                               BUILTIN        BUILTIN        10x 1GE
Xcvr 1         REV 01    740-011782   P7N0368        SFP-SX
Xcvr 4         REV 01    740-011782   P8J1W27        SFP-SX
Xcvr 6         REV 01    740-011782   P8J1VSD        SFP-SX
Xcvr 9         REV 01    740-011782   P8J1W25        SFP-SX
Fan Tray 0
Fan Tray 1

```

show chassis hardware (T320 Router)

```

user@host> show chassis hardware
Hardware inventory:
Item          Version  Part number  Serial number  Description
Chassis                               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
CB 0          REV 13    710-002728   BC1577         unknown
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 1	RevX02	740-002595	MD21814	Power Entry Module

SCG 0	REV 03	710-003423	HA4508	T640 Sonet Clock Gen.
Routing Engine 0	REV 02	740-005022	210865700483	RE-3.0 (RE-600)
CB 0	REV 01	710-002728	HD3044	T-series Control Board
FPC 2	REV 04	710-001721	HD5572	FPC Type 3
CPU	REV 06	710-001726	HA4712	FPC CPU
PIC 1	REV 03	750-009567	HV2331	1x 10GE(LAN),XENPAK
SFP 0	REV 01	740-009898	USC202R103	XENPAK-SR
PIC 2	REV 03	750-009567	HV2332	1x 10GE(LAN),XENPAK
SFP 0	REV 01	740-011268	USC202R112	XENPAK-ZR
PIC 3	REV 03	750-009567	HX4416	1x 10GE(LAN),XENPAK
SFP 0	REV 01	740-012056	434TC004	XENPAK-CX4
PIC 4	REV 03	750-009567	HX4420	1x 10GE(LAN),XENPAK
SFP 0	REV 01	740-012058	434TC124	XENPAK-LX4
FPC 5	REV 01	710-013553	JE4839	E2-FPC Type 1
CPU	REV 01	710-013569	JW9163	FPC CPU
PIC 0	REV 01	750-009567	HX4419	1x 10GE(LAN),XENPAK
SFP 0	REV 01	740-009898	USC202RT05	XENPAK-LR
PIC 1	REV 03	750-009567	HN7426	1x 10GE(LAN),XENPAK
SFP 0	REV 01	740-009550	03L90051	XENPAK-ER
PIC 2	REV 03	750-009467	HT7423	1x 10GE(LAN),XENPAK
SFP 0		NON-JNPR		UNKNOWN
PIC 3	REV 04	750-005100	AY4850	1x 10GE(LAN),DWDM
FPC 4	REV 01	710-010845	JD3872	FPC Type 4
CPU	REV 02	710-011481	JB6042	FPC CPU
Fan Tray 0				Front Top Fan Tray
Fan Tray 1				Front Bottom Fan Tray
Fan Tray 2				Rear Fan Tray

show chassis hardware models (T640 Router)

```
user@host> show chassis hardware models
Hardware inventory:
```

Item	Version	Part number	CLEI code	FRU model number
Midplane	REV 04	710-002726		CHAS-BP-T640-S
FPM Display	REV 02	710-002897		CRAFT-T640-S
CIP	REV 05	710-002895		CIP-L-T640-S
PEM 0	Rev 01	740-002595		PWR-T-DC-S
SCG 0	REV 04	710-003423		SCG-T-S
SCG 1	REV 04	710-003423		SCG-T-S
Routing Engine 0	REV 01	740-005022		RE-600-2048-S
Routing Engine 1	REV 07	740-005022		RE-600-2048-S
CB 0	REV 06	710-002726		CHAS-BP-T640-S
CB 1	REV 06	710-002728		CB-L-T-S
FPC 5	REV 05	710-007527		T640-FPC2
PIC 0	REV 05	750-002510		PB-2GE-SX
PIC 1	REV 05	750-001901		PB-40C12-SON-SMIR
FPC 6	REV 03	710-001721		T640-FPC3
PIC 1	REV 01	750-009553		PC-40C48-SON-SFP
SIB 4	REV 02	750-005486		SIB-I-T640-S
Fan Tray 0				FANTRAY-T-S
Fan Tray 1				FANTRAY-T-S
Fan Tray 2				FAN-REAR-TX-T640-S

show chassis hardware extensive (T640 Router)

```
user@host> show chassis hardware extensive
Hardware inventory:
```

Item	Version	Part number	Serial number	Description
Chassis				T640
Jedec Code:	0x7fb0	EEPROM Version:	0x01	
P/N:	S/N:	
Assembly ID:	0x0507	Assembly Version:	00.00	
Date:	00-00-0000	Assembly Flags:	0x00	
Version:			
ID: Gibson LCC Chassis				

```

Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
  Address 0x00: 7f b0 01 ff 05 07 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x20: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Midplane          REV 04   710-002726   AX5633
Jedec Code:      0x7fb0          EEPROM Version:    0x01
P/N:             710-002726.      S/N:             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
lcc (Routing Matrix)

```

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 (Routing Matrix)**

```
user@host> show chassis hardware scc
scc-re0:
```

```
-----
Hardware inventory:
Item          Version  Part number  Serial number  Description
Chassis
Midplane      REV 04    710-004396   RB0014         SCC Midplane
FPM GBUS      REV 04    710-004617   HW9141         SCC FPM Board
FPM Display   REV 04    710-004619   HS5950         SCC FPM
CIP 0         REV 01    710-010218   HV9151         SCC CIP
CIP 1         REV 01    710-010218   HV9152         SCC CIP
PEM 1         Rev 11    740-002595   QB13977        Power Entry Module
Routing Engine 0 REV 05    740-008883   P11123900153  RE-4.0 (RE-1600)
CB 0          REV 01    710-011709   HR5964         Control Board (CB-TX)
SPMB 0        REV 09    710-003229   HW5293         T-series Switch CPU
SIB 3
SIB 4         REV 01    710-005839   HW1177         SIB-S8-F16
B Board       REV 01    710-005840   HW1202         SIB-S8-F16 (B)
```

show chassis in-service-upgrade

Syntax show chassis in-service-upgrade

Release Information Command introduced in JUNOS Release 9.0.

Description Display the status of Flexible PIC Concentrators (FPCs) and their corresponding Physical Interface Cards (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 Topics request system software in-service-upgrade
request system software abort

List of Sample Output show chassis in-service-upgrade on page 288

Output Fields Table 69 on page 288 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 69: show chassis in-service-upgrade Output Fields

Field Name	Field Description
Item	Flexible PIC Concentrator (FPC) slot number.
Status	FPC and corresponding PIC state: Online or Offline.
Reason	Reason for the state (if offline).

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 lccs

Syntax	show chassis lccs
Release Information	Command introduced before JUNOS Release 7.4.
Description	(Routing matrix only) Display the status of all T640 routing nodes (or line-card chassis) connected to the TX Matrix platform.
Required Privilege Level	view
Related Topics	request chassis lcc
List of Sample Output	show chassis lccs on page 290
Output Fields	Table 70 on page 290 lists the output fields for the <code>show chassis lccs</code> command. Output fields are listed in the approximate order in which they appear.

Table 70: show chassis lccs Output Fields

Field Name	Field Description
Slot	LCC slot number.
State	LCC status: Online, Offline, or Empty.
Uptime	How long the LCC has been up and running.

show chassis lccs

```

user@host> show chassis lccs
Slot  State      Uptime
0     Online      3 minutes, 17 seconds
1     Empty
2     Online      3 minutes, 23 seconds
3     Empty

```

show chassis location

Syntax	show chassis location
Syntax (Routing Matrix)	show chassis location <fpc interface (by-name <i>name</i> by-slot fpc <i>number</i> lcc <i>number</i>) lcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display the physical location of the chassis. This command can only be used on the master Routing Engine.
Options	<p>none—Display all information about the physical location of the chassis. For the routing matrix only, display all information about the physical location of the TX Matrix platform and its attached T640 routing nodes.</p> <p>fpc—(Routing matrix only) (Optional) Display the physical location of all Flexible PIC Concentrators (FPCs).</p> <p>interface by-name <i>name</i>—(Routing matrix only) (Optional) Display the physical location of a specified interface name. This option displays the FPC number and T640 routing node (or line-card chassis) number associated with the specified interface.</p> <p>interface by-slot fpc <i>number</i> lcc <i>number</i>—(Routing matrix only) (Optional) Display the global FPC number of an interface by specifying its local FPC number and T640 routing node (or line-card chassis) number.</p> <ul style="list-style-type: none"> ■ The global FPC number is the FPC slot number when all the FPC slots in the routing matrix are considered: 0 through 31. The local FPC number is the FPC slot number on a particular T640 routing node. ■ For fpc, replace <i>number</i> with a value from 0 through 7. ■ For lcc, replace <i>number</i> with a value from 0 through 3. <p>lcc <i>number</i>—(Routing matrix only) (Optional) Display the physical location of a specified T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display the physical location of the TX Matrix platform (or switch-card chassis).</p>
Required Privilege Level	view
List of Sample Output	show chassis location on page 292 show chassis location fpc (Routing Matrix) on page 292 show chassis location interface by-slot (Routing Matrix) on page 292
Output Fields	Table 71 on page 292 lists the output fields for the show chassis location command. Output fields are listed in the approximate order in which they appear.

Table 71: 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.
LCC	Line-card chassis number. The number of a particular T640 routing node connected to the TX Matrix platform.
Local FPC	Local FPC number. The FPC slot number on a particular T640 routing node.

show chassis location user@host> **show chassis location**
country-code: US
postal-code: 94404
Building: Building 2, Floor: 2

show chassis location fpc (Routing Matrix) user@host> **show chassis location fpc**
Global FPC LCC Local FPC
17 2 1
21 2 5

show chassis location interface by-slot (Routing Matrix) user@host> **show chassis location interface by-slot fpc 1 lcc 1**
Global FPC: 9

show chassis mac-addresses

Syntax	show chassis mac-addresses
Syntax (Routing Matrix)	show chassis mac-addresses <fcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display the media access control (MAC) addresses for the router chassis.
Options	<p>none—Display the MAC addresses for the router chassis. For the routing matrix only, display MAC addresses on the TX Matrix platform and its attached T640 routing nodes.</p> <p>fcc <i>number</i>—(Routing matrix only) (Optional) Display MAC addresses for a specified T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display MAC addresses for the TX Matrix platform (or switch-card chassis).</p>
Required Privilege Level	view
List of Sample Output	<p>show chassis mac-addresses on page 293</p> <p>show chassis mac-addresses (Routing Matrix) on page 294</p>
Output Fields	Table 72 on page 293 lists the output fields for the show chassis mac-addresses command. Output fields are listed in the approximate order in which they appear.

Table 72: 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.
Public count	Number of allocated public addresses.
Private base address	Base address of the private MAC addresses allocated to this router.
Private count	Number of allocated private addresses.

```

show chassis      user@host> show chassis mac-addresses
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 (Routing Matrix) 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 network services

Syntax	show chassis network services
Release Information	Command introduced in JUNOS Release 9.4.
Description	(MX-series routers only) Display the network services mode that the router is configured to run in—IP Services mode or Ethernet Services mode.
Required Privilege Level	view
Output Fields	Table 73 on page 295 lists the output fields for the show chassis network services command. Output fields are listed in the approximate order in which they appear.

Table 73: show chassis network services Output Fields

Field Name	Field Description
Network services mode	Network services mode configured for the MX-series router: <ul style="list-style-type: none"> ■ IP—IP Services mode. ■ Ethernet—Ethernet Services mode.

show chassis network services user@host> **show chassis network services**
Network Services Mode: IP

show chassis pic

Syntax `show chassis pic fpc-slot slot-number pic-slot slot-number`

Syntax (Routing Matrix) `show chassis pic fpc-slot slot-number pic-slot slot-number <fcc number>`

Release Information Command introduced before JUNOS Release 7.4.

Description Display status information about the Physical Interface Card (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:

- Routing matrix only—If you specify the number of the T640 routing node by using the `fcc 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 fcc 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.
- 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.
- Other routing platforms—Replace *slot-number* with a value from 0 through 7.

`fcc number`—(Routing matrix only) (Optional) Display PIC information for a specified T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace *number* with a value from 0 through 3.

`pic-slot slot-number`—Display information about the PIC in this particular PIC slot. Replace *slot-number* with a value from 0 through 3.

Required Privilege Level view

Related Topics request chassis pic

List of Sample Output

- show chassis pic fpc-slot pic-slot on page 298
- show chassis pic fpc-slot pic-slot (PIC Offline) on page 298
- show chassis pic fpc-slot pic-slot (FPC Offline) on page 298
- show chassis pic fpc-slot pic-slot (FPC Not Present) on page 298
- show chassis pic fpc-slot pic-slot (PIC Not Present) on page 298
- show chassis pic fpc-slot 3 pic-slot 0 (M120 Router) on page 298
- show chassis pic fpc-slot pic-slot (MX960 Router Bidirectional Optics) on page 299
- show chassis pic fpc-slot pic-slot fcc (Routing Matrix) on page 299
- show chassis pic fpc-slot pic-slot (Next-generation SONET/SDH SFP) on page 299

show chassis pic fpc-slot pic-slot (12-port T1/E1) on page 299

show chassis pic fpc-slot 0 pic-slot 1 (4x CHOC3 SONET CE SFP) on page 300

show chassis pic fpc-slot pic-slot (OTN) on page 300

Output Fields Table 74 on page 297 lists the output fields for the show chassis pic command. Output fields are listed in the approximate order in which they appear.

Table 74: show chassis pic Output Fields

Field Name	Field Description
Type	PIC type.
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 or Offline .
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 .
PIC Port Information	Port-level information for the PIC.
Port Number	Port number for the PIC.
Cable Type	Type of cable connected to the port: LH , LX , or SX
PIC Port Information (MX960 Router Bidirectional Optics)	Port-level information for the PIC. <ul style="list-style-type: none"> ■ Port—Port number ■ Cable type—Type of small form-factor pluggable (SFP) optical transceiver installed. Uplink interfaces display -U. Down link interfaces display -D. ■ Fiber type—Type of fiber. SM is single-mode. ■ Xcvr vendor—Transceiver vendor name. ■ Xcvr vendor part number—Transceiver vendor part number. <ul style="list-style-type: none"> ■ BX10-10-km bidirectional optics. ■ BX40-40-km bidirectional optics. ■ SFP-LX-40-km SFP optics. ■ Wavelength—Wavelength of the transmitted signal. Uplinks are always 1310 nm. Downlinks are either 1490 nm or 1550 nm.

Table 74: show chassis pic Output Fields (continued)

Field Name	Field Description
PIC Port Information (next-generation SONET/SDH SFP)	<p>Port-level information for the next-generation SONET/SDH SFP PIC.</p> <ul style="list-style-type: none"> ■ Port—Port number ■ Cable type—Type of small form-factor pluggable (SFP) optical transceiver installed. ■ Fiber type—Type of fiber: SM (single-mode) or MM (multimode). ■ Xcvr vendor—Transceiver vendor name. ■ Xcvr vendor part number—Transceiver vendor part number. ■ Wavelength—Wavelength of the transmitted signal. Next-generation SONET/SDH SFPs use 1310 nm.

```

show chassis pic fpc-slot pic-slot
user@host> show chassis pic fpc-slot 2 pic-slot 0
PIC fpc slot 2 pic slot 0 information:
  Type          10x 1GE(LAN), 1000 BASE
  ASIC type     H chip
  State         Online
  PIC version   1.1
  Uptime        1 day, 50 minutes, 58 seconds
PIC Port Information:
  Port      Cable
  Number    Type
  0         GIGE 1000LX
  6         GIGE 1000LX

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 (MX960 Router Bidirectional Optics)

```

user@host> show chassis pic fpc-slot 4 pic-slot 1
FPC slot 4, PIC slot 1 information:
  Type          10x 1GE(LAN)
  State          Online
  PIC version    0.0
  Uptime        18 days, 5 hours, 41 minutes, 54 seconds

PIC port information:
  Port  Cable type      Fiber type  Xcvr vendor      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 lcc (Routing Matrix)

```

user@host> show chassis pic fpc-slot 1 pic-slot 1 lcc 0
lcc0-re0:
-----
PIC fpc slot 1 pic slot 1 information:
  Type          4x OC-3 SONET, SMIR
  ASIC type      D chip
  State          Online
  PIC version    1.2
  Uptime        5 days, 2 hours, 12 minutes, 8 seconds

```

show chassis pic fpc-slot pic-slot (Next-generation SONET/SDH SFP)

```

user@host> show chassis pic fpc-slot 4 pic-slot 0
FPC slot 4, PIC slot 0 information:
  Type          4x OC-3 1x OC-12 SFP
  ASIC type      D FPGA
  State          Online
  PIC version    1.3
  Uptime        1 day, 50 minutes, 4 seconds

PIC port information:
  Port  Cable type      Fiber type  Xcvr vendor      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:
```

Port	Cable type	Fiber type	Xcvr vendor	Xcvr vendor part number	Wavelength
0	OC3 short reach	MM	AVAGO	HFBR-57E0P-JU2	n/a
1	OC3 short reach	MM	AVAGO	HFBR-57E0P-JU2	n/a
3	OC3 long reach	SM	OPNEX INC	TRF5456AVLB314	1310 nm

**show chassis pic
fpc-slot pic-slot (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 power-ratings

Syntax	show chassis power-ratings
Release Information	Command introduced in JUNOS Release 8.4.
Description	(J-series only) Display the low-power consumption, high-power consumption, and heat dissipation ratings of the router. Low-power consumption, high-power consumption, and heat dissipation values are represented in nondimensional tokens.
Required Privilege Level	view
List of Sample Output	show chassis power-ratings on page 303 show chassis power-ratings (Power Management Disabled) on page 303
Output Fields	Table 75 on page 301 lists the output fields for the show chassis power-ratings command. Output fields are listed in the approximate order in which they appear.

Table 75: show chassis power-ratings Output Fields

Field Name	Field Description
Device	Physical Interface Module (PIM) slot. (PIM slot numbers appear as FPC numbers in the output.)
Total Tokens	<p>Maximum number of low-power, high-power, and heat tokens available for the router:</p> <ul style="list-style-type: none"> ■ Low Power—Maximum number of low-power consumption tokens available for the router. ■ High Power—Maximum number of high-power consumption tokens available for the router. ■ Heat—Maximum number of heat tokens available for the router.

Table 75: show chassis power-ratings Output Fields (continued)

Field Name	Field Description
<i>FPC number</i>	<p>PIM slot number and power and heat information for the PIM in this slot:</p> <ul style="list-style-type: none"> ■ Low Power—PIM low-power consumption. The number of low-power tokens used by the PIM. ■ High Power—PIM high-power consumption. The number of high-power tokens used by the PIM. ■ Heat—The number of PIM heat dissipation tokens used by this PIM. ■ Ratings—Status of the PIM slot. The status of the slot is based on either the configuration of the slot or the power use and heat dissipation of the PIM in that slot: <p>NOTE: The <code>request chassis fpc</code> command has no effect on the status of the PIM slot.</p> <ul style="list-style-type: none"> ■ OK—The PIM in this PIM slot can be brought online. ■ Exceeded—The PIM cannot be brought online because the PIM slot has been disabled by J-series power management. The PIM in this PIM slot exceeds the maximum number of low-power tokens, high-power tokens, or heat tokens. ■ Empty—No PIM is installed in the PIM slot. ■ Cfg offline—The PIM cannot be brought online because the PIM slot has been disabled by the <code>set chassis fpc offline</code> command.
<i>Tokens Used</i>	<p>Total number of low-power, high-power, and heat tokens used by the router:</p> <ul style="list-style-type: none"> ■ Low Power—The total number of low-power tokens used by the router. ■ High Power—The total number of high-power tokens used by the router. ■ Heat—Number of heat tokens used by the router. ■ Ratings—If blank, J-series power management is enabled. No Power Mgmt indicates that J-series power management has been disabled by the <code>set chassis disable_power_management</code> command. <p>CAUTION: Use extreme caution when disabling J-series power management. To prevent equipment damage, do not install a combination of PIMs that exceeds the power and heat capacity of the router when J-series power management is disabled.</p>

```

show chassis power-ratings user@host> show chassis power-ratings
Device      Low      High      Heat      Ratings
            Power      Power
Total Tokens 83       83       83       -
FPC 1       6        27       21       OK
FPC 2       3        27       18       OK
FPC 3       0        0        0        Empty
FPC 4       0        0        0        Empty
FPC 5       2        0        2        Exceeded
Tokens Used 11       54       41       -

```

```

show chassis power-ratings (Power Management Disabled) user@host> show chassis power-ratings
Device      Low      High      Heat      Ratings
            Power      Power
Total Tokens 83       83       83       -
FPC 1       6        27       21       OK
FPC 2       3        27       18       OK
FPC 3       0        0        0        Empty
FPC 4       0        0        0        Empty
FPC 5       2        0        2        Exceeded
Tokens Used 11       54       41       No Power Mgmt

```

show chassis psd

Syntax	show chassis psd
Release Information	Command introduced in JUNOS Release 9.1.
Description	(Root System Domain [RSD] only) Display information about Protected System Domains (PSDs). A PSD is initially created by the RSD configuration. An RSD and PSDs are supported on a T320 router or T640 or T1600 routing node that is interconnected with the Juniper Control System (JCS) platform.
Options	This command has no options
Additional Information	For more information about PSDs, RSDs, and the JCS 1200 platform, see the <i>JUNOS Protected System Domain Configuration Guide</i> .
Required Privilege Level	view
List of Sample Output	show chassis psd on page 304
Output Fields	Table 76 on page 304 lists the output fields for the show chassis psd command. Output fields are listed in the approximate order in which they appear.

Table 76: show chassis psd Output Fields

Field Name	Field Description
Slot Description	PSD identification.
State	PSD status: Online or Offline.
Uptime	Length of time that the PSD has been up and running.

```

show chassis psd {master}
user@host> show chassis psd
Slot Description      State      Uptime
1                    Online    12 hours, 19 minutes, 51 seconds
2                    Online    2 hours, 18 minutes, 17 seconds
3                    Online    12 hours, 19 minutes, 51 seconds

```

show chassis redundancy feb

Syntax	show chassis redundancy feb <redundancy-group <i>group-name</i> > <errors>
Release Information	Command introduced in JUNOS Release 8.2.
Description	(M120 routers only) Display information about the status of configured Forwarding Engine Board (FEB) redundancy groups.
Options	<p>none—Display information about the status of all configured FEB redundancy groups.</p> <p><redundancy-group <i>group-name</i>>—Display information about the specified configured redundancy group.</p> <p><errors>—Display information about any errors encountered on the components in configured redundancy groups or on links between a FEB and a Flexible PIC Concentrator (FPC).</p>
Required Privilege Level	view
List of Sample Output	<p>show chassis redundancy feb on page 306</p> <p>show chassis redundancy feb redundancy-group grp1 on page 306</p> <p>show chassis redundancy feb redundancy-group grp0 errors on page 306</p>
Output Fields	Table 77 on page 305 lists the output fields for the show chassis redundancy feb command. Output fields are listed in the approximate order in which they appear.

Table 77: show chassis redundancy feb Output Fields

Field name	Field Description
Group	Name of configured redundancy group.
FEB	Slot number of each FEB included in redundancy groups.
State	State of each FEB.
Priority	(Standard and redundancy-group option) Status of FEB in the redundancy group: Backup, Primary, or null.
Connected FPCs	(Standard and redundancy-group option) Slot number of each FPC connected to the FEB. The status Check is displayed when an error might have occurred.
Redundancy State	<p>(Standard and redundancy-group option) Status of the FEB:</p> <ul style="list-style-type: none"> ■ Active—FEB is currently active. ■ Ready—Backup FEB is ready for a switchover ■ Not Ready—Backup FEB is not ready for a switchover.

Table 77: show chassis redundancy feb Output Fields (*continued*)

Field name	Field Description
Auto-failover	(Standard and redundancy-group option) Automatic failover status of redundancy group: Enabled or Disabled.
Switch-reason	(Standard and redundancy-group option) Reason a switchover occurred to the backup FEB in the redundancy group.
Hard error: Yes	(errors option only) Displayed when a hard error occurs on a FEB.
FPC	(errors option only) Slot number and status of FPC: link ok or link error.
Fabric plane	(errors option only) Slot number and status of fabric plane.

```

show chassis redundancy feb      user@host> show chassis redundancy feb
Group: cfpc
FEB State Priority Connected FPCs Redundancy state
0 Offline Backup 5 Not ready
1 Online 5 Active
Auto-failover: Enabled
Group: grp0
FEB State Priority Connected FPCs Redundancy state
3 Offline Backup 0 Not ready
5 Online Primary 0 Active
Auto-failover: Enabled

show chassis redundancy feb redundancy-group grp1
user@host> show chassis redundancy feb redundancy-group grp1
Group: grp1
FEB State Priority Connected FPC(s) Redundancy state
0 Online Backup 5 Active
3 Online 3 Active
5 Online Primary Ready
Auto-failover: Enabled
Switch-reason: Switchover from CLI

show chassis redundancy feb redundancy-group grp0 errors
user@host> show chassis redundancy feb redundancy-group grp0 errors
Group: grp0
FEB: 0 State: Online
FPC 0 link OK
Fabric plane 0 OK
Fabric plane 1 OK
Fabric plane 2 OK
Fabric plane 3 OK
FEB: 1 State: Online
FPC 0 link OK
Fabric plane 0 OK
Fabric plane 1 OK
Fabric plane 2 OK
Fabric plane 3 OK
FEB: 2 State: Online
FPC 2 link OK
Fabric plane 0 OK
Fabric plane 1 OK
Fabric plane 2 OK
Fabric plane 3 OK
FEB: 3 State: Online

```

```
FPC 3 link OK
Fabric plane 0 OK
Fabric plane 1 OK
Fabric plane 2 OK
Fabric plane 3 OK
FEB: 4    State: Online
FPC 4 link OK
Fabric plane 0 OK
Fabric plane 1 OK
Fabric plane 2 OK
Fabric plane 3 OK
FEB: 5    State: Online
FPC 5 link OK
Fabric plane 0 OK
Fabric plane 1 OK
Fabric plane 2 OK
Fabric plane 3 OK
```

show chassis routing-engine

Syntax	show chassis routing-engine <bios <i>slot</i> >
Syntax (Routing Matrix)	show chassis routing-engine <bios <i>slot</i> > <lcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display the status of the Routing Engine.
Options	<p>none—Display information about one or more Routing Engines. For the routing matrix only, display information about all Routing Engines on the TX Matrix platform and its attached T640 routing nodes.</p> <p>bios—(Optional) Display the basic input/output system (BIOS) firmware version.</p> <p><i>slot</i>—(Systems with multiple Routing Engines) (Optional) Display information for an individual Routing Engine. Replace <i>slot</i> with 0 or 1.</p> <p><i>lcc number</i>—(Routing matrix only) (Optional) Display Routing Engine information for a specified T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display Routing Engine information for the TX Matrix platform (or switch-card chassis).</p>
Required Privilege Level	view
Related Topics	request chassis routing-engine master
List of Sample Output	<p>show chassis routing-engine (M5) on page 310</p> <p>show chassis routing-engine (M10) on page 310</p> <p>show chassis routing-engine (M20) on page 310</p> <p>show chassis routing-engine (M40) on page 311</p> <p>show chassis routing-engine (M120) on page 311</p> <p>show chassis routing-engine (M160) on page 313</p> <p>show chassis routing-engine (MX240) on page 313</p> <p>show chassis routing-engine (MX480) on page 314</p> <p>show chassis routing-engine (MX960) on page 314</p> <p>show chassis routing-engine (Routing Matrix) on page 314</p> <p>show chassis routing-engine lcc (Routing Matrix) on page 315</p> <p>show chassis routing-engine bios (Routing Matrix) on page 316</p>
Output Fields	Table 78 on page 309 lists the output fields for the <code>show chassis routing-engine</code> command. Output fields are listed in the approximate order in which they appear.

Table 78: show chassis routing-engine Output Fields

Field Name	Field Description
Slot	(Systems with 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.
DRAM	Total DRAM available to the Routing Engine's processor.
Memory utilization	Percentage of Routing Engine memory being used.
CPU utilization	Information about the Routing Engine's CPU utilization: <ul style="list-style-type: none"> ■ User—Percentage of CPU time being used by user processes. ■ Background—Percentage of CPU time being used by background processes. ■ Kernel—Percentage of CPU time being used by kernel processes. ■ Interrupt—Percentage of CPU time being used by interrupts. ■ Idle—Percentage of CPU time that is idle.
Model	Routing Engine model number.
Serial ID	(Systems with multiple Routing Engines) Identification number of the Routing Engine in this slot.
Start time	Time at which the Routing Engine started running.
Uptime	How long the Routing Engine has been running.
Last reboot reason	Reason for last reboot, including: <ul style="list-style-type: none"> ■ power cycle/failure—Reboot due to the switching off of the power button behind the Routing Engine, not the power button on the chassis. ■ watchdog—Reboot due to a hardware watchdog. ■ reset-button reset—(Not available on the J-series routing platform) 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. ■ misc hardware reason—Reboot due to miscellaneous hardware reasons. ■ thermal shutdown—Reboot due to the router reaching a critical temperature point at which it is unsafe to continue operations. ■ hard disk failure—Reboot due to a hard disk failure. ■ reset from debugger—Reboot due to reset from the debugger. ■ chassis control reset—Reboot due to a chassis control reset. ■ 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.
Load averages	Routing Engine load averages for the last 1, 5, and 15 minutes.

```

show chassis      user@host> show chassis routing-engine
routing-engine (M5) 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      user@host> show chassis routing-engine
routing-engine (M10) 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      user@host> show chassis routing-engine
routing-engine (M20) Routing Engine status:
Slot 0:
  Current state      Master
  Election priority   Master (default)
  Temperature        29 degrees C / 84 degrees F
  DRAM               768 MB
  Memory utilization  20 percent
  CPU utilization:
    User             1 percent
    Background       0 percent
    Kernel           2 percent
    Interrupt        0 percent
    Idle            97 percent
  Model             RE-2.0
  Serial ID         58000007348d9a01
  Start time        2003-12-30 07:05:47 PST
  Uptime            3 hours, 41 minutes, 14 seconds
  Last reboot reason Router rebooted after a normal shutdown
  Load averages:    1 minute   5 minute   15 minute
                       0.00       0.02       0.00

Routing Engine status:
Slot 1:

```

```

Current state           Backup
Election priority       Backup (default)
Temperature             29 degrees C / 84 degrees F
DRAM                   768 MB
Memory utilization      0 percent
CPU utilization:
  User                  0 percent
  Background            0 percent
  Kernel                1 percent
  Interrupt             0 percent
  Idle                  99 percent
Model                  RE-2.0
Serial ID               d800000734745701
Start time             2003-06-17 16:37:33 PDT
Uptime                 195 days, 18 hours, 47 minutes, 9 seconds
Last reboot reason     Router rebooted after a normal shutdown

```

**show chassis
routing-engine (M40)**

```

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)**

```

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) user@host> show chassis routing-engine
Routing Engine status:
Slot 0:
  Current state           Master
  Election priority       Master (default)
  Temperature             43 degrees C / 109 degrees F
  DRAM                    2048 MB
  Memory utilization      11 percent
  CPU utilization:
    User                  1 percent
    Background            0 percent
    Kernel                2 percent
    Interrupt             0 percent
    Idle                  97 percent
  Model                  RE-3.0
  Serial ID              210865700403
  Start time              2003-12-23 12:25:55 PST
  Uptime                  6 days, 22 hours, 33 minutes, 24 seconds
  Last reboot reason      Router rebooted after a normal shutdown
  Load averages:         1 minute   5 minute   15 minute
                        0.24       0.13       0.04

Routing Engine status:
Slot 1:
  Current state           Backup
  Election priority       Backup (default)
  Temperature             40 degrees C / 104 degrees F
  DRAM                    2048 MB
  Memory utilization      9 percent
  CPU utilization:
    User                  0 percent
    Background            0 percent
    Kernel                0 percent
    Interrupt             0 percent
    Idle                  100 percent
  Model                  RE-3.0
  Serial ID              210865700332
  Start time              2003-12-23 12:25:55 PST
  Uptime                  6 days, 22 hours, 33 minutes, 21 seconds
  Last reboot reason      Router rebooted after a normal shutdown

```

```

show chassis routing-engine (MX240) user@host> show chassis routing-engine
Routing Engine status:
Slot 0:
  Current state           Backup
  Election priority       Master (default)
  Temperature             40 degrees C / 104 degrees F
  CPU temperature         47 degrees C / 116 degrees F
  DRAM                    3584 MB
  Memory utilization      7 percent
  CPU utilization:
    User                  0 percent
    Background            0 percent
    Kernel                0 percent
    Interrupt             0 percent
    Idle                  100 percent
  Model                  RE-S-2000
  Serial ID              1000703522
  Start time              2007-12-19 10:35:40 PST
  Uptime                  16 days, 3 hours, 15 minutes, 23 seconds
  Last reboot reason      Router rebooted after a normal shutdown

```

```

show chassis routing-engine (MX480) user@host> show chassis routing-engine
Routing Engine status:
Slot 0:
  Current state           Master
  Election priority       Master (default)
  Temperature             41 degrees C / 105 degrees F
  CPU temperature         38 degrees C / 100 degrees F
  DRAM                    2048 MB
  Memory utilization      13 percent
  CPU utilization:
    User                  0 percent
    Background            0 percent
    Kernel                2 percent
    Interrupt             0 percent
    Idle                  98 percent
  Model                   RE-S-1300
  Serial ID               1000697044
  Start time              2008-01-04 06:46:08 PST
  Uptime                  8 hours, 17 minutes, 16 seconds
  Last reboot reason      Router rebooted after a normal shutdown

```

```

show chassis routing-engine (MX960) user@host> show chassis routing-engine
Routing Engine status:
Slot 0:
  Current state           Master
  Election priority       Master (default)
  Temperature             37 degrees C / 98 degrees F
  CPU temperature         37 degrees C / 98 degrees F
  DRAM                    2048 MB
  Memory utilization      18 percent
  CPU utilization:
    User                  0 percent
    Background            0 percent
    Kernel                4 percent
    Interrupt             0 percent
    Idle                  96 percent
  Model                   RE-S-1300
  Serial ID               1000617944
  Start time              2006-10-26 12:37:13 PDT
  Uptime                  6 days, 4 hours, 59 minutes, 40 seconds
  Last reboot reason      Router rebooted after a normal shutdown
  Load averages:         1 minute   5 minute   15 minute
                        0.16       0.08       0.02

```

```

show chassis routing-engine (Routing Matrix) 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
(Routing Matrix)**

user@host> show chassis routing-engine 0 lcc 0

lcc0-re0:

Routing Engine status:

Slot 0:

```

Current state           Master
Election priority       Master (default)
Temperature             33 degrees C / 91 degrees F
CPU temperature         30 degrees C / 86 degrees F
DRAM                   2048 MB
Memory utilization      12 percent
CPU utilization:
  User                  0 percent
  Background            0 percent
  Kernel                1 percent
  Interrupt             0 percent
  Idle                  98 percent
Model                  RE-3.0
Serial ID               210865700363
Start time              2004-08-05 18:42:05 PDT
Uptime                  7 days, 22 hours, 49 minutes, 6 seconds
Last reboot reason      Router rebooted after a normal shutdown
Load averages:          1 minute   5 minute  15 minute
                        0.00        0.00    0.00

```

**show chassis
routing-engine bios
(Routing Matrix)**

```
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 scb

Syntax	show chassis scb
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M40 router only) Display System Control Board (SCB) status information.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show chassis scb on page 318
Output Fields	Table 79 on page 317 lists the output fields for the show chassis scb command. Output fields are listed in the approximate order in which they appear.

Table 79: show chassis scb Output Fields

Field Name	Field Description
Temperature	Temperature of the air passing by the SCB, in degrees Celsius.
CPU utilization	Total percentage of CPU being used by the SCB's processor.
Interrupt utilization	Of the total CPU being used by the SCB's processor, the percentage being used for interrupts.
Heap utilization	Percentage of heap space being used by the SCB's processor.
Buffer utilization	Percentage of buffer space being used by the SCB's processor.
DRAM	Total DRAM available to the SCB's processor.
Start time	Time when the SCB started running.
Uptime	How long the SCB has been running.
Internet Processor memory	Information about the memory of the Internet Processor ASIC on the SCB: <ul style="list-style-type: none"> ■ IP routes—Number of IP routes known to the Internet Processor. ■ MPLS routes—Number of MPLS routes known to the Internet Processor. ■ SRAM banks enabled—Which SRAM banks are enabled. ■ SRAM size—Size of SCB SRAM, in bytes. ■ SRAM used—Amount of SRAM used, in bytes. ■ SRAM utilization—Percentage of SRAM used.

```
show chassis scb   user@host> show chassis scb
SCB status:
  Temperature:          30 Centigrade
  CPU utilization:      5 percent
  Interrupt utilization: 0 percent
  Heap utilization:     0 percent
  Buffer utilization:    2 percent
  DRAM:                 64 Mbytes
  Start time:           1998-10-28 18:35:46 UTC
  Uptime:               6 minutes, 16 seconds
Internet Processor memory:
  IP routes:            16
  MPLS routes:          1
  SRAM banks enabled:   [ 1 1 1 1 ]
  SRAM size:            4 Mbytes
  SRAM used:            256 bytes
  SRAM utilization:     0 percent
```

show chassis sfm

Syntax	show chassis sfm <detail <sfm-slot>>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M40e and M160 routers only) Display Switching and Forwarding Module (SFM) status information.
Options	<p>none—Display standard status information about all SFMs.</p> <p>detail—(Optional) Display detailed SFM status information.</p> <p>sfm-slot—(Optional) Display status information about the SFM in the specified slot only. For the M40e router, replace <i>sfm-slot</i> with 0 or 1. For the M160 router, replace <i>sfm-slot</i> with a value from 0 through 3.</p>
Required Privilege Level	view
Related Topics	<p>request chassis sfm</p> <p>request chassis sfm master switch</p>
List of Sample Output	<p>show chassis sfm (M160) on page 320</p> <p>show chassis sfm detail (M40e) on page 320</p> <p>show chassis sfm detail (M160) on page 321</p>
Output Fields	Table 80 on page 319 lists the output fields for the show chassis sfm command. Output fields are listed in the approximate order in which they appear.

Table 80: show chassis sfm Output Fields

Field Name	Field Description	Level of Output
Slot	Slot number	All levels
State	Status of the SFMs: Online , Online-Standby (M40e router only), Offline , or Empty .	All levels
Reason	If the status is Offline , reason for this state.	All levels
Temp	Temperature of air passing by the SFM, in degrees Celsius.	none specified
CPU Utilization (%)	Information about CPU usage.	none specified
Total	Total percentage of the CPU being used by the SFM's processor.	All levels
Interrupt	Of the total CPU being used by the SFM's processor, the percentage being used for interrupts.	All levels
Memory Utilization	Information about memory usage.	none specified
DRAM	Total DRAM available to the SFM's processor, in megabytes (MB).	All levels

Table 80: show chassis sfm Output Fields (continued)

Field Name	Field Description	Level of Output
Heap	Percentage of heap space (dynamic memory) being used by the SFM's processor. If this number exceeds 80 percent, it might indicate a software problem (memory leak).	All levels
Buffer	Percentage of buffer space being used by the SFM's processor for buffering internal messages.	All levels
SPP Temperature	Temperature of air passing by the Switch Plane Processor card, in degrees Celsius and Fahrenheit	detail
SPR Temperature	Temperature of air passing by the Switch Plane Router card, in degrees Celsius and Fahrenheit.	detail
Total CPU DRAM	Total amount of CPU DRAM being used by the SFM's processor.	detail
Total SSRAM	Total amount of SSRAM being used by the SFM's processor.	detail
Internet processor II	(M160 router only) Processor type.	detail
Start time	Time this SFM became active.	detail
Uptime	How long the SFM has been up and running.	detail
Packet scheduling mode	(M160 router only) Enabled or disabled.	detail

**show chassis sfm
(M160)**

```
user@host> show chassis sfm
SFM status:
      Temp  CPU Utilization (%)  Memory  Utilization (%)
Slot State (C)  Total  Interrupt  DRAM (MB) Heap  Buffer
  0 Online   39    0        0      64      0      6
  1 Online   43    0        0      64      0      6
  2 Empty    0    0        0       0      0      0
  3 Empty    0    0        0       0      0      0
```

**show chassis sfm detail
(M40e)**

```
user@host> show chassis sfm detail
Slot 0 information:
  State      Offline
  Reason:    - power configured off
Slot 1 information:
  State      Present
  SPP temperature 0 degrees C / 32 degrees F
  SPR temperature 0 degrees C / 32 degrees F
  Total CPU DRAM  0 MB
  Total SSRAM     0 MB
```

```

show chassis sfm detail      user@host> show chassis sfm detail
(M160)
Slot 0 information:
  State                               Online
  SPP temperature                     37 degrees C / 98 degrees F
  SPR temperature                     39 degrees C / 102 degrees F
  Total CPU DRAM                      64 MB
  Total SSRAM                         8 MB
  Internet Processor II               Version 1, Foundry IBM, Part number 9
  Start time:                         2004-08-17 09:23:08 PDT
  Uptime:                             72 days, 1 hour, 15 minutes, 57 seconds
Slot 1 information:
  State                               Online
  SPP temperature                     36 degrees C / 96 degrees F
  SPR temperature                     37 degrees C / 98 degrees F
  Total CPU DRAM                      64 MB
  Total SSRAM                         8 MB
  Internet Processor II               Version 1, Foundry IBM, Part number 9
  Start time:                         2004-08-17 09:23:08 PDT
  Uptime:                             72 days, 1 hour, 15 minutes, 57 seconds
Slot 2 information:
....
Packet scheduling mode : Disabled

```

show chassis sibs

Syntax	show chassis sibs
Syntax (Routing Matrix)	show chassis sibs <fcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M320 routers and T-series routing platforms only) Display Switch Interface Boards (SIB) status information.
Options	<p>none—(Routing matrix only) Display the SIB status for the TX Matrix platform and its attached T640 routing nodes.</p> <p>fcc <i>number</i>—(Routing matrix only) (Optional) Display SIB status information for a specified T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display SIB status information for the TX Matrix platform (or switch-card chassis).</p>
Required Privilege Level	maintenance
Related Topics	<p>request chassis sib</p> <p>show chassis spmb sibs</p>
List of Sample Output	<p>show chassis sibs (T640) on page 322</p> <p>show chassis sibs (Routing Matrix) on page 323</p>
Output Fields	Table 81 on page 322 lists the output fields for the <code>show chassis sibs</code> command. Output fields are listed in the approximate order in which they appear.

Table 81: show chassis sibs Output Fields

Field Name	Field Description
Slot	SIB slot number.
State	SIB status: Disconnected, Online, Offline, Spare, Empty, Fault, and Check.
Uptime	How long the SIB has been up and running.

```

show chassis sibs (T640) user@host> show chassis sibs
Slot State      Uptime
  0   Spare
  1   Online     7 days, 2 hours, 13 minutes, 57 seconds
  2   Online     7 days, 2 hours, 13 minutes, 57 seconds

```

```

3   Online           7 days, 2 hours, 13 minutes, 57 seconds
4   Online           7 days, 2 hours, 13 minutes, 57 seconds

```

show chassis sibs
(Routing Matrix)

```
user@host> show chassis sibs
```

```
scc-re0:
```

```

-----
Slot  State                Uptime
0     Empty
1     Empty
2     Empty
3     Offline
4     Online                7 days, 21 hours, 50 minutes, 4 seconds

```

```
lcc0-re0:
```

```

-----
Slot  State                Uptime
0     Empty
1     Empty
2     Empty
3     Disconnected         7 days, 21 hours, 46 minutes, 53 seconds
4     Online                7 days, 21 hours, 46 minutes, 52 seconds
...

```

show chassis spmb

Syntax	show chassis spmb
Syntax (Routing Matrix)	show chassis spmb <fcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(T-series routing platforms only) Display Switch Processor Mezzanine Board (SPMB) status information.
Options	<p>none—(Routing matrix only) Display SPMB status for the TX Matrix platform and its attached T640 routing nodes.</p> <p>fcc <i>number</i>—(Routing matrix only) (Optional) Display information about the SPMB on a specified T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display information about the SPMB on the TX Matrix platform (or switch-card chassis).</p>
Required Privilege Level	view
Related Topics	<p>request chassis sib</p> <p>show chassis spmb sibs</p>
List of Sample Output	<p>show chassis spmb on page 325</p> <p>show chassis spmb fcc (Routing Matrix) on page 325</p> <p>show chassis spmb scc (Routing Matrix) on page 325</p>
Output Fields	Table 82 on page 324 lists the output fields for the show chassis spmb command. Output fields are listed in the approximate order in which they appear.

Table 82: show chassis spmb Output Fields

Field Name	Field Description
Slot	SPMB slot number: 0 or 1.
State	SPMB status: Online or Offline.
Total CPU Utilization (%)	Total percentage of CPU being used by the SPMB processor.
Interrupt CPU Utilization (%)	Of the total CPU being used by the SPMB processor, the percentage being used for interrupts.
Memory Heap Utilization (%)	Percentage of heap space (dynamic memory) being used by the FPC processor. If this number exceeds 80 percent, there may be a software problem (memory leak).
Buffer Utilization (%)	Percentage of buffer space being used by the SPMB processor for buffering internal messages.

Table 82: show chassis spmb Output Fields *(continued)*

Field Name	Field Description
Start time	Time at which the SPMB last came online.
Uptime	How long the SPMB has been up and running.

```

show chassis spmb      user@host> show chassis spmb
Slot 0 information:
  State                      Online
  Total CPU Utilization      1%
  Interrupt CPU Utilization   0%
  Memory Heap Utilization     0%
  Buffer Utilization          40%
  Start time:                 2001-08-27 14:05:04 PDT
  Uptime:                     46 minutes, 36 seconds

```

```

show chassis spmb lcc  user@host> show chassis spmb lcc 0
(Routing Matrix)      lcc0-re0:
-----
Slot 0 information:
  State                      Online
  Total CPU Utilization      0%
  Interrupt CPU Utilization   0%
  Memory Heap Utilization     0%
  Buffer Utilization          42%
  Start time:                 2004-08-05 18:43:38 PDT
  Uptime:                     8 days, 55 minutes, 52 seconds

```

```

show chassis spmb scc  user@host> show chassis spmb scc
(Routing Matrix)      scc-re0:
-----
Slot 0 information:
  State                      Online
  Total CPU Utilization      1%
  Interrupt CPU Utilization   0%
  Memory Heap Utilization     0%
  Buffer Utilization          42%
  Start time:                 2004-08-05 18:43:37 PDT
  Uptime:                     8 days, 1 hour, 6 minutes, 51 seconds

```

show chassis spmb sibs

Syntax	show chassis spmb sibs
Syntax (Routing Matrix)	show chassis spmb sibs <fcc number scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(T-series routing platforms only) Display Switch Processor Mezzanine Board (SPMB) Switch Interface Board (SIB) status information.
Options	<p>none—(Routing matrix only) Display the SIB status for the TX Matrix platform and its attached T640 routing nodes.</p> <p>fcc <i>number</i>—(Routing matrix only) (Optional) Display SIB status information for a specified T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display SIB status information for the TX Matrix platform (or switch-card chassis).</p>
Additional Information	On a T-series routing platforms, you can use either this command or the <code>show chassis sibs</code> command to produce the same output. The <code>show chassis sibs</code> command is supported on the M320 router and on the T-series routing platforms.
Required Privilege Level	view
Related Topics	request chassis spmb restart
List of Sample Output	<p>show chassis spmb sibs (T320) on page 327</p> <p>show chassis-spmb-sibs (T1600) on page 327</p> <p>show chassis spmb sibs (Routing Matrix) on page 327</p> <p>show chassis spmb sibs fcc (Routing Matrix) on page 327</p> <p>show chassis spmb sibs scc (Routing Matrix) on page 327</p>
Output Fields	Table 83 on page 326 lists the output fields for the <code>show chassis spmb sibs</code> command. Output fields are listed in the approximate order in which they appear.

Table 83: show chassis spmb sibs Output Fields

Field Name	Field Description
Slot	<p>SIB slot number:</p> <ul style="list-style-type: none"> ■ T640 routing node, T1600 routing node or TX Matrix platform—0 through 4 ■ T320 router—0 through 2
State	SIB status: Disconnected, Online, Offline, Spare, Empty, Fault, and Check.

Table 83: show chassis spmb sibs Output Fields *(continued)*

Field Name	Field Description
Uptime	How long the SIB has been up and running.

show chassis spmb sibs (T320) user@host> show chassis spmb sibs

```
Slot  State
0      Spare
1      Online
2      Online
```

show chassis-spmb-sibs (T1600) user@host> show chassis spmb sibs

```
Slot  State
0      Spare
1      Online
2      Empty
3      Online
4      Offline
```

show chassis spmb sibs (Routing Matrix) user@host> show chassis spmb sibs

```
Slot  State
0      Online
1      Online
2      Empty
3      Online
4      Offline
```

show chassis spmb sibs lcc (Routing Matrix) user@host> show chassis spmb sibs lcc 0
lcc0-re0:

```
-----
Slot  State          Uptime
0      Empty
1      Empty
2      Empty
3      Disconnected    8 days, 48 minutes, 58 seconds
4      Online          8 days, 48 minutes, 57 seconds
```

show chassis spmb sibs scc (Routing Matrix) user@host> show chassis spmb sibs scc
scc-re0:

```
-----
Slot  State          Uptime
0      Empty
1      Empty
2      Empty
3      Offline
4      Online          8 days, 54 minutes, 1 second
```

show chassis ssb

Syntax	show chassis ssb <slot>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M20 routers only) Display status information about the System and Switch Board (SSB).
Options	none—Display information about all SSBs. slot—(Optional) Display information about the SSB in the specified slot. Replace <i>slot</i> with 0 or 1.
Required Privilege Level	view
Related Topics	request chassis ssb master switch
List of Sample Output	show chassis ssb on page 329
Output Fields	Table 84 on page 328 lists the output fields for the <code>show chassis ssb</code> command. Output fields are listed in the approximate order in which they appear.

Table 84: show chassis ssb Output Fields

Field Name	Field Description
Failover	Number of times the mastership has changed.
Slot	SSB slot number.
State	Current state of the SSB in this slot: Master , Backup , or Empty .
Temperature	Temperature of the air passing by the SSB, in degrees Celsius.
CPU utilization	Total percentage of the CPU being used by the SSB's processor.
Interrupt utilization	Of the total CPU being used by the SSB's processor, the percentage being used for interrupts.
Heap utilization	Percentage of heap space being used by the SSB's processor.
Buffer utilization	Percentage of buffer space being used by the SSB's processor.
DRAM	Total DRAM available to the SSB's processor.
Start time	Time when the SSB started running.
Uptime	How long the SSB has been up and running.

```
show chassis ssb user@host> show chassis ssb
SSB status:
  Failover:                0 time
  Slot 0:
    State:                  Master
    Temperature:            33 Centigrade
    CPU utilization:         0 percent
    Interrupt utilization:   0 percent
    Heap utilization:        0 percent
    Buffer utilization:       6 percent
    DRAM:                    64 Mbytes
    Start time:              1999-01-15 22:05:36 UTC
    Uptime:                  21 hours, 21 minutes, 22 seconds
...
```

show chassis synchronization

Syntax	show chassis synchronization
Release Information	Command introduced in JUNOS Release 7.6 for M320 routers. Command introduced in JUNOS Release 8.3 for M40e routers. Command introduced in JUNOS Release 9.3 for M120 routers.
Description	(M320, M40e, and M120 routers only) Display information about the external clock source currently used for chassis synchronization.
Options	<p>master— (Optional) Display clock synchronization information about the master clock.</p> <p>backup—(Optional) Display clock synchronization information about the backup clock.</p> <p>extensive—(Optional) Display clock synchronization information in detail.</p>
Required Privilege Level	maintenance
Related Topics	request chassis synchronization switch
List of Sample Output	<p>show chassis synchronization on page 331</p> <p>show chassis synchronization master on page 331</p> <p>show chassis synchronization backup on page 331</p> <p>show chassis synchronization extensive on page 332</p>
Output Fields	Table 85 on page 330 lists the output fields for the show chassis synchronization command. Output fields are listed in the approximate order in which they appear.

Table 85: show chassis synchronization Output Fields

Field Name	Field Description
Current state	<p>Indicates current status of external clock sources:</p> <ul style="list-style-type: none"> ■ backup—Source is currently the backup clock source. ■ master—Source is currently the master clock source.
Current clock state	<p>Indicates current source of external synchronization:</p> <ul style="list-style-type: none"> ■ internal—Source is providing its own clocking. ■ locked to master CB—Source is locked to master clock source.
Selected for	Number of seconds this clock has been the master or backup clock source.
Selected since	Time stamp for establishment as master or backup clock source.
Deviation (in ppm)	Difference in clock timing, in parts per million (ppm).
Last deviation (in ppm)	Previous difference in clock timing, if any, in ppm.

Table 85: show chassis synchronization Output Fields (continued)

Field Name	Field Description
Configured sources	Information of clock sources eligible for selection as master clock.
Source	Information following concerns external source A or B.
Priority	Indicates priority of external clock sources: <ul style="list-style-type: none"> ■ primary—Source is a primary reference. ■ secondary—Source is a secondary reference.
Deviation (in ppm)	Current difference in clock timing, in ppm: <ul style="list-style-type: none"> ■ measuring—Establishing source deviation. ■ number—Deviation in ppm.
Last deviation (in ppm)	Previous difference in clock timing, in ppm: <ul style="list-style-type: none"> ■ number—Deviation in ppm.
Status	Indicates status of external sources: <ul style="list-style-type: none"> ■ present—Source is configured and present. ■ qualified—Source is eligible for synchronization source.

```

show chassis synchronization user@host> show chassis synchronization
Clock Synchronization Status :
  Clock module on CB 0
    Current state           : master
    Current clock state     : internal
    Selected for            : 18 hours, 12 minutes, 43 seconds
    Selected since          : 2008-09-10 03:27:47 PDT
    Deviation (in ppm)      : +0.00
    Last deviation (in ppm): +0.00
  Clock Synchronization Status :
    Clock module on CB 1
      Current state         : backup
      Current clock state   : locked to master CB
      Selected for          : 1 day, 12 hours, 49 minutes, 20 seconds
      Selected since        : 2008-09-09 08:51:10 PDT

show chassis synchronization master user@host> show chassis synchronization master
Clock Synchronization Status :
  Clock module on CB 0
    Current state           : master
    Current clock state     : internal
    Selected for            : 8 days, 21 minutes, 12 seconds
    Selected since          : 2008-08-27 21:05:40 PDT
    Deviation (in ppm)      : +0.00
    Last deviation (in ppm): +0.00

show chassis synchronization backup user@host> show chassis synchronization backup
Clock Synchronization Status :
  Clock module on CB 1
    Current state           : backup

```

```

Current clock state      : locked to master CB
Selected for            : 34 days, 20 hours, 17 minutes, 8 seconds
Selected since         : 2008-08-01 01:22:16 PDT

show chassis            user@host> show chassis synchronization extensive
synchronization        Clock Synchronization Status :
extensive              Clock module on CB 0
                       Current state                : master
                       Current clock state           : internal
                       Selected for                  : 8 days, 36 minutes, 29 seconds
                       Selected since                : 2008-08-27 21:05:40 PDT
                       Deviation (in ppm)           : +0.00
                       Last deviation (in ppm):      : +0.00
Clock Synchronization Status :
Clock module on CB 1
Current state           : backup
Current clock state     : locked to master CB
Selected for           : 34 days, 20 hours, 19 minutes, 53 seconds
Selected since         : 2008-08-01 01:22:16 PDT

```


show chassis temperature-thresholds

Syntax	show chassis temperature-thresholds
Release Information	Command introduced in JUNOS Release 8.0.
Description	Display chassis temperature threshold settings, in degrees Celsius.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show chassis temperature-thresholds on page 334 show chassis temperature-thresholds on page 334
Output Fields	Table 86 on page 333 lists the output fields for the show chassis temperature-thresholds command. Output fields are listed in the approximate order in which they appear.

Table 86: show chassis temperature-thresholds Output Fields

Field name	Field Description
Item	Chassis component. If per FRU per slot thresholds are configured, the components about which information is displayed include the chassis, the Routing Engines, FPCs, and FEBs. If per FRU per slot thresholds are not configured, the components about which information is displayed include the chassis and the Routing Engines.
Fan speed	<p>The temperature threshold settings, in degrees Celsius, for the fans to operate at normal and high speeds.</p> <ul style="list-style-type: none"> ■ Normal—The fans operate at normal speed if the component is at or below this temperature and all the fans are present and functioning normally. ■ High—The fans operate at high speed if the component has exceeded this temperature or a fan has failed or is missing. <p>An alarm is not triggered until the temperature exceeds the threshold settings for a yellow alarm or a red alarm.</p>
Yellow alarm	<p>The temperature threshold settings, in degrees Celsius, that trigger a yellow alarm.</p> <ul style="list-style-type: none"> ■ Normal—The component has exceeded this temperature and the fans have been turned on to full speed. ■ Bad fan—The component has exceeded this temperature and one or more fans have failed or are missing.
Red alarm	<p>The temperature threshold settings, in degrees Celsius, that trigger a red alarm.</p> <ul style="list-style-type: none"> ■ Normal—The component has exceeded this temperature and the fans have been turned on to full speed. ■ High—The component has exceeded this temperature and one or more fans have failed or are missing.

```

show chassis temperature-thresholds user@host> show chassis temperature-thresholds

```

	Fan speed		Yellow alarm		Red alarm		
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	48	54	70	60	80	70	
FPC 3	48	54	70	60	80	70	
FPC 4	48	54	70	60	80	70	
FPC 5	48	54	70	60	80	70	
FEB 0	48	54	70	60	80	70	
FEB 1	48	54	70	60	80	70	
FEB 2	48	54	70	60	80	70	
FEB 3	48	54	70	60	80	70	
FEB 4	48	54	70	60	80	70	
FEB 5	48	54	70	60	80	70	

```

show chassis temperature-thresholds user@host> show chassis temperature-thresholds

```

	Fan speed		Yellow alarm		Red alarm		
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	48	54	85	85	100	100	

Chapter 8

Command-Line Interface Operational Mode Commands

Table 87 on page 335 summarizes the command-line interface (CLI) commands you can use to perform and monitor CLI management functions. Commands are listed in alphabetical order.

Table 87: CLI Operational Mode Commands

Task	Command
Clear the logical system view and return to a full router view.	<code>clear cli logical-system</code>
Set the CLI to complete partial command entries.	<code>set cli complete-on-space</code>
Set the current working directory.	<code>set cli directory</code>
Set the maximum time that an individual session can be idle before the user is logged off the router.	<code>set cli idle-timeout</code>
Set the CLI to the specified logical routing instance.	<code>set cli logical-system</code>
Set the CLI prompt.	<code>set cli prompt</code>
Set the CLI to prompt you to restart the router after a software upgrade.	<code>set cli restart-on-upgrade</code>
Set the number of lines on the screen.	<code>set cli screen-length</code>
Set the number of characters on a line.	<code>set cli screen-width</code>
Set the terminal type.	<code>set cli terminal</code>
Timestamp CLI output.	<code>set cli timestamp</code>
Set the system date and time.	<code>set date</code>
Display all CLI settings.	<code>show cli</code>
Display login permissions for the current user.	<code>show cli authorization</code>
Display the current working directory.	<code>show cli directory</code>

Table 87: CLI Operational Mode Commands (*continued*)

Task	Command
Display a list of previous CLI commands.	show cli history



NOTE: For information about how to configure CLI parameters, see the *JUNOS CLI User Guide*.

For information about related tasks performed by network operations center (NOC) personnel, see the *JUNOS Baseline Network Operations Guide*.

clear cli logical-system

Syntax	clear cli logical-system
Release Information	Command introduced before JUNOS Release 7.4.
Description	Clear the logical system view and return to a full router view. In a logical system view, the output of the command displays information related to the logical system only.
Options	This command has no options.
Required Privilege Level	clear
Related Topics	set cli logical-system
List of Sample Output	clear cli logical-system on page 337
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear cli logical-system	<pre>user@host:lr1> clear cli logical-system Cleared default logical system user@host></pre>

set cli complete-on-space

Syntax	set cli complete-on-space (off on)
Release Information	Command introduced before JUNOS Release 7.4.
Description	Set the command-line interface (CLI) to complete a partial command entry when you type a space or a tab. This is the default behavior of the CLI.
Options	<p>off—Turn off command completion.</p> <p>on—Allow either a space or a tab to be used for command completion.</p>
Required Privilege Level	view
Related Topics	show cli
List of Sample Output	set cli complete-on-space on page 338
Output Fields	When you enter this command, you are provided feedback on the status of your request.
set cli complete-on-space	<p>In the following example, pressing the Spacebar changes the partial command entry from com to complete-on-space. The example shows how adding the keyword off at the end of the command disables command completion.</p> <pre> user@host> set cli com<Space> user@host>set cli complete-on-space off Disabling complete-on-space </pre>

set cli directory

Syntax	set cli directory <i>directory</i>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Set the current working directory.
Options	<i>directory</i> —Pathname of the working directory.
Required Privilege Level	view
Related Topics	show cli directory
List of Sample Output	set cli directory on page 339
Output Fields	When you enter this command, you are provided feedback on the status of your request.
set cli directory	user@host> set cli directory /var/home/regress Current directory: /var/home/regress

set cli idle-timeout

Syntax	set cli idle-timeout <minutes>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Set the maximum time that an individual session can be idle before the user is logged off the router.
Options	<i>minutes</i> —(Optional) Maximum idle time. The range of values, in minutes, is 0 through 100,000. If you do not issue this command, and the user's login class does not specify this value, the user is never forced off the system after extended idle times. Setting the value to 0 disables the timeout.
Required Privilege Level	view
Related Topics	show cli
List of Sample Output	set cli idle-timeout on page 340
Output Fields	When you enter this command, you are provided feedback on the status of your request.
set cli idle-timeout	user@host> set cli idle-timeout 60 Idle timeout set to 60 minutes

set cli logical-system

Syntax	set cli logical-system <i>logical-system</i>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Set the CLI to the specified logical system view.
Options	<i>logical-system</i> —logical system name.
Required Privilege Level	view
List of Sample Output	set cli logical-system on page 341
Output Fields	When you enter this command, you are provided feedback on the status of your request.
set cli logical-system	<pre>user@host> set cli logical-system log-router-A logical system: log-router-A user@host:log-router-A></pre>

set cli prompt

Syntax	set cli prompt <i>string</i>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Set the prompt so that it is displayed within the CLI.
Options	<i>string</i> —CLI prompt string. To include spaces in the prompt, enclose the string in quotation marks. By default, the string is <i>username@hostname</i> .
Required Privilege Level	view
Related Topics	show cli
List of Sample Output	set cli prompt on page 342
Output Fields	When you enter this command, the new CLI prompt is displayed.
set cli prompt	user@host> set cli prompt lab1-router> lab1-router>

set cli restart-on-upgrade

Syntax	set cli restart-on-upgrade string (off on)
Release Information	Command introduced before JUNOS Release 7.4.
Description	For an individual session, set the CLI to prompt you to restart the router after upgrading the software.
Options	off—Disables the prompt. on—Enables the prompt.
Required Privilege Level	view
Related Topics	show cli
List of Sample Output	set cli restart-on-upgrade on page 343
Output Fields	When you enter this command, you are provided feedback on the status of your request.
set cli restart-on-upgrade	user@host> set cli restart-on-upgrade on Enabling restart-on-upgrade

set cli screen-length

Syntax	set cli screen-length <i>length</i>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Set terminal screen length.
Options	<i>length</i> —Number of lines of text that the terminal screen displays. The range of values, in number of lines, is 24 through 100,000. The default is 24.
Additional Information	The point at which the <code>—(more)—</code> prompt appears on the screen is a function of this setting and the settings for the <code>set cli screen-width</code> and <code>set cli terminal</code> commands.
Required Privilege Level	view
Related Topics	set cli screen-width set cli terminal show cli
List of Sample Output	set cli screen-length on page 344
Output Fields	When you enter this command, you are provided feedback on the status of your request.
set cli screen-length	<pre>user@host> set cli screen-length 75 Screen length set to 75</pre>

set cli screen-width

Syntax	set cli screen-width <i>width</i>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Set the terminal screen width.
Options	<i>width</i> —Number of characters in a line. The range of values is 80 through 100,000. The default is 80.
Additional Information	The point at which the <code>—(more)—</code> prompt appears on the screen is a function of this setting and the settings for the <code>set cli screen-length</code> and <code>set cli terminal</code> commands.
Required Privilege Level	view
Related Topics	set cli screen-length set cli terminal show cli
List of Sample Output	set cli screen-width on page 345
Output Fields	When you enter this command, you are provided feedback on the status of your request.
set cli screen-width	user@host> set cli screen-width Screen width set to 132

set cli terminal

Syntax	set cli terminal <i>terminal-type</i>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Set the terminal type.
Options	<i>terminal-type</i> —Type of terminal that is connected to the Ethernet management port: <ul style="list-style-type: none">■ ansi—ANSI-compatible terminal (80 characters by 24 lines)■ small-xterm—Small xterm window (80 characters by 24 lines)■ vt100—VT100-compatible terminal (80 characters by 24 lines)■ xterm—Large xterm window (80 characters by 65 lines)
Required Privilege Level	view
Related Topics	show cli
List of Sample Output	set cli terminal on page 346
Output Fields	This command provides no output.
set cli terminal	user@host> set cli terminal xterm

set cli timestamp

Syntax	set cli timestamp (format <i>timestamp-format</i> disable)
Release Information	Command introduced before JUNOS Release 7.4.
Description	Set a timestamp for CLI output.
Options	<p>format <i>timestamp-format</i>—Set the date and time format for the timestamp. The timestamp format you specify can include the following placeholders in any order:</p> <ul style="list-style-type: none"> ■ %m—Two-digit month ■ %d—Two-digit date ■ %T—Six-digit hour, minute, and seconds <p>disable—Remove the timestamp from the CLI.</p>
Required Privilege Level	view
Related Topics	show cli
List of Sample Output	set cli timestamp on page 347
Output Fields	When you enter this command, you are provided feedback on the status of your request.
set cli timestamp	<pre>user@host> set cli timestamp format '%m-%d-%T' '04-21-17:39:13' CLI timestamp set to: '%m-%d-%T'</pre>

set date

Syntax	set date (<i>date-time</i> ntp < <i>ntp-server</i> > <source-address <i>source-address</i> >)
Release Information	Command introduced before JUNOS Release 7.4.
Description	Set the data and time.
Options	<p><i>date-time</i>—Date and time. Enter this string inside quotation marks.</p> <p>ntp—Use a Network Time Protocol (NTP) server to synchronize the current date and time setting on the router.</p> <p><i>ntp-server</i>—(Optional) Specify the IP address of one or more NTP servers.</p> <p>source-address <i>source-address</i>—(Optional) Specify the source address that is used by the router to contact the remote NTP server.</p>
Required Privilege Level	view
Related Topics	show cli
List of Sample Output	set date on page 348
Output Fields	When you enter this command, you are provided feedback on the status of your request.
set date	<pre>user@host> set date ntp 21 Apr 17:22:02 ntpdate[3867]: step time server 172.17.27.46 offset 8.759252 sec</pre>

show cli

Syntax	show cli
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display configured CLI settings.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show cli on page 349
Output Fields	Table 88 on page 349 lists the output fields for the show cli command. Output fields are listed in the approximate order in which they appear.

Table 88: 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 off the router. 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 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.

```

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/home/regress'

```

show cli authorization

Syntax	show cli authorization
Release Information	Command introduced before JUNOS Release 7.4.
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 351
Output Fields	Table 89 on page 350 lists the output fields for the <code>show cli authorization</code> command. In the table, all possible permissions are displayed and output fields are listed in alphabetical order.

Table 89: 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.
flow-tap-control	Can configure flow-tap configuration information.
interface	Can view interface configuration information.
interface-control	Can modify interface configuration information.

Table 89: show cli authorization Output Fields *(continued)*

Field Name	Field Description
maintenance	Can perform system maintenance.
network	Can access the network by entering the ping, ssh, telnet, and traceroute commands.
reset	Can reset or restart interfaces and system processes.
rollback	Can rollback 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.
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).

show cli authorization

```

user@host> show cli authorization
Current user: 'remote' login: 'user' class ''
Permissions:
  admin      -- Can view user accounts
  admin-control-- Can modify user accounts
  clear      -- Can clear learned network information
  configure  -- Can enter configuration mode
  control    -- Can modify any configuration
  edit       -- Can edit full files
  field      -- Special for field (debug) support
  floppy     -- Can read and write from the floppy
  interface  -- Can view interface configuration
  interface-control-- Can modify interface configuration

```

```

network      -- Can access the network
reset        -- Can reset/restart interfaces and daemons
routing      -- Can view routing configuration
routing-control-- Can modify routing configuration
shell        -- Can start a local shell
snmp         -- Can view SNMP configuration
snmp-control-- Can modify SNMP configuration
system       -- Can view system configuration
system-control-- Can modify system configuration
trace        -- Can view trace file settings
trace-control-- Can modify trace file settings
view         -- Can view current values and statistics
maintenance -- Can become the super-user
firewall     -- Can view firewall configuration
firewall-control-- Can modify firewall configuration
secret       -- Can view secret configuration
secret-control-- Can modify secret configuration
rollback     -- Can rollback to previous configurations
security     -- Can view security configuration
security-control-- Can modify security configuration
access       -- Can view access configuration
access-control-- Can modify access configuration
view-configuration-- Can view all configuration (not including secrets)
flow-tap     -- Can view flow-tap configuration
flow-tap-control-- Can configure flow-tap service

```

Individual command authorization:

```

Allow regular expression: none
Deny regular expression: none
Allow configuration regular expression: none
Deny configuration regular expression: none

```

show cli directory

Syntax	show cli directory
Release Information	Command introduced before JUNOS Release 7.4.
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 353
Output Fields	Table 90 on page 353 lists the output fields for the <code>show cli directory</code> command. Output fields are listed in the approximate order in which they appear.

Table 90: show cli directory Output Fields

Field Name	Field Description
Current directory	Pathname of the current working directory.

show cli directory user@host> **show cli directory**
 Current directory: /var/home/regress

show cli history

Syntax	show cli history <i><count></i>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display a list of previous CLI commands.
Options	none—Display all previous CLI commands. <i>count</i> —(Optional) Maximum number of commands to display.
Required Privilege Level	view
List of Sample Output	show cli history on page 354
Output Fields	Table 91 on page 354 lists the output fields for the <code>show cli history</code> command. Output fields are listed in the approximate order in which they appear.

Table 91: show cli history Output Fields

Field Name	Field Description
<i>timestamp</i>	Time at which the command was entered.
<i>command-syntax</i>	Command that was entered.

```

show cli history user@host> show cli history
11:14:14 -- show arp
11:22:10 -- show cli authorization
11:27:12 -- show cli history

```

Chapter 9

File Management Operational Mode Commands

Table 92 on page 355 summarizes the command-line interface (CLI) commands you can use to perform and monitor file management functions. Commands are listed in alphabetical order.

Table 92: File Management Operational Mode Commands

Task	Command
Remove contents of a log file.	clear log
Archive files or archive and compress files.	file archive
Calculate checksum using MD5 has algorithm.	file checksum md5
Calculate checksum using Secure Hash Algorithm SHA1 .	file checksum sha1
Calculate checksum using Secure Hash Algorithm SHA-256.	file checksum sha-256
Compare two files.	file compare
Copy files.	file copy
Delete files.	file delete
List files and directories on the router.	file list
Rename files.	file rename
Display the contents of a file.	file show
List log files, display log file contents, and display information about users who have logged in to the router.	show log



NOTE: See also the `monitor list`, `monitor start`, and `monitor stop` commands, which are documented in “Real-Time Router Monitoring Operational Mode Commands” on page 71.

For information about how to configure file parameters, see the *JUNOS System Basics Configuration Guide*.

For information about related tasks performed by network operations center (NOC) personnel, see the *JUNOS Baseline Network Operations Guide*.

clear log

Syntax	<code>clear log filename</code> <code><all></code>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Remove contents of a log file.
Options	<i>filename</i> —Name of the specific log file to truncate. <i>all</i> —(Optional) Truncate the specified log file and delete all archived versions of it.
Required Privilege Level	clear
Related Topics	show log
List of Sample Output	clear log on page 357
Output Fields	See file list for an explanation of output fields.

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
```

file archive

Syntax	file archive destination <i>destination</i> source <i>source</i> <compress>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Archive, and optionally compress, one or multiple local system files as a single file, locally or at a remote location.
Options	<p>destination <i>destination</i>—Destination of the archived file or files. Specify the destination as a URL or filename. The JUNOS software adds one of the following suffixes if the destination filename does not already have it:</p> <ul style="list-style-type: none"> ■ For archived files—The suffix .tar ■ For archived and compressed files—The suffix .tgz <p>source <i>source</i>—Source of the original file or files. Specify the source as a URL or filename.</p> <p>compress—(Optional) Compress the archived file with the GNU zip (gzip) compression utility. The compressed files have the suffix .tgz.</p>
Required Privilege Level	maintenance
List of Sample Output	<p>file archive (Multiple Files) on page 358</p> <p>file archive (Single File) on page 358</p> <p>file archive (with Compression) on page 359</p>
Output Fields	When you enter this command, you are provided feedback on the status of your request.
file archive (Multiple Files)	<p>The following sample command archives all message files in the local directory /var/log/messages as the single file messages-archive.tar in the same directory:</p> <pre>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></pre>
file archive (Single File)	<p>The following sample command archives one message file in the local directory /var/log/messages as the single file messages-archive.tar in the same directory:</p> <pre>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></pre>

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` in the same directory:

```
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.  
user@host>
```

file checksum md5

Syntax	<code>file checksum md5 <pathname> filename</code>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Calculate the Message Digest 5 (MD5) checksum of a file.
Options	<i>pathname</i> —(Optional) Path to a filename. <i>filename</i> —Name of a local file for which to calculate the MD5 checksum.
Required Privilege Level	maintenance
List of Sample Output	file checksum md5 on page 360
Output Fields	When you enter this command, you are provided feedback on the status of your request.
file checksum md5	<pre>user@host> file checksum md5 jbundle-5.3R2.4-export-signed.tgz MD5 (jbundle-5.3R2.4-export-signed.tgz) = 2a3b69e43f9bd4893729cc16f505a0f5</pre>

file checksum sha1

Syntax	<code>file checksum sha1 <pathname> filename</code>
Release Information	Command introduced in JUNOS Release 9.5.
Description	Calculate the Secure Hash Algorithm (SHA-1) checksum of a file.
Options	<p><i>pathname</i>—(Optional) Path to a filename.</p> <p><i>filename</i>—Name of a local file for which to calculate the SHA-1 checksum.</p>
Required Privilege Level	maintenance
List of Sample Output	file checksum sha1 on page 361
Output Fields	When you enter this command, you are provided feedback on the status of your request.
file checksum sha1	<pre>user@host> file checksum sha1 /var/db/scripts/opscript.slax SHA1 (/var/db/scripts/commitscript.slax) = ba9e47120c7ce55cff29afd73eacd370e162c676</pre>

file checksum sha-256

Syntax	<code>file checksum sha-256 <pathname> filename</code>
Release Information	Command introduced in JUNOS Release 9.5.
Description	Calculate the Secure Hash Algorithm 2 family (SHA-256) checksum of a file.
Options	<p><i>pathname</i>—(Optional) Path to a filename.</p> <p><i>filename</i>—Name of a local file for which to calculate the SHA-256 checksum.</p>
Required Privilege Level	maintenance
List of Sample Output	file checksum sha-256 on page 362
Output Fields	When you enter this command, you are provided feedback on the status of your request.
file checksum sha-256	<pre> user@host> file checksum sha-256 /var/db/scripts/commitscript.slax SHA256 (/var/db/scripts/commitscript.slax) = 94c2b061fb55399e15babd2529453815601a602b5c98e5c12ed929c9d343dd71 </pre>

file compare

Syntax	file compare (files <i>filename filename</i>) < context unified> <ignore-white-space >
Release Information	Command introduced before JUNOS Release 7.4.
Description	<p>Compare two local files and describe the differences between them in default, context, or unified output styles:</p> <ul style="list-style-type: none"> ■ 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—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—Display is preceded by the line number from the first and the second file (<i>xx,xxx,x</i>). 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	<p>context—(Optional) Display output in context format.</p> <p>files <i>filename</i>—Names of two local files to compare.</p> <p>ignore-white-space—(Optional) Ignore changes in amount of white space.</p> <p>unified—(Optional) Display output in unified format.</p>
Required Privilege Level	none
List of Sample Output	<p>file compare files on page 364</p> <p>file compare files context on page 364</p> <p>file compare files unified on page 364</p> <p>file compare files unified ignore-white-space on page 365</p>
Output Fields	When you enter this command, you are provided feedback on the status of your request.

```

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 user@host> file compare files /tmp/one /tmp/two unified ignore-white-space
ignore-white-space --- /tmp/one    Wed Dec  3 09:13:10 2003
+++ /tmp/two    Wed Dec  3 09:13:14 2003
@@ -99,7 +99,7 @@
     user bill {
         full-name "Bill Smith";
         uid 1089;
-        class foo; # 'foo' is not defined
+        class super-user;
         authentication {
             encrypted-password <SECRET>; # SECRET-DATA
         }

```

file copy

Syntax	<code>file copy <i>source destination</i></code> <code><source-address <i>address</i>></code>
Release Information	Command introduced before JUNOS Release 7.4. source-address option added in JUNOS Release 7.4.
Description	Copy files from one place to another on the local router or between the local router and a remote system.
Options	<p><i>source</i>—Source of the original file. Specify this as a URL or filename.</p> <p><i>destination</i>—Destination of the copied file. Specify this as a URL or filename. If you are copying a file to the current directory (your home directory on the local router) and are not renaming the file, specify the destination with a period (.).</p> <p>source-address <i>address</i>—(Optional) Source IP host address. This option is useful for specifying the source address of a secure copy (scp) file transfer.</p>
Required Privilege Level	maintenance
List of Sample Output	<p>file copy (A File from the Router to a PC) on page 366</p> <p>file copy (A Configuration File Between Routing Engines) on page 366</p> <p>file copy (A Log File Between Routing Engines) on page 366</p>
Output Fields	When you enter this command, you are provided feedback on the status of your request.
file copy (A File from the Router to a PC)	<pre>user@host> file copy /var/tmp/rpd.core.4 berry:/c/junipero/tmp ...transferring.file..... 0 KB 0.3 kB/s ETA: 00:00:00 100%</pre>
file copy (A Configuration File Between Routing Engines)	<p>The following sample command copies a configuration file from Routing Engine 0 to Routing Engine 1:</p> <pre>user@host> file copy /config/juniper.conf re1:/var/tmp/copied-juniper.conf</pre>
file copy (A Log File Between Routing Engines)	<p>The following sample command copies a log file from Routing Engine 0 to Routing Engine 1:</p> <pre>user@host> file copy lcc0-re0:/var/log/chassisd lcc0-re1:/var/tmp</pre>

file delete

Syntax	<code>file delete filename</code> <code><purge></code>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Delete a file on the local router.
Options	<p><i>filename</i>—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.</p> <p><i>purge</i>—(Optional) Overwrite regular files before deleting them.</p>
Required Privilege Level	maintenance
List of Sample Output	<p>file delete on page 367</p> <p>file delete (Routing Matrix) on page 367</p>
Output Fields	When you enter this command, you are provided feedback on the status of your request.
file delete	<pre> 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 </pre>
file delete (Routing Matrix)	<pre> 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 </pre>

file list

Syntax	file list <detail recursive> <filename>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display a list of files on the local router.
Options	<p>none—Display a list of all files for the current directory.</p> <p>detail recursive—(Optional) Display detailed output or descend recursively through the directory hierarchy, respectively.</p> <p>filename—(Optional) Display a list of files. For a routing matrix, the filename must include the chassis information.</p>
Additional Information	The default directory is the home directory of the user logged into the router. 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	<p>file list on page 368</p> <p>file list (Routing Matrix) on page 369</p>
Output Fields	When you enter this command, you are provided feedback on the status of your request.
file list	<pre>user@host> file list /var/tmp dcd.core rpd.core snmpd.core</pre>

file list (Routing Matrix) user@host> file list lcc0-re0:var/tmp
lcc0-re0:

```
-----
/var/tmp/:
.gdbinit
.pccardd
Test/
chassisd*
chassisd.nathan*
check_time*
cores/
diagTestPrep*
diagtest*
diagtest.regress*
do_switchovers*
dump_test*
err.manoj.log
esw_clearstats*
esw_counter*
esw_debug*
esw_debug_ge*
esw_filt_test*
esw_filter_tnp_addr*
esw_getstats*
esw_phy*
esw_stats*
```

file rename

Syntax	<code>file rename <i>source destination</i></code>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Rename a file on the local router.
Options	<p><i>source</i> —Original name of the file. For a routing matrix, the filename must include the chassis information.</p> <p><i>destination</i>—New name for the file.</p>
Required Privilege Level	maintenance
List of Sample Output	<p>file rename on page 370</p> <p>file rename (Routing Matrix) on page 371</p>
Output Fields	When you enter this command, you are provided feedback on the status of your request.
file rename	<p>The following example lists the files in <code>/var/tmp</code>, renames one of the files, and then displays the list of files again to reveal the newly named file.</p> <pre> 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 </pre>

file rename
(Routing Matrix) The following example lists the files in `/var/tmp`, renames one of the files, and then displays the list of files again to reveal the newly named file.

```
user@host> file list lcc0-re1:/var/tmp
lcc0-re1:
```

```
-----

/var/tmp:
.pccardd
sartre.conf
snmpd
syslogd.core-tarball.0.tgz
user@host> file rename lcc0-re0:/var/tmp/snmpd /var/tmp/snmpd.rr
user@host> file list lcc0-re1:/var/tmp
lcc0-re1:
```

```
-----

/var/tmp:
.pccardd
sartre.conf
snmpd.rr
syslogd.core-tarball.0.tgz
```

file show

Syntax	<code>file show <i>filename</i></code> <code><encoding base64></code>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display the contents of a file.
Options	<i>filename</i> —Name of a file. For a routing matrix, the filename must include the chassis information. <code>encoding base64</code> —(Optional) Encode file contents.
Required Privilege Level	maintenance
List of Sample Output	<code>file show</code> on page 372 <code>file show (Routing Matrix)</code> on page 372
Output Fields	When you enter this command, you are provided feedback on the status of your request.

```

file show user@host> file show /var/log/messages
Apr 13 21:00:08 romney /kernel: so-1/1/2: loopback suspected; going to standby.
Apr 13 21:00:40 romney /kernel: so-1/1/2: loopback suspected; going to standby.
Apr 13 21:02:48 romney last message repeated 4 times
Apr 13 21:07:04 romney last message repeated 8 times
Apr 13 21:07:13 romney /kernel: so-1/1/0: Clearing SONET alarm(s) RDI-P
Apr 13 21:07:29 romney /kernel: so-1/1/0: Asserting SONET alarm(s) RDI-P
...

```

```

file show user@host> file show lcc0-re0:/var/tmp/.gdbinit
(Routing Matrix) 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]
    end
end

```



```
        set $j = $j + 1
        if (!($j % 16))
            printf "\n"
        end
    end
end
```

show log

Syntax	show log <filename user <username>>
Syntax (Routing Matrix)	show log <all-lcc lcc <i>number</i> scc> <filename user <username>>
Release Information	Command introduced before JUNOS Release 7.4.
Description	List log files, display log file contents, or display information about users who have logged in to the router.
Options	<p>none—List all log files.</p> <p><all-lcc lcc <i>number</i> scc>—(Routing matrix only) (Optional) Display logging information about all T640 routing nodes (or line-card chassis) or a specific T640 routing node (replace <i>number</i> with a value from 0 through 3) connected to a TX Matrix platform. Or, display logging information about the TX Matrix platform (or switch-card chassis).</p> <p><i>filename</i>—(Optional) Display the log messages in the specified log file. For the routing matrix, the filename must include the chassis information.</p> <p>user <username>—(Optional) Display logging information about users who have recently logged in to the router. If you include <i>username</i>, display logging information about the specified user.</p>
Required Privilege Level	trace
List of Sample Output	show log on page 374 show log filename on page 374 show log user on page 375
Output Fields	Output field descriptions to be provided.

```

show log user@host> show log
total 57518
-rw-r--r--  1 root  bin      211663 Oct  1 19:44 dcd
-rw-r--r--  1 root  bin      999947 Oct  1 19:41 dcd.0
-rw-r--r--  1 root  bin      999994 Oct  1 17:48 dcd.1
-rw-r--r--  1 root  bin      238815 Oct  1 19:44 rpd
-rw-r--r--  1 root  bin     1049098 Oct  1 18:00 rpd.0
-rw-r--r--  1 root  bin     1061095 Oct  1 12:13 rpd.1
-rw-r--r--  1 root  bin     1052026 Oct  1 06:08 rpd.2
-rw-r--r--  1 root  bin     1056309 Sep 30 18:21 rpd.3
-rw-r--r--  1 root  bin     1056371 Sep 30 14:36 rpd.4
-rw-r--r--  1 root  bin     1056301 Sep 30 10:50 rpd.5
-rw-r--r--  1 root  bin     1056350 Sep 30 07:04 rpd.6
-rw-r--r--  1 root  bin     1048876 Sep 30 03:21 rpd.7
-rw-rw-r--  1 root  bin       19656 Oct  1 19:37 wtmp

```

```

show log filename user@host> show log rpd

```

```

Oct  1 18:00:18 trace_on: Tracing to ?/var/log/rpd? started
Oct  1 18:00:18 EVENT <MTU> ds-5/2/0.0 index 24 <Broadcast PointToPoint Multicast
Oct  1 18:00:18
Oct  1 18:00:19 KRT rcv len 56 V9 seq 148 op add Type route/if af 2 addr
13.13.13.21 nhop type local nhop 13.13.13.21
Oct  1 18:00:19 KRT rcv len 56 V9 seq 149 op add Type route/if af 2 addr
13.13.13.22 nhop type unicast nhop 13.13.13.22
Oct  1 18:00:19 KRT rcv len 48 V9 seq 150 op add Type ifaddr index 24 devindex
43
Oct  1 18:00:19 KRT rcv len 144 V9 seq 151 op chnge Type ifdev devindex 44
Oct  1 18:00:19 KRT rcv len 144 V9 seq 152 op chnge Type ifdev devindex 45
Oct  1 18:00:19 KRT rcv len 144 V9 seq 153 op chnge Type ifdev devindex 46
Oct  1 18:00:19 KRT rcv len 1272 V9 seq 154 op chnge Type ifdev devindex 47
...

```

```

show log user      user@host> show log user
darius  mg2546                Thu Oct  1 19:37   still logged in
darius  mg2529                Thu Oct  1 19:08 - 19:36 (00:28)
darius  mg2518                Thu Oct  1 18:53 - 18:58 (00:04)
root    mg1575                Wed Sep 30 18:39 - 18:41 (00:02)
root    ttyp2      jun.site.per Wed Sep 30 18:39 - 18:41 (00:02)
alex    ttyp1      192.168.1.2   Wed Sep 30 01:03 - 01:22 (00:19)

```


Chapter 10

Packet Forwarding Engine Operational Mode Commands

Table 93 on page 377 summarizes the command-line interface (CLI) commands you can use to perform and monitor Packet Forwarding Engine management functions. Commands are listed in alphabetical order.

Table 93: PFE Operational Mode Commands

Task	Command
Display Packet Forwarding Engine Compact Forwarding Engine Board (CFEB) status and statistics information.	<code>show pfe cfeb</code>
Display Packet Forwarding Engine Forwarding Engine Board (FEB) status and statistics information.	<code>show pfe feb</code>
Display Packet Forwarding Engine statistics for the specified Flexible PIC Concentrator (FPC).	<code>show pfe fpc</code>
(J-series routing platform only) Display Packet Forwarding Engine forwarding process (fwdd) status and statistics information.	<code>show pfe fwdd</code>
(Routing matrix only) Display Packet Forwarding Engine information for the specified T640 routing node (or line-card chassis).	<code>show pfe lcc</code>
Display Packet Forwarding Engine next-hop information.	<code>show pfe next-hop</code>
Display IPv4 Packet Forwarding Engine statistics.	<code>show pfe statistics ip</code>
(M320 and T320 routers, and T-640 routing platform only) Display Packet Forwarding Engine resource and L-chip SRAM memory usage statistics.	<code>show pfe resource usage memory</code>
Display the routes in the Packet Forwarding Engine forwarding table.	<code>show pfe route</code>
(M40 routers only) Display Packet Forwarding Engine System Control Board (SCB) status and statistics information.	<code>show pfe scb</code>
(M40e and M160 routers only) Display Packet Forwarding Engine Switching and Forwarding Module (SFM) status and statistics information.	<code>show pfe sfm</code>

Table 93: PFE Operational Mode Commands *(continued)*

Task	Command
(M20 routers only) Display Packet Forwarding Engine System and Switch Board (SSB) status and statistics information.	<code>show pfe ssb</code>
Display Packet Forwarding Engine direct memory access (DMA) statistics.	<code>show pfe statistics dma</code>
Display Packet Forwarding Engine error statistics.	<code>show pfe statistics error</code>
Display IPv4 Packet Forwarding Engine statistics.	<code>show pfe statistics ip</code>
Display Packet Forwarding Engine IPv6 statistics.	<code>show pfe statistics ip6</code>
Display Packet Forwarding Engine notification statistics.	<code>show pfe statistics notification</code>
Display Packet Forwarding Engine polled I/O (PIO) statistics.	<code>show pfe statistics pio</code>
Display Packet Forwarding Engine traffic statistics.	<code>show pfe statistics traffic</code>
Display Packet Forwarding Engine traffic statistics for Bidirectional Forwarding Detection (BFD).	<code>show pfe statistics traffic protocol bfd</code>
Display Packet Forwarding Engine traffic statistics for Connectivity Fault Management (CFM).	<code>show pfe statistics traffic protocol cfm</code>
Display Packet Forwarding Engine traffic statistics for Link Fault Management (LFM).	<code>show pfe statistics traffic protocol lfm</code>
Display Packet Forwarding Engine status information.	<code>show pfe terse</code>



NOTE: For information about how to configure PFE parameters, see the *JUNOS System Basics Configuration Guide*.

show pfe cfeb

Syntax	show pfe cfeb
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M7i routers only) Display Packet Forwarding Engine Compact Forwarding Engine Board (CFEB) status and statistics information.
Options	This command has no options.
Required Privilege Level	admin
List of Sample Output	show pfe cfeb on page 379
Output Fields	Output field descriptions to be provided.

```

show pfe cfeb user@host> show pfe cfeb
CFEB status:
  Slot:                Present
  State:                Online
  Last State Change:    2005-03-10 09:01:25 PST
  Uptime (total):       2d 00:44
  Failures:             0
  Pending:              0

```

```

Peer message type receive qualifiers:
Message Type      Receive Qualifier
-----
                TTP All
                IFD All
                IFL All
                Nexthop All
                COS All
                Route All
                SW Firewall All
                HW Firewall All
                PFE Statistics All
                PIC Statistics All
                Sampling All
                Monitoring None
                ASP None
                L2TP None
                Collector None
                PIC Configuration All
                Queue Statistics All
                (null) None

```

```

PFE listener statistics:
  Open:              1
  Close:             0
  Sleep:             0
  Wakeup:            0
  Resync Request:    0
  Resync Done:       1
  Resync Fail:       0
  Resync Time:       0

```

PFE IPC statistics:

type	TX Messages	RX messages
Header	0	0
Test	0	0
Interface	562	14582
Chassis	0	0
Boot	0	0
Next-hop	104	0
Jtree	0	0
Cprod	0	0
Route	103	1
Pfe	3770	2925
Dfw	10	0
Mastership	0	0
Sampling	0	0
GUCP	0	0
CoS	50	0
GCCP	0	0
GHCP	0	0
IRSD	0	0
Monitoring	0	0
RE	0	0
PIC	0	0
ASP cfg	0	0
ASP cmd	0	0
L2TP cfg	0	0
Collector	0	0
PIC state	0	0
Aggregator	0	0
Empty	0	0

PFE socket-buffer mbuf depth:

bucket	count
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0

PFE socket-buffer bytes pending transmit:

bucket	count
-----	-----

0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0

show pfe feb

Syntax	show pfe feb
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M5 and M10 routers only) Display Packet Forwarding Engine Forwarding Engine Board (FEB) status and statistics information.
Options	This command has no options.
Required Privilege Level	admin
List of Sample Output	show pfe feb on page 382
Output Fields	Output field descriptions to be provided.

```

show pfe feb user@host> show pfe feb
FEB status:
  Slot:                Present
  State:                Online
  Last State Change:    2005-03-11 00:33:57 PST
  Uptime (total):       1d 09:14
  Failures:             0
  Pending:              0

```

```

Peer message type receive qualifiers:
Message Type      Receive Qualifier
-----
          TTP      All
          IFD      All
          IFL      All
        Nexthop    All
          COS      All
          Route    All
        SW Firewall All
        HW Firewall All
      PFE Statistics All
      PIC Statistics All
        Sampling    All
        Monitoring  None
          ASP       None
          L2TP      None
        Collector   None
PIC Configuration  All
Queue Statistics   All
          (null)    None

```

```

PFE listener statistics:
  Open:              1
  Close:              0
  Sleep:              0
  Wakeup:             0
  Resync Request:     0
  Resync Done:        1
  Resync Fail:        0
  Resync Time:        0

```

PFE IPC statistics:

type	TX Messages	RX messages
Header	0	0
Test	0	0
Interface	639	11889
Chassis	0	0
Boot	0	0
Next-hop	104	0
Jtree	0	0
Cprod	0	0
Route	940	0
Pfe	3008	1995
Dfw	9	0
Mastership	0	0
Sampling	0	0
GUCP	0	0
CoS	35	0
GCCP	0	0
GHCP	0	0
IRSD	0	0
Monitoring	0	0
RE	0	0
PIC	0	0
ASP cfg	0	0
ASP cmd	0	0
L2TP cfg	0	0
Collector	0	0
PIC state	0	0
Aggregator	0	0
Empty	0	0

PFE socket-buffer mbuf depth:

bucket	count
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0

PFE socket-buffer bytes pending transmit:

bucket	count
--------	-------

-----	-----
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0

show pfe fpc

Syntax	<code>show pfe fpc slot</code>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display Packet Forwarding Engine statistics for the specified Flexible PIC Concentrator (FPC).
Options	<i>slot</i> —FPC slot number, for example, 0. The number of slots depends on the routing platform.
Required Privilege Level	admin
List of Sample Output	<code>show pfe fpc</code> on page 385
Output Fields	Output field descriptions to be provided.

```

user@host> show pfe fpc 1
FPC 1 status:
  Slot:                Present
  State:                Online
  Last State Change:    2000-01-10 18:12:27 UTC
  Uptime:               1d 03:31
  Failures:             0
  Pending:              0

PFE listener statistics:
  Open:                 1
  Close:                0
  Sleep:                0
  Wakeup:               0
  Resync Request:       0
  Resync Done:          0
  Resync Fail:          0
  Resync Time:          0

PFE IPC statistics:
type      TX Messages  RX messages
-----
Header    0            0
Test      0            0
Interface 2251          2219
Chassis   0            0
Boot      0            0
Next-hop  0            0
Jtree     0            0
Cprod     0            0
Route     0            0
Pfe       0            1
Dfw

```

show pfe fwdd

Syntax show pfe fwdd**Release Information** Command introduced before JUNOS Release 7.4.**Description** (J-series routing platform only) Display Packet Forwarding Engine forwarding process (fwdd) status and statistics information.**Options** This command has no options.**Required Privilege Level** view**List of Sample Output** show pfe fwdd on page 386**Output Fields** Output field descriptions to be provided.

```

user@host> show pfe fwdd
FWDD status:
  Slot:                Present
  State:               Online
  Last State Change:   2004-09-15 16:00:36 PDT
  Uptime (total):      1d 01:16
  Failures:            0
  Pending:             0

```

```

Peer message type receive qualifiers:
Message Type      Receive Qualifier
-----
                TTP Slot only
                IFD All
                IFL All
                Nexthop All
                COS All
                Route All
                SW Firewall All
                HW Firewall All
                PFE Statistics All
                PIC Statistics All
                Sampling All
                Monitoring All
                ASP Slot only
                L2TP None
                Collector None

```

PFE listener statistics:

```

Open:              1
Close:             0
Sleep:             0
Wakeup:            0
Resync Request:    0
Resync Done:       1
Resync Fail:       0
Resync Time:       0

```

PFE IPC statistics:

```

type      TX Messages  RX messages
-----

```

Header	0	0
Test	0	0
Interface	221	3189
Chassis	0	0
Boot	0	0
Next-hop	40	0
Jtree	0	0
Cprod	0	0
Route	45	0
Pfe	1907	1520
Dfw	16	0
Mastership	0	0
Sampling	0	0
GUCP	0	0
CoS	20	0
GCCP	0	0
GHCP	0	0
IRSD	0	0
Monitoring	0	0
RE	0	0
PIC	0	0
ASP cfg	0	0
ASP cmd	0	0
L2TP cfg	0	0
Collector	0	0
PIC state	0	0

PFE socket-buffer mbuf depth:

bucket	count
-----	-----
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0

PFE socket-buffer bytes pending transmit:

bucket	count
-----	-----
0	0
1	0
2	0
3	0
4	0

5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0

show pfe lcc

Syntax (Routing Matrix) show pfe lcc *number*

Release Information Command introduced before JUNOS Release 7.4.

Description (Routing matrix only) Display Packet Forwarding Engine status and statistics for the specified T640 routing node (or line-card chassis).

Options lcc *number*—Slot number of the T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace *number* with a value from 0 through 3.

Required Privilege Level admin

List of Sample Output show pfe lcc on page 389

Output Fields Output field descriptions to be provided.

```
user@host> show pfe lcc 0
LCC 0 status:
  Slot:                Present
  State:                Online
  Last State Change:    2005-03-10 19:31:50 PST
  Uptime (total):       1d 14:20
  Failures:             23
  Pending:              0
```

Peer message type receive qualifiers:

Message Type	Receive Qualifier
TTP	All detail
IFD	All detail
IFL	All detail
Nexthop	All
COS	All
Route	All
SW Firewall	All
HW Firewall	All
PFE Statistics	All
PIC Statistics	All
Sampling	All detail
Monitoring	All detail
ASP	All detail
L2TP	All detail
Collector	All detail

PFE listener statistics:

```
Open:                25
Close:               23
Sleep:               0
Wakeup:              0
Resync Request:      0
Resync Done:         2
Resync Fail:         0
Resync Time:         0
```

PFE IPC statistics:

type	TX Messages	RX messages
Header	0	0
Test	0	0
Interface	163	2923
Chassis	0	0
Boot	0	0
Next-hop	15	0
Jtree	0	0
Cprod	0	0
Route	100	0
Pfe	5369	3072
Dfw	11	0
Mastership	0	0
Sampling	0	0
GUCP	0	0
CoS	20	0
GCCP	0	0
GHCP	0	0
IRSD	0	0
Monitoring	0	0
RE	3	6930
PIC	0	0
ASP cfg	0	0
ASP cmd	0	0
L2TP cfg	0	0
Collector	0	0
PIC state	4	0

PFE socket-buffer mbuf depth:

bucket	count
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0

PFE socket-buffer bytes pending transmit:

bucket	count
0	0
1	0
2	0

3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0

show pfe next-hop

Syntax	show pfe next-hop <interface <i>interface-name</i> >
Syntax (Routing Matrix)	show pfe next-hop <fpc <i>slot</i> > <interface <i>interface-name</i> > <lcc <i>number</i> >
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display Packet Forwarding Engine next-hop information.
Options	<p>none—Display all Packet Forwarding Engine next-hop information.</p> <p>fpc <i>slot</i>—(Routing matrix only) (Optional) Show the next hops for a Flexible PIC Concentrator (FPC) slot.</p> <p>If you specify the number of a T640 routing node by using the lcc <i>number</i> option (the recommended method), replace <i>slot</i> with a value from 0 through 7. Otherwise, replace <i>slot</i> with a value from 0 through 31. For example, the following commands have the same result:</p> <pre> user@host> show pfe next-hop fpc 1 lcc 1 user@host> show pfe next-hop fpc 9 </pre> <p>interface <i>interface-name</i>—(Optional) Display the Packet Forwarding Engine next-hop interface.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Slot number of the T640 routing node (or line-card chassis) that houses the FPC. Replace <i>number</i> with a value from 0 through 3.</p>
Required Privilege Level	admin
List of Sample Output	<p>show pfe next-hop on page 393</p> <p>show pfe next-hop fpc (Routing Matrix) on page 393</p>
Output Fields	Output field descriptions to be provided.

show pfe next-hop

user@host> show pfe next-hop

NextHop Info:

ID	Type	Interface	Protocol	Encap	Next Hop Addr	MTU
4	Mcast	-	IPv4	-	0.0.0.0	0
5	Bcast	-	IPv4	-	-	0
7	Discard	-	IPv4	-	-	0
8	MDiscard	-	IPv4	-	-	0
9	Reject	-	IPv4	-	-	0
13	Local	-	IPv4	-	192.168.4.60	0
14	Resolve	fxp0.0	IPv4	Unspecified	-	0
17	Local	-	IPv4	-	127.0.0.1	0
18	Unicast	fxp0.0	IPv4	Unspecified	192.168.4.254	0
21	Local	-	IPv4	-	11.1.0.1	0
22	Unicast	at-0/1/0.0	IPv4	ATM SNAP	11.1.0.2	4482

...

**show pfe next-hop fpc
(Routing Matrix)**

user@host> show pfe next-hop fpc 1

Slot 1

NextHop Info:

ID	Type	Interface	Next Hop Addr	Protocol	Encap	MTU
5	Mcast	-	default	IPv4	-	0
6	Bcast	-	-	IPv4	-	0
8	Discard	-	-	IPv4	-	0
9	MDiscard	-	-	IPv4	-	0
13	Mcast	-	default	IPv6	-	0
17	MDiscard	-	-	IPv6	-	0
18	Reject	-	-	IPv6	-	0
24	Discard	-	-	None	-	0
68	Local	-	192.168.66.113	IPv4	-	0
69	Resolve	fxp0.0	-	IPv4	Unspecified	0
70	Unicast	fxp0.0	192.168.71.254	IPv4	Unspecified	0
256	Local	-	10.71.71.1	IPv4	-	0
257	Local	-	127.0.0.1	IPv4	-	0
258	Mcast.local..1	default	-	IPv4	Unspecified	0
259	Bcast.local..1	-	-	IPv4	Unspecified	0
261	Discard.local..1	-	-	IPv4	Unspecified	0
262	MDiscard.local..1	-	-	IPv4	Unspecified	0
269	Mcast.local..1	default	-	IPv6	Unspecified	0
271	Discard.local..1	-	-	IPv6	Unspecified	0

...

show pfe route

Syntax show pfe route
 <<inet6 | ip | iso> <prefix prefix> | <table <table-name> <index index> <prefix prefix>>>
 <mpls>
 <summary>

Syntax (Routing Matrix) show pfe route
 <fpc slot>
 <<inet6 | ip | iso> <prefix prefix> | <table <table-name> <index index> <prefix prefix>>>
 <lcc number>
 <mpls>
 <summary>

Release Information Command introduced before JUNOS Release 7.4.

Description Display the routes in the Packet Forwarding Engine forwarding table. The Packet Forwarding Engine forwards packets between input and output interfaces.



NOTE: The Routing Engine maintains a master copy of the forwarding table. It copies the forwarding table to the Packet Forwarding Engine, which is the part of the router responsible for forwarding packets. To display the routes in the Routing Engine forwarding table, use the **show route forwarding** table command. For more information, see the *JUNOS Routing Protocols and Policies Command Reference*.

Options none—Display all Packet Forwarding Engine forwarding table information.

fpc slot—(Routing matrix only) (Optional) Show the routes for a Flexible PIC Concentrator (FPC) slot. If you specify the number of a T640 routing node by using 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 pfe route fpc 1 lcc 1
user@host> show pfe route fpc 9
```

inet6—(Optional) Display Packet Forwarding Engine IPv6 routes.

ip—(Optional) Display Packet Forwarding Engine IPv4 routes.

iso —(Optional) Display ISO version routing tables.

prefix prefix—(Optional) IPv4 or IPv6 prefix for which to show table entries.

table <table-name> <index index> <prefix prefix>—(Optional) Display table information. Optionally, specify the table name, index, or prefix.

lcc number—(Routing matrix only) (Optional) Slot number of the T640 routing node (or line-card chassis) that houses the FPC. Replace *number* with a value from 0 through 3.

mpls—(Optional) Display Packet Forwarding Engine Multiprotocol Label Switching (MPLS) information.

summary—(Optional) Display summary of Packet Forwarding Engine information.

Required Privilege Level admin

List of Sample Output show pfe route ip on page 395
show pfe route iso on page 395
show pfe route lcc summary (Routing Matrix) on page 395

Output Fields Output field descriptions to be provided.

show pfe route ip user@host> show pfe route ip

```
IPv4 Route Table 0, default.0, 0x0:
Destination              NH IP Addr      Type      NH ID Interface
-----
default                  127.0.0.1      Discard    8
127.0.0.1                127.0.0.1      Local      256
172.16/12                192.168.71.254 Unicast    68 fxp0.0
192.168.0/18             192.168.71.254 Unicast    68 fxp0.0
192.168.40/22            192.168.71.254 Unicast    68 fxp0.0
192.168.64/18            192.168.71.254 Unicast    68 fxp0.0
192.168.64/21            192.168.71.254 Resolve    67 fxp0.0
192.168.71.249           192.168.71.249 Local       66
192.168.220.0/30         192.168.220.0 Resolve    303 fe-0/0/0.0
192.168.220.0            192.168.220.0 Receive    301 fe-0/0/0.0
224.0.0.1                Mcast          5
255.255.255.255         Bcast          6

...
```

show pfe route iso user@host# show pfe route iso

```
CLNS Route Table 0, CLNP.0, 0x0:
Destination              Type      NH ID Interface
-----
default                  Reject    60
47.0005.80ff.f800.0000.0108.0001.0102.5508.2159/152 Local     514
49.0001.00a0.c96b.c491/72 Local     536
```

show pfe route lcc summary user@host> show pfe route lcc 2 summary
(Routing Matrix) Slot 0

```
IPv4 Route Tables:
Index      Routes      Size(b)
-----
Default    43           3081
1          4            281

MPLS Route Tables:
Index      Routes      Size(b)
-----
Default    1           68
```

```

IPV6 Route Tables:
Index      Routes      Size(b)
-----
Default    9        717
1          5        389

```

Slot 1

```

IPv4 Route Tables:
Index      Routes      Size(b)
-----
Default    43       3081
1          4        281

```

MPLS Route Tables:

```

Index      Routes      Size(b)
-----
Default    1         68

```

```

IPV6 Route Tables:
Index      Routes      Size(b)
-----
Default    9        717
1          5        389

```

Slot 16

```

IPv4 Route Tables:
Index      Routes      Size(b)
-----
Default    41       2938
1          4        281

```

MPLS Route Tables:

```

Index      Routes      Size(b)
-----
Default    1         68

```

```

IPV6 Route Tables:
Index      Routes      Size(b)
-----
Default    9        717
1          5        389

```

Slot 17

```

IPv4 Route Tables:
Index      Routes      Size(b)
-----
Default    41       2938
1          4        281

```

MPLS Route Tables:

```

Index      Routes      Size(b)
-----
Default    1         68

```


IPv6 Route Tables:

Index	Routes	Size(b)
Default	9	717
1	5	389

show pfe scb

Syntax	show pfe scb
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M40 routers only) Display Packet Forwarding Engine System Control Board (SCB) status and statistics information.
Options	This command has no options.
Required Privilege Level	admin
List of Sample Output	show pfe scb on page 398
Output Fields	Output field descriptions to be provided.

```

user@host> show pfe scb
SCB status:
  Slot:                Present
  State:                Online
  Last State Change:   1999-02-05 11:02:36 UTC
  Uptime:              1d 02:31
  Failures:            0
  Pending:             0

PFE listener statistics:
  Open:                1
  Close:               0
  Sleep:              1
  Wakeup:             0
  Resync Request:      1
  Resync Done:         1
  Resync Fail:         0
  Resync Time:         0

PFE IPC statistics:
type      TX Messages  RX messages
-----
  Header          0          0
  Test            0          0
  Interface     10715     10594
  Chassis         0          0
  Boot            0          0
  Next-hop        8          0
  Jtree           0          0
  Cprod           0          0
  Route          11          0
  Pfe            1592       1593
  Dfw             0          0
  Mastership      0          0
  Empty           0          0

PFE socket-buffer mbuf depth:
bucket      count
-----
  0          5298
  1           0

```

2	0
3	0
4	0
5	0
6	0
7	0

...

PFE socket-buffer bytes pending transmit:

bucket	count
0	5298
1	0
2	0
3	0
4	2
5	3
6	1
7	1

...

show pfe sfm

Syntax	<code>show pfe sfm slot</code>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M40e and M160 routers only) Display Packet Forwarding Engine Switching and Forwarding Module (SFM) status and statistics information.
Options	<i>slot</i> —Display statistics from the specified SFM slot. Replace <i>slot</i> with a value from 0 through 3.
Additional Information	This command applies only to systems with multiple SFMs.
Required Privilege Level	admin
List of Sample Output	show pfe sfm on page 400
Output Fields	Output field descriptions to be provided.

```

show pfe sfm user@host> show pfe sfm 1
SFM 1 status:
  Slot:                Offline
  State:                Init
  Last State Change:    2000-03-01 07:45:55 UTC
  Downtime:             17:47:29
  Failures:             167
  Pending:              0

```

```

PFE listener statistics:
  Open:                 167
  Close:                167
  Sleep:                2
  Wakeup:               1
  Resync Request:       2
  Resync Done:          2
  Resync Fail:          0
  Resync Time:          1

```

```

PFE IPC statistics:
type      TX Messages  RX messages
-----
Header    0            0
Test      0            0
Interface 0            0
Chassis   0            0
Boot      0            0
Next-hop  0            0
Jtree     0            0
Cprod     0            0
Route     0            0
Pfe       0            0
Dfw       0            0
Mastership 0            0
Empty     0            0

```

```

PFE socket-buffer mbuf depth:

```

bucket	count
-----	-----
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0

PFE socket-buffer bytes pending transmit:

bucket	count
-----	-----
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0

show pfe ssb

Syntax show pfe ssb**Release Information** Command introduced before JUNOS Release 7.4.**Description** (M20 routers only) Display Packet Forwarding Engine System and Switch Board (SSB) status and statistics information.**Options** This command has no options.**Required Privilege Level** admin**List of Sample Output** show pfe ssb on page 402**Output Fields** Output field descriptions to be provided.

```

user@host> show pfe ssb
SSB status:
  Slot:                Present
  State:               Online
  Last State Change:   2005-03-06 03:10:28 PST
  Uptime (total):      11:23:27
  Failures:            0
  Pending:             0

```

```

Peer message type receive qualifiers:
Message Type      Receive Qualifier
-----

```

```

      TTP Slot only
      IFD All
      IFL All
      Nexthop All
      COS All
      Route All
      SW Firewall All
      HW Firewall All
      PFE Statistics All
      PIC Statistics None
      Sampling All
      Monitoring None
      ASP None
      L2TP None
      Collector None
      PIC Configuration None
      Queue Statistics None
      (null) None

```

```

PFE listener statistics:

```

```

  Open:             1
  Close:            0
  Sleep:            0
  Wakeup:           0
  Resync Request:   0
  Resync Done:      1
  Resync Fail:      0
  Resync Time:      0

```

PFE IPC statistics:

type	TX Messages	RX messages
-----	-----	-----
Header	0	0
Test	0	0
Interface	737	9911
Chassis	0	0
Boot	0	0
Next-hop	48	0
Jtree	0	0
Cprod	0	0
Route	94	0
Pfe	2034	683
Dfw	8	0
Mastership	0	0
Sampling	0	0
GUCP	0	0
CoS	73	0
GCCP	0	0
GHCP	0	0
IRSD	0	0
Monitoring	0	0
RE	0	0
PIC	0	0
ASP cfg	0	0
ASP cmd	0	0
L2TP cfg	0	0
Collector	0	0
PIC state	0	0
Aggregator	0	0
Empty	0	0

PFE socket-buffer mbuf depth:

bucket	count
-----	-----
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0

PFE socket-buffer bytes pending transmit:

bucket	count
-----	-----
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0

show pfe statistics dma

Syntax show pfe statistics dma

Syntax (Routing Matrix) show pfe statistics dma
 <fpc slot>
 <lcc number>

Release Information Command introduced before JUNOS Release 7.4.

Description Display Packet Forwarding Engine direct memory access (DMA) statistics.

Options none—Display all Packet Forwarding Engine direct memory access statistics.

fpc slot—(Routing matrix only) (Optional) Display statistics for a Flexible PIC Concentrator (FPC) slot.

If you specify the number of a T640 routing node by using 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 pfe statistics dma fpc 1 lcc 1
user@host> show pfe statistics dma fpc 9
```

lcc number—(Routing matrix only) (Optional) Display statistics for a specific T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace *number* with a value from 0 through 3.

Required Privilege Level admin

List of Sample Output show pfe statistics dma on page 405
 show pfe statistics dma lcc (Routing Matrix) on page 406

Output Fields Output field descriptions to be provided.

show pfe statistics dma user@host> show pfe statistics dma

DMA Statistics:

Name	Requests	Completed	Failed
Packet Read	905119	905119	0
Packet Write	943761	943761	0
Physical Read	0	0	0
Physical Write	0	0	0

DMA Errors:

Name	Write 0	Write 1	Read 0	Read 1
Illegal Bank	0	0	0	0
Address Range	0	0	0	0
ECC Error	0	0	0	0
PCI Retries	0	0	0	0
PCI Error	0	0	0	0

DMA Requests:

Requests available: 256, Requests used: 0

**show pfe statistics dma
lcc (Routing Matrix)**user@host> **show pfe statistics dma lcc 2**

Slot 0

DMA Statistics:

Name	Requests	Completed	Failed
-----	-----	-----	-----
Packet Read	10718	10718	0
Packet Write	9935	9935	0

DMA Errors:

Name	Write 0	Write 1	Read 0	Read 1
-----	-----	-----	-----	-----
Illegal Bank	0	0		
Address Range	0	0		
ECC Error	0	0		

DMA Requests:

Requests available: 768, Requests used: 0

DMA Statistics:

Name	Requests	Completed	Failed
-----	-----	-----	-----
Packet Read	0	0	0
Packet Write	0	0	0

DMA Errors:

Name	Write 0	Write 1	Read 0	Read 1
-----	-----	-----	-----	-----
Illegal Bank	0	0		
Address Range	0	0		
ECC Error	0	0		

DMA Requests:

Requests available: 768, Requests used: 0

Slot 1

DMA Statistics:

Name	Requests	Completed	Failed
-----	-----	-----	-----
Packet Read	2	2	0
Packet Write	10154	10154	0

DMA Errors:

Name	Write 0	Write 1	Read 0	Read 1
-----	-----	-----	-----	-----
Illegal Bank	0	0		
Address Range	0	0		
ECC Error	0	0		

DMA Requests:

Requests available: 768, Requests used: 0

Slot 16

DMA Statistics:

Name	Requests	Completed	Failed
-----	-----	-----	-----
Packet Read	0	0	0
Packet Write	0	0	0

DMA Errors:

Name	Write 0	Write 1	Read 0	Read 1
-----	-----	-----	-----	-----
Illegal Bank	0	0		
Address Range	0	0		
ECC Error	0	0		

DMA Requests:

Requests available: 768, Requests used: 0

DMA Statistics:

Name	Requests	Completed	Failed
-----	-----	-----	-----
Packet Read	0	0	0
Packet Write	0	0	0

DMA Errors:

Name	Write 0	Write 1	Read 0	Read 1
-----	-----	-----	-----	-----
Illegal Bank	0	0		
Address Range	0	0		
ECC Error	0	0		

DMA Requests:

Requests available: 768, Requests used: 0

Slot 17

DMA Statistics:

Name	Requests	Completed	Failed
-----	-----	-----	-----
Packet Read	0	0	0
Packet Write	0	0	0

DMA Errors:

Name	Write 0	Write 1	Read 0	Read 1
-----	-----	-----	-----	-----
Illegal Bank	0	0		
Address Range	0	0		
ECC Error	0	0		

DMA Requests:

Requests available: 768, Requests used: 0

show pfe statistics error

Syntax show pfe statistics error

Syntax (Routing Matrix) show pfe statistics error
 <fpc slot>
 <lcc number>

Release Information Command introduced before JUNOS Release 7.4.

Description Display Packet Forwarding Engine error statistics.

Options none—Display all Packet Forwarding Engine error statistics.

fpc slot—(Routing matrix only) (Optional) Display error statistics for a Flexible PIC Concentrator (FPC) slot. If you specify the number of a T640 routing node by using 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 pfe statistics error fpc 1 lcc 1
user@host> show pfe statistics error fpc 9
```

lcc number—(Routing matrix only) (Optional) Display error statistics for a specific T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace *number* with a value from 0 through 3.

Required Privilege Level admin

List of Sample Output show pfe statistics error on page 408
 show pfe statistics error lcc (Routing Matrix) on page 409
 show pfe statistics error on page 410

Output Fields Output field descriptions to be provided.

```
user@host> show pfe statistics error
PFE error statistics:
      C chip    A1 chip    A2 chip
-----
          0          0          0  scan fail
          0          0         N/A  A1<->C FCS error
          0         N/A          0  A2<->C FCS error
         N/A          0          0  A<->B FCS error
B chip slots:
          0          1          2          3
-----
          0          0          0          0  scan fail
          0          0          0          0  A1->B FCS error
          0          0          0          0  A2->B FCS error
          0          0          0          0  correctable ECC error
          0          0          0          0  uncorrectable ECC error
          0          0          0          0  multiple ECC errors
          0          0          0          0  B->HS link error
          0          0          0          0  A1->Bm error
          0          0          0          0  A2->Bo error
```

0	0	0	0	write buffer overflow
0	0	0	0	Bo FIFO sync error
0	0	0	0	Bo FIFO size error
0	0	0	0	Bo stream stuck error
0	0	0	0	Bo SRAM parity error
4	5	6	7	

0	0	0	0	scan fail
0	0	0	0	A1->B FCS error
0	0	0	0	A2->B FCS error
0	0	0	0	correctable ECC error
0	0	0	0	uncorrectable ECC error
0	0	0	0	multiple ECC errors
0	0	0	0	B->HS link error
0	0	0	0	A1->Bm error
0	0	0	0	A2->Bo error
0	0	0	0	write buffer overflow
0	0	0	0	Bo FIFO sync error
0	0	0	0	Bo FIFO size error
0	0	0	0	Bo stream stuck error
0	0	0	0	Bo SRAM parity error

show pfe statistics error lcc (Routing Matrix) user@host> **show pfe statistics error lcc 2**

Slot 0

LCHIP Error statistics:

LCHIP	0	1	2	3

Lin PIF:	0	0	0	0
Lin SRCTL:	0	0	0	0
Lout NLIF:	0	0	0	0
Lout DESRD:	0	0	0	0
Lout HDRF:	0	0	0	0

HSL Map for PFE complex 0 (Top):

Index	HST Name	---->	Index	HSR Name	Errors
=====	=====		=====	=====	=====
***** No errors on this PFE *****					

HSL Map for PFE complex 1 (Bottom):

Index	HST Name	---->	Index	HSR Name	Errors
=====	=====		=====	=====	=====
***** No errors on this PFE *****					

Slot 1

LCHIP Error statistics:

LCHIP	0	1	2	3

Lin PIF:	0	0	0	0
Lin SRCTL:	0	0	0	0
Lout NLIF:	0	0	0	0
Lout DESRD:	0	0	0	0
Lout HDRF:	0	0	0	0

HSL Map for PFE complex 1 (Bottom):

Index	HST Name	---->	Index	HSR Name	Errors
=====	=====		=====	=====	=====
***** No errors on this PFE *****					

show pfe statistics error user@host> **show pfe statistics error**

Slot 1

ICHIP Error statistics:

ICHIP	0	1	2	3
SPI4 Sink(Rx):	0	0	0	0
SPI4 Src(Tx):	0	0	0	0
Iwi SPI Total:	0	0	0	0
Iwi PIF:	0	0	0	0
Iwo DESRD:	0	0	0	0
Iwo HDRF:	0	0	0	0
Ipktwr Drops:	0	0	0	0
HSL2 Errors:				
***** No errors on this PFE *****				

show pfe statistics ip

Syntax	show pfe statistics ip <icmp options>
Syntax (Routing Matrix)	show pfe statistics ip <fpc slot> <icmp options> <lcc number>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display IPv4 Packet Forwarding Engine statistics.
Options	<p>none—Display all IPv4 Packet Forward Engine statistics.</p> <p>fpc slot—(Routing matrix only) (Optional) Display statistics for a Flexible PIC Concentrator (FPC) slot. If you specify the number of a T640 routing node by using 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:</p> <pre> user@host> show pfe statistics ip fpc 1 lcc 1 user@host> show pfe statistics ip fpc 9 </pre> <p>icmp—(Optional) Display Packet Forwarding Engine IP ICMP statistics.</p> <p>options—(Optional) Display Packet Forwarding Engine IP options statistics.</p> <p>lcc number—(Routing matrix only) (Optional) Display error statistics for a specific T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace number with a value from 0 through 3.</p>
Required Privilege Level	admin
List of Sample Output	<p>show pfe statistics ip icmp on page 412</p> <p>show pfe statistics ip options on page 413</p>
Output Fields	Table 94 on page 412 lists the output fields for the show pfe statistics ip command. Output fields are listed in the approximate order in which they appear.

Table 94: show pfe statistics ip Output Fields

Field Name	Field Description
ICMP Statistics	<p>ICMP statistics, including the following:</p> <ul style="list-style-type: none"> ■ requests—Number of ICMP notifications sent to the PFE. If a throttler is configured, the number of notifications might not reflect all requests made. (See the throttled icmps field description.) ■ network unreachable—When route lookups fail, ICMP packets are sent to the source. These packets are ICMP TypeDestination Unreachable (3) and ICMP Code = Network Unreachable (0). ■ ttl expired—Number of notifications processed as a result of time-to-live (TTL) expiration packets. ■ ttl captured—Number of TTL expired packets sent by PFE interfaces to the Routing Engine. ■ redirects—Number of ICMP errors sent with Type = Redirect (5). ■ mtu exceeded—Number of ICMP errors sent with Type = Source Quench (4). ■ icmp/option handoffs—Number of packets that the PFE hardware requests the PFE software to process.
ICMP errors	<p>ICMP errors, including the following:</p> <ul style="list-style-type: none"> ■ unknown unreachable—Unknown code (greater than 16) found for an unknown unreachable type ICMP error. ■ unsupported ICMP type—Any ICMP type other than UNREACH, REDIRECT, TIME_EXCEED, and PARAM_PROB. ■ unprocessed redirects—When trying to find the neighbor to send redirects to, the PFE could not find the next-hop information. ■ invalid ICMP type—Any ICMP type other than UNREACH, REDIRECT, TIME_EXCEED, and PARAM_PROB. ■ invalid protocol—An incorrect protocol was detected by the ICMP processor. ■ bad input interface if1—The PFE software cannot map the interface index supplied by the chips to a proper data structure in the microkernel. ■ throttled icmps—Number of requests dropped because of rate limiting by the PFE. ■ runts—Number of packets for which the IP header length is less than the minimum length that is supported.
ICMP Discards	<p>ICMP discard statistics, including the following:</p> <ul style="list-style-type: none"> ■ multicasts—ICMP packets are not sent for link-layer multicast packets. These are counted as invalid source addresses (not a unicast address or all zeros). ■ bad source addresses—ICMP packets were received from an invalid source address (not a unicast address or all zeros). ■ bad dest addresses—ICMP packets were sent to an invalid destination address (not a unicast address or all zeros). ■ IP fragments—ICMP responses are sent only for the first fragments. The rest do not receive a response. This is the count for ICMP requests that receive no response. ■ ICMP errors—Number of ICMP error packets.

```

show pfe statistics ip  user@host> show pfe statistics ip icmp
icmp                  ICMP Statistics:
                        0 requests
                        0 network unreachable
                        0 ttl expired
                        0 ttl captured
                        0 redirects

```



```

0 mtu exceeded
0 icmp/option handoffs
ICMP Errors:
0 unknown unreachable
0 unsupported ICMP type
0 unprocessed redirects
0 invalid ICMP type
0 invalid protocol
0 bad input interface
0 throttled icmps
0 runts
ICMP Discards:
0 multicasts
0 bad source addresses
0 bad dest addresses
0 IP fragments
0 ICMP errors

```

```

show pfe statistics ip options user@host> show pfe statistics ip options
IP Option Values:
LSRR/SSRR forwarding enabled
IP Option Statistics:
0 loose source routes
0 strict source routes
0 record routes
889382 router alerts
0 other options
IP Option Errors:
0 runts
2 bad versions
0 runt header lengths
0 giant header lengths
0 null frames
0 bad option lengths
0 duplicate options
0 bad option pointers
0 source route frames dropped
188 frames queued
1126 frames dropped

```

show pfe statistics ip6

Syntax	show pfe statistics ip6 <icmp>
Syntax (Routing Matrix)	show pfe statistics ip6 <fpc slot> <icmp> < lcc number>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display Packet Forwarding Engine IPv6 statistics.
Options	<p>none—Display all Packet Forwarding Engine IPv6 statistics.</p> <p>fpc slot—(Routing matrix only) (Optional) Display statistics for a Flexible PIC Concentrator slot. If you specify the number of a T640 routing node by using 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:</p> <pre> user@host> show pfe statistics ip6 fpc 1 lcc 1 user@host> show pfe statistics ip6 fpc 9 </pre> <p>icmp—(Optional) Display Packet Forwarding Engine IP ICMP statistics.</p> <p>lcc number—(Routing matrix only) (Optional) Display statistics for a specific T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace number with a value from 0 through 3.</p>
Required Privilege Level	admin
List of Sample Output	show pfe statistics ip6 icmp on page 415
Output Fields	Table 95 on page 415 lists the output fields for the show pfe statistics ip6 command. Output fields are listed in the approximate order in which they appear.

Table 95: show pfe statistics ip6 Output Fields

Field Name	Field Description
ICMP6 Statistics	<p>ICMP6 statistics, including the following:</p> <ul style="list-style-type: none"> ■ requests—Number of ICMP notifications sent to the PFE. If a throttler is configured, the number of notifications might not reflect all requests made. (See the throttled icmps field description.) ■ network unreachable—When route lookups fail, ICMP packets are sent to the source. These packets are ICMP Type = Destination Unreachable (3) and ICMP Code = Network Unreachable (0). ■ ttl expired—Number of notifications processed as a result of time-to-live (TTL) expiration packets. ■ ttl captured—Number of TTL expired packets sent by PFE interfaces to the Routing Engine. ■ redirects—Number of ICMP errors sent with Type = Redirect (5). ■ mtu exceeded—Number of ICMP errors sent with Type = Source Quench (4). ■ icmp/option handoffs—Number of packets that the PFE hardware requests the PFE software to process.
ICMP6 errors	<p>ICMP6 errors, including the following:</p> <ul style="list-style-type: none"> ■ unknown unreachable—Unknown code (greater than 16) found for an unknown unreachable type ICMP error. ■ unsupported ICMP type—Any ICMP type other than UNREACH, REDIRECT, TIME_EXCEED, and PARAM_PROB. ■ unprocessed redirects—When trying to find the neighbor to send redirects to, the PFE could not find the next-hop information. ■ invalid ICMP type—Any ICMP type other than UNREACH, REDIRECT, TIME_EXCEED, and PARAM_PROB. ■ invalid protocol—An incorrect protocol was detected by the ICMP processor. ■ bad input interface if1—The PFE software cannot map the interface index supplied by the chips to a proper data structure in the microkernel. ■ throttled icmps—Number of requests dropped because of rate limiting by the PFE. ■ runts—Number of packets for which the IP header length is less than the minimum length that is supported.
ICMP6 Discards	<p>ICMP6 discard statistics, including the following:</p> <ul style="list-style-type: none"> ■ multicasts—ICMP packets are not sent for link-layer multicast packets. These are counted as invalid source addresses (not a unicast address or all zeros). ■ bad source addresses—ICMP packets were received from an invalid source address (not a unicast address or all zeros). ■ bad dest addresses—ICMP packets were sent to an invalid destination address (not a unicast address or all zeros). ■ IP fragments—ICMP responses are sent only for the first fragments. The rest do not receive a response. This is the count for ICMP requests that receive no response. ■ ICMP errors—Number of ICMP error packets.

```

show pfe statistics ip6 icmp  user@host> show pfe statistics ip6 icmp
                                ICMP6 Statistics:
                                    0 requests
                                    0 network unreachable
                                    0 ttl expired
                                    0 ttl captured

```

```
0 redirects
0 mtu exceeded
0 icmp/option handoffs
ICMP6 Errors:
0 unknown unreachable
0 unsupported ICMP type
0 unprocessed redirects
0 invalid ICMP type
0 invalid protocol
0 bad input interface
0 throttled icmps
0 runts
ICMP6 Discards:
0 multicasts
0 bad source addresses
0 bad dest addresses
0 IP fragments
0 ICMP errors
```

show pfe statistics notification

Syntax show pfe statistics notification

Syntax (Routing Matrix) show pfe statistics notification
 <fpc slot>
 < lcc number>

Release Information Command introduced before JUNOS Release 7.4.

Description Display Packet Forwarding Engine notification statistics.

Options none—(Routing matrix only) Display statistics about the Packet Forwarding Engine notification on the TX Matrix platform and its attached T640 routing nodes.

fpc slot—(Routing matrix only) (Optional) Display notification for a Flexible PIC Concentrator (FPC) slot. If you specify the number of a T640 routing node by using 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 pfe statistics notification fpc 1 lcc 1
user@host> show pfe statistics notification fpc 9
```

lcc number—(Routing matrix only) (Optional) Display notification for a specific T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace *number* with a value from 0 through 3.

Required Privilege Level admin

List of Sample Output show pfe statistics notification on page 417
 show pfe statistics notification lcc (Routing Matrix) on page 418

Output Fields Output field descriptions to be provided.

show pfe statistics notification user@host> show pfe statistics notification
 PFE Notification statistics:

```
2453 parsed
0 aged
0 corrupt
0 illegal
0 sample
0 giants
0 transit options/ttl-exceeded
```

PFE Notification Type statistics:

	Parsed	Input	Failed	Ignored	
Illegal		0	0	0	0
Unclass		1733	1733	0	0
Option		0	0	0	0
Next-Hop		720	720	0	0
Discard		0	0	0	0
Sample		0	0	0	0
Redirect		0	0	0	0

```

DontFrag      0      0      0      0
CfDF          0      0      0      0

```

show pfe statistics notification lcc (Routing Matrix) user@host> **show pfe statistics notification lcc 0**
Slot 0

```

PFE Notification statistics:
  1252 parsed
    0 aged
    0 corrupt
    0 illegal
    0 sample
    0 giants
    0 transit options/ttl-exceeded
    0 transit options/ttl-exceeded errors
    0 svc options sent to ASP
    0 svc options sent to RE
    0 post svc options sent out
  121 options or ttl expired (not RE-destined)

```

```

PFE Notification Type statistics:
      Parsed      Input      Failed      Ignored
Illegal          0          0          0          0
Unclass         695         695          0          0
Option           30          30          0          0
Next-Hop        527         527          0          0
Discard          0          0          0          0
Sample           0          0          0          0
Redirect         0          0          0          0
DontFrag         0          0          0          0
CfDF             0          0          0          0
Poison           0          0          0          0

```

Slot 1

```

PFE Notification statistics:
  0 parsed
  0 aged
...

```

show pfe statistics pio

Syntax	show pfe statistics pio
Syntax (Routing Matrix)	show pfe statistics pio <fpc slot> < lcc number>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display Packet Forwarding Engine polled I/O (PIO) statistics.
Options	<p>none—(Routing matrix only) Display statistics about the Packet Forwarding Engine polled I/O on the TX Matrix platform and its attached T640 routing nodes.</p> <p>fpc slot—(Routing matrix only) (Optional) Display statistics for a Flexible PIC Concentrator (FPC) slot. If you specify the number of a T640 routing node by using 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:</p> <pre> user@host> show pfe statistics pio fpc 1 lcc 1 user@host> show pfe statistics pio fpc 9 </pre> <p>lcc number—(Routing matrix only) (Optional) Display statistics for a specific T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace number with a value from 0 through 3.</p>
Required Privilege Level	admin
List of Sample Output	show pfe statistics pio on page 419 show pfe statistics pio lcc (Routing Matrix) on page 419
Output Fields	Output field descriptions to be provided.
show pfe statistics pio	<pre> user@host> show pfe statistics pio PIO Statistics: 8542732 PIO read requests 8542732 PIO read replies 586193 PIO write requests 586191 PIO write replies 0 PIO error replies 0 PIO bad requests 0 PIO bad replies 0 PIO bad address 0 PIO extra replies 0 PIO timeouts </pre>
show pfe statistics pio lcc (Routing Matrix)	<pre> user@host> show pfe statistics pio lcc 0 Slot 0 PIO Statistics (chip 0): 425582 PIO reads 120303 PIO writes PIO Statistics (chip 1): 406993 PIO reads </pre>

```
117769 PIO writes
...
```


show pfe statistics traffic

Syntax	show pfe statistics traffic <fpc slot>
Syntax (Routing Matrix)	show pfe statistics traffic <fpc slot> < lcc number>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display Packet Forwarding Engine traffic statistics.
Options	<p>none—Display statistics about PFE traffic. On the TX Matrix platform, display statistics about PFE traffic for all its attached T640 routing nodes.</p> <p>fpc slot—(T-series and M320 platforms only) (Optional) Display statistics for a Flexible PIC Concentrator (FPC) slot. If you specify the number of a T640 routing node by using 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:</p> <pre> user@host> show pfe statistics traffic fpc 1 lcc 1 user@host> show pfe statistics traffic fpc 9 </pre> <p>lcc number—(Routing matrix only) (Optional) Display statistics for a specific T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace number with a value from 0 through 3.</p>
Required Privilege Level	admin
List of Sample Output	show pfe statistics traffic on page 423
Output Fields	Table 96 on page 421 lists the output fields for the show pfe statistics traffic command. Output fields are listed in the approximate order in which they appear.

Table 96: show pfe statistics traffic Output Fields

Field Name	Field Description
Packet Forwarding Engine Traffic statistics	<p>Information about Packet Forwarding Engine traffic:</p> <ul style="list-style-type: none"> ■ Input Packets—Number and rate of input packets. ■ Output Packets—Number and rate of output packets.

Table 96: show pfe statistics traffic Output Fields (continued)

Field Name	Field Description
Packet Forwarding Engine Local Traffic statistics	<p>Information about Packet Forwarding Engine local traffic:</p> <ul style="list-style-type: none"> ■ Local packets input—Number of local input packets. ■ Local packets output—Number of local output packets. ■ Software input high drops—Number of software input high-priority drops. ■ Software input medium drops—Number of software input medium-priority drops. ■ Software input low drops—Number of software input low-priority drops. ■ Software output drops—Number of software output drops. ■ Hardware input drops—Number of hardware input drops.
Packet Forwarding Engine Local Protocol statistics	<p>Information about the Packet Forwarding Engine Local Protocol:</p> <ul style="list-style-type: none"> ■ HDLC keepalives—Number of HDLC keepalive packets. ■ ATM OAM—Number of Asynchronous Transfer Mode (ATM) Operation, Administration, and Maintenance (OAM) packets. ■ Frame Relay LMI—Number of Frame Relay Local Management Interface (LMI) packets. ■ PPP LCP/NCP—Number of Point-to-Point Protocol (PPP) Link Control Protocol (LCP) or Network Control Protocol (NCP) packets. ■ OSPF hello—Number of Open Shortest Path First (OSPF) hello packets. ■ OSPF3 hello—Number of Open Shortest Path First version 3 (OSPFv3) hello packets. ■ RSVP hello—Number of Reservation Setup Protocol (RSVP) hello packets. ■ LDP hello—Number of Label Distribution Protocol (LDP) hello packets. ■ BFD—Number of Bidirectional Forwarding Detection Protocol (BFD) hello packets. ■ IS-IS IIH—Number of Intermediate System-to-Intermediate System Hello (IIH) packets. ■ LACP—Number of Link Aggregation Control Protocol (LACP) packets. ■ ARP—Number of Address Resolution Protocol (ARP) packets. ■ ETHER OAM—Number of Ethernet Operations, Administration, and Management (OAM) packets. ■ Unknown—Number of unknown packets not matching any of the packet types listed above.
Packet Forwarding Engine Hardware Discard statistics	<p>Information about Packet Forwarding Engine hardware discards:</p> <ul style="list-style-type: none"> ■ Timeout—Number of packets discarded because of timeouts. ■ Truncated key—Number of packets discarded because of truncated keys. ■ Bits to test—Number of bits to test. ■ Data error—Number of packets discarded because of data errors. ■ Stack underflow—Number of packets discarded because of stack underflows. ■ Stack overflow—Number of packets discarded because of stack overflows. ■ Normal discard—Number of packets discarded because of discard routes. ■ Extended discard—Number of packets discarded because of illegal next hops. ■ Invalid interface—Number of packets discarded because of invalid incoming interfaces. ■ Info cell drops—Number of information cell drops. ■ Fabric drops—Number of fabric drops.

```

show pfe statistics user@host> show pfe statistics traffic
traffic Packet Forwarding Engine traffic statistics:
          Input packets:          102682          5 pps
          Output packets:         58033          4 pps
Packet Forwarding Engine local traffic statistics:
          Local packets input      :          44628
          Local packets output    :          46146
          Software input control plane drops :          0
          Software input high drops :          0
          Software input medium drops :          0
          Software input low drops  :          0
          Software output drops    :          0
          Hardware input drops     :          0
Packet Forwarding Engine local protocol statistics:
          HDLC keepalives         :          0
          ATM OAM                  :          0
          Frame Relay LMI         :          0
          PPP LCP/NCP              :          5597
          OSPF hello               :          3195
          OSPF3 hello              :          0
          RSVP hello               :          0
          LDP hello                :          7478
          BFD                      :          0
          IS-IS IIH                :          0
          LACP                     :          0
          ARP                     :          0
          ETHER OAM                :          0
          Unknown                  :          8
Packet Forwarding Engine hardware discard statistics:
          Timeout                  :          0
          Truncated key            :          0
          Bits to test             :          0
          Data error               :          0
          Stack underflow          :          0
          Stack overflow           :          0
          Normal discard           :          0
          Extended discard         :          0
          Invalid interface        :          0
          Info cell drops          :          0
          Fabric drops             :          0
Packet Forwarding Engine Input IPv4 Header Checksum Error and Output MTU Error
statistics:
          Input Checksum           :          0
          Output MTU               :          0

```

show pfe statistics traffic protocol bfd

Syntax	show pfe statistics traffic protocol bfd <fpc slot>
Syntax (Routing Matrix)	show pfe statistics traffic protocol bfd <fpc slot> <lcc number>
Release Information	Command introduced in JUNOS Release 8.4.
Description	Display Packet Forwarding Engine traffic protocol statistics for Bidirectional Forwarding Detection hello packets.
Options	<p>None—Display all PFE traffic protocol BFD statistics.</p> <p>fpc slot—(M320 and MX960 routers, and T-series routing platform only) (Optional) Display statistics for a Flexible PIC Concentrator (FPC) slot.</p> <p>user@host> show pfe statistics traffic protocol bfd fpc 1</p> <p>lcc number—(Routing matrix only) (Optional) Display statistics for a specific T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>user@host> show pfe statistics traffic protocol bfd fpc 1 lcc 1</p>
Required Privilege Level	admin
List of Sample Output	show pfe statistics traffic protocol bfd on page 425
Output Fields	Table 97 on page 424 lists the output fields for the show pfe statistics traffic protocol bfd command. Output fields are listed in the approximate order in which they appear.

Table 97: show pfe statistics traffic protocol bfd Output Fields

Field Name	Field Description
Packets with invalid interface	Number of packets discarded due to invalid interface.
Packets with invalid address family	Number of packets discarded due to invalid address family.
Packets with bad IP checksum	Number of packets discarded due to bad IP checksum.
Packets with bad IP options	Number of packets discarded due to bad IP options.
Packets with bad IP length	Number of packets discarded due to bad IP length.

Table 97: show pfe statistics traffic protocol bfd Output Fields *(continued)*

Field Name	Field Description
Packets with bad udp checksum	Number of packets discarded due to bad UDP checksum.
Packets with bad udp length	Number of packets discarded due to bad UDP length.
Packets with bad udp ports	Number of packets discarded due to bad UDP ports.
Packets with no logical interface	(T640 and M20 only) Number of packets discarded due to non-availability of logical interface.
Packets with prefix length mismatch	(T640 and M20 only) Number of packets discarded due to prefix length mismatch.
Packets received	Number of packets received.
Packets absorbed	Number of packets absorbed.
Packets failed to transmit	Number of packets discarded due to transmission failure.
Packets receive failures	Number of packet receive failures.
Packets allocation failures	Number of packet allocation failures.

show pfe statistics traffic protocol bfd user@host> **show pfe statistics traffic protocol bfd**

```

BFD protocol statistics:
Packets with invalid interface      : 0
Packets with invalid address family : 0
Packets with bad IP checksum        : 0
Packets with bad IP options         : 0
Packets with bad IP length          : 0
Packets with bad udp checksum       : 0
Packets with bad udp length         : 0
Packets with bad udp ports          : 0
Packets with no logical interface   : 0
Packets with prefix length mismatch : 0
Packets received                    : 0
Packets absorbed                    : 0
Packets failed to transmit          : 0
Packets receive failures            : 0
Packets allocation failures          : 0

```

show pfe statistics traffic protocol cfm

Syntax	show pfe statistics traffic protocol cfm <fpc slot >
Syntax (Routing Matrix)	show pfe statistics traffic protocol cfm <fpc slot > <lcc number>
Release Information	Command introduced in JUNOS Release 8.5.
Description	Display Packet Forwarding Engine traffic protocol statistics for Connectivity Fault Management (CFM).
Options	None—Display all PFE traffic protocol CFM statistics. fpc slot—(M320 and MX960 routers, and T-series routing platform only) (Optional) Display statistics for a Flexible PIC Concentrator (FPC) slot. user@host> show pfe statistics traffic protocol cfm fpc 1 lcc number—(Routing matrix only) (Optional) Display statistics for a specific T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3. user@host> show pfe statistics traffic protocol cfm fpc 1 lcc 1
Required Privilege Level	admin
List of Sample Output	show pfe statistics traffic protocol cfm on page 427
Output Fields	Table 98 on page 426 lists the output fields for the show pfe statistics traffic protocol cfm command. Output fields are listed in the approximate order in which they appear.

Table 98: show pfe statistics traffic protocol cfm Output Fields

Field Name	Field Description
Packets transmitted	Number of packets transmitted.
Packets failed to transmit	Number of packets that were not transmitted.
Packets received	Number of packets received.
Packets sent to RE	Number of packets sent to the Routing Engine.
Packets absorbed	Number of packets absorbed.
Packets with invalid length	Number of packets with invalid length.

Table 98: show pfe statistics traffic protocol cfm Output Fields *(continued)*

Field Name	Field Description
Packets with sequence number	Number of packets with a sequence number.
Packets dropped (Invalid)	Number of invalid packets dropped.

```

show pfe statistics      user@host> show pfe statistics traffic protocol cfm
traffic protocol cfm
CFM protocol statistics:
Packets transmitted      : 0
Packets failed to transmit : 0
Packets received         : 0
Packets send to RE       : 0
Packets absorbed         : 0
Packets with invalid length : 0
Packets with sequence number : 0
Packets dropped (Invalid) : 0

```

show pfe statistics traffic protocol lfm

Syntax	show pfe statistics traffic protocol lfm <fpc slot >
Syntax (Routing Matrix)	show pfe statistics traffic protocol lfm <fpc slot> <lcc number>
Release Information	Command introduced in JUNOS Release 8.5
Description	Display Packet Forwarding Engine traffic protocol Link Fault Management (LFM) statistics.
Options	<p>none—Display all PFE traffic protocol LFM statistics.</p> <p>fpc slot—(M320 and MX960 routers, and T-series routing platform only) (Optional) Display statistics for a Flexible PIC Concentrator (FPC) slot.</p> <p>user@host> show pfe statistics traffic protocol lfm fpc 1</p> <p>lcc number—(Routing matrix only) (Optional) Display statistics for a specific T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>user@host> show pfe statistics traffic protocol lfm fpc 1 lcc 1</p>
Required Privilege Level	admin
List of Sample Output	show pfe statistics traffic protocol lfm on page 429
Output Fields	Table 99 on page 428 lists the output fields for the show pfe statistics traffic protocol lfm command. Output fields are listed in the approximate order in which they appear.

Table 99: show pfe statistics traffic protocol lfm Output Fields

Field Name	Field Description
Packets transmitted	Number of packets transmitted.
Packets failed to transmit	Number of packets that were not transmitted.
Packets received	Number of packets received.
Packets send to RE	Number of packets sent to the Routing Engine.
Packets absorbed	Number of packets absorbed.
Packets dropped (Invalid)	Number of invalid packets dropped.

show pfe statistics user@host> **show pfe statistics traffic protocol lfm**
traffic protocol lfm

user@host> show pfe statistics traffic protocol lfm

LFM protocol statistics:
Packets transmitted : 0
Packets failed to transmit : 0
Packets received : 0
Packets send to RE : 0
Packets absorbed : 0
Packets dropped (Invalid) : 0

show pfe terse

Syntax show pfe terse**Syntax (Routing Matrix)** show pfe terse
<fcc *number* | scc>**Release Information** Command introduced before JUNOS Release 7.4.**Description** Display Packet Forwarding Engine status information.**Options** none—(Routing matrix only) Display brief information about the Packet Forwarding Engine on the TX Matrix platform and its attached T640 routing nodes.fcc *number*—(Routing matrix only) (Optional) Display Packet Forwarding Engine information for a specific T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace *number* with a value from 0 through 3.

scc—(Routing matrix only) (Optional) Display Packet Forwarding Engine information for the TX Matrix platform (or switch-card chassis).

Required Privilege Level admin**List of Sample Output** show pfe terse on page 430**Output Fields** Output field descriptions to be provided.

```

show pfe terse user@host> show pfe terse
Slot Type Slot  State  Flags Uptime
0  SFM  Present Online  0x0bf 01:25:42
2  SFM  Present Online  0x0bf 01:25:40
0  FPC  Present Online  0x102 01:25:57
1  FPC  Present Online  0x102 01:25:55
2  FPC  Present Online  0x102 01:25:53

```

show pfe resource usage memory

Syntax show pfe resource usage memory (fpc <0..n>) (extensive | brief)

Release Information Command introduced in JUNOS Release 9.3.

Description (M320 and T320 routers, and T-640 routing platform only) Display Packet Forwarding Engine resource and L-chip SRAM memory usage statistics.



NOTE: On M320 routers, this command is not supported for the following FPCs:

- M320 E3-FPC Type 1
- M320 E3-FPC Type 2
- M320 E3-FPC Type 3

Options fpc slot—(Optional) Display L-chip-based FPC SRAM usage statistics for a Flexible PIC Concentrator (FPC) slot.

user@host> **show pfe resource usage memory fpc 1**

brief | extensive—(Optional) Display the specified level of output.

Required Privilege Level admin

List of Sample Output show pfe resource usage memory on page 432

Output Fields Table 100 on page 431 lists the output fields for the show pfe resource usage memory command. Output fields are listed in the approximate order in which they appear.

Table 100: show pfe resource usage memory Output Fields

Field Name	Field Description
Resource Name	Name of the resource, including: <ul style="list-style-type: none"> ■ FPC ■ Pfe
Free	Free L-chip SRAM memory.
Inuse	L-chip SRAM memory that is currently in use.
Total	Total of Free and Inuse memory.
%Use	Percentage of Total L-chip memory that is in use.

```

show pfe resource usage memory
user@host> show pfe resource usage memory
Resource Name                               Free      Inuse      Total      %Use

  Fpc 0                                     (* - resource 80% used)

Pfe 1   Lin  2

SRAM Pages (Page = 4096 bytes)    510         2         512         0.39

Pfe 1   Lout 2

L2rw Zones (Bytes)
Multicast List Table              16384         0         16384         0.00
L2 Descriptor Table              2080744        24         2080768        0.00
L2 Tag Table                      488          24          512          4.69

Pfe 1   Lin  3

SRAM Pages (Page = 4096 bytes)    511         1         512         0.20

Pfe 1   Lout 3

L2rw Zones (Bytes)
Multicast List Table              16384         0         16384         0.00
L2 Descriptor Table              2080768         0         2080768        0.00
L2 Tag Table                      504           8          512          1.56

Resource Name                               Free      Inuse      Total      %Use

  Fpc 1                                     (* - resource 80% used)

Pfe 1   Lin  2

SRAM Pages (Page = 4096 bytes)    511         1         512         0.20

Pfe 1   Lout 2

L2rw Zones (Bytes)
Multicast List Table              16384         0         16384         0.00
L2 Descriptor Table              2080768         0         2080768        0.00
L2 Tag Table                      504           8          512          1.56

Pfe 1   Lin  3

SRAM Pages (Page = 4096 bytes)    511         1         512         0.20

Pfe 1   Lout 3

L2rw Zones (Bytes)
Multicast List Table              16384         0         16384         0.00
L2 Descriptor Table              2080696        72         2080768        0.00
L2 Tag Table                      496          16          512          3.12

Resource Name                               Free      Inuse      Total      %Use

  Fpc 3                                     (* - resource 80% used)

  Fpc 5                                     (* - resource 80% used)

user@host> show pfe resource usage memory fpc 0 extensive

```

Resource Name	Free	Inuse	Total	%Use
Fpc 0				
(* - resource 80% used)				
Pfe 2 Lin 3				
SRAM Pages (Page = 4096 bytes)	510	3	512	0.59
Channel Table Pages		1		
Accounting Pages		1		
Pfe 2 Lout 3				
L2rw Zones (Bytes)				
Multicast List Table	16384	0	16384	0.00
L2 Descriptor Table	2080748	20	2080768	0.00
L2 Tag Table	488	24	512	4.69
Pfe 2 Lin 4				
SRAM Pages (Page = 4096 bytes)	511	33	512	6.45
Channel Table Pages		0		
Accounting Pages		1		
Pfe 2 Lout 4				
L2rw Zones (Bytes)				
Multicast List Table	16384	0	16384	0.00
L2 Descriptor Table	2080768	0	2080768	0.00
L2 Tag Table	504	8	512	1.56

Chapter 11

Remote System Access Operational Mode Commands

Table 101 on page 435 summarizes the command-line interface (CLI) commands you can use to access remote systems. Commands are listed in alphabetical order.

Table 101: Remote System Access Operational Mode Commands

Task	Command
Open a Secure Shell (SSH) connection to a remote system.	ssh
Open a telnet session to a remote system.	telnet



NOTE: To configure SSH and Telnet parameters, see the *JUNOS System Basics Configuration Guide*.

ssh

Syntax `ssh host`
`<bypass-routing>`
`<inet | inet6>`
`<interface interface-name>`
`<logical-system logical-system-name>`
`<routing-instance routing-instance-name>`
`<source address>`
`<v1 | v2>`

Release Information Command introduced before JUNOS Release 7.4.

Description Use the Secure Shell (SSH) program to open a connection between a local router and a remote system and execute commands on the remote system. You can issue the `ssh` command from the JUNOS CLI to log in to a remote system or from a remote system to log in to the local router. When executing this command, you include one or more CLI commands by enclosing them in quotation marks and separating the commands with semicolons:

```
ssh address 'cli-command1 ; cli-command2 '
```

Options `host`—Name or address of the remote system.

`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.

`inet | inet6`—(Optional) Create an IPv4 or IPv6 connection, respectively.

`interface interface-name`—(Optional) Interface name for the SSH session. (This option does not work when `default-address-selection` is configured at the `[edit system]` hierarchy level, because this configuration uses the loopback interface as the source address for all locally generated IP packets.)

`logical-system logical-system-name`—(Optional) Name of a particular logical system for the SSH attempt.

`routing-instance routing-instance-name`—(Optional) Name of the routing instance for the SSH attempt.

`source address`—(Optional) Source address of the SSH connection.

`v1 | v2`—(Optional) Use SSH version 1 or 2, respectively, when connecting to a remote host.

Additional Information To configure an SSH (version 1) key for your user account, include the **authentication ssh-rsa** statement at the `[edit system login user user-name]` hierarchy level. To configure an SSH (version 2) key for your user account, include the **authentication dsa-rsa** statement at the `[edit system login user user-name]` hierarchy level. For details, see the *JUNOS System Basics Configuration Guide*.

Beginning with Release 8.0, you can limit the number of times a user can attempt to enter a password while logging in through SSH. To specify the number of times a user can attempt to enter a password to log in through SSH, include the **retry-options** statement at the `[edit system login]` hierarchy level. For details, see the *JUNOS System Basics Configuration Guide*.

If you use SSH to connect between a router running JUNOS Release 5.x and one running Release 4.x, the console displays warnings because of minor discrepancies between the two implementations: “Warning: Server lies about size of server host key: actual size is 1023 bits vs. announced 1024. Warning: This may be due to an old implementation of ssh.” The warnings are informational and do not affect SSH operation.

Required Privilege Level network

List of Sample Output ssh on page 437

Output Fields When you enter this command, you are provided feedback on the status of your request.

```
ssh user@host> ssh cree
Host key not found from the list of known hosts.
Are you sure you want to continue connecting (yes/no)? yes

Host ?cree' added to the list of known hosts.
boojun@cree's password:
Last login: Sun Jun 21 10:43:42 1998 from junos-router
% ...
```

telnet

Syntax telnet *host*
 <8bit>
 <bypass-routing>
 <inet | inet6>
 <interface *interface-name*>
 <logical-system *logical-system-name*>
 <no-resolve>
 <port *port-number*>
 <routing-instance *routing-instance-name*>
 <source *source-address*>

Release Information Command introduced before JUNOS Release 7.4.

Description Open a telnet session to a remote system. Type Ctrl +] to escape from the telnet session to the telnet command level, and then type **quit** to exit from telnet.

Options *host*—Name or address of the remote system.

8bit—(Optional) Use an 8-bit data path.

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.

inet | inet6—(Optional) Open an IPv4 or IPv6 session, respectively.

interface *interface-name*—(Optional) Interface name for the telnet session. (This option does not work when **default-address-selection** is configured at the [edit system] hierarchy level, because this configuration uses the loopback interface as the source address for all locally generated IP packets.)

logical-system *logical-system-name*—(Optional) Name of a particular logical system for the telnet attempt.

no-resolve—(Optional) Do not attempt to determine the hostname that corresponds to the IP address.

port *port-number*—(Optional) Port number or service name on the remote system.

routing-instance *routing-instance-name*—(Optional) Name of the routing instance for the telnet attempt.

source *source-address*—(Optional) Source address of the telnet connection.

Additional Information Beginning with Release 8.0, you can limit the number of times a user can attempt to enter a password while logging in through telnet. To specify the number of times a user can attempt to enter a password to log in through telnet, include the `retry-options` statement at the `[edit system login]` hierarchy level. For details, see the *JUNOS System Basics Configuration Guide*.

Required Privilege Level network

List of Sample Output telnet on page 439

Output Fields When you enter this command, you are provided feedback on the status of your request.

```
telnet user@host> telnet 192.154.1.254
Trying 192.154.169.254...
Connected to level5.company.net.
Escape character is '^]'.
ttypa
login:
```


Chapter 12

Simple Network Management Protocol Operational Mode Commands

Table 102 on page 441 summarizes the command-line interface (CLI) commands that allow you to monitor the Simple Network Management Protocol (SNMP). Commands are listed in alphabetical order.

Table 102: SNMP Operational Commands

Task	Command
Clear SNMP statistics.	<code>clear snmp statistics</code>
Spoof (mimic) the behavior of an SNMP trap.	<code>request snmp spoof-trap</code>
Display information about health monitor alarms.	<code>show snmp health-monitor</code>
Display statistics about SNMP informs.	<code>show snmp inform-statistics</code>
Display local Management Information Base (MIB) object values through the command-line interface (CLI).	<code>show snmp mib</code>
Display information about Remote Monitoring (RMON) alarms and events.	<code>show snmp rmon</code>
Display statistics about SNMP packets sent and received.	<code>show snmp statistics</code>
Display SNMP version 3 statistics.	<code>show snmp v3</code>



NOTE: For information about how to configure SNMP, see the *JUNOS Network Management Configuration Guide*.

clear snmp statistics

Syntax	clear snmp statistics
Release Information	Command introduced before JUNOS Release 7.4.
Description	Clear Simple Network Management Protocol (SNMP) statistics.
Options	This command has no options.
Required Privilege Level	clear
Related Topics	show snmp statistics
List of Sample Output	clear snmp statistics on page 442
Output Fields	See show snmp statistics for an explanation of output fields.
clear snmp statistics	<p>In the following example, SNMP statistics are displayed before and after the clear snmp statistics command is issued:</p> <pre> user@host> show snmp statistics SNMP statistics: Input: Packets: 8, Bad versions: 0, Bad community names: 0, Bad community uses: 0, ASN parse errors: 0, Too bigs: 0, No such names: 0, Bad values: 0, Read onlys: 0, General errors: 0, Total request varbinds: 8, Total set varbinds: 0, Get requests: 0, Get nexts: 8, Set requests: 0, Get responses: 0, Traps: 0, Silent drops: 0, Proxy drops 0 Output: Packets: 2298, Too bigs: 0, No such names: 0, Bad values: 0, General errors: 0, Get requests: 0, Get nexts: 0, Set requests: 0, Get responses: 8, Traps: 2290 user@host> clear snmp statistics user@host> show snmp statistics SNMP statistics: Input: Packets: 0, Bad versions: 0, Bad community names: 0, Bad community uses: 0, ASN parse errors: 0, Too bigs: 0, No such names: 0, Bad values: 0, Read onlys: 0, General errors: 0, Total request varbinds: 0, Total set varbinds: 0, Get requests: 0, Get nexts: 0, Set requests: 0, Get responses: 0, Traps: 0, Silent drops: 0, Proxy drops 0 Output: Packets: 0, Too bigs: 0, No such names: 0, Bad values: 0, General errors: 0, Get requests: 0, Get nexts: 0, Set requests: 0, Get responses: 0, Traps: 0 </pre>

request snmp spoof-trap

Syntax	request snmp spoof-trap <trap> variable-bindings <object> <instance> <value>
Release Information	Command introduced in JUNOS Release 8.2.
Description	Spoof (mimic) the behavior of a Simple Network Management Protocol (SNMP) trap.
Options	<p><trap>—Name of the trap to spoof.</p> <p>variable-bindings <object> <instance> <value>—(Optional) List of variables and values to include in the trap. Each variable binding is specified as an object name, the object instance, and the value (for example, ifIndex[14] = 14). Enclose the list of variable bindings in quotation marks (" ") and use a comma to separate each object name, instance, and value definition (for example, variable-bindings "ifIndex[14] = 14, ifAdminStatus[14] = 1, ifOperStatus[14] = 2"). Objects included in the trap definition that do not have instances and values specified as part of the command are included in the trap and spoofed with automatically generated instances and values.</p>
Required Privilege Level	request
List of Sample Output	request snmp spoof-trap (with Variable Bindings) on page 443 request snmp spoof-trap (Illegal Trap Name) on page 443
request snmp spoof-trap (with Variable Bindings)	<pre>user@host> request snmp spoof-trap linkUp variable-bindings "ifIndex[14] = 14, ifAdminStatus[14] = 1, ifOperStatus[14] = 2" Spoof trap request result: trap sent successfully</pre>
request snmp spoof-trap (Illegal Trap Name)	<pre>user@host> request snmp spoof-trap xx Spoof trap request result: trap not found</pre> <p>Allowed Traps:</p> <pre>adslAtucInitFailureTrap adslAtucPerfESsThreshTrap adslAtucPerfLoFsThreshTrap adslAtucPerfLoIsThreshTrap adslAtucPerfLossThreshTrap adslAtucPerfLprsThreshTrap adslAtucRateChangeTrap adslAturPerfESsThreshTrap adslAturPerfLoFsThreshTrap adslAturPerfLossThreshTrap adslAturPerfLprsThreshTrap adslAturRateChangeTrap apsEventChannelMismatch apsEventFEPLF apsEventModeMismatch apsEventPSBF apsEventSwitchover authenticationFailure bfdSessDown bfdSessUp bgpBackwardTransition bgpEstablished</pre>

```

coldStart
dlswTrapCircuitDown
dlswTrapCircuitUp
dlswTrapTConnDown
dlswTrapTConnPartnerReject
dlswTrapTConnProtViolation
dlswTrapTConnUp
dsx1LineStatusChange
dsx3LineStatusChange
fallingAlarm
frDLCIStatusChange
ggsnTrapChanged
ggsnTrapCleared
ggsnTrapNew
ipv6IfStateChange
isisAreaMismatch
isisAttemptToExceedMaxSequence
isisAuthenticationFailure
isisAuthenticationTypeFailure
isisCorruptedLSPDetected
isisDatabaseOverload
isisIDLenMismatch
isisLSPTooLargeToPropagate
isisManualAddressDrops
isisMaxAreaAddressesMismatch
isisOriginatingLSPBufferSizeMismatch
isisOwnLSPPurge
isisProtocolsSupportedMismatch
isisRejectedAdjacency
isisSequenceNumberSkip
isisVersionSkew
jnxBgpM2BackwardTransition
jnxBgpM2Established
jnxCmCfgChange
jnxCmRescueChange
jnxCollFlowOverload
jnxCollFlowOverloadCleared
jnxCollFtpSwitchover
jnxCollMemoryAvailable
jnxCollMemoryUnavailable
jnxCollUnavailableDest
jnxCollUnavailableDestCleared
jnxCollUnsuccessfulTransfer
jnxDfcHardMemThresholdExceeded
jnxDfcHardMemUnderThreshold
jnxDfcHardPpsThresholdExceeded
jnxDfcHardPpsUnderThreshold
jnxDfcSoftMemThresholdExceeded
jnxDfcSoftMemUnderThreshold
jnxDfcSoftPpsThresholdExceeded
jnxDfcSoftPpsUnderThreshold
jnxEventTrap
jnxFanFailure
jnxFanOK
jnxFruCheck
jnxFruFailed
jnxFruInsertion
jnxFruOffline
jnxFruOnline
jnxFruPowerOff
jnxFruPowerOn

```



```

jnxFruRemoval
jnxLdpLspDown
jnxLdpLspUp
jnxLdpSesDown
jnxLdpSesUp
jnxMplsLdpInitSesThresholdExceeded
jnxMplsLdpPathVectorLimitMismatch
jnxMplsLdpSessionDown
jnxMplsLdpSessionUp
jnxOverTemperature
jnxPMonOverloadCleared
jnxPMonOverloadSet
jnxPingEgressJitterThresholdExceeded
jnxPingEgressStdDevThresholdExceeded
jnxPingEgressThresholdExceeded
jnxPingIngressJitterThresholdExceeded
jnxPingIngressStddevThresholdExceeded
jnxPingIngressThresholdExceeded
jnxPingRttJitterThresholdExceeded
jnxPingRttStdDevThresholdExceeded
jnxPingRttThresholdExceeded
jnxPowerSupplyFailure
jnxPowerSupplyOK
jnxRedundancySwitchover
jnxRmonAlarmGetFailure
jnxRmonGetOk
jnxSonetAlarmCleared
jnxSonetAlarmSet
jnxSpSvcSetCpuExceeded
jnxSpSvcSetCpuOk
jnxSpSvcSetZoneEntered
jnxSpSvcSetZoneExited
jnxSyslogTrap
jnxTemperatureOK
jnxVpnIfDown
jnxVpnIfUp
jnxVpnPwDown
jnxVpnPwUp
linkDown
linkUp
mfrMibTrapBundleLinkMismatch
mplsLspChange
mplsLspDown
mplsLspPathDown
mplsLspPathUp
mplsLspUp
mplsNumVrfRouteMaxThreshExceeded
mplsNumVrfRouteMidThreshExceeded
mplsNumVrfSecIllglblThrshExcd
mplsTunnelDown
mplsTunnelReoptimized
mplsTunnelRerouted
mplsTunnelUp
mplsVrfIfDown
mplsVrfIfUp
mplsXCDown
mplsXCUp
msdpBackwardTransition
msdpEstablished
ospfIfAuthFailure
ospfIfConfigError

```

ospfIfRxBadPacket
ospfIfStateChange
ospfLsdbApproachingOverflow
ospfLsdbOverflow
ospfMaxAgeLsa
ospfNbrStateChange
ospfOriginateLsa
ospfTxRetransmit
ospfVirtIfAuthFailure
ospfVirtIfConfigError
ospfVirtIfRxBadPacket
ospfVirtIfStateChange
ospfVirtIfTxRetransmit
ospfVirtNbrStateChange
pingProbeFailed
pingTestCompleted
pingTestFailed
risingAlarm
sd1cLSStatusChange
sd1cPortStatusChange
traceRoutePathChange
traceRouteTestCompleted
traceRouteTestFailed
vrrpTrapAuthFailure
vrrpTrapNewMaster
warmStart

show snmp health-monitor

Syntax	show snmp health-monitor <alarms <detail>> <logs>
Release Information	Command introduced in JUNOS Release 8.0.
Description	Display information about Simple Network Management Protocol (SNMP) health monitor alarms and logs.
Options	<p>none—Display information about all health monitor alarms and logs.</p> <p>alarms <detail>—(Optional) Display detailed information about health monitor alarms.</p> <p>logs—(Optional) Display information about health monitor logs.</p>
Required Privilege Level	view
List of Sample Output	<p>show snmp health-monitor on page 449</p> <p>show snmp health-monitor alarms detail on page 451</p>
Output Fields	Table 103 on page 447 describes the output fields for the <code>show snmp health-monitor</code> command. Output fields are listed in the approximate order in which they appear.

Table 103: show snmp health-monitor Output Fields

Field Name	Field Description	Level of Output
Alarm Index	Alarm identifier.	All levels
Variable description	Description of the health monitor object instance being monitored.	All levels
Variable name	Name of the health monitor object instance being monitored.	All levels
Value	Current value of the monitored variable in the most recent sample interval.	All levels

Table 103: show snmp health-monitor Output Fields (continued)

Field Name	Field Description	Level of Output
State	<p>State of the alarm or event entry:</p> <ul style="list-style-type: none"> ■ Alarms: <ul style="list-style-type: none"> ■ active—Entry is fully configured and activated. ■ falling threshold crossed—Value of the variable has crossed the lower threshold limit. ■ rising threshold crossed—Value of the variable has crossed the upper threshold limit. ■ under creation—Entry is being configured and is not yet activated. ■ startup—Alarm is waiting for the first sample of the monitored variable. ■ object not available—Monitored variable of that type is not available to the health monitor agent. ■ instance not available—Monitored variable's instance is not available to the health monitor agent. ■ object type invalid—Monitored variable is not a numeric value. ■ object processing errored—An error occurred when the monitored variable was processed. ■ unknown—State is not one of the above. 	All levels
Variable OID	Object ID to which the variable name is resolved. The format is x.x.x.x.	detail
Sample type	Method of sampling the monitored variable and calculating the value to compare against the upper and lower thresholds. It can have the value of absolute value or delta value .	detail
Startup alarm	<p>Alarm that might be sent when this entry is first activated, depending on the following criteria:</p> <ul style="list-style-type: none"> ■ Alarm is sent when one of the following situations exists: <ul style="list-style-type: none"> ■ Value of the alarm is above or equal to the rising threshold and the startup type is either rising alarm or rising or falling alarm. ■ Value of the alarm is below or equal to the falling threshold and the startup type is either falling alarm or rising or falling alarm. ■ Alarm is <i>not</i> sent when one of the following situations exists: <ul style="list-style-type: none"> ■ Value of the alarm is above or equal to the rising threshold and the startup type is falling alarm. ■ Value of the alarm is below or equal to the falling threshold and the startup type is rising alarm. ■ Value of the alarm is between the thresholds. 	detail
Owner	Name of the entry configured by the user. If the entry was created through the CLI, the owner has monitor prepended to it.	detail
Creator	Mechanism by which the entry was configured (Health Monitor).	detail
Sample interval	Time period between samples (in seconds).	detail
Rising threshold	Upper limit threshold value as a percentage of the maximum possible value.	detail

Table 103: show snmp health-monitor Output Fields (continued)

Field Name	Field Description	Level of Output
Falling threshold	Lower limit threshold value as a percentage of the maximum possible value.	detail
Rising event index	Event triggered when the rising threshold is crossed.	detail
Falling event index	Event triggered when the falling threshold is crossed.	detail

**show snmp
health-monitor**

user@host> show snmp health-monitor

Alarm

Index	Variable description	Value	State
32768	Health Monitor: root file system utilization jnxHrStoragePercentUsed.1	58	active
32769	Health Monitor: /config file system utilization jnxHrStoragePercentUsed.2	0	active
32770	Health Monitor: RE 0 CPU utilization jnxOperatingCPU.9.1.0.0	0	active
32773	Health Monitor: RE 0 Memory utilization jnxOperatingBuffer.9.1.0.0	35	active
32775	Health Monitor: jkernel daemon CPU utilization		
	Init daemon	0	active
	Chassis daemon	50	active
	Firewall daemon	0	active
	Interface daemon	5	active
	SNMP daemon	11	active
	MIB2 daemon	42	active
	Sonet APS daemon	0	active
	VRRP daemon	0	active
	Alarm daemon	3	active
	PFE daemon	0	active
	CRAFT daemon	0	active
	Traffic sampling control daemon	0	active
	Ilmi daemon	0	active
	Remote operations daemon	0	active
	CoS daemon	0	active
	Pic Services Logging daemon	0	active
	Internal Routing Service Daemon	3	active
	Network Access Service daemon	0	active
	Forwarding UDP daemon	0	active
	Routing socket proxy daemon	0	active
	Disk Monitoring daemon	1	active
	Inet daemon	0	active
	Syslog daemon	0	active
	Adaptive Services PIC daemon	0	active
	ECC parity errors logging Daemon	0	active
	Layer 2 Tunneling Protocol daemon	0	active
	PPPoE daemon	3	active
	Redundancy device daemon	0	active
	PPP daemon	0	active
	Dynamic Flow Capture Daemon	0	active

```

32776 Health Monitor: jroute daemon CPU utilization
Routing protocol daemon          1 active
Management daemon               0 active
Management daemon               0 active
Command line interface          4 active
Periodic Packet Management daemon 0 active
Link Management daemon          0 active
Pragmatic General Multicast daemon 0 active
Bidirectional Forwarding Detection daemon 0 active
SRC daemon                      0 active
audit daemon                   0 active
Event daemon                    0 active

32777 Health Monitor: jcrypto daemon CPU utilization
IPSec Key Management daemon      0 active

32779 Health Monitor: jkernel daemon Memory utilization
Init daemon                     47384 active
Chassis daemon                  20204 active
Firewall daemon                 1956 active
Interface daemon                3340 active
SNMP daemon                     4540 active
MIB2 daemon                     3880 active
Sonet APS daemon                2632 active
VRRP daemon                     2672 active
Alarm daemon                    1856 active
PFE daemon                      2600 active
CRAFT daemon                    2000 active
Traffic sampling control daemon 3164 active
Ilmi daemon                     2132 active
Remote operations daemon        2964 active
CoS daemon                      3044 active
Pic Services Logging daemon     1944 active
Internal Routing Service Daemon 1392 active
Network Access Service daemon   1992 active
Forwarding UDP daemon           1876 active
Routing socket proxy daemon     1296 active
Disk Monitoring daemon          1180 active
Inet daemon                     1296 active
Syslog daemon                   1180 active
Adaptive Services PIC daemon    3220 active
ECC parity errors logging Daemon 1100 active
Layer 2 Tunneling Protocol daemon 3372 active
PPPoE daemon                    1424 active
Redundancy device daemon        1820 active
PPP daemon                      2060 active
Dynamic Flow Capture Daemon     10740 active

32780 Health Monitor: jroute daemon Memory utilization
Routing protocol daemon          8104 active
Management daemon               13360 active
Management daemon               19252 active
Command line interface          9912 active
Periodic Packet Management daemon 1484 active
Link Management daemon          2016 active
Pragmatic General Multicast daemon 1968 active
Bidirectional Forwarding Detection daemon 1956 active
SRC daemon                      1772 active
audit daemon                   1772 active
Event daemon                    1808 active

```

```
32781 Health Monitor: jcrypto daemon Memory utilization
IPSec Key Management daemon                    5600 active
```

show snmp
health-monitor alarms
detail

```
user@host> show snmp health-monitor alarms detail
```

```
Alarm Index 32768:
Variable name          jnxHrStoragePercentUsed.1
Variable OID           1.3.6.1.4.1.2636.3.31.1.1.1.1.1
Sample type            absolute value
Startup alarm          rising alarm
Owner                  Health Monitor: root file system
                      utilization
Creator                Health Monitor
State                  active
Sample interval        300 seconds
Rising threshold       80
Falling threshold      70
Rising event index     32768
Falling event index    32768
Instance Value: 58
Instance State: active

Alarm Index 32769:
Variable name          jnxHrStoragePercentUsed.2
Variable OID           1.3.6.1.4.1.2636.3.31.1.1.1.1.2
Sample type            absolute value
Startup alarm          rising alarm
Owner                  Health Monitor: /config file system
                      utilization
Creator                Health Monitor
State                  active
Sample interval        300 seconds
Rising threshold       80
Falling threshold      70
Rising event index     32768
Falling event index    32768
Instance Value: 0
Instance State: active

Alarm Index 32770:
Variable name          jnxOperatingCPU.9.1.0.0
Variable OID           1.3.6.1.4.1.2636.3.1.13.1.8.9.1.0.0
Sample type            absolute value
Startup alarm          rising alarm
Owner                  Health Monitor: RE 0 CPU utilization

Creator                Health Monitor
State                  active
Sample interval        300 seconds
Rising threshold       80
Falling threshold      70
Rising event index     32768
Falling event index    32768
Instance Value: 0
Instance State: active

Alarm Index 32773:
Variable name          jnxOperatingBuffer.9.1.0.0
Variable OID           1.3.6.1.4.1.2636.3.1.13.1.11.9.1.0.0
Sample type            absolute value
```

```

Startup alarm          rising alarm
Owner                  Health Monitor: RE 0 Memory utilization

Creator                Health Monitor
State                  active
Sample interval        300 seconds
Rising threshold       80
Falling threshold      70
Rising event index     32768
Falling event index    32768
    Instance Value: 35
    Instance State: active

Alarm Index 32775:
Variable name          sysAppElmtRunCPU.3
Variable OID           1.3.6.1.2.1.54.1.2.3.1.9.3
Sample type            delta value
Startup alarm          rising alarm
Owner                  Health Monitor: jkernel daemon CPU
                        utilization
Creator                Health Monitor
State                  active
Sample interval        300 seconds
Rising threshold       24000
Falling threshold      21000
Rising event index     32768
Falling event index    32768
    Instance Name: sysAppElmtRunCPU.3.1.1
    Instance Description: Init daemon
    Instance Value: 0
    Instance State: active

    Instance Name: sysAppElmtRunCPU.3.2.2786
    Instance Description: Chassis daemon
    Instance Value: 50
    Instance State: active

    Instance Name: sysAppElmtRunCPU.3.3.2938
    Instance Description: Firewall daemon
    Instance Value: 0
    Instance State: active

    Instance Name: sysAppElmtRunCPU.3.4.2942
    Instance Description: Interface daemon
    Instance Value: 5
    Instance State: active

    Instance Name: sysAppElmtRunCPU.3.7.7332
    Instance Description: SNMP daemon
    Instance Value: 11
    Instance State: active

    Instance Name: sysAppElmtRunCPU.3.9.2914
    Instance Description: MIB2 daemon
    Instance Value: 42
    Instance State: active

    Instance Name: sysAppElmtRunCPU.3.12.2916
    Instance Description: Sonet APS daemon
    Instance Value: 0

```



```
Instance State: active

Instance Name: sysAppElmtRunCPU.3.13.2917
Instance Description: VRRP daemon
Instance Value: 0
Instance State: active

Instance Name: sysAppElmtRunCPU.3.14.2787
Instance Description: Alarm daemon
Instance Value: 3
Instance State: active

Instance Name: sysAppElmtRunCPU.3.15.2940
Instance Description: PFE daemon
Instance Value: 0
Instance State: active

Instance Name: sysAppElmtRunCPU.3.16.2788
Instance Description: CRAFT daemon
Instance Value: 0
Instance State: active

Instance Name: sysAppElmtRunCPU.3.17.2918
Instance Description: Traffic sampling control daemon
---(more 23%)---
```

show snmp inform-statistics

Syntax	show snmp inform-statistics
Release Information	Command introduced in JUNOS Release 7.4.
Description	Display information about Simple Network Management Protocol (SNMP) inform requests.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show snmp inform-statistics on page 454
Output Fields	Table 104 on page 454 describes the output fields for the show snmp inform-statistics command. Output fields are listed in the approximate order in which they appear.

Table 104: show snmp inform-statistics Output Fields

Field Name	Field Description
Target Name	Name of the device configured to receive and respond to SNMP informs.
Address	IP address of the target device.
Sent	Number of informs sent to the target device and acknowledged by the target device.
Pending	Number of informs held in memory pending a response from the target device.
Discarded	Number of informs discarded after the specified number of retransmissions to the target device were attempted.
Timeouts	Number of informs that did not receive an acknowledgement from the target device within the timeout specified.
Probe Failures	Connection failures that occurred (for example, when the target server returned invalid content or you incorrectly configured the target address).

```

show snmp      user@host> show snmp inform-statistics
inform-statistics Inform Request Statistics:
                    Target Name: TA1_v3_md5_none Address: 172.17.20.184
                    Sent: 176, Pending: 0
                    Discarded: 0, Timeouts: 0, Probe Failures: 0
                    Target Name: TA2_v3_sha_none Address: 192.168.110.59
                    Sent: 0, Pending: 4
                    Discarded: 84, Timeouts: 0, Probe Failures: 258
                    Target Name: TA5_v2_none Address: 172.17.20.184
                    Sent: 0, Pending: 0
                    Discarded: 2, Timeouts: 10, Probe Failures: 0

```

show snmp mib

Syntax	<code>show snmp mib (get get-next walk)<name "name name name ..."></code>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display local Simple Network Management Protocol (SNMP) Management Information Base (MIB) object values.
Options	<p><code>get</code>—Retrieve and display one or more SNMP object values.</p> <p><code>get-next</code>—Retrieve and display the next SNMP object values.</p> <p><code>walk</code>—Retrieve and display the SNMP object values that are associated with the requested object identifier (OID). When you use this option, the JUNOS software displays the objects below the subtree that you specify.</p> <p><code>name</code>—(Optional) The object can be represented by a sequence of dotted integers (such as 1.3.6.1.2.1.2) or by its subtree name (such as <code>interfaces</code>). When entering multiple objects, enclose the objects in quotation marks.</p>
Required Privilege Level	<code>snmp</code> —To view this statement in the configuration.
List of Sample Output	<p><code>show snmp mib get</code> on page 455</p> <p><code>show snmp mib get (Multiple Objects)</code> on page 455</p> <p><code>show snmp mib get-next</code> on page 456</p> <p><code>show snmp mib get-next (Specify an OID)</code> on page 456</p> <p><code>show snmp mib walk</code> on page 456</p>
Output Fields	Table 105 on page 455 describes the output fields for the <code>show snmp mib</code> command. Output fields are listed in the approximate order in which they appear.

Table 105: show snmp mib Output Fields

Field Name	Field Description
<i>name</i>	Object name and numeric instance value.
<i>object value</i>	Object value. The JUNOS software translates OIDs into the corresponding object names.

show snmp mib get	<pre>user@host> show snmp mib get sysObjectID.0 sysObjectID.0 = jnxProductNameM20</pre>
show snmp mib get (Multiple Objects)	<pre>user@host> show snmp mib get ?sysObjectID.0 sysUpTime.0? sysObjectID.0 = jnxProductNameM20 sysUpTime.0 = 1640992</pre>

```
show snmp mib get-next user@host> show snmp mib get-next jnxMibs
jnxBoxClass.0 = jnxProductLineM20.0

show snmp mib get-next user@host> show snmp mib get-next 1.3.6.1
(Specify an OID) sysDescr.0 = Juniper Networks, Inc. m20 internet router, kernel
JUNOS release: 2004-1 Build date: build date UTC Copyright (c) 1996-2004 Juniper
Networks, Inc.

show snmp mib walk user@host> show snmp mib walk system
sysDescr.0 = Juniper Networks, Inc. m20 internet router, kernel
JUNOS release #0: 2004-1 Build date: build date UTC Copyright (c) 1996-2004 Juniper
Networks, Inc.
sysObjectID.0 = jnxProductNameM20
sysUpTime.0 = 1640992
sysContact.0 = Your contact
sysName.0 = my router
sysLocation.0 = building 1
sysServices.0 = 4
```

show snmp rmon

Syntax	show snmp rmon <alarms <brief detail> events <brief detail> logs>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display information about Simple Network Management Protocol (SNMP) Remote Monitoring (RMON) alarms and events.
Options	<p>none—Display information about all RMON alarms and events.</p> <p>alarms—(Optional) Display information about RMON alarms.</p> <p>brief detail—(Optional) Display brief or detailed information about RMON alarms or events.</p> <p>events—(Optional) Display information about RMON events.</p> <p>logs—(Optional) Display information about RMON monitoring logs.</p>
Required Privilege Level	view
List of Sample Output	<p>show snmp rmon on page 459</p> <p>show snmp rmon alarms detail on page 459</p> <p>show snmp rmon events detail on page 460</p>
Output Fields	Table 106 on page 457 describes the output fields for the show snmp rmon command. Output fields are listed in the approximate order in which they appear.

Table 106: show snmp rmon Output Fields

Field Name	Field Description	Level of Output
Alarm Index	Alarm identifier.	All levels

Table 106: show snmp rmon Output Fields (continued)

Field Name	Field Description	Level of Output
State	<p>State of the alarm or event entry:</p> <p>Alarms:</p> <ul style="list-style-type: none"> ■ active—Entry is fully configured and activated. ■ falling threshold crossed—Value of the variable has crossed the lower threshold limit. ■ rising threshold crossed—Value of the variable has crossed the upper threshold limit. ■ under creation—Entry is being configured and is not yet activated. ■ startup—Alarm is waiting for the first sample of the monitored variable. ■ object not available—Monitored variable of that type is not available to the SNMP agent. ■ instance not available—Monitored variable's instance is not available to the SNMP agent. ■ object type invalid—Monitored variable is not a numeric value. ■ object processing errored—An error occurred when the monitored variable was processed. ■ unknown—State is not one of the above. <p>Events:</p> <ul style="list-style-type: none"> ■ active—Entry has been fully configured and activated. ■ under creation—Entry is being configured and is not yet activated. ■ unknown—State is not one of the above. 	All levels
Variable name	Name of the SNMP object instance being monitored.	All levels
Event Index	Event identifier.	All levels
Type	<p>Type of notification made when an event is triggered. It can be one of the following:</p> <ul style="list-style-type: none"> ■ log—A system log message is generated and an entry is made to the log table. ■ snmptrap—An SNMP trap is sent to the configured destination. ■ log and trap—A system log message is generated, an entry is made to the log table, and an SNMP trap is sent to the configured destination. ■ none—Neither log nor trap will be sent. 	detail
Last Event	Date and time of the last event. It has the format <i>yyyy-mm-dd hh:mm:ss timezone</i> .	brief
Community	Identifies the trap group used for sending the SNMP trap.	detail
Variable OID	Object ID to which the variable name is resolved. The format is x.x.x.x.	detail
Sample type	Method of sampling the monitored variable and calculating the value to compare against the upper and lower thresholds. It can have the value of absolute value or delta value .	detail

Table 106: show snmp rmon Output Fields (continued)

Field Name	Field Description	Level of Output
Startup alarm	Alarm that might be sent when this entry is first activated, depending on the following criteria: <ul style="list-style-type: none"> ■ Alarm is sent when one of the following situations exists: <ul style="list-style-type: none"> ■ Value of the alarm is above or equal to the rising threshold and the startup type is either rising alarm or rising or falling alarm. ■ Value of the alarm is below or equal to the falling threshold and the startup type is either falling alarm or rising or falling alarm. ■ Alarm is <i>not</i> sent when one of the following situations exists: <ul style="list-style-type: none"> ■ Value of the alarm is above or equal to the rising threshold and the startup type is falling alarm. ■ Value of the alarm is below or equal to the falling threshold and the startup type is rising alarm. ■ Value of the alarm is between the thresholds. 	detail
Owner	Name of the entry configured by the user. If the entry was created through the CLI, the owner has monitor prepended to it.	detail
Creator	Mechanism by which the entry was configured (CLI or SNMP).	detail
Sample interval	Time period between samples (in seconds).	detail
Rising threshold	Upper limit threshold value configured by the user.	detail
Falling threshold	Lower limit threshold value configured by the user.	detail
Rising event index	Event triggered when the rising threshold is crossed.	detail
Falling event index	Event triggered when the falling threshold is crossed.	detail
Current value	Current value of the monitored variable in the most recent sample interval.	detail

```

show snmp rmon      user@host> show snmp rmon
Alarm
Index  State                      Variable name
   1    falling threshold crossed  ifInOctets.1

Event
Index  Type                        Last Event
   1    log and trap              2002-01-30 01:13:01 PST

```

```

show snmp rmon alarms detail  user@host> show snmp rmon alarms detail

Alarm Index 1:
Variable name      ifInOctets.1
Variable OID       1.3.6.1.2.1.2.2.1.10.1
Sample type        delta value
Startup alarm      rising or falling alarm
Owner              monitor
Creator            CLI

```

State	falling threshold crossed
Sample interval	60 seconds
Rising threshold	100000
Falling threshold	80000
Rising event index	1
Falling event index	1
Current value	0

show snmp rmon events detail user@host> **show snmp rmon events detail**

Event Index 1:

Type	log and trap
Community	boy-elroy
Last event	2002-01-30 01:13:01 PST
Creator	CLI
State	active

show snmp statistics

Syntax	show snmp statistics
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display statistics about Simple Network Management Protocol (SNMP) packets sent and received by the router.
Options	This command has no options.
Required Privilege Level	view
Related Topics	clear snmp statistics
List of Sample Output	show snmp statistics on page 464
Output Fields	Table 107 on page 461 describes the output fields for the <code>show snmp statistics</code> command. Output fields are listed in the approximate order in which they appear.

Table 107: show snmp statistics Output Fields

Field Name	Field Description
Input	<p>Information about received packets:</p> <ul style="list-style-type: none"> ■ Packets(snmplnPks)—Total number of messages delivered to the SNMP entity from the transport service. ■ Bad versions—(snmplnBadVersions) Total number of messages delivered to the SNMP entity that were for an unsupported SNMP version. ■ Bad community names—(snmplnBadCommunityNames) Total number of messages delivered to the SNMP entity that used an SNMP community name not known to the entity. ■ Bad community uses—(snmplnBadCommunityUses) Total number of messages delivered to the SNMP entity that represented an SNMP operation that was not allowed by the SNMP community named in the message. ■ ASN parse errors—(snmplnASNParseErrs) Total number of ASN.1 or BER errors encountered by the SNMP entity when decoding received SNMP messages. ■ Too big—(snmplnTooBigs) Total number of SNMP PDUs delivered to the SNMP entity with an error status field of <code>tooBig</code>. ■ No such names—(snmplnNoSuchNames).Total number of SNMP PDUs delivered to the SNMP entity with an error status field of <code>noSuchName</code>. ■ Bad values—(snmplnBadValues) Total number of SNMP PDUs delivered to the SNMP entity with an error status field of <code>badValue</code>. ■ Read only—(snmplnReadOnlys) Total number of valid SNMP PDUs delivered to the SNMP entity with an error status field of <code>readOnly</code>. Only incorrect implementations of SNMP generate this error.

Table 107: show snmp statistics Output Fields (continued)

Field Name	Field Description
Input (continued)	<ul style="list-style-type: none"> ■ General errors—(snmplnGenErrs) Total number of SNMP PDUs delivered to the SNMP entity with an error status field of genErr. ■ Total requests varbinds—(snmplnTotalReqVars) Total number of MIB objects retrieved successfully by the SNMP entity as a result of receiving valid SNMP GetRequest and GetNext PDUs. ■ Total set varbinds—(snmplnSetVars) Total number of MIB objects modified successfully by the SNMP entity as a result of receiving valid SNMP SetRequest PDUs. ■ Get requests—(snmplnGetRequests) Total number of SNMP GetRequest PDUs that have been accepted and processed by the SNMP entity. ■ Get nexts—(snmplnGetNexts) Total number of SNMP GetNext PDUs that have been accepted and processed by the SNMP entity. ■ Set requests—(snmplnSetRequests) Total number of SNMP SetRequest PDUs that have been accepted and processed by the SNMP entity. ■ Get responses—(snmplnGetResponses) Total number of SNMP GetResponse PDUs that have been accepted and processed by the SNMP entity. ■ Traps—(snmplnTraps) Total number of SNMP traps generated by the SNMP entity. ■ Silent drops—(snmpSilentDrops) Total number of GetRequest, GetNextRequest, GetBulkRequest, SetRequests, and InformRequest PDUs delivered to the SNMP entity that were silently dropped because the size of a reply containing an alternate response PDU with an empty variable-bindings field was greater than either a local constraint or the maximum message size associated with the originator of the requests. ■ Proxy drops.—(snmpProxyDrops) Total number of GetRequest, GetNextRequest, GetBulkRequest, SetRequests, and InformRequest PDUs delivered to the SNMP entity that were silently dropped because the transmission of the message to a proxy target failed in such a way (other than a timeout) that no response PDU could be returned. ■ Commit pending drops—Number of SNMP packets for Set requests dropped because of a previous pending SNMP Set request on the committed configuration. ■ Throttle drops—Number of SNMP packets for any requests dropped reaching the throttle limit.

Table 107: show snmp statistics Output Fields (continued)

Field Name	Field Description
V3 Input	<p>Information about SNMP version 3 packets:</p> <ul style="list-style-type: none"> ■ Unknown security models—(snmpUnknownSecurityModels) Total number of packets received by the SNMP engine that were dropped because they referenced a security model that was not known to or supported by the SNMP engine. ■ Invalid messages—(snmpInvalidMsgs) Number of packets received by the SNMP engine that were dropped because there were invalid or inconsistent components in the SNMP message. ■ Unknown pdu handlers—(snmpUnknownPDUHandlers) Number of packets received by the SNMP engine that were dropped because the PDU contained in the packet could not be passed to an application responsible for handling the PDU type. ■ Unavailable contexts—(snmpUnavailableContexts) Number of requests received for a context that is known to the SNMP engine, but is currently unavailable. ■ Unknown contexts—(snmpUnknownContexts) Total number of requests received for a context that is unknown to the SNMP engine. ■ Unsupported security levels—(usmStatsUnsupportedSecLevels) Total number of packets received by the SNMP engine which were dropped because they requested a security level unknown to the SNMP engine (or otherwise unavailable). ■ Not in time windows—(usmStatsNotInTimeWindows) Total number of packets received by the SNMP engine that were dropped because they appeared outside of the authoritative SNMP engine's window. ■ Unknown user names—(usmStatsUnknownUserNames) Total number of packets received by the SNMP engine that were dropped because they referenced a user that was not known to the SNMP engine. ■ Unknown engine ids—(usmStatsUnknownEngineIDs) Total number of packets received by the SNMP engine that were dropped because they referenced an SNMP engine ID that was not known to the SNMP engine. ■ Wrong digests—(usmStatsWrongDigests) Total number of packets received by the SNMP engine that were dropped because they didn't contain the expected digest value. ■ Decryption errors—(usmStatsDecryptionErrors) Total number of packets received by the SNMP engine that were dropped because they could not be decrypted.

Table 107: show snmp statistics Output Fields (continued)

Field Name	Field Description
Output	<p>Information about transmitted packets:</p> <ul style="list-style-type: none"> ■ Packets—(snmpOutPkts) Total number of messages passed from the SNMP entity to the transport service. ■ Too bigs—(snmpOutTooBig) Total number of SNMP PDUs generated by the SNMP entity with an error status field of tooBig. ■ No such names—(snmpOutNoSuchNames) Total number of SNMP PDUs delivered to the SNMP entity with an error status field of noSuchName. ■ Bad values—(snmpOutBadValues) Total number of SNMP PDUs generated by the SNMP entity with an error status field of badValue. ■ General errors—(snmpOutGenErrs) Total number of SNMP PDUs generated the SNMP entity with an error status field of genErr. ■ Get requests—(snmpOutGetRequests) Total number of SNMP GetRequest PDUs generated by the SNMP entity. ■ Get nexts—(snmpOutGetNexts) Total number of SNMP GetNext PDUs generated by the SNMP entity. ■ Set requests—(snmpOutSetRequests) Total number of SNMP SetRequest PDUs generated by the SNMP entity. ■ Get responses—(snmpOutGetResponses) Total number of SNMP GetResponse PDUs generated by the SNMP entity. ■ Traps—(snmpOutTraps) Total number of SNMP traps generated by the SNMP entity.

```

show snmp statistics user@host> show snmp statistics
SNMP statistics:
Input:
Packets: 246213, Bad versions: 12, Bad community names: 12,
Bad community uses: 0, ASN parse errors: 96,
Too bigs: 0, No such names: 0, Bad values: 0,
Read onlys: 0, General errors: 0,
Total request varbinds: 227084, Total set varbinds: 67,
Get requests: 44942, Get nexts: 190371, Set requests: 10712,
Get responses: 0, Traps: 0,
Silent drops: 0, Proxy drops: 0, Commit pending drops: 0,
Throttle drops: 0,
V3 Input:
Unknown security models: 0, Invalid messages: 0
Unknown pdu handlers: 0, Unavailable contexts: 0
Unknown contexts: 0, Unsupported security levels: 1
Not in time windows: 0, Unknown user names: 0
Unknown engine ids: 44, Wrong digests: 23, Decryption errors: 0
Output:
Packets: 246093, Too bigs: 0, No such names: 31561,
Bad values: 0, General errors: 2,
Get requests: 0, Get nexts: 0, Set requests: 0,
Get responses: 246025, Traps: 0

```

show snmp v3

Syntax	show snmp v3 <access <brief detail> community general groups notify <filter> target <address parameters> users>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display the Simple Network Management Protocol version 3 (SNMPv3) operating configuration.
Options	<p>none—Display all of the SNMPv3 operating configuration.</p> <p>access—(Optional) Display SNMPv3 access information.</p> <p>brief detail—(Optional) Display brief or detailed information about SNMPv3 access information.</p> <p>community—(Optional) Display SNMPv3 community information.</p> <p>general—(Optional) Display SNMPv3 general information.</p> <p>groups—(Optional) Display SNMPv3 security-to-group information.</p> <p>notify <filter>—(Optional) Display SNMPv3 notify and, optionally, notify filter information.</p> <p>target <address parameters>—(Optional) Display SNMPv3 target and, optionally, either target address or target parameter information.</p> <p>users—(Optional) Display SNMPv3 user information.</p>
Additional Information	To edit the default display of the show snmp v3 command, specify options in the show statement at the [edit snmp v3] hierarchy level.
Required Privilege Level	view
List of Sample Output	show snmp v3 on page 466
Output Fields	Table 108 on page 466 describes the output fields for the show snmp v3 command. Output fields are listed in the approximate order in which they appear.

Table 108: show snmp v3 Output Fields

Field Name	Field Description
Access control	<p>Information about access control:</p> <ul style="list-style-type: none"> ■ Group—Group name for which the configured access privileges apply. The group, together with the context prefix and the security model and security level, forms the index for this table. ■ Context prefix—SNMPv3 context for which the configured access privileges apply. ■ Security model/level—Security model and security level for which the configuration access privileges apply. ■ Read view—Identifies the MIB view applied to SNMPv3 read operations. ■ Write view—Identifies the MIB view applied to SNMPv3 write operations. ■ Notify view—Identifies the MIB view applied to outbound SNMP notifications.
Engine	<p>Information about local engine configuration:</p> <ul style="list-style-type: none"> ■ Local engine ID—Identifier that uniquely and unambiguously identifies the local SNMPv3 engine. ■ Engine boots—Number of times the local SNMPv3 engine has rebooted or reinitialized since the engine ID was last changed. ■ Engine time—Number of seconds since the local SNMPv3 engine was last rebooted or reinitialized. ■ Max msg size—Maximum message size the sender can accommodate.
Engine ID	<p>Information about engine ID:</p> <ul style="list-style-type: none"> ■ Local engine ID—Identifier that uniquely and unambiguously identifies the local SNMPv3 engine. ■ Engine boots—Number of times the local SNMPv3 engine has rebooted or reinitialized since the engine ID was last changed. ■ Engine time—Number of seconds since the local SNMPv3 engine was last rebooted or reinitialized. ■ Max msg size—Maximum message size the sender can accommodate. ■ Engine ID—SNMPv3 engine ID associated with each user. ■ User—SNMPv3 user. ■ Auth/Priv—Authentication and encryption algorithm available for use by each user. ■ Storage—Indicates whether a user is saved to the configuration file (nonvolatile) or not (volatile). Applies only to users with active status. ■ Status—Status of the conceptual row. Only rows with an active status are used by the SNMPv3 engine.
Group name	Name of the group to which this entry belongs.
Security model	Identifies the security model context for the security name.
Security name	Used with the security model; identifies a specific security name instance. Each security model/security name combination can be assigned to a specific group.
Storage type	Indicates whether a user is saved to the configuration file (nonvolatile) or not (volatile). Applies only to users with active status.
Status	Status of the conceptual row. Only rows with active status are used by the SNMPv3 engine.

```

show snmp v3  user@host> show snmp v3
                  Local engine ID: 80 00 0a 4c e04 31 32 33 34
                  Engine boots:      38

```

Engine time: 64583 seconds
 Max msg size: 2048 bytes

Engine ID: local

User	Auth/Priv	Storage	Status
user1	md5/des	nonvolatile	active
user2	sha/none	nonvolatile	active
user3	none/none	nonvolatile	active

Engine ID: 81 00 0a 4c 04 64 64 64 64

User	Auth/Priv	Storage	Status
UNEW	md5/none	nonvolatile	active

Group name	Security model	Security name	Storage type	Status
g1	usm	user1	nonvolatile	active
g2	usm	user2	nonvolatile	active
g3	usm	user3	nonvolatile	active

Access control:

Group	Context prefix	Security model/level	Read view	Write view	Notify view
g1		usm/privacy	v1	v1	
g2		usm/authent	v1	v1	
g3		usm/none	v1	v1	

Chapter 13

System Software Operational Mode Commands

Table 109 on page 469 summarizes the command-line interface (CLI) commands you can use to perform and monitor system software management functions. Commands are listed in alphabetical order.

Table 109: System Software Operational Mode Commands

Task	Command
Clear the Address Resolution Protocol (ARP) table.	clear arp
Clear the binding state of a Dynamic Host Configuration Protocol (DHCP) client from the client table on the extended DHCP local server.	clear dhcp server binding
Clear all extended DHCP local server statistics.	clear dhcp server statistics
Log out AAA subscribers and clear the AAA subscriber statistics.	clear network-access aaa subscriber
Clear a pending commit operation.	clear system commit
Clear a pending system halt or reboot.	clear system reboot
(J-series routing platform only) Remove obsolete IP address bindings on a Dynamic Host Configuration Protocol (DHCP) server.	clear system services dhcp binding
(J-series routing platform only) Clear IP addresses from the DHCP server conflicts list.	clear system services dhcp conflict
(J-series routing platform only) Clear DHCP server statistics.	clear system services dhcp statistics
Enter configuration mode.	configure
Execute an operation (op) script.	op
Send messages to users currently logged in to the router.	request message

Table 109: System Software Operational Mode Commands *(continued)*

Task	Command
On a routing platform with two Routing Engines, specify a tty connection for login.	<code>request routing-engine login</code>
Collect information for customer support.	<code>request support information</code>
Delete an existing rescue configuration.	<code>request system configuration rescue delete</code>
Save the most recently committed configuration as the rescue configuration.	<code>request system configuration rescue save</code>
(J-series routing platform only) Upgrade or downgrade firmware.	<code>request system firmware</code>
Stop the routing software.	<code>request system halt</code>
Add a license key.	<code>request system license add</code>
Delete a license key.	<code>request system license delete</code>
(J-series routing platform only) Save installed license keys to a file or URL.	<code>request system license save</code>
Log out a user from the configuration database.	<code>request system logout</code>
Abort a previously scheduled partition request.	<code>request system partition abort</code>
Schedule the hard disk for partitioning.	<code>request system partition hard-disk</code>
Power off the routing software.	<code>request system power-off</code>
Reboot the routing software.	<code>request system reboot</code>
Convert an Extensible Stylesheet Language Transformations (XSLT) script to Stylesheet Language, Alternative syntax (SLAX), or convert a SLAX script to XSLT.	<code>request system scripts convert</code>
Back up the file systems on the router.	<code>request system snapshot</code>
(M320 router, T320 router, and T640 routing node only) Abort a unified in-service software upgrade (ISSU).	<code>request system software abort</code>
Install software bundles or packages onto the router.	<code>request system software add</code>
Remove software bundles or packages from the router.	<code>request system software delete</code>
(J-series routing platform only) Delete the backup JUNOS software file (if it exists) to free up compact flash drive space.	<code>request system software delete-backup</code>

Table 109: System Software Operational Mode Commands *(continued)*

Task	Command
(M320 router, T320 router, and T640 routing node only) Perform a unified ISSU.	request system software in-service-upgrade
Roll back to a previously installed version.	request system software rollback
Check candidate software compatibility against the current configuration.	request system software validate
Free storage space on the router by rotating log files and deleting unnecessary files.	request system storage cleanup
Restart a JUNOS software process.	restart
Display the contents of the ARP table.	show arp
Display the current running system configuration.	show configuration
Display the address bindings in the client table on the extended DHCP local server.	show dhcp server binding
Display extended DHCP local server statistics.	show dhcp server statistics
Display Domain Name System (DNS) hostname information.	show host
Display AAA statistics.	show network-access aaa statistics
Display information about AAA subscribers.	show network-access aaa subscribers
Display state information for address-assignment pools.	show network-access address-assignment pool
Display Network Time Protocol (NTP) peers.	show ntp associations
Display variables returned by NTP peers.	show ntp status
Display information about active subscribers	show subscribers
Show system alarms.	show system alarms
Display state and checksum values for files in a file system.	show system audit
(J-series routing platform only) Display autoinstallation status information.	show system autoinstallation status
Display boot messages.	show system boot-messages
Display system memory and buffer usage information.	show system buffers
Display information about a pending commit operation.	show system commit

Table 109: System Software Operational Mode Commands *(continued)*

Task	Command
Display directory and number of files queued for archival transfer.	<code>show system configuration archival</code>
Display information about the rescue configuration.	<code>show system configuration rescue</code>
Display information about active IP sockets on the Routing Engine.	<code>show system connections</code>
Display directory usage information.	<code>show system directory-usage</code>
(J-series routing platform only) Display system firmware information.	<code>show system firmware</code>
Display a list of installed licenses.	<code>show system license</code>
Display dynamic hostname to IP address mappings.	<code>show system name-resolution</code>
Display software processes running on the router.	<code>show system processes</code>
Display statistics about queues on interfaces.	<code>show system queues</code>
Display any pending system reboots or halts.	<code>show system reboot</code>
View or compare previous configurations.	<code>show system rollback</code>
(J-series routing platform only) Display client binding information.	<code>show system services dhcp binding</code>
(J-series routing platform only) Display DHCP client-detected conflicts for IP addresses.	<code>show system services dhcp conflict</code>
(J-series routing platform only) Display global configuration settings for a DHCP server.	<code>show system services dhcp global</code>
(J-series routing platform only) Display IP address pools defined for a DHCP server.	<code>show system services dhcp pool</code>
(J-series routing platform only) Display statistics associated with a DHCP server.	<code>show system services dhcp statistics</code>
Display information about a Session and Resource Control (SRC) client.	<code>show system services service-deployment</code>
Display information about the backup software that located in the <code>/altroot</code> and <code>/altconfig</code> file systems.	<code>show system snapshot</code>
Display JUNOS software extensions.	<code>show system software</code>
Display system-wide protocol-related statistics.	<code>show system statistics</code>

Table 109: System Software Operational Mode Commands *(continued)*

Task	Command
Display system-wide Address Resolution Protocol (ARP) statistics.	<code>show system statistics arp</code>
Display system-wide Connectionless Network Layer (CLNL) statistics.	<code>show system statistics clnl</code>
Display system-wide End System-to-Intermediate System (ES-IS) statistics.	<code>show system statistics esis</code>
Display system-wide Internet Control Message Protocol (ICMP) statistics.	<code>show system statistics icmp</code>
Display system-wide ICMP version 6 statistics.	<code>show system statistics icmp6</code>
Display system-wide Internet Group Management Protocol (IGMP) statistics.	<code>show system statistics igmp</code>
Display system-wide IPv4 statistics.	<code>show system statistics ip</code>
Display system-wide IPv6 statistics.	<code>show system statistics ip6</code>
Display system-wide Multiprotocol Label Switching (MPLS) statistics.	<code>show system statistics mpls</code>
Display system-wide Reliable Datagram Protocol (RDP) statistics.	<code>show system statistics rdp</code>
Display system-wide Transmission Control Protocol (TCP) statistics.	<code>show system statistics tcp</code>
Display system-wide Trivial Network Protocol (TNP) statistics.	<code>show system statistics tnp</code>
Display system-wide Trivial User Datagram Protocol (TUDP) statistics.	<code>show system statistics tudp</code>
Display system-wide User Datagram Protocol (UDP) statistics.	<code>show system statistics udp</code>
Display system-wide Virtual Private LAN Services (VPLS) statistics.	<code>show system statistics vpls</code>
Display statistics about the amount of free disk space in the router's file systems.	<code>show system storage</code>
View configurations of the primary and secondary Routing Engines.	<code>show system switchover</code>
Display the current time and information about how long the router, router software, and routing protocols have been running.	<code>show system uptime</code>
Display users currently logged in to the router.	<code>show system users</code>

Table 109: System Software Operational Mode Commands *(continued)*

Task	Command
Display JUNOS kernel memory usage.	<code>show system virtual-memory</code>
Display routing protocol tasks on the Routing Engine.	<code>show task</code>
Display I/O statistics for routing protocol tasks on the Routing Engine.	<code>show task io</code>
Display memory utilization for routing protocol tasks on the Routing Engine.	<code>show task memory</code>
Display whether or not graceful Routing Engine switchover (GRES) and nonstop active routing (NSR) are configured on the routing platform.	<code>show task replication</code>
Display the hostname and version information about the software running on the router.	<code>show version</code>
Display the hostname and version information about the software running on a routing platform with two Routing Engines.	<code>show version invoke-on</code>
Create a UNIX-level shell.	<code>start shell</code>
Verify the syntax of a configuration file.	<code>test configuration</code>



NOTE: For information about the `request system certificate add` and `show system certificate` commands, see “IP Security Operational Mode Commands” on page 857.



NOTE: For information about how to configure system software parameters, see the *JUNOS System Basics Configuration Guide*.

For information about related tasks performed by network operations center (NOC) personnel, see the *JUNOS Baseline Network Operations Guide*.

clear arp

Syntax	clear arp <hostname <i>hostname</i> > <logical-system <i>logical-system-name</i> > <vpn <i>vpn</i> >
Release Information	Command introduced before JUNOS Release 7.4.
Description	Remove entries from the Address Resolution Protocol (ARP) table for the current CLI view. To clear entries for a specific logical system, you must first enter the set cli logical-system <i>logical-system-name</i> command, and then issue the clear arp command.
Options	<p>none—Clear all entries from the ARP table.</p> <p>hostname <i>hostname</i>—(Optional) Clear the specified host entry only.</p> <p>logical-system <i>logical-system-name</i>—(Optional) Clear entries for the specified logical system; only available in main router context.</p> <p>vpn <i>vpn</i>—(Optional) Clear entries from the ARP table for the specified virtual private network (VPN).</p>
Required Privilege Level	clear
Related Topics	<p>set cli logical-system</p> <p>show arp</p>
List of Sample Output	<p>clear arp on page 475</p> <p>clear arp logical-system ls1 on page 475</p>
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear arp	<pre>user@host> clear arp 192.168.71.254 deleted 192.168.65.46 deleted 192.168.64.10 deleted 10.0.12.14 deleted 10.0.17.14 deleted</pre>
clear arp logical-system ls1	<pre>user@host> clear arp logical-system ls1 192.168.71.254 deleted 192.168.65.46 deleted 192.168.64.10 deleted 10.0.12.14 deleted 10.0.17.14 deleted</pre>

clear dhcp server binding

Syntax clear dhcp server binding
 <all | *ip-address* | *mac-address*>
 <interface *interface-name*>
 <logical-system *logical-system-name*>
 <routing-instance *routing-instance-name*>

Release Information Command introduced in JUNOS Release 9.0.

Description Clear the binding state of a Dynamic Host Configuration Protocol (DHCP) client from the client table on the extended DHCP local server.

Options all—(Optional) Clear the binding state for all DHCP clients.

ip-address—(Optional) Clear the binding state for the DHCP client with the specified IP address.

mac-address—(Optional) Clear the binding state for the DHCP client with the specified MAC address.

interface *interface-name*—(Optional) Clear the binding state for DHCP clients on the specified interface.



NOTE: This option clears all bindings whose initial login requests were received over the specified interface. Dynamic demux login requests are not received over the dynamic demux interface, but rather the underlying interface of the dynamic demux interface. To clear a specific dynamic demux interface, use the *ip-address* or *mac-address* options.

logical-system *logical-system-name*—(Optional) Clear the binding state for DHCP clients on the specified logical system.

routing-instance *routing-instance-name*—(Optional) Clear the binding state for DHCP clients on the specified routing instance.

Required Privilege Level view

List of Sample Output clear dhcp server binding on page 476
 clear dhcp server binding all on page 477
 clear dhcp server binding interface on page 477

Output Fields See show dhcp server binding for an explanation of output fields.

clear dhcp server binding The following sample output displays the address bindings in the DHCP client table on the extended DHCP local server before and after the clear dhcp server binding command is issued.

```
user@host> show dhcp server binding
```

```
2 clients, (0 bound, 0 selecting, 0 renewing, 0 rebinding)
```


IP address	Hardware address	Type	Lease expires at
100.20.32.1	90:00:00:01:00:01	active	2007-01-17 11:38:47 PST
100.20.32.3	90:00:00:02:00:01	active	2007-01-17 11:38:41 PST

```
user@host> clear dhcp server binding 10.20.32.1
```

```
user@host> show dhcp server binding
```

```
1 clients, (0 bound, 0 selecting, 0 renewing, 0 rebinding)
```

IP address	Hardware address	Type	Lease expires at
100.20.32.3	90:00:00:02:00:01	active	2007-01-17 11:38:41 PST

```
clear dhcp server user@host> clear dhcp server binding all
binding all
```

```
clear dhcp server user@host> clear dhcp server binding interface fe-0/0/2
binding interface
```

clear dhcp server statistics

Syntax	clear dhcp server statistics <logical-system <i>logical-system-name</i> > <routing-instance <i>routing-instance-name</i> >
Release Information	Command introduced in JUNOS Release 9.0.
Description	Clear all extended Dynamic Host Configuration Protocol (DHCP) local server statistics.
Options	<p>logical-system <i>logical-system-name</i>—(Optional) Clear the statistics for DHCP clients on the specified logical system. If you do not specify a logical system, statistics are cleared for the default logical system.</p> <p>routing-instance <i>routing-instance-name</i>—(Optional) Clear the statistics for DHCP clients on the specified routing instance. If you do not specify a routing instance, statistics are cleared for the default routing instance.</p>
Required Privilege Level	view
List of Sample Output	clear dhcp server statistics on page 478
Output Fields	See show dhcp server statistics for an explanation of output fields.

clear dhcp server statistics The following sample output displays the extended DHCP local server statistics before and after the clear dhcp server statistics command is issued.

```

user@host> show dhcp server statistics
Packets dropped:
    Total                0

Messages received:
    BOOTREQUEST          89163
    DHCPDECLINE           0
    DHCPDISCOVER          8110
    DHCPINFORM            0
    DHCPRELEASE           0
    DHCPREQUEST           81053

Messages sent:
    BOOTREPLY             32420
    DHCPOFFER             8110
    DHCPACK               8110
    DHCPNAK               8100

user@host> clear dhcp server statistics
user@host> show dhcp server statistics
Packets dropped:
    Total                0

Messages received:
    BOOTREQUEST           0
    DHCPDECLINE           0
    DHCPDISCOVER          0
    DHCPINFORM            0
    DHCPRELEASE           0
    DHCPREQUEST           0

```

```
Messages sent:
  BOOTREPLY      0
  DHCPPOFFER     0
  DHCPACK        0
  DHCPNAK        0
```

clear network-access aaa subscriber

Syntax	clear network-access aaa subscriber <statistics username <i>username</i> > <username <i>username</i> >
Release Information	Command introduced in JUNOS Release 9.1.
Description	Clear AAA subscriber statistics and log out subscribers.
Options	statistics username <i>username</i> —(Optional) Clear AAA subscriber statistics and log out the subscriber. username <i>username</i> —(Optional) Log out the AAA subscriber.
Required Privilege Level	maintenance
List of Sample Output	clear network-access aaa subscriber statistics username on page 480 clear network-access aaa subscriber username on page 480
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear network-access aaa subscriber statistics username	user@host> clear network-access aaa subscriber statistics username dsmith@isp5555.com
clear network-access aaa subscriber username	user@host> clear network-access aaa subscriber username dsmith@isp5555.com

clear system commit

Syntax	clear system commit
Release Information	Command introduced before JUNOS Release 7.4.
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 Topics	show system commit
List of Sample Output	clear system commit on page 481 clear system commit (None Pending) on page 481 clear system commit (User Does Not Have Required Privilege Level) on page 481
Output Fields	When you enter this command, you are provided feedback on the status of your request.
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

Syntax	clear system reboot <both-routing-engines>
Syntax (Routing Matrix)	clear system reboot <both-routing-engines> <all-lcc lcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Clear any pending system software reboots or halts. When used on a routing matrix without any options, the default behavior clears all pending system software reboots or halts on all T640 routing nodes connected to the TX Matrix platform.
Options	<p>none—Clear all pending system software reboots or halts.</p> <p>both-routing-engines—(Optional) Clear all halt or reboot requests on both Routing Engines. For a routing matrix, clears both Routing Engines on all chassis connected to the routing matrix.</p> <p>all-lcc—(Routing matrix only) (Optional) Clear all halt or reboot requests for all T640 routing nodes (or line-card chassis) connected to a TX Matrix platform.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Clear all halt or reboot requests for a specific T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Clear all halt or reboot requests for the TX Matrix platform (or switch-card chassis).</p>
Required Privilege Level	maintenance
Related Topics	request system reboot
List of Sample Output	<p>clear system reboot on page 483</p> <p>clear system reboot (Routing Matrix) on page 483</p>
Output Fields	When you enter this command, you are provided feedback on the status of your request.

```

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  user@host> clear system reboot
(Routing Matrix)    scc-re0:

```

```

-----
No shutdown/reboot scheduled.
lcc0-re0:

```

```

-----
No shutdown/reboot scheduled.
lcc2-re0:

```

```

-----
No shutdown/reboot scheduled.

```

clear system services dhcp binding

Syntax	clear system services dhcp binding <address>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(J-series routing platform only) Remove obsolete IP address bindings on a Dynamic Host Configuration Protocol (DHCP) server and return them to the IP address pool.
Options	<i>address</i> —(Optional) Remove a specific IP address binding and return it to the address pool.
Required Privilege Level	view and system
Related Topics	show system services dhcp binding
List of Sample Output	clear system services dhcp binding on page 484
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear system services dhcp binding	user@host> clear system services dhcp binding

clear system services dhcp conflict

Syntax	clear system services dhcp conflict <address>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(J-series routing platform only) Remove IP addresses from the Dynamic Host Configuration Protocol (DHCP) server conflict list and return them to the IP address pool.
Options	<i>address</i> —(Optional) Remove a specific IP address from the conflict list and return it to the address pool.
Required Privilege Level	view and system
Related Topics	show system services dhcp conflict
List of Sample Output	clear system services dhcp conflict on page 485
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear system services dhcp conflict	user@host> clear system services dhcp conflict

clear system services dhcp statistics

Syntax	clear system services dhcp statistics
Release Information	Command introduced before JUNOS Release 7.4.
Description	(J-series routing platform only) Clear Dynamic Host Configuration Protocol (DHCP) server statistics.
Options	This command has no options.
Required Privilege Level	view and system
Related Topics	show system services dhcp statistics
List of Sample Output	clear system services dhcp statistics on page 486
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear system services dhcp statistics	user@host> clear system services dhcp statistics

configure

Syntax	configure <exclusive> <private>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Enter configuration mode. When this command is entered without any optional keywords, everyone can make configuration changes and commit all changes made to the configuration.
Options	<p>exclusive—(Optional) Lock the candidate configuration for as long as you remain in configuration mode, allowing you to make changes without interference from other users. Other users can enter and exit configuration mode, but they cannot change the configuration.</p> <p>private—(Optional) Allow multiple users to edit different parts of the configuration at the same time and to commit only their own changes, or to roll back without interfering with one another's changes. You cannot commit changes in configure private mode when another user is in configure exclusive mode.</p>
Additional Information	For more information about the different methods of entering configuration mode and the restrictions that apply, see the <i>JUNOS System Basics Configuration Guide</i> .
Required Privilege Level	configure
Related Topics	show configuration
List of Sample Output	configure on page 487
Output Fields	When you enter this command, you are placed in configuration mode and the system prompt changes from <i>hostname></i> to <i>hostname#</i> .
configure	<pre> user@host> configure Entering configuration mode [edit] user@host# </pre>

op

Syntax	<code>op filename</code> <code><argument-name argument-value></code>
Release Information	Command introduced in JUNOS Release 7.6.
Description	Execute an op script stored in the <code>/var/db/scripts/op</code> directory on the routing platform.
Options	<i>argument-name argument-value</i> —(Optional) Specify one or more arguments to the script. For each argument you include on the command line, you must specify a corresponding value for the argument.
Additional Information	For more information about JUNOS op scripts, see the <i>JUNOS Configuration and Diagnostic Automation Guide</i> .
Required Privilege Level	maintenance
List of Sample Output	op on page 488
Output Fields	When you enter this command, you are provided feedback on the status of your request.
op	<code>user@host> op script1 interface ge-0/2/0.0 protocol inet</code>

request message

Syntax	request message all message "text" request message message "text" (terminal <i>terminal-name</i> user <i>user-name</i>)
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display a message on the screens of all users who are logged in to the router 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 <i>terminal-name</i> —Name of the terminal on which to display the message. user <i>user-name</i> —Name of the user to whom to direct the message.
Required Privilege Level	maintenance
List of Sample Output	request message message on page 489
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request message message	<pre> user@host> request message message "Maintenance window in 10 minutes" user maria Message from user@host on tty0 at 20:27 ... Maintenance window in 10 minutes EOF </pre>

request routing-engine login

Syntax	request routing-engine login (backup master other-routing-engine re0 re1)
Syntax (Root System Domain)	request routing-engine login (backup (psd <i>n</i> rsd) master (psd <i>n</i> rsd) other-routing-engine re0 (psd <i>n</i> rsd) re1 (psd <i>n</i> rsd))
Syntax (Routing Matrix)	request routing-engine login (backup master other-routing-engine re0 re1) <fcc <i>number</i> >
Release Information	<p>Command introduced before JUNOS Release 7.4.</p> <p>psd and rsd options added in JUNOS Release 9.1. These options are available from the Root System Domain (RSD). An RSD is supported on a T320 router or T640 or T1600 routing node that is interconnected with the Juniper Control System (JCS) platform.</p>
Description	On a routing platform with two Routing Engines, specify a tty connection for login.
Options	<p>backup—Log in to the backup Routing Engine.</p> <p>fcc <i>number</i>—(Routing matrix only) (Optional) Log in to a specific T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>master—Log in to the master Routing Engine.</p> <p>other-routing-engine—Log in to the other Routing Engine.</p> <p>psd <i>n</i>—(RSD only) Log in to the specified Protected System Domain (PSD). Replace <i>n</i> with a value from 1 to 31. A PSD is accessible from a T320 router or a T640 or T1600 routing node that is interconnected with the JCS 1200 platform. When you log in to a PSD, you are required to provide user authentication.</p> <p>re0—Log in to the Routing Engine in slot 0.</p> <p>re1—Log in to the Routing Engine in slot 1.</p> <p>rsd—(RSD only) Log in to the RSD (as opposed to a PSD). A T320 router or a T640 or T1600 routing node that is interconnected with the JCS 1200 platform can be configured as an RSD.</p>
Additional Information	For more information about PSDs, RSDs, and the JCS 1200 platform, see the <i>JUNOS Protected System Domain Configuration Guide</i> .
Required Privilege Level	maintenance
List of Sample Output	<p>request routing-engine login other-routing-engine on page 491</p> <p>request routing-engine login psd on page 491</p>
Output Fields	When you enter this command, you are provided feedback on the status of your request.

```

request      user@host> request routing-engine login other-routing-engine
routing-engine login
other-routing-engine --- JUNOS 7.2-20050217.0 built 2005-02-17 08:12:50 UTC

request routing-engine {master}
login psd             user@host> request routing-engine login psd 1 re0
                        €login: regress
                        Password:

                        --- JUNOS 9.1-20080321.0 built 2008-03-21 05:43:06 UTC
                        % cli
                        user@psd1>

```

request support information

Syntax	request support information
Syntax (Routing Matrix)	request support information <all-lcc lcc <i>number</i> scc>
Release Information	<p>Command introduced before JUNOS Release 7.4.</p> <p>show chassis alarms added to output in JUNOS Release 8.0.</p> <p>show route summary added to output in JUNOS Release 8.5.</p> <p>show krt queue added to output in JUNOS Release 8.5.</p> <p>show krt state added to output in JUNOS Release 8.5.</p>
Description	Display information about the system. Issue this command before contacting customer support, and then include the command output in your support request.
Options	<p>all-lcc—(Routing matrix only) (Optional) Display system information for all T640 routing nodes connected to a TX Matrix platform.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Display system information for a specific T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display system information for the TX Matrix platform (or switch-card chassis).</p>
Additional Information	<p>The output of this command can be lengthy. We recommend that you redirect the output to a file. This command is a combination of the following commands:</p> <ul style="list-style-type: none"> ■ show chassis alarms ■ show chassis environment ■ show chassis firmware ■ show chassis fpc detail ■ show chassis hardware detail ■ show chassis hardware extensive ■ show chassis routing-engine ■ show configuration except SECRET DATA ■ show configuration chassis network-services ■ show interfaces extensive ■ show krt queue ■ show krt state ■ show pfe statistics error ■ show route summary ■ show system boot messages

- show system core-dumps
- show system processes extensive
- show system queues
- show system statistics
- show system storage
- show system uptime
- show system virtual memory
- show version

Required Privilege Level maintenance

List of Sample Output request support information | save on page 493
request support information scc (Routing Matrix) on page 493

Output Fields For information about output fields, see the description for the specific command (listed in the “Additional Information” section) in which you are interested.

request support information | save user@host> **request support information | save** goose
Wrote 1143 lines of output to 'goose'
user@host>

request support information scc (Routing Matrix) user@host> **request support information scc**
user@host> **show system uptime**

scc-re0:

```
-----
Current time: 2004-09-15 00:49:06 PDT
System booted: 2004-09-14 12:53:26 PDT (11:55:40 ago)
Protocols started: 2004-09-14 12:54:19 PDT (11:54:47 ago)
Last configured: 2004-09-14 13:07:47 PDT (11:41:19 ago) by regress
12:49AM PDT up 11:56, 3 users, load averages: 0.00, 0.02, 0.03
```

lcc0-re0:

```
-----
Current time: 2004-09-15 00:49:06 PDT
System booted: 2004-09-14 15:36:41 PDT (09:12:25 ago)
Last configured: 2004-09-14 15:38:06 PDT (09:11:00 ago) by root
12:49AM PDT up 9:12, 0 users, load averages: 0.13, 0.05, 0.02
```

lcc2-re0:

```
-----
Current time: 2004-09-15 00:49:06 PDT
System booted: 2004-09-14 15:36:47 PDT (09:12:19 ago)
Last configured: 2004-09-14 15:38:09 PDT (09:10:57 ago) by root
12:49AM PDT up 9:12, 0 users, load averages: 0.00, 0.00, 0.00
```

user@host> **show version**

scc-re0:

```
-----
Hostname: hostA
Model: TX Matrix
JUNOS Base OS boot [7.0I20040914_1707_mapte]
```

```

JUNOS Base OS Software Suite [7.0I20040907_1922_rtuplur]
JUNOS Kernel Software Suite [7.0I20040914_1707_mapte]
JUNOS Packet Forwarding Engine Support (T-Series) [7.0I20040914_1707_mapte]
JUNOS Routing Software Suite [7.0I20040914_1707_mapte]
JUNOS Online Documentation [7.0I20040914_1707_mapte]
JUNOS Crypto Software Suite [7.0I20040914_1707_mapte]
JUNOS Support Tools Package [7.0-20040908.0]

```

```
lcc0-re0:
```

```

-----
Hostname: hostB
Model: t640
JUNOS Base OS boot [7.0I20040914_1707_mapte]
JUNOS Base OS Software Suite [7.0I20040907_1922_rtuplur]
JUNOS Kernel Software Suite [7.0I20040914_1707_mapte]
JUNOS Packet Forwarding Engine Support (T-Series) [7.0I20040914_1707_mapte]
JUNOS Routing Software Suite [7.0I20040914_1707_mapte]
JUNOS Online Documentation [7.0I20040914_1707_mapte]
JUNOS Crypto Software Suite [7.0I20040914_1707_mapte]

```

```
lcc2-re0:
```

```

-----
Hostname: dewey
Model: t640
JUNOS Base OS boot [7.0I20040914_1707_mapte]
JUNOS Base OS Software Suite [7.0I20040907_1922_rtuplur]
JUNOS Kernel Software Suite [7.0I20040914_1707_mapte]
JUNOS Packet Forwarding Engine Support (T-Series) [7.0I20040914_1707_mapte]
JUNOS Routing Software Suite [7.0I20040914_1707_mapte]
JUNOS Online Documentation [7.0I20040914_1707_mapte]
JUNOS Crypto Software Suite [7.0I20040914_1707_mapte]
...

```

request system configuration rescue delete

Syntax	request system configuration rescue delete
Release Information	Command introduced before JUNOS Release 7.4.
Description	Delete an existing rescue configuration.
Options	This command has no options.
Required Privilege Level	maintenance
Related Topics	request system configuration rescue save request system software rollback show system commit
List of Sample Output	request system configuration rescue delete on page 495
Output Fields	This command produces no 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 Release 7.4.
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.
Options	This command has no options.
Required Privilege Level	maintenance
Related Topics	request system software delete request system software rollback show system commit
List of Sample Output	request system configuration rescue save on page 496
Output Fields	This command produces no output.
request system configuration rescue save	user@host> request system configuration rescue save

request system firmware

Syntax	request system firmware (<i>upgrade</i> <i>downgrade</i>) (<i>fpc</i> <slot slot-number> <i>pic</i> <assembly-id assembly-id> < fpc-slot fpc-slot-number> <partnumber partnumber> <pic-slot pic-slot-number> <tag tag>)
Release Information	Command introduced in JUNOS Release 7.4.
Description	(J-series routing platform only) Upgrade or downgrade firmware on a Physical Interface Modules (PIM).
Options	<p><i>fpc</i>—Flexible PIM concentrator (FPC).</p> <p><i>slot slot-number</i>—(Optional) Location of the FPC to upgrade or downgrade.</p> <p><i>pic</i>—Physical interface card (PIC).</p> <p><i>assembly-id assembly-id</i>—(Optional) Component assembly identifier.</p> <p><i>fpc-slot fpc-slot-number</i>—(Optional) Physical location of the PIC to upgrade or downgrade.</p> <p><i>partnumber partnumber</i>—(Optional) Part number of the component to upgrade or downgrade.</p> <p><i>pic-slot pic-slot-number</i>—(Optional) Location of the PIC to upgrade or downgrade.</p> <p><i>tag tag</i>—(Optional) Firmware release number.</p>
Required Privilege Level	maintenance
List of Sample Output	request system firmware upgrade on page 497
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request system firmware upgrade	user@host> request system configuration firmware upgrade fpc

request system halt

Syntax request system halt
 <at *time*>
 <both-routing-engines>
 <other-routing-engine>
 <in *minutes*>
 <media (compact-flash | disk | removable-compact-flash | usb)>
 <message "*text*">

Syntax (Routing Matrix) request system halt
 <all-lcc | lcc *number* | scc>
 <at *time*>
 <both-routing-engines>
 <other-routing-engine>
 <in *minutes*>
 <media (compact-flash | disk)>
 <message "*text*">

Release Information Command introduced before JUNOS Release 7.4.
 other-routing-engine option introduced in JUNOS Release 8.0.

Description Stop the router software.

Options none—Stop the router software immediately.

all-lcc—(Optional) (Routing matrix only) Halt all T640 routing nodes (or line-card chassis) connected to the TX Matrix platform.

lcc *number*—(Optional) (Routing matrix only) Halt a T640 routing node that is connected to the TX Matrix platform. Replace *number* with a value from 0 through 3.

scc—(Optional) (Routing matrix only) Halt only the master Routing Engine or the backup Routing Engine on the TX Matrix platform (or switch-card chassis). If you issue the command from the master Routing Engine, the master SCC is halted. If you issue the command from the backup Routing Engine, the backup SCC is halted.

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.

both-routing-engines—(Optional) Halt both Routing Engines at the same time.

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.

in *minutes*—(Optional) Number of minutes from now to stop the software. This option is an alias for the **at +*minutes*** option.

media (compact-flash | disk | removable-compact-flash | usb)—(Optional) Boot medium for next boot. (The options **removable-compact-flash** and **usb** pertain to the J-series routing platform only.)

message "text"—(Optional) Message to display to all system users before stopping the software.

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 routing matrix, if you issue the **request system halt** command on the TX Matrix 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. If you issue the **request system halt both-routing-engines** command on the TX Matrix, all the Routing Engines on the routing matrix are halted.



NOTE: If you have a router with two Routing Engines and you want to shut the power off to the router or remove a Routing Engine, you must first halt the backup Routing Engine (if it has been upgraded), 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

List of Sample Output request system halt on page 500
 request system halt (In 2 Hours) on page 500
 request system halt (Immediately) on page 500
 request system halt (at 1:20 AM) on page 500

Output Fields When you enter this command, you are provided feedback on the status of your request.

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 the system to 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
```


request system license add

Syntax	<code>request system license add (filename terminal)</code>
Description	Add a license key.
Options	<i>filename</i> —License key from a file or URL. Specify the filename or the URL where the key is located. <i>terminal</i> —License key from the terminal.
Required Privilege Level	maintenance
List of Sample Output	request system license add on page 501
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request system license add	<code>user@host> request system license add terminal</code>

request system license delete

Syntax	<code>request system license delete <i>license-id</i></code>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Delete a license key. You can delete only one license at a time.
Options	<i>license-id</i> —License ID that uniquely identifies a license key.
Required Privilege Level	maintenance
List of Sample Output	request system license delete on page 502
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request system license delete	<pre>user@host> request system license delete G03000002223</pre>

request system license save

Syntax	<code>request system license save (<i>filename</i> terminal)</code>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(J-series routing platform only) Save installed license keys to a file or URL.
Options	<i>filename</i> —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
List of Sample Output	request system license save on page 503
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request system license save	<code>user@host> request system license save ftp://user@host/license.conf</code>

request system logout

Syntax	request system logout (pid <i>pid</i> terminal <i>terminal</i> user <i>username</i>) <all>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Log out users from the router and the configuration database. If a user held the configure exclusive lock, this command clears the exclusive lock.
Options	<p>pid <i>pid</i>—Log out the user session using the specified management process identifier (PID). The PID type must be management process.</p> <p>terminal <i>terminal</i>—Log out the user for the specified terminal session.</p> <p>user <i>username</i>—Log out the specified user.</p> <p>all—(Optional) Log out all sessions owned by a particular PID, terminal session, or user. (On a TX Matrix platform, this command is broadcast to all chassis.)</p>
Additional Information	For information about using the configure exclusive command, see the <i>JUNOS System Basics Configuration Guide</i> .
Required Privilege Level	configure
List of Sample Output	request system logout on page 504
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request system logout	<pre>user@host> request system logout user tammy all Connection closed by foreign host.</pre>

request system partition abort

Syntax	request system partition abort
Syntax (Routing Matrix)	request system partition abort <all-lcc lcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Terminate a previously scheduled storage media partition operation. If the command is issued between the time of a partition request and a reboot, the partition request is aborted and the storage media is not affected.
Options	<p>all-lcc—(Routing matrix only) (Optional) Abort a previously scheduled partition operation on all T640 routing nodes (or line-card chassis) connected to a TX Matrix platform.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Abort a previously scheduled partition operation on a specific T640 routing node that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Abort a previously scheduled partition operation for only the TX Matrix platform (or switch-card chassis).</p>
Required Privilege Level	maintenance
Related Topics	request system partition hard-disk
List of Sample Output	request system partition abort on page 505
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request system partition abort	<pre>user@host> request partition abort</pre> <p>The hard disk is no longer scheduled to be partitioned.</p>

request system partition hard-disk

Syntax	request system partition hard-disk
Syntax (Routing Matrix)	request system partition hard-disk <all-lcc lcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Set up the hard disk for partitioning. After this command is issued, the hard disk is partitioned the next time the system is rebooted. When the hard disk is partitioned, the contents of <code>/altroot</code> and <code>/altconfig</code> are saved and restored. All other data on the hard disk is at risk of being lost.
Options	<p>all-lcc—(Routing matrix only) (Optional) Schedule a partition of the hard disk for all T640 routing nodes (or line-card chassis) connected to the TX Matrix platform at their next reboot.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Schedule a partition of the hard disk on a specific T640 routing node that is connected to a TX Matrix platform at its next reboot. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Schedule a partition of the hard disk for the TX Matrix platform (or switch-card chassis).</p>
Additional Information	To immediately partition the hard disk, use the <code>request system reboot</code> command. To cancel the partition request, use the <code>request system partition abort</code> command.
Required Privilege Level	maintenance
Related Topics	request system partition abort
List of Sample Output	request system partition hard-disk on page 506
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request system partition hard-disk	user@host> request partition hard-disk

request system power-off

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 (Routing Matrix) request system power-off
 <all-lcc | lcc *number* | scc>
 <both-routing-engines>
 <other-routing-engine>
 <at *time*>
 <in *minutes*>
 <media (compact-flash | disk)>
 <message "*text*">

Release Information Command introduced in JUNOS Release 8.0.

Description Power off the software.

Options none—Power off the router software immediately.

all-lcc—(Optional) (Routing matrix only) Power off all T640 routing nodes (or line-card chassis) connected to the TX Matrix platform.

lcc *number*—(Optional) (Routing matrix only) Power off a T640 routing node that is connected to the TX Matrix platform. Replace *number* with a value from 0 through 3.

scc—(Optional) (Routing matrix only) Power off only the master Routing Engine or the backup Routing Engine on the TX Matrix platform (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.

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.

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.

in *minutes*—(Optional) Number of minutes from now to power off the software. This option is an alias for the **at +*minutes*** option.

media (compact-flash | disk | removable-compact-flash | usb)—(Optional) Boot medium for next boot. (The options **removable-compact-flash** and **usb** pertain to the J-series routing platform only.)

message "text"—(Optional) Message to display to all system users before powering off the software.

Additional Information On a routing matrix, 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.

If you issue the **request system power-off both-routing-engines** command on the TX Matrix, 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 508

Output Fields When you enter this command, you are provided feedback on the status of your request.

```

request system power-off user@host> request system power-off message "This router will be powered off in
30 minutes. Please save your data and log out immediately."
warning: This command will not halt the other routing-engine.
If planning to switch off power, use the both-routing-engines option.
Power Off the system ? [yes,no] (no) yes

*** FINAL System shutdown message from remote@nutmeg ***
System going down IMMEDIATELY

This router will be powered off in 30 minutes. Please save your data and log out
immediately.

Shutdown NOW!
[pid 5177]
```


request system reboot

Syntax	request system reboot <other-routing-engine> <at <i>time</i> > <in <i>minutes</i> > <media (compact-flash disk removable-compact-flash usb)> <message " <i>text</i> ">
Syntax (Routing Matrix)	request system reboot <all-lcc lcc <i>number</i> scc> <other-routing-engine> <at <i>time</i> > <in <i>minutes</i> > <media (compact-flash disk)> <message " <i>text</i> ">
Release Information	Command introduced before JUNOS Release 7.4. other-routing-engine option added in JUNOS Release 8.0.
Description	Reboot the software.
Options	<p>none—Reboot the software immediately.</p> <p>all-lcc—(Routing matrix only) (Optional) Reboot all T640 routing nodes (or line-card chassis) connected to the TX Matrix platform.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Number of a T640 routing node that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Reboot the Routing Engine on the TX Matrix platform (or switch-card chassis). If you issue the command from re0, re0 is rebooted. If you issue the command from re1, re1 is rebooted.</p> <p>other-routing-engine—Reboot 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 rebooted. Similarly, if you issue the command from the backup Routing Engine, the master Routing Engine is rebooted.</p> <p>at <i>time</i>—(Optional) Time at which to reboot the software, specified in one of the following ways:</p> <ul style="list-style-type: none"> ■ now—Stop or reboot the software immediately. This is the default. ■ +minutes—Number of minutes from now to reboot the software. ■ yymmddhhmm—Absolute time at which to reboot the software, specified as year, month, day, hour, and minute. ■ hh:mm—Absolute time on the current day at which to stop the software, specified in 24-hour time.

in *minutes*—(Optional) Number of minutes from now to reboot the software. This option is an alias for the `at +minutes` option.

media (compact-flash | disk | removable-compact-flash | usb)—(Optional) Boot medium for next boot. (The options `removable-compact-flash` and `usb` pertain to the J-series routing platform only.)

message "text"—(Optional) Message to display to all system users before stopping or rebooting the software.

Additional Information Reboot requests are recorded in the system log files, which you can view with the `show log` command (see `show log`). Also, the names of any running processes that are scheduled to be shut down are changed. You can view the process names with the `show system processes` command (see `show system processes`).

On a routing matrix, if you issue the `request system reboot` command on the master Routing Engine, all the master Routing Engines connected to the routing matrix are rebooted. If you issue this command on the backup Routing Engine, all the backup Routing Engines connected to the routing matrix are rebooted.



NOTE: To reboot a router that has two Routing Engines, reboot the backup Routing Engine (if you have upgraded it) first, and then reboot the master Routing Engine.

Required Privilege Level maintenance

Related Topics clear system reboot

List of Sample Output request system reboot on page 510
 request system reboot (at 2300) on page 510
 request system reboot (In 2 Hours) on page 510
 request system reboot (Immediately) on page 511
 request system reboot (At 1:20 AM) on page 511

Output Fields When you enter this command, you are provided feedback on the status of your request.

request system reboot user@host> **request system reboot**
 Reboot the system ? [yes,no] (no)

request system reboot (at 2300) user@host> **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 (17:00), illustrates three different ways to request the system to reboot in two hours:
 user@host> **request system reboot at +120**
 user@host> **request system reboot in 120**
 user@host> **request system reboot at 19:00**

request system reboot
(Immediately)

```
user@host> 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@host> request system reboot at 06060120
request system reboot at 120
Reboot the system at 120? [yes,no] (no) yes
```

request system scripts convert

Syntax	request system scripts convert (slax-to-xslt xslt-to-slax) source <i>source/filename</i> destination <i>destination/<filename></i>
Release Information	Command introduced in JUNOS Release 8.2.
Description	Convert an Extensible Stylesheet Language Transformations (XSLT) script to Stylesheet Language, Alternative syntaX (SLAX), or convert a SLAX script to XSLT.
Options	<p>slax-to-xslt—Convert a SLAX script to XSLT.</p> <p>xslt-to-slax—Convert an XSLT script to SLAX.</p> <p>source <i>source/filename</i>—Specify a source file that you want to convert.</p> <p>destination <i>destination/<filename></i>—Specify a destination for the converted file.</p> <p>Optionally, you can specify a filename for the converted file. If you do not specify a filename, the software assigns one automatically. The default destination filename is the same as the source filename, except the file extension is altered. For example, the software converts a source file called test.xml to test.slax. The software converts a source file called test1.slax to test1.xml.</p>
Required Privilege Level	maintenance
List of Sample Output	<p>request system scripts convert slax-to-xslt on page 512</p> <p>request system scripts convert xslt-to-slax on page 512</p>
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request system scripts convert slax-to-xslt	<pre>user@host> request system scripts convert slax-to-xslt source /var/db/scripts/op/script1.slax destination /var/db/scripts/op conversion complete</pre>
request system scripts convert xslt-to-slax	<pre>user@host> request system scripts convert xslt-to-slax source /var/db/scripts/commit/script1.xml destination /var/db/scripts/commit conversion complete</pre>

request system snapshot

Syntax	request system snapshot <partition>
Syntax (Routing Matrix)	request system snapshot <all-lcc lcc <i>number</i> scc> <partition>
Syntax (J-series Routing Platform)	request system snapshot <as-primary> <config-size <i>size</i> > <data-size <i>size</i> > <factory> <media type > <partition> <root-size <i>size</i> > <swap-size <i>size</i> >
Release Information	Command introduced before JUNOS Release 7.4.
Description	Back up the currently running and active file system partitions on the router to standby partitions that are not running. Specifically, the root file system (/) is backed up to /altroot, and /config is backed up to /altconfig. The root and /config file systems are on the router's flash drive, and the /altroot and /altconfig file systems are on the router's hard drive.



CAUTION: 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.

Options	<p>none—Back up the currently running and active file system partitions on the router to standby partitions that are not running.</p> <p>all-lcc—(Routing matrix only) (Optional) Archive data and executable areas for all T640 routing nodes (or line-card chassis) connected to a TX Matrix platform.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Archive data and executable areas for a specific T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Archive data and executable areas for a TX Matrix platform (or switch-card chassis).</p> <p>as-primary—(J-series routing platform only) (Optional) Create a snapshot that can be used to replace the medium in the primary compact flash drive. This option can be used on the removable compact flash only. The option copies the default files that were loaded on the primary compact flash drive when it was shipped from</p>
----------------	---

the factory, plus the rescue configuration if one has been set. This option is useful if you have multiple routers and want to use the same software and configuration on each router. After a boot device is created as a primary compact flash drive, it can operate in only a primary compact flash drive slot. This option causes the boot medium to be partitioned.

config-size size—(J-series routing platform only) (Optional) Specify the size of the config partition, in megabytes. The default value is **10** percent of physical memory on the boot partition. The config partition is mounted on `/config`, and the configuration files are stored in this partition. This option causes the boot medium to be partitioned.

data-size size—(J-series routing platform only) (Optional) Specify the size of the data partition, in megabytes. The default value is **0** MB. The data partition is mounted on `/data`. This space is not used by the router, and can be used for extra storage. This option causes the boot medium to be partitioned.

factory—(J-series routing platform only) (Optional) Copy only default files that were loaded on the primary compact flash drive when it was shipped from the factory, plus the rescue configuration if one has been set. After the boot medium is created with the factory option, it can operate in only the primary compact flash drive.

media type—(J-series routing platform only) (Optional) Specify the boot device the software is copied to:

- **compact-flash**—Copy software to the primary compact flash drive.
- **removable-compact-flash**—Copy software to the removable compact flash drive.
- **usb**—Copy software to the device connected to the USB port.

partition—(Optional) Repartition the flash drive before a snapshot occurs. If the partition table on the flash drive is corrupted, the request system snapshot command fails and reports errors. The partition option is only supported for restoring the software image from the hard drive to the flash drive. You cannot issue the request system snapshot command when you enable flash disk mirroring. We recommend that you disable flash disk mirroring when you upgrade or downgrade the software. For more information, see the *JUNOS System Basics Configuration Guide*.

root-size size—(J-series routing platform only) (Optional) Specify the size of the root partition, in megabytes. The default value is one-third of the physical memory minus the config, data, and swap partitions. The root partition is mounted on `/` and does not include configuration files. This option causes the boot medium to be partitioned.

swap-size size—(J-series routing platform only) (Optional) Specify the size of the swap partition, in megabytes. The default value is one-third of the physical memory on a boot medium larger than 128 MB, or 0 MB on a smaller boot device. The swap partition is used for swap files and software failure memory snapshots. Software failure memory snapshots are saved to the boot medium only if it is

specified as the dump device in the system dump-device configuration hierarchy. This option causes the boot medium to be partitioned.

Additional Information Before upgrading the software on the router, 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 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 a routing matrix, if you issue the **request system snapshot** command on the master Routing Engine, all the master Routing Engines connected to the routing matrix are backed up. If you issue this command on the backup Routing Engine, all the backup Routing Engines connected to the routing matrix are backed up.

You cannot issue the **request system snapshot** command when you enable flash disk mirroring. We recommend that you disable flash disk mirroring when you upgrade or downgrade the software. For more information, see the *JUNOS System Basics Configuration Guide*.

Required Privilege Level maintenance

Related Topics show system snapshot

List of Sample Output request system snapshot on page 515
 request system snapshot (When Partition Flag Is On) on page 515
 request system snapshot (When Mirroring Is Enabled) on page 515
 request system snapshot all-hcc (Routing Matrix) on page 516

Output Fields When you enter this command, you are provided feedback on the status of your request.

request system snapshot user@host> **request system snapshot**
 umount: /altroot: not currently mounted
 Copying / to /altroot.. (this may take a few minutes)
 umount: /altconfig: not currently mounted
 Copying /config to /altconfig.. (this may take a few minutes)

The following filesystems were archived: / /config

request system snapshot (When Partition Flag Is On) user@host> **request system snapshot partition**
 Performing preliminary partition checks ...
 Partitioning ad0 ...
 umount: /altroot: not currently mounted
 Copying / to /altroot.. (this may take a few minutes)

The following filesystems were archived: / /config

request system snapshot (When Mirroring Is Enabled) user@host> **request system snapshot**
 Snapshot is not possible since mirror-flash-on-disk is configured.

```
request system      user@host> request system snapshot all-lcc  
snapshot all-lcc    1cc0-re0:  
(Routing Matrix) -----  
Copying '/' to '/altroot' .. (this may take a few minutes)  
Copying '/config' to '/altconfig' .. (this may take a few minutes)  
The following filesystems were archived: / /config  
  
1cc2-re0:  
-----  
Copying '/' to '/altroot' .. (this may take a few minutes)  
Copying '/config' to '/altconfig' .. (this may take a few minutes)  
The following filesystems were archived: / /config
```


request system software abort

Syntax	<code>request system software abort in-service-upgrade</code>
Release Information	Command introduced in JUNOS Release 9.0.
Description	Abort a unified in-service software upgrade (ISSU). The unified ISSU must be in progress and you must issue this command from a router session other than the one on which you issued the <code>request system in-service-upgrade</code> command that launched the unified ISSU.
Options	This command has no options.
Required Privilege Level	view
Related Topics	<code>request system software in-service-upgrade</code> <code>show chassis in-service-upgrade</code>
List of Sample Output	<code>request system software abort</code> (New Router Session) on page 517 <code>request system software in-service-upgrade</code> (Unified ISSU Session) on page 517
Output Fields	When you enter the <code>request system software abort</code> command on a new router session, you are provided feedback on the status of your request in the router session on which you issued the <code>request system software in-service-upgrade</code> command.
request system software abort (New Router Session)	<pre> user@host> request system software abort </pre>
request system software in-service-upgrade (Unified ISSU Session)	<pre> user@host> request system software in-service-upgrade /var/tmp/jinstall-9.0-20080117.0-domestic-signed.tgz ISSU: Preparing Backup RE Pushing bundle to re1 Checking compatibility with configuration Initializing... Using jbase-9.0-20080116.2 Verified manifest signed by PackageProduction_9_0_0 Using /var/tmp/jinstall-9.0-20080117.0-domestic-signed.tgz Verified jinstall-9.0-20080117.0-domestic.tgz signed by PackageProduction_9_0_0 Using jinstall-9.0-20080117.0-domestic.tgz Using jbundle-9.0-20080117.0-domestic.tgz Checking jbundle requirements on / Using jbase-9.0-20080117.0.tgz Verified manifest signed by PackageProduction_9_0_0 Using jkernel-9.0-20080117.0.tgz Verified manifest signed by PackageProduction_9_0_0 Using jcrypto-9.0-20080117.0.tgz Verified manifest signed by PackageProduction_9_0_0 Using jpfe-9.0-20080117.0.tgz Using jdocs-9.0-20080117.0.tgz Verified manifest signed by PackageProduction_9_0_0 Using jroute-9.0-20080117.0.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-9.0-20080117.0-domestic-signed.tgz' ... Verified jinstall-9.0-20080117.0-domestic.tgz signed by PackageProduction_9_0_0 Adding jinstall... Verified manifest signed by PackageProduction_9_0_0 </pre>

```

WARNING: This package will load JUNOS 9.0-20080117.0 software.
WARNING: It will save JUNOS configuration files, and SSH keys
WARNING: (if configured), but erase all other files and information
WARNING: stored on this machine. It will attempt to preserve dumps
WARNING: and log files, but this can not be guaranteed. This is the
WARNING: pre-installation stage and all the software is loaded when
WARNING: you reboot the system.

```

```

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-9.0-20080117.0-domestic-signed.tgz ...
Saving state for rollback ...
Backup upgrade done
Rebooting Backup RE

```

```

Rebooting re1
error: ISSU Aborted! Backup RE maybe in inconsistent state, Please restore backup
RE
ISSU: IDLE

```

```

{master}
user@host>

```

request system software add

Syntax request system software add *package-name*
 <best-effort-load>
 <delay-restart>
 <force>
 <no-copy>
 <no-validate>
 <reboot>
 <unlink>
 <validate>

Syntax (Routing Matrix) request system software add *package-name*
 <best-effort-load>
 <delay-restart>
 <force>
 <lcc number | scc>
 <no-copy>
 <no-validate>
 <re0 | re1>
 <reboot>
 <unlink>
 <validate>

Release Information Command introduced before JUNOS Release 7.4.
 best-effort-load and unlink options added in JUNOS Release 7.4.

Description Install a software package or bundle on the router.

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.
 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.
 - On a J-series Services Router, when you install the software from a remote location, the package is removed at the earliest opportunity in order to make room for the installation to be completed. If you copy the software to a local directory on the router and then install the new package, use the **unlink** option to achieve the same effect and allow the installation to be completed.
-

best-effort-load—(Optional) Activate a partial load and treat parsing errors as warnings instead of errors.

delay-restart—(Optional) Install software package or bundle, but do not restart software processes.

force—(Optional) Force the addition of the software package or bundle (ignore warnings).

lcc number | **scc**—(Routing matrix only) (Optional) Install a software package or bundle on a T640 routing node (or line-card chassis) or on a Routing Engine on a TX Matrix platform (or switch-card chassis), respectively. Replace *number* with a value from 0 through 3.

no-copy—(Optional) Install a software package or bundle, but do not save copies of 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**—(Routing matrix only) Load a software package or bundle on a particular Routing Engine.

reboot—(Optional) After adding the software package or bundle, reboot the system.

unlink—(Optional) On J-series Services Routers, this option ensures that the software package is removed at the earliest opportunity in order to make room for the installation to be completed. On M-series and T-series routers, use the **unlink** option to remove the software package from this directory after a successful upgrade is completed.

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.

Additional Information Before upgrading the software on the router, 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 and are satisfied that the new package or bundle is successfully installed and running, issue the **request system snapshot** command again to back up the new software to the `/altroot` and `/altconfig` file systems.

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, `jkernl`, last. Add the operating system package, `jkernl`, 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/jkernl
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.

Required Privilege Level maintenance

Related Topics request system software delete

request system software rollback

request system software validate

request system storage cleanup

List of Sample Output request system software add validate on page 521

Output Fields When you enter this command, you are provided feedback on the status of your request.

```
request system software add validate
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/jkernl-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 ...

```

request system software delete

Syntax request system software delete *software-package*
 <force>

Syntax (Routing Matrix) request system software delete *software-package*
 <force>
 <lcc *number* | scc>

Release Information Command introduced before JUNOS Release 7.4.

Description Remove a software package or bundle from the router.



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.

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
- jkernel—(Optional) JUNOS kernel software suite
- jpfe—(Optional) JUNOS Packet Forwarding Engine support
- jroute—(Optional) JUNOS routing software suite
- junos—(Optional) JUNOS base software

force—(Optional) Ignore warnings and force removal of the software.

lcc *number*—(Routing matrix only) (Optional) Remove an extension or upgrade package from a specific T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace *number* with a value from 0 through 3.

scc—(Routing matrix only) (Optional) Remove an extension or upgrade package from the TX Matrix platform (or switch-card chassis).

Additional Information Before upgrading the software on the router, 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 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. 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 Topics request system software add

request system software rollback

request system software validate

List of Sample Output request system software delete jdocs on page 524

Output Fields When you enter this command, you are provided feedback on the status of your request.

request system software delete jdocs The following example displays the system software packages before and after the jdocs package is deleted through the **request system software delete** command:

```
user@host> show system software
Information for jbase:
```

```
Comment:
JUNOS Base OS Software Suite [7.2R1.7]
```

```
Information for jcrypto:
```

```
Comment:
JUNOS Crypto Software Suite [7.2R1.7]
```

```
Information for jdocs:
```

```
Comment:
JUNOS Online Documentation [7.2R1.7]
```

```
Information for jkernel:
```

```
Comment:
JUNOS Kernel Software Suite [7.2R1.7]
```

```
...
```

```
user@host> request system software delete jdocs
Removing package 'jdocs' ...
```

```
user@host> show system software
Information for jbase:
```

```
Comment:
JUNOS Base OS Software Suite [7.2R1.7]
```


Information for jcrypto:

Comment:

JUNOS Crypto Software Suite [7.2R1.7]

Information for jkernel:

Comment:

JUNOS Kernel Software Suite [7.2R1.7]

...

request system software delete-backup

Syntax	request system software delete-backup
Release Information	Command introduced before JUNOS Release 7.4.
Description	(J-series routing platform only) Delete the backup JUNOS software file (if it exists) to free up compact flash drive space. After running this command, you can no longer use the <code>request system software rollback</code> command to revert to the earlier version of the JUNOS software.
Options	This command has no options.
Required Privilege Level	maintenance
List of Sample Output	request system software delete-backup on page 526
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request system software delete-backup	<pre>user@host> request system software delete-backup Delete backup system software package [yes,no] (no) yes</pre>

request system software in-service-upgrade

Syntax	request system software in-service-upgrade <i>package-name</i> <no-old-master-upgrade> <reboot>
Release Information	Command introduced in JUNOS Release 9.0.
Description	Perform a unified in-service software upgrade (ISSU). A unified ISSU enables you to upgrade from one JUNOS software release to another with no disruption on the control plane and with minimal disruption of traffic. A unified ISSU is only supported by dual Routing Engine platforms. In addition, graceful Routing Engine switchover (GRES) and nonstop active routing (NSR) must be enabled.
Options	<p><i>package-name</i>—Location from which the software package or bundle is to be installed. For example:</p> <ul style="list-style-type: none"> ■ <i>/var/tmp/package-name</i>— For a software package or bundle that is being installed from a local directory on the router. ■ <i>protocol://hostname/pathname/package-name</i>—For a software package or bundle that is to be downloaded and installed from a remote location. Replace <i>protocol</i> with one of the following: <ul style="list-style-type: none"> ■ <i>ftp</i>—File Transfer Protocol ■ <i>http</i>—Hypertext Transfer Protocol ■ <i>scp</i>—Secure copy (available only for Canada and U.S. version) <p><i>no-old-master-upgrade</i>—(Optional) When the <i>no-old-master-upgrade</i> 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 <i>no-old-master-upgrade</i> option, the system will automatically upgrade the former master Routing Engine.</p> <p><i>reboot</i>—(Optional) When the <i>reboot</i> option is included, the former master (new backup) Routing Engine is automatically rebooted after being upgraded to the new software. When the <i>reboot</i> option is not included, you must manually reboot the former master (new backup) Routing Engine using the request system reboot command.</p>
Additional Information	<p>The following conditions apply to unified ISSUs:</p> <ul style="list-style-type: none"> ■ Unified ISSUs are supported on M320 and T320 routers and on T640 routing nodes only. ■ Unsupported PICs are restarted during a unified ISSU. For information about supported PICs, see the <i>JUNOS High Availability Configuration Guide</i>.

- Unsupported protocols will experience packet loss during a unified ISSU. For information about supported protocols, see the *JUNOS High Availability Configuration Guide*.
- During a unified ISSU, you cannot bring any PICs online or offline.

For more information, see the *JUNOS High Availability Configuration Guide*.

Required Privilege Level view

Related Topics request system software abortrequest system software abort

show chassis in-service-upgrade

List of Sample Output request system software-in-service upgrade reboot on page 528

Output Fields When you enter this command, you are provided feedback on the status of your request.

```

request system      {master}
software-in-service user@host> request system software in-service-upgrade
upgrade reboot      /var/tmp/jinstall-9.0-20080114.2-domestic-signed.tgz reboot
ISSU: Validating Image
PIC 0/3 will be offlined (In-Service-Upgrade not supported)
Do you want to continue with these actions being taken ? [yes,no] (no) yes

ISSU: Preparing Backup RE
Pushing bundle to re1
Checking compatibility with configuration
Initializing...
Using jbase-9.0-20080114.2
Verified manifest signed by PackageProduction_9_0_0
Using /var/tmp/jinstall-9.0-20080114.2-domestic-signed.tgz
Verified jinstall-9.0-20080114.2-domestic.tgz signed by PackageProduction_9_0_0
Using jinstall-9.0-20080114.2-domestic.tgz
Using jbundle-9.0-20080114.2-domestic.tgz
Checking jbundle requirements on /
Using jbase-9.0-20080114.2.tgz
Verified manifest signed by PackageProduction_9_0_0
Using jkernel-9.0-20080114.2.tgz
Verified manifest signed by PackageProduction_9_0_0
Using jcrypto-9.0-20080114.2.tgz
Verified manifest signed by PackageProduction_9_0_0
Using jpfe-9.0-20080114.2.tgz
Using jdocs-9.0-20080114.2.tgz
Verified manifest signed by PackageProduction_9_0_0
Using jroute-9.0-20080114.2.tgz
Verified manifest signed by PackageProduction_9_0_0
Hardware Database regeneration succeeded
Validating against /config/juniper.conf.gz
mgd: commit complete
Validation succeeded
Installing package '/var/tmp/jinstall-9.0-20080114.2-domestic-signed.tgz' ...
Verified jinstall-9.0-20080114.2-domestic.tgz signed by PackageProduction_9_0_0
Adding jinstall...
Verified manifest signed by PackageProduction_9_0_0

WARNING: This package will load JUNOS 9.0-20080114.2 software.
WARNING: It will save JUNOS configuration files, and SSH keys
WARNING: (if configured), but erase all other files and information

```

```

WARNING:    stored on this machine. It will attempt to preserve dumps
WARNING:    and log files, but this can not be guaranteed. This is the
WARNING:    pre-installation stage and all the software is loaded when
WARNING:    you reboot the system.

```

Saving the config files ...

NOTICE: uncommitted changes have been saved in

/var/db/config/juniper.conf.pre-install

Installing the bootstrap installer ...

```

WARNING:    A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the
WARNING:    'request system reboot' command when software installation is
WARNING:    complete. To abort the installation, do not reboot your system,
WARNING:    instead use the 'request system software delete jinstall'
WARNING:    command as soon as this operation completes.

```

Saving package file in /var/sw/pkg/jinstall-9.0-20080114.2-domestic-signed.tgz

...

Saving state for rollback ...

Backup upgrade done

Rebooting Backup RE

Rebooting re1

ISSU: Backup RE Prepare Done

Waiting for Backup RE reboot

GRES operational

Initiating Chassis In-Service-Upgrade

Chassis ISSU started

ISSU: Backup RE Prepare Done

ISSU: Preparing Daemons

ISSU: Daemons Ready for ISSU

ISSU: Starting Upgrade for FRUs

ISSU: Preparing for Switchover

ISSU: Ready for Switchover

Checking In-Service-Upgrade status

Item	Status	Reason
FPC 0	Online (ISSU)	
FPC 1	Online (ISSU)	
FPC 2	Online (ISSU)	
FPC 6	Online (ISSU)	
FPC 7	Online (ISSU)	

Resolving mastership...

Complete. The other routing engine becomes the master.

ISSU: RE switchover Done

ISSU: Upgrading Old Master RE

Installing package '/var/tmp/paKEuy' ...

Verified jinstall-9.0-20080114.2-domestic.tgz signed by PackageProduction_9_0_0

Adding jinstall...

Verified manifest signed by PackageProduction_9_0_0

```

WARNING:    This package will load JUNOS 9.0-20080114.2 software.
WARNING:    It will save JUNOS configuration files, and SSH keys
WARNING:    (if configured), but erase all other files and information
WARNING:    stored on this machine. It will attempt to preserve dumps
WARNING:    and log files, but this can not be guaranteed. This is the
WARNING:    pre-installation stage and all the software is loaded when
WARNING:    you reboot the system.

```

Saving the config files ...

NOTICE: uncommitted changes have been saved in

/var/db/config/juniper.conf.pre-install

Installing the bootstrap installer ...

```
WARNING:      A REBOOT IS REQUIRED TO LOAD THIS SOFTWARE CORRECTLY. Use the
WARNING:      'request system reboot' command when software installation is
WARNING:      complete. To abort the installation, do not reboot your system,
WARNING:      instead use the 'request system software delete jinstall'
WARNING:      command as soon as this operation completes.
```

Saving package file in /var/sw/pkg/jinstall-9.0-20080114.2-domestic-signed.tgz

...

cp: /var/tmp/paKEuy is a directory (not copied).

Saving state for rollback ...

ISSU: Old Master Upgrade Done

ISSU: IDLE

Shutdown NOW!

Reboot consistency check bypassed - jinstall 9.0-20080114.2 will complete
installation upon reboot

[pid 30227]

*** FINAL System shutdown message from root@host ***

System going down IMMEDIATELY

Connection to host closed.

request system software rollback

Syntax	request system software rollback
Syntax (Routing Matrix)	request system software rollback <fcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Revert to the software that was loaded at the last successful request system software add command.
Options	<p>none—(Routing matrix only) Revert to the set of software as of the last successful request system software add on the TX Matrix platform and its attached T640 routing nodes.</p> <p>fcc <i>number</i>—(Routing matrix only) (Optional) Attempt to roll back to the previous set of packages on a T640 routing node (or line-card chassis) connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Attempt to roll back to the previous set of packages on the TX Matrix platform (or switch-card chassis).</p>
Additional Information	<p>On the J-series routing platform, you can use this command to roll back to a previous software package when the current upgrade has been successful or has failed. On M-series and T-series routing platforms, use this command only to recover from a failed software upgrade—you cannot issue this command to return to the previously installed software after using a jinstall package. To return to the previously installed software, use the corresponding jinstall package.</p> <p>A software rollback fails if any required package (or a jbundle package containing the required package) cannot be found in <code>/var/sw/pkg</code>.</p>
Required Privilege Level	maintenance
Related Topics	<p>request system software add</p> <p>request system software delete</p> <p>request system software validate</p> <p>request system configuration rescue delete</p> <p>request system configuration rescue save</p>
List of Sample Output	request system software rollback on page 532
Output Fields	When you enter this command, you are provided feedback on the status of your request.

```

request system software rollback
user@host> request system software rollback
Verified SHA1 checksum of ./jbase-7.2R1.7.tgz
Verified SHA1 checksum of ./jdocs-7.2R1.7.tgz
Verified SHA1 checksum of ./jroute-7.2R1.7.tgz
Installing package './jbase-7.2R1.7.tgz' ...
Available space: 35495 require: 7335
Installing package './jdocs-7.2R1.7.tgz' ...
Available space: 35339 require: 3497
Installing package './jroute-7.2R1.7.tgz' ...
Available space: 35238 require: 6976
NOTICE: uncommitted changes have been saved in
/var/db/config/juniper.conf.pre-install
Reloading /config/juniper.conf.gz ...
Activating /config/juniper.conf.gz ...
mgd: commit complete
Restarting mgd ...
Restarting aprobed ...
Restarting apsd ...
Restarting cosd ...
Restarting fsad ...
Restarting fud ...
Restarting gcdrd ...
Restarting ilmid ...
Restarting irsd ...
Restarting l2tpd ...
Restarting mib2d ...
Restarting nasd ...
Restarting pppoed ...
Restarting rdd ...
Restarting rmopd ...
Restarting rtspd ...
Restarting sampled ...
Restarting serviced ...
Restarting snmpd ...
Restarting spd ...
Restarting vrrpd ...

WARNING: cli has been replaced by an updated version:
CLI release 7.2R1.7 built by builder on 2005-04-22 02:03:44 UTC
Restart cli using the new version ? [yes,no] (yes) yes

Restarting cli ...
user@host

```


request system software validate

Syntax	<code>request system software validate <i>package-name</i></code>
Syntax (Routing Matrix)	<code>request system software validate <i>package-name</i> <<i>lcc number</i> <i>scc</i>></code>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Validate candidate software against the current configuration of the router.
Options	<p><i>package-name</i>—Name of the software bundle or package to test.</p> <p><i>lcc number</i>—(Routing matrix only) (Optional) Validate the software bundle or package on a specific T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p><i>scc</i>—(Routing matrix only) (Optional) Validate the software bundle or package for the TX Matrix platform (or switch-card chassis).</p>
Additional Information	By default, when you issue the <code>request system software validate</code> command on a TX Matrix master Routing Engine, all the T640 master Routing Engines that are connected to it are validated. If you issue the same command on the TX Matrix backup Routing Engine, all the T640 backup Routing Engines that are connected to it are upgraded to the same version of software.
Required Privilege Level	maintenance
Related Topics	<p><code>request system software add</code></p> <p><code>request system software delete</code></p> <p><code>request system software rollback</code></p>
List of Sample Output	<p><code>request system software validate</code> (Successful Case) on page 534</p> <p><code>request system software validate</code> (Failure Case) on page 534</p>
Output Fields	When you enter this command, you are provided feedback on the status of your request.

```

request system software user@host> request system software validate
validate (Successful /var/sw/pkg/jbundle-5.3I20020124_0520_sjg.tgz
Case) 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 user@host> request system software validate 6.3/
validate (Failure Case) 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

```

request system storage cleanup

Syntax	<code>request system storage cleanup <dry-run></code>
Release Information	Command introduced in JUNOS Release 7.4. dry-run option introduced in JUNOS Release 7.6.
Description	Free storage space on the router by rotating log files and proposing a list of files for deletion. User input is required for file deletion.
Options	dry-run—(Optional) List files proposed for deletion (without deleting them).
Additional Information	If logging is configured and being used, the dry-run option will rotate the log files. In that case, the output displays the message “Currently rotating log files, please wait.” If no logging is currently underway, the output displays only a list of files to delete.
Required Privilege Level	maintenance
List of Sample Output	<code>request system storage cleanup dry-run</code> on page 535 <code>request system storage cleanup</code> on page 535
Output Fields	When you enter this command, you are provided feedback on the status of your request.

```

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)

restart

Syntax 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 |
 mib-process | pgcp-service | pgm | pic-services-logging | ppp | pppoe |
 protected-system-domain-service | redundancy-interface-process | remote-operations |
 root-system-domain-service | routing <logical-system *logical-system-name*> | sampling
 | service-deployment | snmp>
 <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 (J-series Routing Platform) restart
 <adaptive-services | audit-process | chassis-control | class-of-service | dhcp |
 dialer-services | dlsw | event-processing | firewall | interface-control |
 ipsec-key-management | isdn-signaling | l2-learning | l2tp-service | mib-process |
 network-access-service | pgm | ppp | pppoe | remote-operations | routing <logical-system
logical-system-name> | sampling | service-deployment | snmp | usb-control |
 web-management>
 <gracefully | immediately | soft>

Release Information Command introduced before JUNOS Release 7.4.
 dynamic-flow-capture option added in JUNOS Release 7.4.
 dlsw option added in JUNOS Release 7.5.
 event-processing option added in JUNOS Release 7.5.
 link-management option added in Release 8.0.
 ppp option added in JUNOS Release 7.5.
 l2ald option added in JUNOS Release 8.0.
 pgcp-service option added in JUNOS Release 8.4.

Description Restart a JUNOS software process.



CAUTION: Never restart a software process unless instructed to do so by a customer support engineer. A restart might cause the router 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.

audit-process—(Optional) Restart the RADIUS accounting process.

chassis-control—(Optional) Restart the chassis management process.

class-of-service—(Optional) Restart the class-of-service (CoS) process, which controls the router's CoS configuration.

dhcp—(J-series routing platform 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.

dialer-services—(Optional) Restart the Integrated Services Digital Network (ISDN) dial out process.

disk-monitoring—(Optional) Restart disk monitoring, which checks the health of the hard disk drive on the Routing Engine.

dls—(J-series routing platform only) (Optional) Restart the data link switching (DLSw) service.

dynamic-flow-capture—(Optional) Restart the dynamic flow capture (DFC) process, which controls DFC configurations on Monitoring Services III PICs.

ecc-error-logging—(Optional) Restart the error checking and correcting (ECC) process, which logs ECC parity errors in memory on the Routing Engine.

event-processing—(Optional) Restart the event process (eventd).

firewall—(Optional) Restart the firewall management process, which manages firewall configuration.

interface-control—(Optional) Restart the interface process, which controls the router's physical interface devices and logical interfaces.

ipsec-key-management—(Optional) Restart the IPSEC key management process.

isdn-signaling—(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 is configured.

l2-learning—(Optional) Restart the Layer 2 address flooding and learning process.

l2tp-service—(Optional) (M10, M10i, and M7i routers only) Restart the Layer 2 Tunneling Protocol (L2TP) process, which establishes L2TP tunnels and Point-to-Point Protocol (PPP) sessions through L2TP tunnels.

- lACP**—(Optional) Restart the link aggregation control protocol process.
- link-management**—(Optional) Restart the Link Management Protocol (LMP) process, which establishes and maintains LMP control channels.
- mib-process**—(Optional) Restart the Management Information Base (MIB) II process, which provides the router's MIB II agent.
- network-access-service**—(Optional) Restart the network access process, which provides the router's Challenge Handshake Authentication Protocol (CHAP) authentication service.
- pgcp-service**—(Optional) Restart the PGCP service process.
- 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 Physical Interface Cards (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) Restart the Point-to-Point Protocol (PPP) process.
- pppoe**—(Optional) Restart the Point-to-Point Protocol over Ethernet (PPPoE) process.
- 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** <logical-system *logical-system-name*>—(Optional) Restart the routing protocol process, which controls the routing protocols that run on the router 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 and cflowd export.
- service-development**—(Optional) Restart the service deployment service process.
- snmp**—(Optional) Restart the SNMP process, which provides the router's SNMP master agent.
- usb-control**—(J-series routing platform only) (Optional) Restart the USB control process.
- web-management**—(J-series routing platform only) (Optional) Restart the Web management process.

all—(Routing matrix only) (Optional) Restart the software process on all chassis.

all-lcc—(Routing matrix only) (Optional) Restart the software process on all T640 routing nodes connected to a TX Matrix platform.

lcc *number*—(Routing matrix only) (Optional) Restart the software process for a specific T640 routing node that is connected to a TX Matrix platform. Replace *number* with a value from 0 through 3.

gracefully—(Optional) Restart the software process.

immediately—(Optional) Immediately restart the software process.

soft—(Optional) Reread and reactivate the configuration without completely restarting the software processes. For example, Border Gateway Protocol (BGP) peers stay up and the routing table stays constant. Omitting this option results in a graceful restart of the software process.

Required Privilege Level reset

List of Sample Output restart interfaces on page 540

Output Fields When you enter this command, you are provided feedback on the status of your request.

restart interfaces user@host> **restart interfaces**
 interfaces process terminated
 interfaces process restarted

show arp

Syntax	show arp <no-resolve> <expiration-time>
Release Information	Command introduced before JUNOS Release 7.4. expiration-time option added in JUNOS Release 8.1.
Description	Display all entries in the Address Resolution Protocol (ARP) table. To display entries for a particular logical system only, first enter the set cli logical-system <i>logical-system-name</i> command, and then enter the show arp command.
Options	<p>none—Display the entries in the ARP table.</p> <p>no-resolve—(Optional) Do not attempt to determine the hostname that corresponds to the IP address.</p> <p>expiration-time—(Optional) Display the amount of time, in seconds, until each ARP entry is set to expire.</p>
Required Privilege Level	view
Related Topics	<p>clear arp</p> <p>set cli logical-system</p>
List of Sample Output	<p>show arp on page 542</p> <p>show arp no-resolve on page 542</p> <p>show arp expiration-time on page 542</p>
Output Fields	Table 110 on page 541 describes the output fields for the show arp command. Output fields are listed in the approximate order in which they appear.

Table 110: show arp Output Fields

Field Name	Field Description
MAC Address	Media access control (MAC) address that corresponds to the IP address.
Address	IP address that corresponds to the hostname.
Name	Hostname.
Interface	Interface name.
Flags	<p>(no-resolve option only) Indicates how mappings between IP and MAC addresses are defined:</p> <ul style="list-style-type: none"> ■ Permanent—Static mapping. ■ Permanent and published—Static mapping that is published. ■ None—Dynamic mapping.
TTE	(expiration-time option only) Amount of time, in seconds, until ARP entry is set to expire.

show arp user@host> **show arp**

MAC Address	Address	Name	Interface
00:e0:81:22:fd:74	192.168.64.10	firewall.my.net	fxp0.0
00:04:5a:65:78:e1	192.168.65.13	lab.my net	fxp0.0

show arp no-resolve user@host> **show arp no-resolve**

MAC Address	Address	Interface	Flags
00:90:69:96:00:01	10.10.45.5	fe-0/0/1.0	none
00:00:00:00:00:01	200.200.200.1	fe-0/0/0.0	permanent published
00:00:00:00:00:02	200.200.200.2	fe-0/0/0.0	permanent
00:90:69:91:b0:00	200.200.200.3	fe-0/0/0.0	none

Total entries: 4

show arp expiration-time user@host> **show arp expiration-time**

MAC Address	Address	Name	Interface	Flags	TTE
00:a0:a5:12:3e:d4	10.0.0.5	10.0.0.5	fxp1.0	none	
00:e0:81:22:fd:74	192.168.64.10	supernova.englab.juniper.	fxp0.0	none	1491
00:30:48:84:03:56	192.168.65.46	kgb.englab.juniper.net	fxp0.0	none	1279
00:03:ba:12:f7:5e	192.168.65.226	nmssun1-eri0.englab.junip	fxp0.0	none	452
00:90:69:8e:b0:fc	192.168.71.254	stonewall-ge-200.englab.j	fxp0.0	none	1421

Total entries: 5

show configuration

Syntax	show configuration <statement-path>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display the configuration that currently is running on the router, which is the last committed configuration.
Options	<p>none—Display the entire configuration.</p> <p><i>statement-path</i>—(Optional) Display one of the following hierarchies in a configuration. (Each <i>statement-path</i> option has additional suboptions not described here. See the appropriate configuration guide for more information.)</p> <ul style="list-style-type: none"> ■ access—Network access configuration. ■ accounting-options—Accounting data configuration. ■ applications—Applications defined by protocol characteristics. ■ apply-groups—Groups from which configuration data is inherited. ■ chassis—Chassis configuration. ■ chassis network-services—Current running mode. ■ class-of-service—Class-of-service configuration. ■ firewall—Firewall configuration. ■ forwarding-options—Options that control packet sampling. ■ groups—Configuration groups. ■ interfaces—Interface configuration. ■ logical-systems—Logical system configuration. ■ policy-options—Routing policy option configuration. ■ protocols—Routing protocol configuration. ■ routing-instances—Routing instance configuration. ■ routing-options—Protocol-independent routing option configuration. ■ security—Security configuration. ■ services—Service PIC applications configuration. ■ snmp—Simple Network Management Protocol configuration. ■ system—System parameters configuration.
Additional Information	The portions of the configuration that you can view depend on the user class that you belong to and the corresponding permissions. If you do not have permission to view a portion of the configuration, the text ACCESS-DENIED is substituted for that portion of the configuration. If you do not have permission to view authentication

keys and passwords in the configuration, because the **secret** permission bit is not set for your user account, the text **SECRET-DATA** is substituted for that portion of the configuration. If an identifier in the configuration contains a space, the identifier is displayed in quotation marks.

Required Privilege Level view

List of Sample Output show configuration on page 544
show configuration policy-options on page 544

Output Fields This command displays information about the current running configuration.

show configuration

```

user@host> show configuration
## Last commit: 2006-10-31 14:13:00 PST by alant version "8.2IO [builder]"; ##
last changed: 2006-10-31 14:05:53 PST
system {
  host-name nestor;
  domain-name east.net;
  backup-router 192.1.1.254;
    time-zone America/Los_Angeles;
    default-address-selection;
  name-server {
    192.154.169.254;
    192.154.169.249;
    192.154.169.176;
  }
  services {
    telnet;
  }
  tacplus-server {
    1.2.3.4 {
      secret /* SECRET-DATA */;
    }
  }
  interfaces {
    ...
  }
  protocols {
    isis {
      export "direct routes";
    }
  }
  policy-options {
    policy-statement "direct routes" {
      from protocol direct;
      then accept;
    }
  }
}

```

show configuration policy-options

```

user@host> show configuration policy-options
policy-options {
  policy-statement "direct routes" {
    from protocol direct;
    then accept;
  }
}

```

show dhcp server binding

Syntax	show dhcp server binding <detail> <interface <i>interface-name</i> > < <i>ip-address</i> <i>mac-address</i> > <logical-system <i>logical-system-name</i> > <routing-instance <i>routing-instance-name</i> >
Release Information	Command introduced in JUNOS Release 9.0.
Description	Display the address bindings in the client table on the extended Dynamic Host Configuration Protocol (DHCP) local server.
Options	<p>detail—(Optional) Display detailed information about all active client bindings.</p> <p>interface <i>interface-name</i>—(Optional) Display information about active client bindings on the specified interface.</p> <p><i>ip-address</i>—(Optional) IP address of the DHCP client.</p> <p><i>mac-address</i>—(Optional) MAC address of the DHCP client.</p> <p>logical-system <i>logical-system-name</i>—(Optional) Display information about active client bindings for DHCP clients on the specified logical system.</p> <p>routing-instance <i>routing-instance-name</i>—(Optional) Display information about active client bindings for DHCP clients on the specified routing instance.</p>
Required Privilege Level	view
Related Topics	clear dhcp server binding
List of Sample Output	<p>show dhcp server binding on page 547</p> <p>show dhcp server binding detail on page 547</p> <p>show dhcp server binding <i>ip-address</i> on page 547</p> <p>show dhcp server binding <i>ip-address</i> detail on page 547</p>
Output Fields	Table 111 on page 545 lists the output fields for the show dhcp server binding command. Output fields are listed in the approximate order in which they appear.

Table 111: show dhcp server binding Output Fields

Field Name	Field Description	Level of Output
<i>number</i> clients, (<i>number</i> bound, <i>number</i> selecting, <i>number</i> renewing, <i>number</i> rebinding)	Summary counts of the total number of DHCP clients and the number of DHCP clients in each state.	detail none
IP address	IP address of the DHCP client.	All levels

Table 111: show dhcp server binding Output Fields (continued)

Field Name	Field Description	Level of Output
Hardware address	Hardware address of the DHCP client.	All levels
Request received on	Name of the interface on which the DHCP request was received and the IP address from which the request was relayed (if applicable). This field might also display the Integrated Routing and Bridging (IRB) unit to which the interface is assigned if IRB is configured for the interface.	detail
Type	Type of DHCP packet processing performed on the router: <ul style="list-style-type: none"> ■ active—Router actively processes and relays DHCP packets. ■ passive—Router passively snoops DHCP packets passing through the router. 	All levels
Lease expires at	Date and time at which the client's IP address lease expires or, for a client with a state of bound-grace , the time at which the grace period for the client's IP address lease expires.	All levels
State	State of the address binding table on the extended DHCP local server: <ul style="list-style-type: none"> ■ init—Initial state. ■ reboot—Client sends DHCP DISCOVER request. ■ select—Client receives offers from DHCP servers. ■ request—Client requests a DHCP server. ■ add—Client is in process of being added. ■ delete—Client is in process of being deleted. ■ bound—Client has active IP address lease. ■ bound-grace—Grace period for the client's IP address lease is active in the client table; this entry is included in the summary counts line in the number bound category. ■ renew—Client sends request to renew IP address lease. ■ rebind—Client broadcasts request to renew IP address lease. 	detail
Active binding information	Information about active IP address binding: <ul style="list-style-type: none"> ■ IP address—IP address of the DHCP client. ■ Hardware address—Hardware address of the DHCP client. ■ Request received on—(detail level only) Interface on which the client request was received. ■ relayed by—(detail level only) IP address on which the client request was relayed. 	All levels (unless otherwise specified) when command includes <i>ip-address</i> or <i>mac-address</i> value
Lease information	Information about the client's IP address lease: <ul style="list-style-type: none"> ■ Type—Type of IP address lease; always DHCP. ■ Obtained at—Date and time at which the client's IP address lease was obtained. ■ Expires at—Date and time at which the client's IP address lease expires. ■ State—(detail level only) State of the address binding table on the extended DHCP local server. 	All levels (unless otherwise specified) when command includes <i>ip-address</i> or <i>mac-address</i> value

show dhcp server binding user@host> **show dhcp server binding**

5 clients, (0 bound, 0 selecting, 0 renewing, 5 rebinding)

IP address	Hardware address	Type	Lease expires at
100.20.32.1	90:00:00:01:00:01	active	2007-01-17 11:38:47 PST
100.20.32.3	90:00:00:02:00:01	active	2007-01-17 11:38:41 PST
100.20.32.4	90:00:00:03:00:01	active	2007-01-17 11:38:01 PST
100.20.32.5	90:00:00:04:00:01	active	2007-01-17 11:38:07 PST
100.20.32.6	90:00:00:05:00:01	active	2007-01-17 11:38:47 PST

show dhcp server binding detail user@host> **show dhcp server binding detail**

5 clients, (0 bound, 0 selecting, 0 renewing, 5 rebinding)

IP address	Hardware address	Type	Lease expires	State
100.20.32.1	90:00:00:01:00:01	active	2007-01-17 11:38:47 PST	rebind
100.20.32.3	90:00:00:02:00:01	active	2007-01-17 11:38:41 PST	rebind
100.20.32.4	90:00:00:03:00:01	active	2007-01-17 11:38:01 PST	rebind
100.20.32.5	90:00:00:04:00:01	active	2007-01-17 11:38:07 PST	rebind
100.20.32.6	90:00:00:05:00:01	active	2007-01-17 11:38:47 PST	rebind
100.20.32.6	90:00:00:06:00:01	active	2007-01-19 16:38:47 PST	bound-grace

show dhcp server binding ip-address user@host> **show dhcp server binding 100.20.32.1**

Active binding information:

IP address	100.20.32.1
Hardware address	90:00:00:01:00:01

Lease information:

Type	DHCP
Obtained at	2007-01-17 11:28:47 PST
Expires at	2007-01-17 11:38:47 PST

show dhcp server binding ip-address detail user@host> **show dhcp server binding 100.20.32.1 detail**

Active binding information:

IP address	100.20.32.1
Hardware address	90:00:00:01:00:01
Request received on	fe-0/0/2.0, relayed by 100.20.32.2

Lease information:

Type	DHCP
Obtained at	2007-01-17 11:28:47 PST
Expires at	2007-01-17 11:38:47 PST
State	rebind

show dhcp server statistics

Syntax	show dhcp server statistics <logical-system <i>logical-system-name</i> > <routing-instance <i>routing-instance-name</i> >
Release Information	Command introduced in JUNOS Release 9.0.
Description	Display extended Dynamic Host Configuration Protocol (DHCP) local server statistics.
Options	<p>logical-system <i>logical-system-name</i>—(Optional) Display information about extended DHCP local server statistics on the specified logical system. If you do not specify a logical system, statistics are displayed for the default logical system.</p> <p>routing-instance <i>routing-instance-name</i>—(Optional) Display information about extended DHCP local server statistics on the specified routing instance. If you do not specify a routing instance, statistics are displayed for the default routing instance.</p>
Required Privilege Level	view
Related Topics	clear dhcp server statistics
List of Sample Output	show dhcp server statistics on page 549
Output Fields	Table 112 on page 549 lists the output fields for the show dhcp server statistics command. Output fields are listed in the approximate order in which they appear.

Table 112: show dhcp server statistics Output Fields

Field Name	Field Description
Packets dropped	<p>Number of packets discarded by the extended DHCP local server because of errors. Only nonzero statistics appear in the Packets dropped output. When all of the Packets dropped statistics are 0 (zero), only the Total field appears.</p> <ul style="list-style-type: none"> ■ Total—Total number of packets discarded by the extended DHCP local server ■ Bad hardware address—Number of packets discarded because an invalid hardware address was specified ■ Bad opcode—Number of packets discarded because an invalid operation code was specified ■ Bad options—Number of packets discarded because invalid options were specified ■ Invalid server address—Number of packets discarded because an invalid server address was specified ■ No available addresses—Number of packets discarded because there were no addresses available for assignment ■ No interface match—Number of packets discarded because they did not belong to a configured interface ■ No routing instance match—Number of packets discarded because they did not belong to a configured routing instance ■ No valid local address—Number of packets discarded because there was no valid local address ■ Packet too short—Number of packets discarded because they were too short ■ Read error—Number of packets discarded because of a system read error ■ Send error—Number of packets that the extended DHCP local server could not send
Messages received	<p>Number of DHCP messages received.</p> <ul style="list-style-type: none"> ■ BOOTREQUEST—Number of BOOTP protocol data units (PDUs) received ■ DHCPDECLINE—Number of DHCP PDUs of type DECLINE received ■ DHCPDISCOVER—Number of DHCP PDUs of type DISCOVER received ■ DHCPINFORM—Number of DHCP PDUs of type INFORM received ■ DHCPRELEASE—Number of DHCP PDUs of type RELEASE received ■ DHCPREQUEST—Number of DHCP PDUs of type REQUEST received
Messages sent	<p>Number of DHCP messages sent.</p> <ul style="list-style-type: none"> ■ BOOTREPLY—Number of BOOTP PDUs transmitted ■ DHCPOFFER—Number of DHCP OFFER PDUs transmitted ■ DHCPACK—Number of DHCP ACK PDUs transmitted ■ DHCPNACK—Number of DHCP NACK PDUs transmitted

```

show dhcp server statistics user@host> show dhcp server statistics
Packets dropped:
    Total                  30
    Bad hardware address   1
    Bad opcode             1
    Bad options            3
    Invalid server address  5
    No available addresses  1
    No interface match     2
    No routing instance match 9
    No valid local address  4

```

Packet too short	2
Read error	1
Send error	1
Messages received:	
BOOTREQUEST	89163
DHCPDECLINE	0
DHCPDISCOVER	8110
DHCPINFORM	0
DHCPRELEASE	0
DHCPREQUEST	81053
Messages sent:	
BOOTREPLY	32420
DHCPOFFER	8110
DHCPACK	8110
DHCPNAK	8100

show host

Syntax	show host <i>hostname</i>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display Domain Name System (DNS) hostname information.
Options	<i>hostname</i> —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 551
Output Fields	Output field descriptions to be provided.
show host	<pre>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:</pre>

show network-access aaa statistics

Syntax	show network-access aaa statistics <accounting> <authentication> <dynamic-requests>
Release Information	Command introduced in JUNOS Release 9.1.
Description	Display AAA accounting and authentication statistics.
Options	accounting—(Optional) Display AAA accounting statistics. authentication—(Optional) Display AAA authentication statistics. dynamic-requests—(Optional) Display AAA dynamic requests.
Required Privilege Level	view
List of Sample Output	show network-access aaa statistics accounting on page 553 show network-access aaa statistics authentication on page 553 show network-access aaa statistics dynamic-requests on page 553
Output Fields	Table 113 on page 552 lists the output fields for the <code>show network-access aaa statistics</code> command. Output fields are listed in the approximate order in which they appear.

Table 113: command-name Output Fields

Field Name	Field Description
Accepts	Number of authentication requests accepted by the authentication server.
Accounting Response Failures	Number of accounting requests not acknowledged (NAK) by the accounting server.
Accounting Response Success	Number of accounting requests acknowledged by the accounting server.
Challenges	Number of authentication requests challenged by the authentication server.
Errors During Processing	Number of dynamic requests that resulted in processing errors by the AAA framework.
Processed Successfully	Number of dynamic requests processed successfully by the AAA framework.
Rejects	Number of authentication requests rejected by the authentication server.
Requests Received	<ul style="list-style-type: none"> ■ Number of authentication requests received from clients. ■ Number of accounting requests generated by the AAA framework. ■ Number of dynamic requests received from the external server.
Requests Timed Out	Number of accounting requests to the accounting server that timed out.

Table 113: command-name Output Fields *(continued)*

Field Name	Field Description
Silently Dropped	Number of dynamic requests dropped by the AAA framework due to multiple back-to-back or duplicate requests.

```

show network-access user@host> show network-access aaa statistics accounting
aaa statistics      Accounting module statistics
accounting          Requests received: 0
                      Accounting Response failures: 0
                      Accounting Response Success: 0
                      Requests timedout: 0

show network-access user@host> show network-access aaa statistics authentication
aaa statistics      Requests received: 0
authentication     Accepts: 0
                      Rejects: 0
                      Challenges: 0

show network-access user@host> show network-access aaa statistics dynamic-requests
aaa statistics      requests received: 0
dynamic-requests    processed successfully: 0
                      errors during processing: 0
                      silently dropped: 0

```

show network-access aaa subscribers

Syntax	show network-access aaa subscribers <logical-system <i>logical-system-name</i> > <routing-instance <i>routing-instance-name</i> > <statistics> <username>
Release Information	Command introduced in JUNOS Release 9.1.
Description	Display subscriber-specific AAA statistics.
Options	<p>logical-system <i>logical-system-name</i>—(Optional) List subscribers in the specific logical system.</p> <p>routing-instance <i>routing-instance-name</i>—(Optional) List subscribers for the specific routing instance. If you do not specify a routing instance name, the default routing instance is assumed.</p> <p>statistics—(Optional) Display statistics for the subscriber events.</p> <p>username—(Optional) Display information for the specific subscriber session.</p>
Required Privilege Level	view
List of Sample Output	<p>show network-access aaa subscribers logical-system on page 555</p> <p>show network-access aaa subscribers on page 555</p> <p>show network-access aaa subscribers statistics username on page 555</p> <p>show network-access aaa subscribers username on page 555</p>
Output Fields	Table 114 on page 554 lists the output fields for the show network-access aaa subscribers command. Output fields are listed in the approximate order in which they appear.

Table 114: show network-access aaa subscribers Output Fields

Field Name	Field Description
Challenge requests	Number of authentication requests challenged by the authentication server for this subscriber.
Challenge responses	Number of challenge responses sent by the subscriber to the authentication server.
START sent successfully	Number of accounting start requests generated by the AAA framework for this subscriber.
START send failures	Number of accounting start requests that failed to make it to the accounting server for this subscriber.
START ack received	Number of accounting start requests acknowledged by the accounting server for this subscriber.
INTERIM sent successfully	Number of accounting interim requests generated by the AAA framework for this subscriber.
INTERIM send failures	Number of accounting interim requests that failed to make it to the accounting server for this subscriber.

Table 114: show network-access aaa subscribers Output Fields (continued)

Field Name	Field Description
INTERIM ack received	Number of accounting interim requests acknowledged by the accounting server for this subscriber.
STOP-on-failure sent successfully	Number of accounting stop-on-failure requests generated by the AAA framework for this subscriber.
STOP-on-failure send failures	Number of accounting stop-on-failure requests that failed to make it to the accounting server for this subscriber.
STOP-on-failure ack received	Number of accounting stop-on-failure requests acknowledged by the accounting server for this subscriber.
STOP sent successfully	Number of accounting stop requests generated by the AAA framework for this subscriber.
STOP send failures	Number of accounting stop requests that failed to make it to the accounting server for this subscriber.
STOP ack received	Number of accounting stop requests acknowledged by the accounting server for this subscriber.

```

show network-access user@host> show network-access aaa subscribers logical-system
aaa subscribers Username Virtual router name Client type
logical-system cbenson@address.net default ppp
00010e020304.1231 isp-bos-metro-12:isp-cmborg-12-32 dhcp
conley@isp3.com default:isp-gtown-r3-00 dhcp
0020df980102.2334 isp-bos-metro-16:isp-cmborg-12-32 dhcp

show network-access user@host> show network-access aaa subscribers logical-system isp-bos-metro-16
aaa subscribers routing-instance isp-cmborg-12-32
Username Client type Original routing context
00010e020304.1231 dhcp default
peter@isp5.net dhcp isp-bos-metro-1:isp-alwf-01-02
conley@isp5.net dhcp isp-bos-metro-16:isp-cmborg-12-32

show network-access user@host> show network-access aaa subscribers statistics username
aaa subscribers 00010e020304.1231
statistics username Authentication statistics
Challenge requests: 0
Challenge responses: 0
Accounting statistics
START sent successfully: 0
START send failures: 0
START ack received: 0
INTERIM sent successfully: 0
INTERIM send failures: 0
INTERIM ack received: 0
STOP-on-failure sent successfully: 0
STOP-on-failure send failures: 0
STOP-on-failure ack received: 0
STOP sent successfully: 0
STOP send failures: 0
STOP ack received: 0

show network-access user@host> show network-access aaa subscribers username fred@isp5.net
aaa subscribers Virtual router name Client type Session uptime Accounting
username isp-bos-metro-16:isp-cmborg-12-32 dhcp 1d 12h 56m on/volume

```

Service name	Service type	Quota	Accounting
I-Cast	volume	1200 Mbps	on/volume+time
Voip			on/volume
GamingBurst	time	6000 secs	on/volume

show network-access address-assignment pool

Syntax	show network-access address-assignment pool <i>pool-name</i> <logical-system <i>logical-system-name</i> > <routing-instance <i>routing-instance-name</i> >
Release Information	Command introduced in JUNOS Release 9.0.
Description	Display state information for each address-assignment pool.
Options	<p>none—Display information about clients that have obtained addresses from the address-assignment pool.</p> <p><i>pool pool-name</i>—Display information about the specified address-assignment pool.</p> <p>logical-system <i>logical-system-name</i>—(Optional) Perform this operation on the specified logical system.</p> <p>routing-instance <i>routing-instance-name</i>—(Optional) Perform this operation on the specified routing instance.</p>
Required Privilege Level	view and system
List of Sample Output	show network-access address-assignment pool on page 557
Output Fields	Table 115 on page 557 lists the output fields for the show address-assignment pool command. Output fields are listed in the approximate order in which they appear.

Table 115: show network-access address-assignment pool Output Fields

Field Name	Field Description
IP address	IP address of the client.
Hardware address	MAC address of the client.
Type	Type of client.

```

show network-access user@host> show network-access address-assignment pool sunnywest logical-system
address-assignment pool ls1 routing-instance routinst2
IP address      Hardware address      Type
192.168.2.1     00:05:1b:00:b9:01     DHCP
192.168.2.2     00:05:1b:00:b9:02     DHCP
192.168.2.3     00:05:1b:00:b9:03     DHCP
192.168.2.4     00:05:1b:00:b9:04     DHCP

```

show ntp associations

Syntax	show ntp associations <no-resolve>
Release Information	Command introduced before JUNOS Release 7.4.
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 Topics	show ntp status
List of Sample Output	show ntp associations on page 559
Output Fields	Table 116 on page 558 describes the output fields for the show ntp associations command. Output fields are listed in the approximate order in which they appear.

Table 116: 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.

Table 116: show ntp associations Output Fields (*continued*)

Field Name	Field Description
<i>peer-name</i>	Peer name and status of the peer in the clock selection process: <ul style="list-style-type: none"> ■ 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.

```

show ntp associations  user@host> show ntp associations
                        remote      refid      st t when poll reach  delay  offset  disp
=====
*wolfe-gw.junipe tick.ucla.edu    2 u  43   64  377   1.86   0.319   0.08

```

show ntp status

Syntax	show ntp status <no-resolve>
Release Information	Command introduced before JUNOS Release 7.4.
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 Topics	show ntp associations
List of Sample Output	show ntp status on page 560
Output Fields	Output field descriptions to be provided.
show ntp status	<pre> user@host> show ntp status status=0644 leap_none, sync_ntp, 4 events, event_peer/strat_chg, version="ntpd 4.1.0-a Fri Jun 24 06:40:56 GMT 2005 (1)", processor="i386", system="JUNOS7.4-20050624.0", leap=00, stratum=2, precision=-28, rootdelay=6.849, rootdispersion=10.615, peer=38788, refid=ntp-server.company-a.net, reftime=c66705d9.06ee0f3c Fri, Jun 24 2005 15:21:13.027, poll=6, clock=c6670602.cf6db940 Fri, Jun 24 2005 15:21:54.810, state=4, offset=0.205, frequency=75.911, jitter=0.396, stability=0.005 </pre>

show subscribers

Syntax show subscribers
 <address *address*>
 <count>
 <interface *interface*>
 <logical-system *logical-system*>
 <profile-name *profile-name*>
 <routing-instance *routing-instance*>
 <vlan-id *vlan-id*>
 <stacked-vlan-id *stacked-vlan-id*>
 <detail | terse>

Release Information Command introduced in JUNOS Release 9.3.

Description Display information for active subscribers.

Options *address*—(Optional) Display subscribers whose IP address matches the specified address.

count—(Optional) Display the specified count. The count option cannot be used with any other options.

interface—(Optional) Display subscribers whose interface matches the specified interface.

logical system—(Optional) Display subscribers whose logical system matches the specified logical system.

profile name—(Optional) Display subscribers whose dynamic profile matches the specified profile name.

routing instance—(Optional) Display subscribers whose routing instance matches the specified routing instance.

vlan-id—(Optional) Display subscribers whose VLAN ID matches the specified VLAN ID.

stacked-vlan-id—(Optional) Display subscribers whose stacked VLAN ID matches the specified stacked VLAN ID.

detail | terse—(Optional) Display the specified level of output.

Required Privilege Level view

List of Sample Output show subscribers on page 562
 show subscribers detail on page 562
 show subscribers logical-system on page 563
 show subscribers count on page 563
 show subscribers vlan-id on page 563
 show subscribers vlan-id detail on page 563
 show subscribers stacked-vlan-id detail on page 563

show subscribers stacked-vlan-id vlan-id detail (combined output) on page 563
 show subscribers stacked-vlan-id vlan-id interface detail (combined output for a specific interface) on page 564

Output Fields Table 117 on page 562 lists the output fields for the `show subscribers` command. Output fields are listed in the approximate order in which they appear.

Table 117: show subscribers Output Fields

Field Name	Field Description
User Name	Name of subscriber.
IP Address	Subscriber IP address. Both IPv4 and IPv6 addresses are supported.
IP Netmask	Subscriber IP netmask.
Logical System	Logical system associated with the subscriber.
Interface	Interface associated with the subscriber. The router displays subscribers whose interface matches or begins with the specified interface.
Interface Type	Whether the subscriber interface is static or dynamic.
Dynamic Profile Name	Dynamic profile used for the subscriber.
Routing Instance	Routing instance associated with the subscriber.
MAC Address	MAC address associated with the subscriber.
State	Current status of the subscriber session.
VLAN Id	VLAN ID associated with the subscriber in the form <i>tpid.vlan-id</i> .
Stacked VLAN Id	Stacked VLAN ID associated with the subscriber in the form <i>tpid.vlan-id</i> .
RADIUS Accounting ID	RADIUS accounting ID associated with the subscriber.
DHCP Relay IP Address	IP address used by the DHCP relay agent.
Login Time	Date and time at which the subscriber logged in.

show subscribers user@host> **show subscribers**

Interface	IP Address	User Name
ge-0/0/0.0	192.168.15.10	user@isp5555.net
ge-0/0/0.1	1234:5678:9012:3456:7890:1234:5678:9012	useripv6@isp5555.net

show subscribers detail user@host> **show subscribers detail**

```
Type: DHCP
User Name: igmp-user1
IP Address: 192.168.1.10
IP Netmask: 255.255.0.0
Logical System: default
```

```

Routing Instance: default
Interface: demux0.1073741824
Interface type: Static
Dynamic Profile Name: user-profile-15
MAC Address: 00:00:65:02:01:02
State: Active
Radius Accounting ID: 1
DHCP Relay IP Address: 192.168.32.2
Login Time: 2008-10-08 08:22:12 PDT

```

```

show subscribers logical-system user@host> show subscribers logical-system default terse
Interface      User Name      Ip Address
ge-0/0/0.1     user1@isp5555.net  192.168.15.10
ge-0/0/0.2     user2@isp5555.net  2001:0db8:0:22:3300:4040:1428:57ab

show subscribers count user@host> show subscribers count
Total Subscribers: 2, Active Subscribers: 2

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 stacked-vlan-id detail user@host> show subscribers stacked-vlan-id 101 detail
Type: VLAN
Interface: ge-1/2/0.1073741824
Interface type: Dynamic
Dynamic Profile Name: svlan-prof
State: Active
Stacked VLAN Id: 0x8100.101
VLAN Id: 0x8100.100
Login Time: 2009-03-27 11:57:19 PDT

show subscribers stacked-vlan-id vlan-id detail (combined output) user@host> show subscribers stacked-vlan-id 101 vlan-id 100 detail
Type: VLAN
Interface: ge-1/2/0.1073741824
Interface type: Dynamic
Dynamic Profile Name: svlan-prof
State: Active
Stacked VLAN Id: 0x8100.101
VLAN Id: 0x8100.100
Login Time: 2009-03-27 11:57:19 PDT

```

show subscribers	user@host> show subscribers stacked-vlan-id 101 vlan-id 100 interface ge-1/2/0.*
stacked-vlan-id vlan-id	detail
interface detail	Type: VLAN
(combined output for a	Interface: ge-1/2/0.1073741824
specific interface)	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 system alarms

Syntax	show system alarms		
Release Information	Command introduced before JUNOS Release 7.4.		
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. For more information about system alarms, see the <i>JUNOS System Basics Configuration Guide</i> .		
Required Privilege Level	admin		
List of Sample Output	show system alarms on page 565		
Output Fields	Output field descriptions to be provided.		
show system alarms	<pre> 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 </pre>		

show system audit

Syntax	show system audit <root-only>
Syntax (Routing Matrix)	show system audit <all-lcc lcc <i>number</i> scc> <root-only>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display the state and checksum values for file systems.
Options	<p>none—Display the state and checksum values for all file systems.</p> <p>all-lcc—(Routing matrix only) (Optional) Display file system MD5 hash and permissions information for all T640 routing nodes (or line-card chassis) connected to a TX Matrix platform.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Display file system MD5 hash and permissions information for a specific T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display file system MD5 hash and permissions information for the TX Matrix platform (or switch-card chassis).</p> <p>root-only—(Optional) Check only the root (/) file system.</p>
Additional Information	<p>To redirect the output to a file, issue the following command:</p> <pre>ssh router-name 'show system audit root-only' > output-file</pre> <p>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.</p> <p>By default, when you issue the show system audit command on a TX Matrix master Routing Engine, the command is broadcast to all the T640 master Routing Engines connected to it. If you issue the command on the TX Matrix backup Routing Engine, the command is broadcast to all the T640 backup Routing Engines that are connected to it.</p>
Required Privilege Level	admin
List of Sample Output	<p>show system audit root-only on page 566</p> <p>show system audit lcc (Routing Matrix) on page 567</p>
Output Fields	Output field descriptions to be provided.
show system audit root-only	<pre>user@host> show system audit root-only # user: root # machine: my-host</pre>

```

#          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=82e1637682d58ec28964dfec7fccb62e
kernel.config \
        mode=0644 size=0 time=915149058.0 \
        md5digest=d41d8cd98f00b204e9800998ecf8427e
sys       type=link mode=0777 size=11 time=915149029.0 \
        link=usr/src/sys

```

**show system audit lcc
(Routing Matrix)**

```

user@host> show system audit lcc 2
lcc2-re0:

```

```

-----
#          user: root
#          machine: rodin-lcc2
#          tree: /
#          date: Mon Sep 13 11:55:33 2004

# .
/set type=file uid=0 gid=0 mode=0555 nlink=1 flags=none
.      type=dir nlink=20 size=512 time=1094982121.0
COPYRIGHT mode=0644 size=4735 time=986012708.0 \
        md5digest=78396df1404ad742e6eb1be28f0cd63b
kernel    type=link mode=0700 size=17 time=1090266262.0 \
        link=/packages/jkernel

# ./altconfig
altconfig type=dir nlink=2 size=512 time=1089801320.0
# ./altconfig
..

# ./altroot
altroot   type=dir nlink=2 size=512 time=1089801320.0
# ./altroot
..

# ./b
b         type=dir mode=0755 nlink=2 size=512 time=1093961429.0
# ./b

```

..

```

# ./bin
/set type=file uid=0 gid=0 mode=0700 nlink=1 flags=none
bin      type=dir mode=0755 nlink=2 size=512 time=1089843059.0
  [      type=link size=28 time=1090266270.0 \
        link=/packages/mnt/jbase/bin/test
  cat    type=link size=27 time=1090266270.0 \
        link=/packages/mnt/jbase/bin/cat
  chmod  type=link size=29 time=1090266270.0 \
        link=/packages/mnt/jbase/bin/chmod
  cp      type=link size=26 time=1090266270.0 \
        link=/packages/mnt/jbase/bin/cp
  csh     type=link size=27 time=1090266270.0 \
        link=/packages/mnt/jbase/bin/csh
  date    type=link size=28 time=1090266270.0 \
        link=/packages/mnt/jbase/bin/date
  dd      type=link size=26 time=1090266270.0 \
        link=/packages/mnt/jbase/bin/dd
  df      type=link size=26 time=1090266270.0 \
        link=/packages/mnt/jbase/bin/df
  echo    type=link size=28 time=1090266270.0 \
        link=/packages/mnt/jbase/bin/echo
  ed      type=link size=26 time=1090266270.0 \
        link=/packages/mnt/jbase/bin/ed
  expr    type=link size=28 time=1090266270.0 \
        link=/packages/mnt/jbase/bin/expr
  hostname type=link size=32 time=1090266270.0 \
        link=/packages/mnt/jbase/bin/hostname
  kill    type=link size=28 time=1090266270.0 \
        link=/packages/mnt/jbase/bin/kill
  ln      type=link size=26 time=1090266270.0 \
        link=/packages/mnt/jbase/bin/ln
  ls      type=link size=26 time=1090266270.0 \
        link=/packages/mnt/jbase/bin/ls
  mkdir   type=link size=29 time=1090266270.0 \
        link=/packages/mnt/jbase/bin/mkdir
  mv      type=link size=26 time=1090266270.0 \
        link=/packages/mnt/jbase/bin/mv
  ps      type=link size=26 time=1090266270.0 \
        link=/packages/mnt/jbase/bin/ps
  pwd     type=link size=27 time=1090266270.0 \
        link=/packages/mnt/jbase/bin/pwd
  rcp     type=link size=27 time=1090266270.0 \
        link=/packages/mnt/jbase/bin/rcp
  red     type=link size=26 time=1090266270.0 \
        link=/packages/mnt/jbase/bin/red
  rm      type=link size=26 time=1090266270.0 \
        link=/packages/mnt/jbase/bin/rm
  rmdir   type=link size=29 time=1090266270.0 \
        link=/packages/mnt/jbase/bin/rmdir
  sh      type=link size=26 time=1090266270.0 \
        link=/packages/mnt/jbase/bin/sh
  sleep   type=link size=29 time=1090266270.0 \
        link=/packages/mnt/jbase/bin/sleep
  stty    type=link size=28 time=1090266270.0 \
        link=/packages/mnt/jbase/bin/stty
  sync    type=link size=28 time=1090266270.0 \
        link=/packages/mnt/jbase/bin/sync
  tcsh    type=link size=27 time=1090266270.0 \

```

```

                                link=/packages/mnt/jbase/bin/csh
test                            type=link size=28 time=1090266270.0 \
                                link=/packages/mnt/jbase/bin/test
# ./bin
..

# ./boot
/set type=file uid=0 gid=0 mode=0444 nlink=1 flags=none
boot                            type=dir mode=0555 nlink=3 size=512 time=1095069935.0
boot0                          size=512 time=1094978286.0 \
                                md5digest=6f780822dd4ae482a20462b66e542cca
boot1                          mode=0555 size=512 time=1094978294.0 \
                                md5digest=8d112b09df342cd0b60fdb9bdcde8e07
boot2                          mode=0555 size=7680 time=1094978294.0 \
                                md5digest=28eb58c4068c6b85717e1484f9e028e4
cdboot                         mode=0555 size=165888 time=1094978298.0 \
                                md5digest=1474c6b800dfc82ba552d7c36116d07d
kgzldr.o                       size=5996 time=1094982121.0 \
                                md5digest=c53dc948eb07e2ea4eb0413e4c4634a3
loader                         mode=0555 size=163840 time=1094978298.0 \
                                md5digest=82d9dc2d31033476bfb61bb7264c4fed
loader.4th                     size=9237 time=986013631.0 \
                                md5digest=43144391465ad50267d31e0a320be1de
...

```

show system autoinstallation status

Syntax	show system autoinstallation status
Description	(J-series routing platform only) Display autoinstallation status information.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show system autoinstallation status on page 570
Output Fields	Output field descriptions to be provided.
show system autoinstallation status	<pre>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: fe-0/0/1 State: None Address acquisition: Protocol: DHCP Client Acquired address: None Protocol: RARP Client Acquired address: None</pre>

show system boot-messages

Syntax	show system boot-messages
Syntax (Routing Matrix)	show system boot-messages <all-lcc lcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display initial messages generated by the system kernel upon startup. These messages are the contents of /var/run/dmesg.boot.
Options	<p>all-lcc—(Routing matrix only) (Optional) Display boot time messages for all T640 routing nodes (or line-card chassis) connected to a TX Matrix platform.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Display boot time messages for a specific T640 routing node connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display boot time messages for the TX Matrix platform (or switch-card chassis).</p>
Additional Information	By default, when you issue the show system boot-messages command on a TX Matrix master Routing Engine, the command is broadcast to all the T640 master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix backup Routing Engine, the command is broadcast to all the T640 backup Routing Engines that are connected to it.
Required Privilege Level	view
List of Sample Output	show system boot-messages on page 571 show system boot-messages lcc (Routing Matrix) on page 573
Output Fields	Output field descriptions to be provided.
show system boot-messages	<pre> 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@single.juniper.net:/p/build/20000216-0905/4.1/release_kernel/sys/compile/GENERIC CPU: Pentium Pro (332.55-MHz 686-class CPU) Origin = "GenuineIntel" Id = 0x66a Stepping=10 Features=0x183f9ff<FPU,VME,DE,PSE,TSC,MSR,PAE,MCE,CX8,SEP,MTRR,PGE,MCA,CMOV,<b16>,<b17>,MMX,<b24>> Teknor CPU Card Recognized real memory = 805306368 (786432K bytes) avail memory = 786280448 (767852K bytes) Probing for devices on PCI bus 0: chip0 <generic PCI bridge (vendor=8086 device=7192 subclass=0)> rev 3 class 6000 0 on pci0:0:0 </pre>

```

chip1 <Intel 82371AB PCI-ISA bridge> rev 1 class 60100 on pci0:7:0
chip2 <Intel 82371AB IDE interface> rev 1 class 10180 on pci0:7:1
chip3 <Intel 82371AB USB interface> rev 1 class c0300 int d irq 11 on pci0:7:2
smb0 <Intel 82371AB SMB controller> rev 1 class 68000 on pci0:7:3
pcic0 <TI PCI-1131 PCI-CardBus Bridge> rev 1 class 60700 int a irq 15 on pci0:13:0
TI1131 PCI Config Reg: [pci only][FUNC0 pci int]
pcic1 <TI PCI-1131 PCI-CardBus Bridge> rev 1 class 60700 int b irq 12 on pci0:13:1
TI1131 PCI Config Reg: [pci only][FUNC1 pci int]
fxp0 <Intel EtherExpress Pro 10/100B Ethernet> rev 8 class 20000 int a irq 12 on

pci0:16:0
chip4 <generic PCI bridge (vendor=1011 device=0022 subclass=4)> rev 4 class 6040
0 on pci0:17:0
fxp1 <Intel EtherExpress Pro 10/100B Ethernet> rev 8 class 20000 int a irq 10 on

pci0:19:0
Probing for devices on PCI bus 1:
mcs0 <Miscellaneous Control Subsystem> rev 12 class ff0000 int a irq 12 on pci1:13:0
fxp2 <Intel EtherExpress Pro 10/100B Ethernet> rev 8 class 20000 int a irq 10 on

pci1:14:0
Probing for devices on the ISA bus:
sc0 at 0x60-0x6f irq 1 on motherboard
sc0: EGA color <16 virtual consoles, flags=0x0>
ed0 not found at 0x300
ed1 not found at 0x280
ed2 not found at 0x340
psm0 not found at 0x60
sio0 at 0x3f8-0x3ff irq 4 flags 0x20010 on isa
sio0: type 16550A, console
sio1 at 0x3e8-0x3ef irq 5 flags 0x20000 on isa
sio1: type 16550A
sio2 at 0x2f8-0x2ff irq 3 flags 0x20000 on isa
sio2: type 16550A
pcic0 at 0x3e0-0x3e1 on isa
PC-Card ctlr(0) TI PCI-1131 [CardBus bridge mode] (5 mem & 2 I/O windows)
pcic0: slot 0 controller I/O address 0x3e0
npx0 flags 0x1 on motherboard
npx0: INT 16 interface
fdc0: direction bit not set
fdc0: cmd 3 failed at out byte 1 of 3
fdc0 not found at 0x3f0
wdc0 at 0x1f0-0x1f7 irq 14 on isa
wdc0: unit 0 (wd0): <SunDisk SDCFB-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      user@host> show system boot-messages lcc 2
boot-messages lcc lcc2-re0:
(Routing Matrix) -----
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@benten.juniper.net:/build/benten-b/7.0/20040912.0/obj-i386/sys/compile/JUNIPER
Timecounter "i8254" frequency 1193182 Hz
Timecounter "TSC" frequency 601368936 Hz
CPU: Pentium III/Pentium III Xeon/Celeron (601.37-MHz 686-class CPU)
    Origin = "GenuineIntel" Id = 0x68a Stepping = 10

Features=0x387f9ff<FPU,WE,DE,PSE,TSC,MSR,PAE,MCE,CX8,SEP,MTRR,PGE,MCA,CMOV,PAT,PSE36,PN,MMX,FXSR,SSE>
real memory = 2147467264 (2097136K bytes)
sio0: gdb debugging port
avail memory = 2084040704 (2035196K bytes)
Preloaded elf kernel "kernel" at 0xc06d9000.
DEVFS: ready for devices
Pentium Pro MTRR support enabled
md0: Malloc disk
DRAM Data Integrity Mode: ECC Mode with h/w scrubbing
npx0: <math processor> on motherboard
npx0: INT 16 interface
pcib0: <ServerWorks NB6635 3.0LE host to PCI bridge> on motherboard
pci0: <PCI bus> on pcib0
pcic-pci0: <TI PCI-1410 PCI-CardBus Bridge> irq 15 at device 1.0 on pci0
pcic-pci0: TI12XX PCI Config Reg: [pwr save][pci only]
fxp0: <Intel Embedded 10/100 Ethernet> port 0x1000-0x103f mem
0xfb800000-0xfb81ffff,0xfb820000-0xfb820fff irq 9 at device 3.0 on pci0
fxp1: <Intel Embedded 10/100 Ethernet> port 0x1040-0x107f mem
0xfb840000-0xfb85ffff,0xfb821000-0xfb821fff irq 11 at device 4.0 on pci0
...

```

show system buffers

Syntax	show system buffers
Syntax (Routing Matrix)	show system buffers <all-lcc lcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
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, as well as the routing and management traffic from IP (that is, from OSPF, BGP, SNMP, ping operations, and so on).
Options	<p>all-lcc—(Routing matrix only) (Optional) Show buffer statistics for all T640 routing nodes (or line-card chassis) connected to a TX Matrix platform.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Show buffer statistics for a specific T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Show buffer statistics for the TX Matrix platform (or switch-card chassis).</p>
Additional Information	<p>By default, when you issue the show system buffers command on a TX Matrix master Routing Engine, the command is broadcast to all the T640 master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix backup Routing Engine, the command is broadcast to all the T640 backup Routing Engines that are connected to it.</p> <p>A special type of memory buffer called a <i>cluster</i> is 2 KB in size. For more information, see <i>The Design and Implementation of the 4.4BSD Operation System</i> by McKusic, Bostic, Karels, and Quarterman.</p>
Required Privilege Level	view
List of Sample Output	<p>show system buffers on page 575</p> <p>show system buffers scc (Routing Matrix) on page 576</p>
Output Fields	Table 118 on page 575 describes the output fields for the show system buffers command. Output fields are listed in the approximate order in which they appear.

Table 118: 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 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 mbuf 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.

```

show system buffers  user@host> show system buffers
                        853 mbufs in use:
                        2 mbufs allocated to packet headers
                        37 mbufs allocated to protocol control blocks
                        28 mbufs allocated to socket names and addresses
                        2 mbufs allocated to socket send data
                        400 mbufs allocated to pfe refill data
                        384 mbufs allocated to fxp data
                        784/944 mbuf clusters in use
                        1994 Kbytes allocated to network (83% in use)
                        0 requests for memory denied
                        0 requests for memory delayed
                        0 calls to protocol drain routines

```

```
show system buffers scc    user@host> show system buffers scc  
(Routing Matrix)         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 commit

Syntax	show system commit
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display the pending commit operation (if any) and the commit history.
Options	This command has no options.
Required Privilege Level	view
Related Topics	clear system commit
List of Sample Output	show system commit on page 578 show system commit (At a Particular Time) on page 578 show system commit (At the Next Reboot) on page 578 show system commit (Rollback Pending) on page 578
Output Fields	Table 119 on page 577 describes the output fields for the <code>show system commit</code> command. Output fields are listed in the approximate order in which they appear.

Table 119: show system commit Output Fields

Field Name	Field Description
Commit History	Displays the last 50 commit operations listed, most recent to first. The identifier <code>rescue</code> designates a configuration created for recovery using the <code>request system configuration rescue save</code> command.
Timestamp	Date and time of the commit operation.
User name	User who executed the commit operation
Commit method	Method used to execute the commit operation: <ul style="list-style-type: none"> ■ <code>cli</code>—CLI interactive user performed the commit operation. ■ <code>junoscript</code>—JUNOScript client performed the commit operation. ■ <code>synchronize</code>—The <code>commit synchronize</code> command was performed on the other Routing Engine. ■ <code>snmp</code>—An SNMP SET request caused the commit operation. ■ <code>button</code>—A button on the router was pressed to commit a rescue configuration for recovery. ■ <code>autoinstall</code>—A configuration obtained through autoinstallation was committed. ■ <code>other</code>—A method other than those identified was used to perform the commit operation.

```

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 regress via cli
2   2003-07-25 22:01:32 PDT by regress via cli
3   2003-07-25 21:30:13 PDT by root via button
4   2003-07-25 13:46:48 PDT by regress 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      user@host> show system commit
(At a Particular Time)  commit requested by root via cli at Tue May  7 15:59:00 2002

show system commit      user@host> show system commit
(At the Next Reboot)    commit requested by root via cli at reboot

show system commit      user@host> show system commit
(Rollback Pending)      0 2005-01-05 15:00:37 PST by root via cli commit confirmed, rollback in 3mins

```

show system configuration archival

Syntax	show system configuration archival
Release Information	Introduced in JUNOS Release 7.6.
Description	Display directory and number of files queued for archival transfer.
Options	This command has no options.
Required Privilege Level	maintenance
List of Sample Output	show system configuration archival on page 579
Output Fields	Output field descriptions to be provided.
show system configuration archival	<pre>user@host> show system configuration archival /var/transfer/config/: total 8</pre>

show system configuration rescue

Syntax	show system configuration rescue
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display a rescue configuration, if one exists.
Options	This command has no options.
Required Privilege Level	maintenance
List of Sample Output	show system configuration rescue on page 580
Output Fields	Output field descriptions to be provided.
show system configuration rescue	<pre> user@host> show system configuration rescue version "7.3"; groups { global { system { host-name router1; domain-name customer.net; domain-search [customer.net]; backup-router 192.168.124.254; name-server { 172.17.28.11; 172.17.28.101; 172.17.28.100; 172.17.28.10; } login { user regress { uid 928; class ; shell csh; authentication { encrypted-password "\$1\$kPU..\$w.4FGRAGanJ8U4Yq6sbj7."; ## SECRET-DATA } } } } } services { ftp; rlogin; rsh; telnet; } } </pre>

show system connections

Syntax	show system connections <extensive> <inet inet6> <show-routing-instances>
Syntax (Routing Matrix)	show system connections <extensive> <all-lcc lcc <i>number</i> scc> <inet inet6> <show-routing-instances>
Release Information	Command introduced before JUNOS Release 7.4.
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	<p>none—Display information about all active IP sockets on the Routing Engine.</p> <p>extensive—(Optional) Display exhaustive system process information, which, for TCP connections, includes the TCP control block. This option is useful for debugging TCP connections.</p> <p>all-lcc—(Routing matrix only) (Optional) Display system connection activity for all T640 routing nodes (or line-card chassis) connected to a TX Matrix platform.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Display system connection activity for a specific T640 routing node that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display system connection activity for the TX Matrix platform (or switch-card chassis).</p> <p>inet inet6—(Optional) Display IPv4 connections or IPv6 connections, respectively.</p> <p>show-routing-instances—(Optional) Display routing instances.</p>
Additional Information	By default, when you issue the show system connections command on a TX Matrix master Routing Engine, the command is broadcast to all the T640 master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix backup Routing Engine, the command is broadcast to all the T640 backup Routing Engines that are connected to it.
Required Privilege Level	view
List of Sample Output	<p>show system connections on page 582</p> <p>show system connections extensive on page 583</p> <p>show system connections lcc (Routing Matrix) on page 583</p> <p>show system connections show-routing-instances on page 584</p>

Output Fields Table 120 on page 582 describes the output fields for the `show system connections` command. Output fields are listed in the approximate order in which they appear.

Table 120: 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 <code>show-routing-instance</code> option is used.	Routing instances associated with active IP sockets on the Routing Engine.
(state)	For TCP, the protocol state of the socket.

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)
tcp        0      2 192.168.4.16.513        208.197.169.254.894     ESTABLISHED
    iss: 3972677059      sndup: 3972693435      sndcc: 10
    snduna: 3972693435    sndnxt: 3972693437    sndwnd: 17376
    sndmax: 3972693437    sndcwnd: 65535      sndssthresh: 1073725440
    irs: 484187869      rcvup: 484188060      rcvcc: 98357
    rcvnxt: 484188070    rcvadv: 484205446    rcvwnd: 17376
    rtt: 1      srtt: 7      rttv: 5
    rxtcur: 120    rxtshift: 0      rtseq: 1103707591
    rttmin: 2      duration: 5011    mss: 1448
    flags: REQ_SCALE RCVD_SCALE REQ_TSTMP RCVD_TSTMP RCVD_CC [0x41e0]
tcp        0      0 192.168.4.16.513        208.197.169.195.945     ESTABLISHED
    iss: 1057609890      sndup: 1057790796      sndcc: 2
    snduna: 1057790810    sndnxt: 1057790810    sndwnd: 17376
    sndmax: 1057790810    sndcwnd: 39096      sndssthresh: 1073725440
    irs: 3551947312      rcvup: 3551947422      rcvcc: 0
    rcvnxt: 3551947422    rcvadv: 3551964798    rcvwnd: 17376
    rtt: 0      srtt: 17      rttv: 11
    rxtcur: 300    rxtshift: 0      rtseq: 0
    rttmin: 2      duration: 125814    mss: 1448
    flags: REQ_SCALE RCVD_SCALE REQ_TSTMP RCVD_TSTMP [0x1e0]
udp0       0192.168.4.16.1634208.197.169.249.2049
udp0       0192.168.4.16.1627208.197.169.254.2049
udp0       0192.168.4.16.1371208.197.169.195.2049
udp 0      0*.*.*.
udp0       0*.9999*.
udp 0      0*.161*.
udp0       0192.168.4.16.1039192.168.4.16.1023
udp0       0192.168.4.16.1038192.168.4.16.1023
udp0       0192.168.4.16.1037192.168.4.16.1023
udp0       0192.168.4.16.1036192.168.4.16.1023
udp0       0*.1022*.
udp 0      0*.1023*.
udp0       0*.111*.
udp0       0*.**.*
```

**show system
connections lcc
(Routing Matrix)**

```
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 Active Internet connections (including servers) (including routing-instances)
show-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 core-dumps

Syntax	show system core-dumps <core-filename> <core-file-info> <brief detail>
Syntax (Routing Matrix)	show system core-dumps <all-lcc lcc <i>number</i> scc> <core-filename> <core-file-info> <brief detail>
Release Information	Command introduced before JUNOS Release 8.5.
Description	<p>Show core files on all JUNOS routing platforms. You can use the show system core-dumps command to show a list of system core files created when the router 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/filename.</p> <p>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.</p>
Options	<p>none—Display a list of all existing core-dump files.</p> <p><all-lcc lcc <i>number</i> scc>—(Routing matrix only) (Optional) Display logging information about all T640 routing nodes (or line-card chassis) or a specific T640 routing node (replace <i>number</i> with a value from 0 through 3) connected to a TX Matrix platform. Or, display logging information about the TX Matrix platform (or switch-card chassis).</p> <p>core-filename—(Optional) Name of a specific core file to display.</p> <p>core-file-info—(Optional) Display the stack trace of a core file.</p> <p>brief—(Optional) View details of binary.</p> <p>detail—(Optional) View stack trace with details of binary.</p>
Required Privilege Level	view
List of Sample Output	<p>show system core-dumps on page 586</p> <p>show system core-dumps on page 586</p>
Output Fields	Table 121 on page 586 describes the output fields for the show system core-dumps command. Output fields are listed in the approximate order in which they appear.

Table 121: show system core-dumps Output Fields

Field Name	Field Description
<i>Permissions</i>	Read/write permissions for the file named.
<i>Links</i>	Number of links to the file.
<i>Owner</i>	Name of the file owner.
<i>Group</i>	Name of the group with file access.
<i>File size</i>	File size in bytes.
<i>Modified</i>	Last file modification date and time.
<i>Path/filename</i>	File path where the file resides and the filename.

**show system
core-dumps**

This example shows the command output if core files exist.

```
user@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
```

**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 directory-usage

Syntax	show system directory-usage <depth <i>number</i> > <path>
Syntax (Routing Matrix)	show system directory-usage <all-lcc lcc <i>number</i> scc> <depth <i>number</i> > <path>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display directory usage information.
Options	<p>none—Display all directory usage information.</p> <p>all-lcc—(Routing matrix only) (Optional) Display directory information for all T640 routing nodes (or line-card chassis) connected to a TX Matrix platform.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Display directory information for a specific T640 routing node that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display Routing Engine graceful switchover information for the TX Matrix platform (or switch-card chassis).</p> <p>depth <i>number</i>—(Optional) Depth of the directory to traverse. This option is useful when you want to limit the output shown for a large file system.</p> <p>path—(Optional) Path or root directory to traverse.</p>
Required Privilege Level	view
List of Sample Output	show system directory-usage scc (Routing Matrix) on page 588
Output Fields	Table 122 on page 587 describes the output fields for the show system directory-usage command. Output fields are listed in the approximate order in which they appear.

Table 122: show system directory-usage Output Fields

Field Name	Field Description
<i>bytes</i>	Number of bytes used by files in a directory.
<i>directory-name</i>	Name of the directory.

```

show system      user@host> show system directory-usage /var/tmp scc
directory-usage scc
(Routing Matrix)
1.0K      /var/tmp
2.0K      /var/tmp/vi.recover
1.0K      /var/tmp/instmp.tPMk8u
           /var/tmp/install
           /var/tmp/instmp.GUMpur
4.8M      /var/tmp/instmp.GUMpur/packages
6.4M      /var/tmp/troy1
297M      /var/tmp/dsw
           /var/tmp/pkg_tmp.2073
83K       /var/tmp/pkg_tmp.2073/bin
           /var/tmp/instmp.oMIDb1
89K       /var/tmp/instmp.oMIDb1/bin
           /var/tmp/instmp.byhMjR
4.6M      /var/tmp/instmp.byhMjR/packages
           /var/tmp/instmp.6fqHf3
1.7M      /var/tmp/instmp.6fqHf3/packages
           /var/tmp/instmp.mljECe
4.6M      /var/tmp/instmp.mljECe/packages

```


show system firmware

Syntax	show system firmware <compatibility>
Release Information	Command introduced in JUNOS Release 7.4.
Description	(J-series routing platform only) Display firmware information.
Options	compatibility—(Optional) Display firmware compatibility information.
Required Privilege Level	view
List of Sample Output	show system firmware on page 589 show system firmware compatibility on page 589
Output Fields	Table 123 on page 589 lists the output fields for the show system firmware command. Output fields are listed in the approximate order in which they appear.

Table 123: show system firmware Output Fields

Field Name	Field Description
Part	Physical part on the router affected by the firmware.
Type	Type of firmware on the router.
Tag	Location of the firmware on the interface.
Current version	Firmware version on the affected router parts.
Available version	New versions of firmware for upgrading or downgrading.
Status	Firmware condition on the router.
Action	Whether you can upgrade or downgrade, or if no action is available (none).

```

show system firmware user@host> show system firmware
Part                Type                Tag Current Available Status
                   version      version
FPC 0               ROM Monitor 0 0 6.4.10          OK
Routing Engine 0 RE BIOS 0 0              OK

```

```

show system firmware compatibility user@host> show system firmware compatibility
Part                Type                Tag Current Available Action
                   version      version
FPC 0               ROM Monitor 0 0 6.4.10          None
Routing Engine 0 RE BIOS 0 0              None

```

show system license

Syntax	show system license <installed keys usage>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display licenses and information about how they are used.
Options	<p>none—Display all license information.</p> <p>installed—(Optional) Display installed licenses only.</p> <p>keys—(Optional) Display a list of license keys. Use this information to verify that each expected license key is present.</p> <p>usage—(Optional) Display the state of licensed features.</p>
Required Privilege Level	maintenance
List of Sample Output	<p>show system license on page 592</p> <p>show system license installed on page 592</p> <p>show system license keys on page 592</p> <p>show system license usage on page 592</p>
Output Fields	Table 124 on page 590 lists the output fields for the show system license command. Output fields are listed in the approximate order in which they appear.

Table 124: 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.
Licenses used	Number of licenses used by a Services Router. 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.
Licenses installed	<p>Information about the installed license key:</p> <ul style="list-style-type: none"> ■ 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.

show system license

show system license user@host> **show system license**

License usage:

Feature name	Licenses used	Licenses installed	Licenses needed	Expiry
subscriber-accounting	0	1	0	permanent
subscriber-authentication	0	1	0	permanent
subscriber-address-assignment	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-accounting - Per Subscriber Radius Accounting
permanent
subscriber-authentication - Per Subscriber Radius Authentication
permanent
subscriber-address-assignment - Radius/SRC Address Pool Assignment
permanent
subscriber-vlan - Dynamic Auto-sensed Vlan
permanent
subscriber-ip - Dynamic and Static IP
permanent

show system license installed user@host> **show system license installed**

License identifier: E000185416

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**

E000185416 aeaqeb qfdyps aijca4 udcgiw pa7tqn uc5fwn
ns3v7t 7hzgbm lrxec vkoqz4 tj6yy4 prms7p
xifvfv 35auxq 7dq

show system license usage user@host> **show system license usage**

Feature name	Licenses used	Licenses installed	Licenses needed	Expiry
subscriber-accounting	1	1	0	permanent
subscriber-authentication	1	1	0	permanent
subscriber-address-assignment	1	1	0	permanent
subscriber-vlan	0	1	0	permanent
subscriber-ip	0	1	0	permanent

show system name-resolution

Syntax	show system name-resolution
Release Information	Command introduced in JUNOS Release 9.5.
Description	Display hostname-to-IP-address mappings.
Required Privilege Level	view
Output Fields	Table 124 on page 590 lists the output fields for the <code>show system name-resolution</code> command. Output fields are listed in the approximate order in which they appear.

Table 125: show system name-resolution Output Fields

Field Name	Field Description
Last update	Date and time when the hostname-to-IP address mapping were last resolved.
Refresh interval	Interval for refreshing the cache with the updated hostname-to-IP address mappings.
Addresses	Resolved IP addresses based on the hostname-to-IP address mappings.
Error	Error message displayed if there is a DNS hostname lookup failure.
Last change	Timestamp for the last change in the hostname-to-IP address mappings.

```

show system      user@host> show system name-resolution
name-resolution

Hostname to IP-address mappings:
-----
Last update: Mon Sep 29 18:42:21 2008
Refresh interval: 600 secs
Host: ntp1
  Addresses:
    3.3.3.11
  Last change: Mon Sep 29 18:42:20 2008
Host: radauth1
  Error: Host name lookup failure
Last change: Mon Sep 29 18:42:20 2008
Host: radacct1
  Error: Host name lookup failure
Host: snmp1
  Addresses:
    4.4.4.1
    4.4.4.2
  Last change: Mon Sep 29 18:45:20 2008
Host: sys1
  Addresses:
    192.168.68.69
  Last change: Mon Sep 29 18:42:21 2008

```

show system processes

Syntax	show system processes <brief detail extensive summary> <wide>
Syntax (Routing Matrix)	show system processes <brief detail extensive summary> <all-lcc lcc <i>number</i> scc> <wide>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display information about software processes that are running on the router and that have controlling terminals.
Options	<p>none—Display standard information about system processes.</p> <p>all-lcc—(Routing matrix only) (Optional) Display standard system process information for all T640 routing nodes (or line-card chassis) connected to a TX Matrix platform.</p> <p>brief detail extensive summary—(Optional) Display the specified level of detail.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Display standard system process information for a specific T640 routing node that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display standard system process information for the TX Matrix platform (or switch-card chassis).</p> <p>wide—(Optional) Display process information that might be wider than 80 columns.</p>
Additional Information	By default, when you issue the show system processes command on a TX Matrix master Routing Engine, the command is broadcast to all the T640 master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix backup Routing Engine, the command is broadcast to all the T640 backup Routing Engines that are connected to it.
Required Privilege Level	view
List of Sample Output	<p>show system processes on page 596</p> <p>show system processes brief on page 597</p> <p>show system processes detail on page 597</p> <p>show system processes extensive on page 597</p> <p>show system processes lcc wide (Routing Matrix) on page 598</p> <p>show system processes summary on page 599</p>
Output Fields	Table 126 on page 595 describes the output fields for the show system processes command. Output fields are listed in the approximate order in which they appear.

Table 126: 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
Swap	Information about physical and virtual memory allocation.	brief extensive summary
PID	Process identifier.	detail extensive summary
TT	Control terminal name.	none detail
STAT	<p>Symbolic process state. The state is given by a sequence of letters. The first letter indicates the run state of the process:</p> <ul style="list-style-type: none"> ■ 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	<p>(D)—Short-term CPU usage.</p> <p>(E and S)—Raw (unweighted) CPU usage. The value of this field is used to sort the processes in the output.</p>	detail extensive summary

Table 126: show system processes Output Fields (continued)

Field Name	Field Description	Level of Output
RSS	Resident set size.	detail
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 resident memory, in kilobytes.	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.	detail extensive summary

```

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 user@host> show system processes brief
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 user@host> show system processes detail
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	(vmdaemon
4	0	0	0	28	0	12	update	1:51PM	??	DL	0:07.15	(update)
5	0	0	0	2	0	12	pfesel	1:51PM	??	IL	0:02.90	(if_pfe)
27	0	1	0	10	0	17936	mfsidl	1:51PM	??	Is	0:00.46	mfs /dev/
81	0	1	0	2	0	496	select	1:52PM	??	Ss	0:31.21	syslogd -
119	1	1	0	2	0	492	select	1:52PM	??	Is	0:00.00	portmap
134	0	1	0	2	0	580	select	1:52PM	??	S	0:02.95	amd -p -a
151	0	1	0	18	0	532	pause	1:52PM	??	Is	0:00.34	cron
183	0	1	0	2	0	420	select	1:52PM	??	Ss	0:00.07	/usr/loca
206	0	1	0	18	0	72	pause	1:52PM	??	S	0:00.51	/sbin/wat
207	0	1	0	2	0	520	select	1:52PM	??	I	0:00.16	/usr/sbin
208	0	1	0	2	0	536	select	1:52PM	??	S	0:08.21	/sbin/dcd
210	0	1	255	2	-12	740	select	1:52PM	??	S<	0:05.83	/usr/sbin
211	0	1	0	2	0	376	select	1:52PM	??	S	0:00.03	/usr/sbin
215	0	1	0	2	0	548	select	1:52PM	??	I	0:00.50	/usr/sbin
219	0	1	0	3	0	540	ttyin	1:52PM	v0	Is+	0:00.02	/usr/libe
220	0	1	0	3	0	540	ttyin	1:52PM	v1	Is+	0:00.01	/usr/libe
221	0	1	0	3	0	540	ttyin	1:52PM	v2	Is+	0:00.01	/usr/libe
222	0	1	0	3	0	540	ttyin	1:52PM	v3	Is+	0:00.01	/usr/libe
735	0	1	0	2	0	468	select	2:47PM	??	S	0:19.14	/usr/sbin
736	0	1	0	2	0	212	select	2:47PM	??	S	0:14.13	/usr/sbin
1380	0	1	0	3	0	888	ttyin	7:32PM	d0	Is+	0:00.46	bash
3019	0	207	0	2	0	636	select	10:49AM	??	Ss	0:02.93	tnp.chass
3122	0	1380	0	2	0	1764	select	12:33PM	d0	S	0:00.77	./rpd -N
3128	0	215	0	2	0	580	select	12:45PM	??	Ss	0:00.12	rlogind
3129	1049	3128	0	18	0	944	pause	12:45PM	p0	Ss	0:00.14	-tcsh (tc
0	0	0	0	-18	0	0	sched	1:51PM	??	DLs	0:00.10	(swapper

```

show system processes user@host> show system processes extensive
extensive last pid: 544; load averages: 0.00, 0.00, 0.00 18:30:33
37 processes: 1 running, 36 sleeping

```

```

Mem: 25M Active, 3968K 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
544	root	30	0	604K	768K	RUN	0:00	0.00%	0.00%	top
3	root	28	0	0K	12K	psleep	0:00	0.00%	0.00%	vmdaemon
4	root	28	0	0K	12K	update	0:03	0.00%	0.00%	update
528	aviva	18	0	660K	948K	pause	0:00	0.00%	0.00%	tcsh
204	root	18	0	300K	544K	pause	0:00	0.00%	0.00%	csh
131	root	18	0	332K	532K	pause	0:00	0.00%	0.00%	cron
186	root	18	0	196K	68K	pause	0:00	0.00%	0.00%	watchdog
27	root	10	0	512M	16288K	mfsidl	0:00	0.00%	0.00%	mount_mfs
1	root	10	0	620K	344K	wait	0:00	0.00%	0.00%	init
304	root	3	0	884K	900K	ttyin	0:00	0.00%	0.00%	bash
200	root	3	0	180K	540K	ttyin	0:00	0.00%	0.00%	getty
203	root	3	0	180K	540K	ttyin	0:00	0.00%	0.00%	getty
202	root	3	0	180K	540K	ttyin	0:00	0.00%	0.00%	getty
201	root	3	0	180K	540K	ttyin	0:00	0.00%	0.00%	getty

```

194 root      2   0 2248K 1640K select 0:11 0.00% 0.00% rpd
205 root      2   0 964K 800K select 0:12 0.00% 0.00% tnp.chassisd
189 root      2 -12 352K 740K select 0:03 0.00% 0.00% xntpd
114 root      2   0 296K 612K select 0:00 0.00% 0.00% amd
188 root      2   0 780K 600K select 0:00 0.00% 0.00% dcd
527 root      2   0 176K 580K select 0:00 0.00% 0.00% rlogind
195 root      2   0 212K 552K select 0:00 0.00% 0.00% inetd
187 root      2   0 192K 532K select 0:00 0.00% 0.00% tnetd
83 root       2   0 188K 520K select 0:00 0.00% 0.00% syslogd
538 root      2   0 1324K 516K select 0:00 0.00% 0.00% mgd
99 daemon     2   0 176K 492K select 0:00 0.00% 0.00% portmap
163 root      2   0 572K 420K select 0:00 0.00% 0.00% nsrexecd
192 root      2   0 560K 400K select 0:10 0.00% 0.00% snmpd
191 root      2   0 1284K 376K select 0:00 0.00% 0.00% mgd
537 aviva     2   0 636K 364K select 0:00 0.00% 0.00% cli
193 root      2   0 312K 204K select 0:07 0.00% 0.00% mib2d
5 root        2   0 0K 12K pfesel 0:00 0.00% 0.00% if_pfe
2 root       -18  0 0K 12K psleep 0:00 0.00% 0.00% pagedaemon
0 root       -18  0 0K 0K sched 0:00 0.00% 0.00% swapper

```

```

show system processes user@host> show system processes lcc 2 wide
lcc wide
(Routing Matrix)

```

```

-----
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
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  user@host> show system processes summary
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 queues

Syntax	show system queues
Syntax (Routing Matrix)	show system queues <all-lcc lcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display queue statistics.
Options	<p>all-lcc—(Routing matrix only) (Optional) Display system queue statistics for all LCC chassis attached to the routing matrix.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Display queue statistics for a specific T640 routing node that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display queue statistics for the TX Matrix platform.</p>
Additional Information	By default, when you issue the show system queues command on a TX Matrix master Routing Engine, the command is broadcast to all the T640 master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix backup Routing Engine, the command is broadcast to all the T640 backup Routing Engines that are connected to it.
Required Privilege Level	maintenance
List of Sample Output	<p>show system queues on page 601</p> <p>show system queues scc (Routing Matrix) on page 601</p>
Output Fields	Table 127 on page 600 lists the output fields for the show system queues command. Output fields are listed in the approximate order in which they appear.

Table 127: show system queues Output Fields

Field Name	Field Description
Output interface	<p>Interface on the router on which the queue exists:</p> <ul style="list-style-type: none"> ■ fxp0—Management Ethernet interface ■ fxp1—Internal Ethernet interface ■ lsi—Internally generated interface and not configurable ■ dsc—Discard interface
bytes	Number of bytes in the queue.
max	Maximum number of bytes allowed in the queue.
packets	Number of packets in the queue.

Table 127: show system queues Output Fields (continued)

Field Name	Field Description
max	Maximum number of packets allowed in the queue.
drops	Number of packets dropped from the queue.

```

show system queues user@host> show system queues
output interface      bytes      max      packets  max      drops
fxp0                  0          1250000  0         4166     6
fxp1                  0          1250000  0         4166    19
lsi                   0           12500   0          41        0
dsc                   0            0        0           0         0

```

```

show system queues user@host> show system queues scc
scc (Routing Matrix) output interface      bytes      max      packets  max      drops
fxp0                  0          1250000  0         4166     5
lsi                   0           12500   0          41        0
dsc                   0            0        0           0         0
lo0                   0            0        0           0         0
bcm0                  0          12500000  0        30000     0
em0                   0          12500000  0        30000     0
gre                   0           12500   0          41        0
ipip                  0           12500   0          41        0
tap                   0            0        0           0         0
pime                  0           12500   0          41        0
pimd                  0           12500   0          41        0
mtun                  0           12500   0          41        0
so-1/0/0              0          125000   0         416       0
so-1/1/0              0          125000   0         416       0
so-21/0/0             0          125000   0         416       0
ge-21/1/0             0          1250000  0        4166     0
ge-21/1/1             0          1250000  0        4166     3
ge-21/2/0             0          1250000  0        4166     0
ge-21/2/1             0          1250000  0        4166     3
so-21/3/0             0          125000   0         416       0
so-0/0/0              0          125000   0         416       0
so-0/1/0              0          125000   0         416       0
so-0/2/0              0          125000   0         416       0
pd-0/3/0              0           12500   0          41        0
pe-0/3/0              0           12500   0          41        0
gr-0/3/0              0           12500   0          41        0
ip-0/3/0              0           12500   0          41        0
vt-0/3/0              0           12500   0          41        0
mt-0/3/0              0           12500   0          41        0
lt-0/3/0              0           12500   0          41        0
so-17/0/0             0          125000   0         416       0
input protocol      bytes      max      packets  max      drops
splfwdq             0          1000000  0         1000     0
splnetq             0          1000000  0         1000     0
arpintrq            0           1000     0          50        0
optionq             0          200000   0          200       0
icmpq               0           50000   0          50        0
frlmiq              0            0        0           0         0
spppintrq           0           25000   0          250       0
clnlintrq           0          200000   0          200       0
tnpintrq            0          1250000  0        4166     0

```

tagintrq	0	200000	0	200	0
tagfragq	0	200000	0	200	0

show system reboot

Syntax	show system reboot <both-routing-engines>
Syntax (Routing Matrix)	show system reboot <all-lcc lcc <i>number</i> scc> <both-routing-engines>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display pending system reboots or halts.
Options	<p>none—Display pending reboots or halts on the active Routing Engine.</p> <p>all-lcc—(Routing matrix only) (Optional) Display halt or reboot request information for all T640 routing nodes (or line-card chassis) connected to a TX Matrix platform.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Display halt or reboot request information for a specific T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display halt or reboot request information for the TX Matrix platform (or switch-card chassis).</p> <p>both-routing-engines—(Optional) Display halt or reboot request information on both Routing Engines.</p>
Additional Information	By default, when you issue the show system reboot command on a TX Matrix master Routing Engine, the command is broadcast to all the T640 master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix backup Routing Engine, the command is broadcast to all the T640 backup Routing Engines that are connected to it.
Required Privilege Level	maintenance
List of Sample Output	show system reboot on page 603 show system reboot all-lcc (Routing Matrix) on page 604
Output Fields	Output field descriptions to be provided.
show system reboot	<pre>user@host> show system reboot reboot requested by root at Wed Feb 10 17:40:46 1999 [process id 17885]</pre>

show system reboot
all-lcc (Routing Matrix)

```
user@host> show system reboot all-lcc  
lcc0-re0:
```

```
-----  
No shutdown/reboot scheduled.
```

```
lcc2-re0:
```

```
-----  
No shutdown/reboot scheduled.
```


show system rollback

Syntax	show system rollback <i>number</i> <compare <i>number</i> >
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display the contents of a previously committed configuration, or the differences between two previously committed configurations.
Options	<p><i>number</i>—Number of a configuration to view. The output displays the configuration. The range of values is 0 through 49.</p> <p>compare <i>number</i> —(Optional) Number of another previously committed (rollback) configuration to compare to rollback <i>number</i>. The output displays the differences between the two configurations. The range of values is 0 through 49.</p>
Required Privilege Level	view
List of Sample Output	show system rollback compare on page 605
Output Fields	Output field descriptions to be provided.

```

show system rollback user@host> show system rollback 3 compare 1
compare [edit]
+ interfaces {
+   ge-1/1/1 {
+     unit 0 {
+       family inet {
+         filter {
+           input mf_plp;
+         }
+         address 14.1.1.1/30;
+       }
+     }
+   }
+   ge-1/2/1 {
+     unit 0 {
+       family inet {
+         filter {
+           input mf_plp;
+         }
+         address 13.1.1.1/30;
+       }
+     }
+   }
+   ge-1/3/0 {
+     unit 0 {
+       family inet {
+         filter {
+           input mf_plp;
+         }
+         address 12.1.1.1/30;
+       }
+     }
+   }
+ }
+}

```

show system services dhcp binding

Syntax	show system services dhcp binding <detail> <address>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(J-series routing platform only) Display Dynamic Host Configuration Protocol (DHCP) server client binding information.
Options	<p>none—Display brief information about all active client bindings.</p> <p>detail—(Optional) Display detailed information about all active client bindings.</p> <p>address—(Optional) Display detailed client binding information for the specified IP address only.</p>
Required Privilege Level	view and system
Related Topics	clear system services dhcp binding
List of Sample Output	<p>show system services dhcp binding on page 607</p> <p>show system services dhcp binding address on page 607</p> <p>show system services dhcp binding address detail on page 607</p>
Output Fields	Table 128 on page 606 describes the output fields for the show system services dhcp binding command. Output fields are listed in the approximate order in which they appear.

Table 128: show system services dhcp binding Output Fields

Field Name	Field Description	Level of Output
Allocated address	List of IP addresses the DHCP server has assigned to clients.	All levels
MAC address	Corresponding media access control (MAC) hardware address of the client.	All levels
Client identifier	(<i>address</i> option only) Client's unique identifier (represented by an ASCII string or hexadecimal digits). This identifier is used by the DHCP server to index its database of address bindings.	All levels
Binding Type	Type of binding assigned to the client. DHCP servers can assign a dynamic binding from a pool of IP addresses or a static binding to one or more specific IP addresses.	All levels
Lease Expires at	Time the lease expires or never for leases that do not expire.	All levels
Lease Obtained at	(<i>address</i> option only) Time the client obtained the lease from the DHCP server.	detail
State	Status of the binding. Bindings can be active or expired.	detail
Pool	Address pool that contains the IP address assigned to the client.	detail

Table 128: show system services dhcp binding Output Fields (continued)

Field Name	Field Description	Level of Output
Request received on	Interface on which the DHCP message exchange occurs. The IP address pool is configured based on the interface's IP address. If a relay agent is used, its IP address is also displayed.	detail
DHCP options	User-defined options created for the DHCP server. If no options have been defined, this field is blank.	detail

```

show system services      user@host> show system services dhcp binding
dhcp binding
Allocated address MAC addressBinding TypeLease expires at
192.168.1.200:a0:12:00:12:abstatic      never
192.168.1.300:a0:12:00:13:02dynamic 2004-05-03 13:01:42 PDT

show system services      user@host> show system services dhcp binding 192.168.1.3
dhcp binding address
DHCP binding information:
Allocated address192.168.1.3
Mac address00:a0:12:00:12:ab
Client identifier
61 63 65 64 2d 30 30 3a 61 30 3a 31 32 3a 30 30aced-00:a0:12:00
3a 31 33 3a 30 32:13:02

Lease information:
Binding Type dynamic
Obtained at 2004-05-02 13:01:42 PDT
Expires at 2004-05-03 13:01:42 PDT

show system services      user@host> show system services dhcp binding 192.168.1.3 detail
dhcp binding address
detail
DHCP binding information:
Allocated address      192.168.1.3
MAC address  00:a0:12:00:12:ab
Pool          192.168.1.0/24
Request received onfe-0/0/0, relayed by 192.168.4.254

Lease information:
Type          DHCP
Obtained at   2004-05-02 13:01:42 PDT
Expires at    2004-05-03 13:01:42 PDT
Stateactive

DHCP options:
Name: name-server, Value: { 6.6.6.6, 6.6.6.7 }
Name: domain-name, Value: mydomain.tld
Code: 19, Type: flag, Value: off
Code: 40, Type: string, Value: domain.tld
Code: 32, Type: ip-address, Value: 3.3.3.33

```

show system services dhcp conflict

Syntax	show system services dhcp conflict
Release Information	Command introduced before JUNOS Release 7.4.
Description	(J-series routing platform only) Display Dynamic Host Configuration Protocol (DHCP) client-detected conflicts for IP addresses.
Options	This command has no options.
Additional Information	When a conflict is detected, the DHCP server removes the address from the address pool.
Required Privilege Level	view and system
Related Topics	clear system services dhcp conflict
List of Sample Output	show system services dhcp conflict on page 608
Output Fields	Table 129 on page 608 describes the output fields for the show system services dhcp conflict command. Output fields are listed in the approximate order in which they appear.

Table 129: show system services dhcp conflict Output Fields

Field Name	Field Description
Detection time	Date and time the client detected the conflict.
Detection method	How the conflict was detected.
Address	IP address where the conflict occurs. The addresses in the conflicts list remain excluded from the pool until you use a clear system services dhcp conflict command to manually clear the list.

```

show system services user@host> show system services dhcp conflict
dhcp conflict
Detection time      Detection method  Address
2004-08-03 19:04:00 PDT  ARP             3.3.3.5
2004-08-04 04:23:12 PDT  Ping            4.4.4.8
2004-08-05 21:06:44 PDT  Client          3.3.3.10

```

show system services dhcp global

Syntax	show system services dhcp global
Release Information	Command introduced before JUNOS Release 7.4.
Description	(J-series routing platform only) Display Dynamic Host Configuration Protocol (DHCP) global configuration options. Global options apply to all scopes and clients served by the DHCP server. Global options are overridden if specified otherwise in scope or client options. Scope options apply to specific subnets or ranges of addresses. Client options apply to specific clients.
Options	This command has no options.
Required Privilege Level	view and system
List of Sample Output	show system services dhcp global on page 610
Output Fields	Table 130 on page 609 describes the output fields for the show system services dhcp global command. Output fields are listed in the approximate order in which they appear.

Table 130: show system services dhcp global Output Fields

Field Name	Field Description
BOOTP lease length	Length of lease time assigned to BOOTP clients.
Default lease time	Lease time assigned to clients that do not request a specific lease time.
Minimum lease time	Minimum time a client retains an IP address lease on the server.
Maximum lease time	Maximum time a client can retain an IP address lease on the server.
DHCP options	User-defined options created for the DHCP server. If no options have been defined, this field is blank.

```
show system services user@host> show system services dhcp global  
dhcp global  
Global settings:  
  BOOTP lease length      infinite  
  
DHCP lease times:  
  Default lease time      1 hour  
  Minimum lease time      2 hours  
  Maximum lease time      infinite  
  
DHCP options:  
  Name: name-server, Value: { 6.6.6.6, 6.6.6.7 }  
  Name: domain-name, Value: mydomain.tld  
  Code: 19, Type: flag, Value: off  
  Code: 40, Type: string, Value: domain.tld  
  Code: 32, Type: ip-address, Value: 3.3.3.33
```

show system services dhcp pool

Syntax	show system services dhcp pool <detail> <subnet-address>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(J-series routing platform only) Display Dynamic Host Configuration Protocol (DHCP) server IP address pools.
Options	none—Display brief information about all IP address pools. detail—(Optional) Display detailed information. subnet-address—(Optional) Display information for the specified subnet address.
Required Privilege Level	view and system
List of Sample Output	show system services dhcp pool on page 612 show system services dhcp pool subnet-address on page 612 show system services dhcp pool subnet-address detail on page 612
Output Fields	Table 131 on page 611 describes the output fields for the show system services dhcp pool command. Output fields are listed in the approximate order in which they appear.

Table 131: show system services dhcp pool Output Fields

Field Name	Field Description	Level of Output
Pool name	Subnet on which the IP address pool is defined.	None specified
Low address	Lowest address in the IP address pool.	None specified
High address	Highest address in the IP address pool.	None specified
Excluded addresses	Addresses excluded from the address pool.	None specified
Subnet	(subnet-address option only) Subnet to which the specified address pool belongs.	None specified
Address range	(subnet-address option only) Range of IP addresses in the address pool.	None specified
Addresses assigned	Number of IP addresses in the pool that are assigned to DHCP clients and the total number of IP addresses in the pool.	detail
Active	Number of assigned IP addresses in the pool that are active.	detail
Excluded	Number of assigned IP addresses in the pool that are excluded.	detail
Default lease time	Lease time assigned to clients that do not request a specific lease time.	detail
Minimum lease time	Minimum time a client can retain an IP address lease on the server.	detail

Table 131: show system services dhcp pool Output Fields *(continued)*

Field Name	Field Description	Level of Output
Maximum lease time	Maximum time a client can retain an IP address lease on the server.	detail
DHCP options	User-defined options created for the DHCP server. If no options have been defined, this field is blank.	detail

```

show system services dhcp pool      user@host> show system services dhcp pool
                                     Pool name Low address High address Excluded addresses
                                     3.3.3.0/24 3.3.3.2 3.3.3.254 3.3.3.1

show system services dhcp pool subnet-address
user@host> show system services dhcp pool 3.3.3.0/24
Pool information:
  Subnet                3.3.3.0/24
  Address range         3.3.3.2 - 3.3.3.254
  Addresses assigned    2/253

show system services dhcp pool subnet-address detail
user@host> show system services dhcp pool 3.3.3.0/24 detail
Pool information:
  Subnet                3.3.3.0/24
  Address range         3.3.3.2 - 3.3.3.254
  Addresses assigned    2/253
  Active: 1, Excluded: 1

DHCP lease times:
  Default lease time    1 hour
  Minimum lease time    2 hours
  Maximum lease time    infinite

DHCP options:
  Name: name-server, Value: { 6.6.6.6, 6.6.6.7 }
  Name: domain-name, Value: mydomain.tld
  Name: router, Value: { 3.3.3.1 }
  Name: server-identifier, Value: 3.3.3.1
  Code: 19, Type: flag, Value: off
  Code: 40, Type: string, Value: domain.tld
  Code: 32, Type: ip-address, Value: 3.3.3.333.3.3.254 3.3.3.1

```


show system services dhcp statistics

Syntax	show system services dhcp statistics
Release Information	Command introduced before JUNOS Release 7.4.
Description	(J-series routing platform only) Display Dynamic Host Configuration Protocol (DHCP) server statistics.
Options	This command has no options.
Required Privilege Level	view and system
Related Topics	clear system services dhcp statistics
List of Sample Output	show system services dhcp statistics on page 614
Output Fields	Table 132 on page 613 describes the output fields for the show system services dhcp statistics command. Output fields are listed in the approximate order in which they appear.

Table 132: show system services dhcp statistics Output Fields

Field Name	Field Description
Default lease time	Lease time assigned to clients that do not request a specific lease time.
Minimum lease time	Minimum time a client can retain an IP address lease on the server.
Maximum lease time	Maximum time a client can retain an IP address lease on the server.
Packets dropped	Total number of packets dropped and number of packets dropped because of: <ul style="list-style-type: none"> ■ Invalid hardware address ■ Invalid opcode ■ Invalid server address ■ No available address ■ No interface match ■ No routing instance match ■ No valid local addresses ■ Packet too short ■ Read error ■ Send error

Table 132: show system services dhcp statistics Output Fields *(continued)*

Field Name	Field Description
Messages received	<p>Number of the following message types sent from DHCP clients and received by the DHCP server:</p> <ul style="list-style-type: none"> ■ BOOTREQUEST ■ DHCPDECLINE ■ DHCPDISCOVER ■ DHCPINFORM ■ DHCPRELEASE ■ DHCPREQUEST
Messages sent	<p>Number of the following message types sent from the DHCP server to DHCP clients:</p> <ul style="list-style-type: none"> ■ BOOTREPLY ■ DHCPACK ■ DHCPOFFER ■ DHCPNAK

show system services dhcp statistics user@host> **show system services dhcp statistics**

```
DHCP lease times:
  Default lease time      1 hour
  Minimum lease time     2 hours
  Maximum lease time     infinite
```

```
Packets dropped:
  Total                  0
  Bad hardware address   0
  Bad opcode             0
  Invalid server address 0
  No available addresses 0
  No interface match     0
  No routing instance match 0
  No valid local address 0
  Packet too short       0
  Read error             0
  Send error             0
```

```
Messages received:
  BOOTREQUEST           0
  DHCPDECLINE           0
  DHCPDISCOVER          0
  DHCPINFORM            0
  DHCPRELEASE           0
  DHCPREQUEST           0
```

```
Messages sent:
  BOOTREPLY             0
  DHCPACK               0
  DHCPOFFER             0
  DHCPNAK               0
```

show system services service-deployment

Syntax	show system services service-deployment
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display information about a Session and Resource Control (SRC) client.
Options	This command has no options.
Required Privilege Level	view and system
List of Sample Output	show system services service-deployment on page 615
Output Fields	Output field descriptions to be provided.
show system services service-deployment	<pre>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</pre>

show system snapshot

Syntax	show system snapshot
Release Information	Command introduced in JUNOS Release 7.6.
Description	Display information about the backup software that is located in the /altroot and /altconfig file systems. To back up software, use the <code>request system snapshot</code> command.
Options	This command has no options.
Required Privilege Level	view
Related Topics	request system snapshot
List of Sample Output	show system snapshot on page 616
Output Fields	Output field descriptions to be provided.
show system snapshot	<pre>user@host> show system snapshot Information for snapshot on hard-disk Creation date: Oct 5 13:53:29 2005 JUNOS version on snapshot: jbase : 7.3R2.5 jcrypto: 7.3R2.5 jdocs : 7.3R2.5 jkernel: 7.3R2.5 jpfe : M40-7.3R2.5 jroute : 7.3R2.5</pre>

show system software

Syntax	show system software <detail>
Syntax (Routing Matrix)	show system software <detail> <all-lcc lcc <i>number</i> scc>
Syntax (J-series Routing Platform)	show system software <detail> <backup>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display the JUNOS extensions loaded on your router.
Options	<p>none—Display standard information about all loaded JUNOS extensions.</p> <p>detail—(Optional) Display detailed information about available JUNOS extensions.</p> <p>all-lcc—(Routing matrix only) (Optional) Display loaded JUNOS extensions on all T640 routing nodes (or line-card chassis) connected to a TX Matrix platform.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Display the system software running on a T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display the system software running on a TX Matrix platform (or switch-card chassis).</p> <p>backup—(J-series routing platform only) (Optional) Display the status of old system software packages only.</p>
Required Privilege Level	maintenance
List of Sample Output	show system software on page 617
Output Fields	Output field descriptions to be provided.
show system software	<pre> 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: </pre>

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 statistics

Syntax show system statistics

Syntax (Routing Matrix) show system statistics
<all-lcc | lcc *number* | scc>

Release Information Command introduced before JUNOS Release 7.4.

Description Display system-wide protocol-related statistics.

Options none —Display system statistics for all the following protocols:

- arp—Address Resolution Protocol
- clnl—Connectionless Network Layer
- esis—End System-to-Intermediate System
- icmp—Internet Control Message Protocol
- icmp6—Internet Control Message Protocol version 6
- igmp—Internet Group Management Protocol
- ip—Internet Protocol version 4
- ip6—Internet Protocol version 6
- mpls—Multiprotocol Label Switching
- rdp—Reliable Datagram Protocol
- tcp—Transmission Control Protocol
- tnp—Trivial Network Protocol
- tudp—Trivial User Datagram Protocol
- udp—User Datagram Protocol
- vpls—Virtual Private LAN Service

all-lcc—(Routing matrix only) (Optional) Display system statistics for a protocol for all T640 routing nodes (or line-card chassis) connected to a TX Matrix platform.

lcc *number*—(Routing matrix only) (Optional) Display systems statistics for a protocol for a specific T640 routing node (or line-card chassis) connected to a TX Matrix platform. Replace *number* with a value from 0 through 3.

scc—(Routing matrix only) (Optional) Display system statistics for a protocol for the TX Matrix platform (or switch-card chassis).

Additional Information By default, when you issue the **show system statistics** command on a TX Matrix master Routing Engine, the command is broadcast to all the T640 master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix

backup Routing Engine, the command is broadcast to all the T640 backup Routing Engines that are connected to it.

Required Privilege Level view

List of Sample Output show system statistics on page 620

Output Fields Output field descriptions to be provided.

```

show system statistics  user@host> show system statistics
ip:
    3682087 total packets received
    0 bad header checksums
    0 with size smaller than minimum
    0 with data size < data length
    0 with header length < data size
    0 with data length < header length
    0 with incorrect version number
    0 packets destined to dead next hop
    0 fragments received
    0 fragments dropped (dup or out of space)
    0 fragments dropped (queue overflow)
    0 fragments dropped after timeout
    0 fragments dropped due to over limit
    0 packets reassembled ok
    3664774 packets for this host
    17316 packets for unknown/unsupported protocol
    0 packets forwarded
    0 packets not forwardable
    0 redirects sent
    6528 packets sent from this host
    0 packets sent with fabricated ip header
    0 output packets dropped due to no bufs
    0 output packets discarded due to no route
    0 output datagrams fragmented
    0 fragments created
    0 datagrams that can't be fragmented
    0 packets with bad options
    1123 packets with options handled without error
    0 strict source and record route options
    0 loose source and record route options
    0 record route options
    0 timestamp options
    0 timestamp and address options
    0 timestamp and prespecified address options
    0 option packets dropped due to rate limit
    1123 router alert options
    0 multicast packets dropped (no iflist)
    0 packets dropped (src and int don't match)
icmp:
    0 drops due to rate limit
    0 calls to icmp_error
    0 errors not generated because old message was icmp
    Output histogram:
        echo reply: 75
    0 messages with bad code fields
    0 messages less than the minimum length
    0 messages with bad checksum
    0 messages with bad source address
    0 messages with bad length
    0 echo drops with broadcast or multicast destination address

```



```

0 timestamp drops with broadcast or multicast destination address
Input histogram:
    echo: 75
    router advertisement: 130
75 message responses generated
tcp:
3844 packets sent
    3618 data packets (1055596 bytes)
    0 data packets (0 bytes) retransmitted
    0 resends initiated by MTU discovery
    205 ack-only packets (148 packets delayed)
    0 URG only packets
    0 window probe packets
    0 window update packets
    1079 control packets
5815 packets received
    3377 acks (for 1055657 bytes)
    24 duplicate acks
    0 acks for unsent data
    2655 packets (15004 bytes) received in-sequence
    1 completely duplicate packet (0 bytes)
    0 old duplicate packets
    0 packets with some dup. data (0 bytes duped)
    0 out-of-order packets (0 bytes)
    0 packets (0 bytes) of data after window
    0 window probes
    7 window update packets
    0 packets received after close
    0 discarded for bad checksums
    0 discarded for bad header offset fields
    0 discarded because packet too short
1 connection request
32 connection accepts
0 bad connection attempts
0 listen queue overflows
33 connections established (including accepts)
30 connections closed (including 0 drops)
    27 connections updated cached RTT on close
    27 connections updated cached RTT variance on close
    0 connections updated cached ssthresh on close
0 embryonic connections dropped
3374 segments updated rtt (of 3220 attempts)
0 retransmit timeouts
    0 connections dropped by rexmit timeout
0 persist timeouts
    0 connections dropped by persist timeout
344 keepalive timeouts
    0 keepalive probes sent
    0 connections dropped by keepalive
1096 correct ACK header predictions
1314 correct data packet header predictions
32 syncache entries added
    0 retransmitted
    0 dupsyn
    0 dropped
    32 completed
    0 bucket overflow
    0 cache overflow
    0 reset
    0 stale
    0 aborted

```

```

0 badack
0 unreach
0 zone failures
0 cookies sent
0 cookies received
0 ACKs sent in response to in-window but not exact RSTs
0 ACKs sent in response to in-window SYNs on established connections
0 rcv packets dropped by TCP due to bad address
0 out-of-sequence segment drops due to insufficient memory
1058 RST packets
0 ICMP packets ignored by TCP
0 send packets dropped by TCP due to auth errors
0 rcv packets dropped by TCP due to auth errors

udp:
3658884 datagrams received
0 with incomplete header
0 with bad data length field
0 with bad checksum
3657342 dropped due to no socket
3657342 broadcast/multicast datagrams dropped due to no socket
0 dropped due to full socket buffers
0 not for hashed pcb
4291311496 delivered
1551 datagrams output

ipsec:
0 inbound packets processed successfully
0 inbound packets violated process security policy
0 inbound packets with no SA available
0 invalid inbound packets
0 inbound packets failed due to insufficient memory
0 inbound packets failed getting SPI
0 inbound packets failed on AH replay check
0 inbound packets failed on ESP replay check
0 inbound AH packets considered authentic
0 inbound AH packets failed on authentication
0 inbound ESP packets considered authentic
0 inbound ESP packets failed on authentication
0 outbound packets processed successfully
0 outbound packets violated process security policy
0 outbound packets with no SA available
0 invalid outbound packets
0 outbound packets failed due to insufficient memory
0 outbound packets with no route

igmp:
17186 messages received
0 messages received with too few bytes
0 messages received with bad checksum
0 membership queries received
0 membership queries received with invalid field(s)
0 membership reports received
0 membership reports received with invalid field(s)
0 membership reports received for groups to which we belong
0 membership reports sent

arp:
44181302 datagrams received
2 ARP requests received
2028 ARP replies received
3156 resolution requests received
0 unrestricted proxy requests
0 received proxy requests
0 proxy requests not proxied

```

```

0 with bogus interface
787 with incorrect length
712 for non-IP protocol
0 with unsupported op code
0 with bad protocol address length
0 with bad hardware address length
0 with multicast source address
7611 with multicast target address
0 with my own hardware address
14241699 for an address not on the interface
0 with a broadcast source address
0 with source address duplicate to mine
29929250 which were not for me
0 packets discarded waiting for resolution
6 packets sent after waiting for resolution
17812 ARP requests sent
2 ARP replies sent
0 requests for memory denied
0 requests dropped on entry
0 requests dropped during retry
ip6:
0 total packets received
0 with size smaller than minimum
0 with data size < data length
0 with bad options
0 with incorrect version number
0 fragments received
0 fragments dropped (dup or out of space)
0 fragments dropped after timeout
0 fragments that exceeded limit
0 packets reassembled ok
0 packets for this host
0 packets forwarded
0 packets not forwardable
0 redirects sent
0 packets sent from this host
0 packets sent with fabricated ip header
0 output packets dropped due to no bufs, etc.
0 output packets discarded due to no route
0 output datagrams fragmented
0 fragments created
0 datagrams that can't be fragmented
0 packets that violated scope rules
0 multicast packets which we don't join
Mbuf statistics:
0 packets whose headers are not continuous
0 tunneling packets that can't find gif
0 packets discarded due to too many headers
0 failures of source address selection
0 forward cache hit
0 forward cache miss
0 packets destined to dead next hop
0 option packets dropped due to rate limit
0 packets dropped (src and int don't match)
0 packets dropped due to bad protocol
icmp6:
0 calls to icmp_error
0 errors not generated because old message was icmp error or so
0 errors not generated because rate limitation
0 messages with bad code fields
0 messages < minimum length

```

```

0 bad checksums
0 messages with bad length
Histogram of error messages to be generated:
    0 no route
    0 administratively prohibited
    0 beyond scope
    0 address unreachable
    0 port unreachable
    0 packet too big
    0 time exceed transit
    0 time exceed reassembly
    0 erroneous header field
    0 unrecognized next header
    0 unrecognized option
    0 redirect
    0 unknown
0 message responses generated
0 messages with too many ND options
ipsec6:
0 inbound packets processed successfully
0 inbound packets violated process security policy
0 inbound packets with no SA available
0 invalid inbound packets
0 inbound packets failed due to insufficient memory
0 inbound packets failed getting SPI
0 inbound packets failed on AH replay check
0 inbound packets failed on ESP replay check
0 inbound AH packets considered authentic
0 inbound AH packets failed on authentication
0 inbound ESP packets considered authentic
0 inbound ESP packets failed on authentication
0 outbound packets processed successfully
0 outbound packets violated process security policy
0 outbound packets with no SA available
0 invalid outbound packets
0 outbound packets failed due to insufficient memory
0 outbound packets with no route
c1n1:
0 total packets received
0 packets delivered
0 too small
0 bad header length
0 bad checksum
0 bad version
0 unknown or unsupported protocol
0 bogus sdl size
0 no free memory in socket buffer
0 send packets discarded
0 sbappend failure
0 mcopy failure
0 address fields were not reasonable
0 segment information forgotten
0 forwarded packets
0 total packets sent
0 output packets discarded
0 non-forwarded packets
0 packets fragmented
0 fragments sent
0 fragments discarded
0 fragments timed out
0 fragmentation prohibited

```

```

0 packets reconstructed
0 packets destined to dead nexthop
0 packets discarded due to no route
0 Error pdu rate drops
0 ER pdu generation failure
esis:
0 total pkts received
0 total packets consumed by protocol
0 pdus received with bad checksum
0 pdus received with bad version number
0 pdus received with bad type field
0 short pdus received
0 bogus sdl size
0 bad header length
0 unknown or unsupported protocol
0 no free memory in socket buffer
0 send packets discarded
0 sbappend failure
0 mcopy failure
0 ISO family not configured
tnp:
146776365 unicast packets received
0 broadcast packets received
0 fragmented packets received
0 hello packets dropped
0 fragments dropped
0 fragment reassembly queue flushes
0 hello packets received
0 control packets received
49681642 rdp packets received
337175 udp packets received
96757548 tunnel packets received
0 input packets discarded with no protocol
98397591 unicast packets sent
0 broadcast packets sent
0 fragmented packets sent
0 hello packets dropped
0 fragments dropped
0 hello packets sent
0 control packets sent
49681642 rdp packets sent
337175 udp packets sent
48378774 tunnel packets sent
0 packets sent with unknown protocol
rdp:
49681642 input packets
0 discards for bad checksum
0 discards bad sequence number
0 refused connections
2031964 acks received
0 dropped due to full socket buffers
49692 retransmits
49681642 output packets
24815968 acks sent
28 connects
0 closes
22783990 keepalives received
22783990 keepalives sent
tudp:
337175 datagrams received
0 with incomplete header

```

```

0 with bad data length field
0 with bad checksum
0 dropped due to no socket
0 broadcast/multicast datagrams dropped due to no socket
0 dropped due to full socket buffers
337175 delivered
337175 datagrams output
ttp:
398749 packets sent
0 packets sent while unconnected
0 packets sent while interface down
0 packets sent couldn't get buffer
0 packets sent couldn't find neighbor
44696687 L2 packets received
0 unknown L3 packets received
3682087 IPv4 L3 packets received
0 MPLS L3 packets received
0 MPLS->IPv4 L3 packets received
0 IPv4->MPLS L3 packets received
0 IPv6 L3 packets received
0 ARP L3 packets received
0 CLNP L3 packets received
0 TNP L3 packets received
0 NULL L3 packets received
0 cyclotron cycle L3 packets received
0 cyclotron send L3 packets received
0 packets received while unconnected
0 packets received from unknown ifl
0 input packets couldn't get buffer
0 input packets with bad type
0 input packets with discard type
0 input packets for which rt lookup is bypassed
mpls:
0 total mpls packets received
0 packets forwarded
0 packets dropped
0 with header too small
0 after tagging, can't fit link MTU
0 with IPv4 explicit NULL tag
0 with IPv4 explicit NULL cksum errors
0 with router alert tag
0 lsp ping packets (ttl-expired/router alert)
0 with ttl expired
0 with tag encoding error
0 packets discarded, no route
vpls:
0 total packets received
0 with size smaller than minimum
0 with incorrect version number
0 packets for this host
0 packets with no logical interface
0 packets with no family
0 packets with no route table
0 packets with no auxiliary table
0 packets with no corefacing entry
0 packets with no CE-facing entry
0 mac route learning requests
0 mac routes learnt
0 requests to learn an existing route
0 learning requests while learning disabled on interface
0 learning requests over capacity

```

```
0 mac routes moved
0 requests to move static route
0 mac route aging requests
0 mac routes aged
0 bogus address in aging requests
0 requests to age static route
0 requests to re-ageout aged route
0 requests involving multiple peer FEs
0 aging acks from PFE
0 aging non-acks from PFE
0 aging requests timed out waiting on FEs
0 aging requests over max-rate
0 errors finding peer FEs
```

show system statistics arp

Syntax	show system statistics arp
Syntax (Routing Matrix)	show system statistics arp <all-lcc lcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display system-wide Address Resolution Protocol (ARP) statistics.
Options	<p>all-lcc—(Routing matrix only) (Optional) Display system-wide ARP statistics for all T640 routing nodes (or line-card chassis) connected to a TX Matrix platform.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Display system statistics for ARP for a specified T640 routing node (or line-card chassis) connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display system statistics for ARP for the TX Matrix platform (or switch-card chassis).</p>
Additional Information	By default, when you issue the show system statistics arp command on a TX Matrix master Routing Engine, the command is broadcast to all the T640 master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix backup Routing Engine, the command is broadcast to all the T640 backup Routing Engines that are connected to it.
Required Privilege Level	view
List of Sample Output	show system statistics arp on page 628
Output Fields	Output field descriptions to be provided.
show system statistics arp	<pre> user@host> show system statistics arp arp: 44134607 datagrams received 2 ARP requests received 2026 ARP replies received 3152 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 7603 with multicast target address 0 with my own hardware address 14218490 for an address not on the interface 0 with a broadcast source address 0 with source address duplicate to mine 29905774 which were not for me </pre>


```
0 packets discarded waiting for resolution
6 packets sent after waiting for resolution
17790 ARP requests sent
2 ARP replies sent
0 requests for memory denied
0 requests dropped on entry
0 requests dropped during retry
```

show system statistics clnl

Syntax	show system statistics clnl
Syntax (Routing Matrix)	show system statistics clnl <all-lcc lcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display system-wide Connectionless Network Layer (CLNL) statistics.
Options	<p>all-lcc—(Routing matrix only) (Optional) Display system statistics for CLNL for all T640 routing nodes (or line-card chassis) connected to a TX Matrix platform.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Display system statistics for CLNL for a specified T640 routing node (or line-card chassis) connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display system statistics for CLNL for the TX Matrix platform (or switch-card chassis).</p>
Additional Information	By default, when you issue the show system statistics clnl command on a TX Matrix master Routing Engine, the command is broadcast to all the T640 master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix backup Routing Engine, the command is broadcast to all the T640 backup Routing Engines that are connected to it.
Required Privilege Level	view
List of Sample Output	show system statistics clnl on page 630
Output Fields	Output field descriptions to be provided.
show system statistics clnl	<pre> user@host> show system statistics clnl 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 </pre>

```
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
```

show system statistics esis

Syntax	show system statistics esis
Syntax (Routing Matrix)	show system statistics esis <all-lcc lcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display system-wide End System-to-Intermediate System (ES-IS) statistics.
Options	<p>all-lcc—(Routing matrix only) (Optional) Display system statistics for ES-IS for all T640 routing nodes (or line-card chassis) connected to a TX Matrix platform.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Display system statistics for ES-IS for a specified T640 routing node (or line-card chassis) connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display system statistics for ES-IS for the TX Matrix platform (or switch-card chassis).</p>
Additional Information	By default, when you issue the show system statistics esis command on a TX Matrix master Routing Engine, the command is broadcast to all the T640 master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix backup Routing Engine, the command is broadcast to all the T640 backup Routing Engines that are connected to it.
Required Privilege Level	view
List of Sample Output	show system statistics esis on page 632
Output Fields	Output field descriptions to be provided.
show system statistics esis	<pre> user@host> show system statistics esis 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 </pre>

show system statistics icmp

Syntax	show system statistics icmp
Syntax (Routing Matrix)	show system statistics icmp <all-lcc lcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display system-wide Internet Control Message Protocol (ICMP) statistics.
Options	<p>all-lcc—(Routing matrix only) (Optional) Display system statistics for ICMP for all T640 routing nodes (or line-card chassis) connected to a TX Matrix platform.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Display system statistics for ICMP for a specified T640 routing node (or line-card chassis) connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display system statistics for ICMP for the TX Matrix platform (or switch-card chassis).</p>
Additional Information	By default, when you issue the show system statistics icmp command on a TX Matrix master Routing Engine, the command is broadcast to all the T640 master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix backup Routing Engine, the command is broadcast to all the T640 backup Routing Engines that are connected to it.
Required Privilege Level	view
List of Sample Output	show system statistics icmp on page 633
Output Fields	Output field descriptions to be provided.
show system statistics icmp	<pre> user@host> show system statistics icmp 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 dest in at on address 0 timestamp drops with broadcast or multicast destination address Input histogram: echo: 75 router advertisement: 130 75 message responses generated </pre>

show system statistics icmp6

Syntax	show system statistics icmp6
Syntax (Routing Matrix)	show system statistics icmp6 <all-lcc lcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display system-wide Internet Control Message Protocol for IPv6 (ICMP6) statistics.
Options	<p>all-lcc—(Routing matrix only) (Optional) Display system statistics for ICMPv6 for all T640 routing nodes (or line-card chassis) connected to a TX Matrix platform.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Display system statistics for ICMPv6 for a specified T640 routing node (or line-card chassis) connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display system statistics for ICMPv6 for the TX Matrix platform (or switch-card chassis).</p>
Additional Information	By default, when you issue the show system statistics icmpv6 command on a TX Matrix master Routing Engine, the command is broadcast to all the T640 master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix backup Routing Engine, the command is broadcast to all the T640 backup Routing Engines that are connected to it.
Required Privilege Level	view
List of Sample Output	show system statistics icmp6 on page 634
Output Fields	Output field descriptions to be provided.
show system statistics icmp6	<pre> user@host> show system statistics icmp6 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 </pre>

```
0 unknown
0 message responses generated
0 messages with too many ND options
```

show system statistics igmp

Syntax	show system statistics igmp
Syntax (Routing Matrix)	show system statistics igmp <all-lcc lcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display system-wide Internet Group Management Protocol (IGMP) statistics.
Options	<p>all-lcc—(Routing matrix only) (Optional) Display system statistics for IGMP for all T640 routing nodes (or line-card chassis) connected to a TX Matrix platform.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Display system statistics for IGMP for a specified T640 routing node (or line-card chassis) connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display system statistics for IGMP for the TX Matrix platform (or switch-card chassis).</p>
Additional Information	By default, when you issue the show system statistics igmp command on a TX Matrix master Routing Engine, the command is broadcast to all the T640 master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix backup Routing Engine, the command is broadcast to all the T640 backup Routing Engines that are connected to it.
Required Privilege Level	view
List of Sample Output	show system statistics igmp on page 636
Output Fields	Output field descriptions to be provided.
show system statistics igmp	<pre> user@host> show system statistics igmp igmp: 17178 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 </pre>

show system statistics ip

Syntax	show system statistics ip
Syntax (Routing Matrix)	show system statistics ip <all-lcc lcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display system-wide IPv4 statistics.
Options	<p>all-lcc—(Routing matrix only) (Optional) Display system statistics for IPv4 for all T640 routing nodes (or line-card chassis) connected to a TX Matrix platform.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Display system statistics for IPv4 for a specified T640 routing node (or line-card chassis) connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display system statistics for IPv4 for the TX Matrix platform (or switch-card chassis).</p>
Additional Information	By default, when you issue the show system statistics ip command on a TX Matrix master Routing Engine, the command is broadcast to all the T640 master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix backup Routing Engine, the command is broadcast to all the T640 backup Routing Engines that are connected to it.
Required Privilege Level	view
List of Sample Output	show system statistics ip on page 637
Output Fields	Output field descriptions to be provided.
show system statistics ip	<pre> user@host> show system statistics ip ip: 3680538 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 3663232 packets for this host 17309 packets for unknown/unsupported protocol 0 packets forwarded 0 packets not forwardable 0 redirects sent 6279 packets sent from this host </pre>

```
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)
```

show system statistics ip6

Syntax	show system statistics ip6
Syntax (Routing Matrix)	show system statistics ip6 <all-lcc lcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display system-wide IPv6 statistics.
Options	<p>all-lcc—(Routing matrix only) (Optional) Display system statistics for IPv6 for all T640 routing nodes (or line-card chassis) connected to a TX Matrix platform.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Display system statistics for IPv6 for a specified T640 routing node (or line-card chassis) connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display system statistics for IPv6 for the TX Matrix platform (or switch-card chassis).</p>
Additional Information	By default, when you issue the show system statistics ip6 command on a TX Matrix master Routing Engine, the command is broadcast to all the T640 master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix backup Routing Engine, the command is broadcast to all the T640 backup Routing Engines that are connected to it.
Required Privilege Level	view
List of Sample Output	show system statistics ip6 on page 639
Output Fields	Output field descriptions to be provided.
show system statistics ip6	<pre> user@host> show system statistics ip6 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 </pre>

```
0 datagrams that can't be fragmented
0 packets that violated scope rules
0 multicast packets which we don't join
Mbuf statistics:
0 packets whose headers are not continuous
0 tunneling packets that can't find gif
0 packets discarded due to too many headers
0 failures of source address selection
0 forward cache hit
0 forward cache miss
0 packets destined to dead next hop
0 option packets dropped due to rate limit
0 packets dropped (src and int don't match)
0 packets dropped due to bad protocol
```

show system statistics mpls

Syntax	show system statistics mpls
Syntax (Routing Matrix)	show system statistics mpls <all-lcc lcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display system-wide Multiprotocol Label Switching (MPLS) statistics.
Options	<p>all-lcc—(Routing matrix only) (Optional) Display system statistics for MPLS for all T640 routing nodes (or line-card chassis) connected to a TX Matrix platform.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Display system statistics for MPLS for a specified T640 routing node (or line-card chassis) connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display system statistics for MPLS for the TX Matrix platform (or switch-card chassis).</p>
Additional Information	By default, when you issue the show system statistics mpls command on a TX Matrix master Routing Engine, the command is broadcast to all the T640 master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix backup Routing Engine, the command is broadcast to all the T640 backup Routing Engines that are connected to it.
Required Privilege Level	view
List of Sample Output	show system statistics mpls on page 641
Output Fields	Output field descriptions to be provided.
show system statistics mpls	<pre> user@host> show system statistics mpls 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 </pre>

show system statistics rdp

Syntax	show system statistics rdp
Syntax (Routing Matrix)	show system statistics rdp <all-lcc lcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display system-wide Reliable Datagram Protocol (RDP) statistics.
Options	<p>all-lcc—(Routing matrix only) (Optional) Display system statistics for RDP for all T640 routing nodes (or line-card chassis) connected to a TX Matrix platform.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Display system statistics for RDP for a specified T640 routing node (or line-card chassis) connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display system statistics for RDP for the TX Matrix platform (or switch-card chassis).</p>
Additional Information	By default, when you issue the show system statistics rdp command on a TX Matrix master Routing Engine, the command is broadcast to all the T640 master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix backup Routing Engine, the command is broadcast to all the T640 backup Routing Engines that are connected to it.
Required Privilege Level	view
List of Sample Output	show system statistics rdp on page 642
Output Fields	Output field descriptions to be provided.
show system statistics rdp	<pre> user@host> show system statistics rdp rdp: 49668864 input packets 0 discards for bad checksum 0 discards bad sequence number 0 refused connections 2031513 acks received 0 dropped due to full socket buffers 49692 retransmits 49668864 output packets 24809579 acks sent 28 connects 0 closes 22778052 keepalives received 22778052 keepalives sent </pre>

show system statistics tcp

Syntax	show system statistics tcp
Syntax (Routing Matrix)	show system statistics tcp <all-lcc lcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display system-wide Transmission Control Protocol (TCP) statistics.
Options	<p>all-lcc—(Routing matrix only) (Optional) Display system statistics for TCP for all T640 routing nodes (or line-card chassis) connected to a TX Matrix platform.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Display system statistics for TCP for a specified T640 routing node (or line-card chassis) connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display system statistics for TCP for the TX Matrix platform (or switch-card chassis).</p>
Additional Information	By default, when you issue the show system statistics tcp command on a TX Matrix master Routing Engine, the command is broadcast to all the T640 master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix backup Routing Engine, the command is broadcast to all the T640 backup Routing Engines that are connected to it.
Required Privilege Level	view
List of Sample Output	show system statistics tcp on page 643 show system statistics tcp lcc on page 645
Output Fields	Output field descriptions to be provided.
show system statistics tcp	<pre> user@host> show system statistics tcp 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 </pre>

```

    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

```



```

show system statistics user@host> show system statistics tcp lcc 2
tcp lcc lcc2-re0:
-----
tcp:
    21271 packets sent
        11069 data packets (12044 bytes)
        0 data packets (0 bytes) retransmitted
        0 resends initiated by MTU discovery
        10198 ack-only packets (10194 packets delayed)
        0 URG only packets
        0 window probe packets
        0 window update packets
        4 control packets
    13363 packets received
        11073 acks (for 12044 bytes)
        0 duplicate acks
        0 acks for unsent data
        12895 packets (2400874 bytes) received in-sequence
        0 completely duplicate packets (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
        0 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
    4 connection requests
    0 connection accepts
    0 bad connection attempts
    0 listen queue overflows
    4 connections established (including accepts)
    33 connections closed (including 0 drops)
        0 connections updated cached RTT on close
        0 connections updated cached RTT variance on close
        0 connections updated cached ssthresh on close
    0 embryonic connections dropped
    11073 segments updated rtt (of 11073 attempts)
    0 retransmit timeouts
        0 connections dropped by rexmit timeout
    0 persist timeouts
        0 connections dropped by persist timeout
    0 keepalive timeouts
        0 keepalive probes sent
        0 connections dropped by keepalive
    464 correct ACK header predictions
    2172 correct data packet header predictions
    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 out-of-sequence segment drops due to insufficient memory
    0 RST packets
    0 ICMP packets ignored by TCP

```

show system statistics tnp

Syntax	show system statistics tnp
Syntax (Routing Matrix)	show system statistics tnp <all-lcc lcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display system-wide Trivial Network Protocol (TNP) statistics.
Options	<p>all-lcc—(Routing matrix only) (Optional) Display system statistics for TNP for all T640 routing nodes (or line-card chassis) connected to a TX Matrix platform.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Display system statistics for TNP for a specified T640 routing node (or line-card chassis) connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display system statistics for TNP for the TX Matrix platform (or switch-card chassis).</p>
Additional Information	By default, when you issue the show system statistics tnp command on a TX Matrix master Routing Engine, the command is broadcast to all the T640 master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix backup Routing Engine, the command is broadcast to all the T640 backup Routing Engines that are connected to it.
Required Privilege Level	view
List of Sample Output	show system statistics tnp on page 646
Output Fields	Output field descriptions to be provided.
show system statistics tnp	<pre> user@host> show system statistics tnp tnp: 146742559 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 49670972 rdp packets received 337101 udp packets received 96734486 tunnel packets received 0 input packets discarded with no protocol 98375316 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 49670972 rdp packets sent </pre>

```
337101 udp packets sent
48367243 tunnel packets sent
0 packets sent with unknown protocol
```

show system statistics tudp

Syntax	show system statistics tudp
Syntax (Routing Matrix)	show system statistics tudp <all-lcc lcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display system-wide Trivial User Datagram Protocol (TUDP) statistics.
Options	<p>all-lcc—(Routing matrix only) (Optional) Display system statistics for TUDP for all T640 routing nodes (or line-card chassis) connected to a TX Matrix platform.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Display system statistics for TUDP for a specified T640 routing node (or line-card chassis) connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display system statistics for TUDP for the TX Matrix platform (or switch-card chassis).</p>
Additional Information	By default, when you issue the show system statistics tudp command on a TX Matrix master Routing Engine, the command is broadcast to all the T640 master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix backup Routing Engine, the command is broadcast to all the T640 backup Routing Engines that are connected to it.
Required Privilege Level	view
List of Sample Output	show system statistics tudp on page 648
Output Fields	Output field descriptions to be provided.
show system statistics tudp	<pre> user@host> show system statistics tudp tudp: 337109 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 337109 delivered 337109 datagrams output </pre>

show system statistics udp

Syntax	show system statistics udp
Syntax (Routing Matrix)	show system statistics udp <all-lcc lcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display system-wide User Datagram Protocol (UDP) statistics.
Options	<p>all-lcc—(Routing matrix only) (Optional) Display system statistics for UDP for all T640 routing nodes (or line-card chassis) connected to a TX Matrix platform.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Display system statistics for UDP for a specified T640 routing node (or line-card chassis) connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display system statistics for UDP for the TX Matrix platform (or switch-card chassis).</p>
Additional Information	By default, when you issue the show system statistics udp command on a TX Matrix master Routing Engine, the command is broadcast to all the T640 master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix backup Routing Engine, the command is broadcast to all the T640 backup Routing Engines that are connected to it.
Required Privilege Level	view
List of Sample Output	show system statistics udp on page 649
Output Fields	Output field descriptions to be provided.
show system statistics udp	<pre> user@host> show system statistics udp udp: 3658427 datagrams received 0 with incomplete header 0 with bad data length field 0 with bad checksum 3656885 dropped due to no socket 3656885 broadcast/multicast datagrams dropped due to no socket 0 dropped due to full socket buffers 0 not for hashed pcb 4291311953 delivered 1551 datagrams output </pre>

show system statistics vpls

Syntax	show system statistics vpls
Syntax (Routing Matrix)	show system statistics vpls <all-lcc lcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display system-wide Virtual Private LAN Service (VPLS) statistics.
Options	<p>all-lcc—(Routing matrix only) (Optional) Display system statistics for VPLS for all T640 routing nodes (or line-card chassis) connected to a TX Matrix platform.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Display system statistics for VPLS for a specified T640 routing node (or line-card chassis) connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display system statistics for VPLS for the TX Matrix platform (or switch-card chassis).</p>
Additional Information	By default, when you issue the show system statistics vpls command on a TX Matrix master Routing Engine, the command is broadcast to all the T640 master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix backup Routing Engine, the command is broadcast to all the T640 backup Routing Engines that are connected to it.
Required Privilege Level	view
List of Sample Output	show system statistics vpls on page 650
Output Fields	Output field descriptions to be provided.
show system statistics vpls	<pre> user@host> show system statistics vpls 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 </pre>

```
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 storage

Syntax	show system storage <detail>
Syntax (Routing Matrix)	show system storage <detail> <all-lcc lcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display statistics about the amount of free disk space in the router's file systems.
Options	<p>none—Display standard information about the amount of free disk space in the router's file systems.</p> <p>detail—Display detailed output.</p> <p>all-lcc—(Routing matrix only) (Optional) Display system storage statistics for all T640 routing nodes (or line-card chassis) connected to a TX Matrix platform.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Display storage statistics for a specific T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display storage statistics for the TX Matrix platform (or switch-card chassis).</p>
Additional Information	By default, when you issue the show system storage command on a TX Matrix master Routing Engine, the command is broadcast to all the T640 master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix backup Routing Engine, the command is broadcast to all the T640 backup Routing Engines that are connected to it.
Required Privilege Level	view
List of Sample Output	show system storage on page 653
Output Fields	Table 133 on page 652 describes the output fields for the show system storage command. Output fields are listed in the approximate order in which they appear.

Table 133: show system storage Output Fields

Field Name	Field Description
Filesystem	Name of the file system.
Size	Size of the file system.
Used	Amount of space used in the file system.
Avail	Amount of space available in the file system.

Table 133: show system storage Output Fields *(continued)*

Field Name	Field Description
Capacity	Percentage of the file system's space that is being used.
Mounted on	Directory in which the file system is mounted.

```

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 switchover

Syntax show system switchover

Syntax (Routing Matrix) show system switchover
<all-lcc | lcc *number* | scc>

Release Information Command introduced before JUNOS Release 7.4.

Description Display whether graceful Routing Engine switchover is configured, the state of the kernel replication (ready or synchronizing), any replication errors, and whether the primary and standby Routing Engines are using compatible versions of the kernel database.



NOTE: Issue the **show system switchover** command on the backup Routing Engine. This command is not supported on the master Routing Engine.

Options all-lcc—(Routing matrix only) (Optional) Display graceful Routing Engine switchover information for all T640 routing nodes (or line-card chassis) connected to a TX Matrix platform.

lcc *number*—(Routing matrix only) (Optional) Display graceful Routing Engine switchover information for a specific T640 routing node (or line-card chassis) connected to a TX Matrix platform. Replace *number* with a value from 0 through 3.

scc—(Routing matrix only) (Optional) Display graceful Routing Engine switchover information for the TX Matrix platform (or switch-card chassis).

Additional Information By default, when you issue the **show system switchover** command on a TX Matrix master Routing Engine, the command is broadcast to all the T640 master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix backup Routing Engine, the command is broadcast to all the T640 backup Routing Engines that are connected to it.

Required Privilege Level view

List of Sample Output show system switchover on page 655
show system switchover all-lcc (Routing Matrix) on page 655

Output Fields Table 134 on page 655 describes the output fields for the **show system switchover** command. Output fields are listed in the approximate order in which they appear.

Table 134: show system switchover Output Fields

Field Name	Field Description
Graceful switchover	Display graceful Routing Engine switchover status: <ul style="list-style-type: none"> ■ On—Indicates <code>graceful-switchover</code> is specified for the <code>routing-options</code> configuration command. ■ Off—Indicates <code>graceful-switchover</code> is not specified for the <code>routing-options</code> configuration command.
Configuration database	State of the configuration database: <ul style="list-style-type: none"> ■ Ready—Configuration database has synchronized. ■ Synchronizing—Configuration database is synchronizing. Displayed when there are updates within the last 5 seconds. ■ Synchronize failed—Configuration database synchronize process failed.
Kernel database	State of the kernel database: <ul style="list-style-type: none"> ■ Ready—Kernel database has synchronized. ■ Synchronizing—Kernel database is synchronizing. Displayed when there are updates within the last 5 seconds. ■ Version incompatible—The primary and standby Routing Engines are running incompatible kernel database versions. ■ Replication error—An error occurred when the state was replicated from the primary Routing Engine. Inspect <code>/var/log/ksyncd</code> for possible causes, or notify Juniper Networks customer support.
Peer state	Routing Engine peer state: <ul style="list-style-type: none"> ■ Steady State—Peer completed switchover transition. ■ Peer Connected—Peer in switchover transition.

```

show system switchover user@host> show system switchover
Graceful switchover: On
Configuration database: Ready
Kernel database: Ready
Peer state: Steady State

```

```

show system switchover user@host> show system switchover all-lcc
all-lcc (Routing Matrix)
lcc0-re0:
-----
Multichassis replication: On
Configuration database: Ready
Kernel database: Ready
Peer state: Steady State
lcc2-re0:
-----
Multichassis replication: On
Configuration database: Ready
Kernel database: Ready
Peer state: Steady State

```

show system uptime

Syntax	show system uptime
Syntax (Routing Matrix)	show system uptime <all-lcc lcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display the current time and information about how long the router, router software, and routing protocols have been running.
Options	<p>all-lcc—(Routing matrix only) (Optional) Show the time since the system booted and processes started on all T640 routing nodes (or line-card chassis) connected to a TX Matrix platform.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Show the time since the system booted and processes started on a specific T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Show the time since the system booted and processes started on the TX Matrix platform (or switch-card chassis).</p>
Additional Information	By default, when you issue the show system uptime command on a TX Matrix master Routing Engine, the command is broadcast to all the T640 master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix backup Routing Engine, the command is broadcast to all the T640 backup Routing Engines that are connected to it.
Required Privilege Level	view
List of Sample Output	<p>show system uptime on page 657</p> <p>show system uptime all-lcc (Routing Matrix) on page 657</p>
Output Fields	Table 135 on page 656 describes the output fields for the show system uptime command. Output fields are listed in the approximate order in which they appear.

Table 135: show system uptime Output Fields

Field Name	Field Description
Current time	Current system time in UTC.
System booted	Date and time when the router 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 name of user who issued the last commit command.
<i>time and up</i>	Current time, in the local time zone, and how long the router has been operational.

Table 135: show system uptime Output Fields *(continued)*

Field Name	Field Description
users	Number of users logged in to the router.
load averages	Load averages for the last 1 minute, 5 minutes, and 15 minutes.

show system uptime user@host> **show system uptime**
 Current time: 1998-10-13 19:45:47 UTC
 System booted: 1998-10-12 20:51:41 UTC (22:54:06 ago)
 Protocols started: 1998-10-13 19:33:45 UTC (00:12:02 ago)
 Last configured: 1998-10-13 19:33:45 UTC (00:12:02 ago) by abc
 12:45PM up 22:54, 2 users, load averages: 0.07, 0.02, 0.01

show system uptime user@host> **show system uptime all-lcc**
all-lcc (Routing Matrix) lcc0-re0:

 Current time: 2004-09-13 09:55:35 PDT
 System booted: 2004-09-13 03:13:55 PDT (06:41:40 ago)
 Last configured: 2004-09-13 03:17:48 PDT (06:37:47 ago) by root
 9:55AM PDT up 6:42, 1 user, load averages: 0.02, 0.03, 0.00
 lcc2-re0:

 Current time: 2004-09-13 09:55:35 PDT
 System booted: 2004-09-12 03:23:43 PDT (1d 06:31 ago)
 Last configured: 2004-09-13 03:05:36 PDT (06:49:59 ago) by root
 9:55AM PDT up 1 day, 6:32, 1 user, load averages: 0.02, 0.01, 0.00

show system users

Syntax	show system users <no-resolve>
Syntax (Routing Matrix)	show system users <all-lcc lcc <i>number</i> scc> <no-resolve>
Release Information	Command introduced before JUNOS Release 7.4.
Description	List information about the users who are currently logged in to the router.
Options	<p>none—List information about the users who are currently logged in to the router.</p> <p>all-lcc—(Routing matrix only) (Optional) Show users who are currently logged on all T640 routing nodes (or line-card chassis) connected to a TX Matrix platform.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Show users who are currently logged onto a specific T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>no-resolve—(Optional) Do not attempt to resolve IP addresses to hostnames.</p> <p>scc—(Optional) (Routing matrix only) Show users currently logged on to the TX Matrix platform (or switch-card chassis).</p>
Additional Information	By default, when you issue the show system users command on a TX Matrix master Routing Engine, the command is broadcast to all the T640 master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix backup Routing Engine, the command is broadcast to all the T640 backup Routing Engines that are connected to it.
Required Privilege Level	view
List of Sample Output	<p>show system users on page 659</p> <p>show system users lcc no-resolve (Routing Matrix) on page 659</p>
Output Fields	Table 136 on page 659 describes the output fields for the show system users command. Output fields are listed in the approximate order in which they appear.

Table 136: show system users Output Fields

Field Name	Field Description
<i>time and up</i>	Current time, in the local time zone, and how long the router has been operational.
<i>users</i>	Number of users logged in to the router.
<i>load averages</i>	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.

```

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.compan 7:30PM  - cli

```

```

show system users lcc user@host> show system users lcc 2 no-resolve
no-resolve (Routing
Matrix)          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
                        regress    p0   scc-re0       10:15AM  - telnet hostA
                        regress    p1   scc-re0       10:16AM  - telnet hostA
                        regress    p2   scc-re0       10:19AM  - telnet hostA
                        regress    p3   scc-re0       10:24AM  - telnet hostA

```

show system virtual-memory

Syntax	show system virtual-memory
Syntax (Routing Matrix)	show system virtual-memory <all-lcc lcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display the usage of JUNOS kernel memory listed first by size of allocation and then by type of usage. Use show system virtual-memory for troubleshooting with Juniper Networks Customer Support.
Options	<p>all-lcc—(Routing matrix only) (Optional) Display kernel dynamic memory usage information for all T640 routing nodes (or line-card chassis) connected to a TX Matrix platform.</p> <p>lcc <i>number</i>—(Routing matrix only) (Optional) Display kernel dynamic memory usage information for a specific T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Routing matrix only) (Optional) Display kernel dynamic memory usage information for the TX Matrix platform (or switch-card chassis).</p>
Additional Information	By default, when you issue the show system virtual-memory command on a TX Matrix master Routing Engine, the command is broadcast to all the T640 master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix backup Routing Engine, the command is broadcast to all the T640 backup Routing Engines that are connected to it.
Required Privilege Level	view
List of Sample Output	<p>show system virtual-memory on page 662</p> <p>show system virtual-memory scc (Routing Matrix) on page 666</p>
Output Fields	Table 137 on page 661 lists the output fields for the show system virtual-memory command. Output fields are listed in the approximate order in which they appear.

Table 137: 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 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).
Requests	Total number of memory allocation requests.
ITEM	Kernel module that is using memory.
Size	Memory block size (bytes).

Table 137: show system virtual-memory Output Fields (continued)

Field Name	Field Description
Llimit	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.

```

show system user@host> show system virtual-memory
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,
rtnextthop, iffamilly
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, rtnextthop
512 UFS mount, temp, devbuf, mount, BIO buffer, ptys, ttys, AR driver,
Gzip trees, ISOFS mount, msg, iocltops, ATA generic, bus, proc,
pfestat, lr, ifstate, pfe_ipc, rtable, ipfw, ifstat, rtnextthop
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, iocltops, bus, ipfw, ifstat, rcache
4K memdesc, iftable, UFS mount, temp, devbuf, kld, Gzip trees, sem, msg
8K temp, devbuf, syncache, Gzip trees
16K indirdep, temp, devbuf, shm, msg
32K pagedep, kld, Gzip trees
64K VM pgdata, devbuf, MSDOSFS mount
128K UFS ihash, inodedep, NFS hash, kld, ISOFS mount
256K mbuf, vfscache
512K SWAP

```

```

Memory statistics by type
Type  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
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
ripccb:	192,	25330,	5,	37,	5
syncache:	128,	15359,	0,	64,	5
tcpcb:	576,	25330,	23,	12,	32
udpcb:	192,	25330,	14,	28,	255
socket:	256,	25330,	246,	26,	819
KNOTE:	96,	0,	27,	57,	71
NFSNODE:	352,	0,	0,	0,	0
NFSMOUNT:	544,	0,	0,	0,	0
VNODE:	224,	0,	2778,	43,	2778
NAMEI:	1024,	0,	0,	8,	40725
VMSPACE:	192,	0,	57,	71,	3906
PROC:	448,	0,	73,	17,	3923
DP fakepg:	64,	0,	0,	0,	0
PV ENTRY:	28,	499566,	44530,	152053,	1525141
MAP ENTRY:	48,	0,	1439,	134,	351075
KMAP ENTRY:	48,	35645,	179,	119,	10904
MAP:	108,	0,	7,	3,	7
VM OBJECT:	92,	0,	2575,	109,	66912

```

792644 cpu context switches
9863474 device interrupts
286510 software interrupts
390851 traps
3596829 system calls
    16 kernel threads created
    3880 fork() calls
    27 vfork() calls
    0 rfork() calls
    0 swap pager pageins
    0 swap pager pages paged in
    0 swap pager pageouts
    0 swap pager pages paged out
    380 vnode pager pageins
    395 vnode pager pages paged in
    122 vnode pager pageouts
    1476 vnode pager pages paged out
    0 page daemon wakeups
    0 pages examined by the page daemon
    101 pages reactivated
161722 copy-on-write faults
    0 copy-on-write optimized faults
84623 zero fill pages zeroed
83063 zero fill pages prezeroed
    7 intransit blocking page faults
535606 total VM faults taken
    0 pages affected by kernel thread creation
238254 pages affected by fork()
2535 pages affected by vfork()

```

```

    0 pages affected by rfork()
283379 pages freed
    0 pages freed by daemon
190091 pages freed by exiting processes
17458 pages active
29166 pages inactive
    0 pages in VM cache
10395 pages wired down
134610 pages free
    4096 bytes per page
183419 total name lookups
    cache hits (90% pos + 7% neg) system 0% per-directory
    deletions 0%, falsehits 0%, toolong 0%

```

interrupt	total	rate
ata0 irq14	113338	3
mux irq7	727643	21
fxp1 irq10	1178671	34
sio0 irq4	833	0
clk irq0	3439769	99
rtc irq8	4403221	127
Total	9863475	286

**show system
virtual-memory scc
(Routing Matrix)**

```
user@host> show system virtual-memory scc
```

```

Memory statistics by bucket size
Size  In Use   Free   Requests  HighWater  Couldfree
  16      898    126    749493    1280        0
  32     2018    1310   980643     640       632
  64     3490   13342   935420     320      5365
...

```

```

Memory usage type by bucket size
Size  Type(s)
  16  uc_devlist, COS, BPF, DEVFS mount, DEVFS node, vnodes, mount, pcb,
      soname, rman, bus, sysctl, ifstate, pfe_ipc, mkey, socket, rtable,
      ifmaddr, ipfw, rnode, iftable, temp, devbuf, atexit, proc-args, kld,
      MD disk
  32  atkbddev, Gzip trees, dirrem, mkdir, diradd, freefile, freefrag,
      indirdep, bmsafemap, newblk, tseg_qent, COS, vnodes,
...

```

```

Memory statistics by type
Type  InUse MemUse HighUse Limit Requests Limit Limit Size(s)
  isadev    12    1K    1K166400K    12    0    0    64
  atkbddev    2    1K    1K166400K    2    0    0    32
  uc_devlist  24    3K    3K166400K   24    0    0  16,2K
....

```

```

Memory Totals:  In Use    Free    Requests
                  6091K    1554K    2897122

```

show task

Syntax	show task <logical-system (all <i>logical-system-name</i>)> <summary> < <i>task-name</i> >
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display routing protocol tasks on the Routing Engine.
Options	<p>none—Display all routing protocol tasks on the Routing Engine on all logical systems.</p> <p><i>logical-system</i> (all <i>logical-system-name</i>)—(Optional) Perform this operation on all logical systems or on a particular logical system.</p> <p><i>summary</i>—(Optional) Display summary information about running tasks.</p> <p><i>task-name</i>—(Optional) Display summary information about running tasks whose name matches this substring.</p>
Required Privilege Level	view
Related Topics	<p>show task io</p> <p>show task memory</p>
List of Sample Output	show task on page 668
Output Fields	Table 138 on page 667 describes the output fields for the show task command. Output fields are listed in the approximate order in which they appear.

Table 138: show task Output Fields

Field Name	Field Description
Pri	Current priority of the process. A lower number indicates a higher priority.
Task Name	Name of the task.
Pro	IP protocol number associated with the process.
Port	TCP or UDP port number associated with the task.
So	Socket number of the task.
Flags	Flags for the task: <ul style="list-style-type: none"> ■ Accept—Task is waiting for incoming connections. ■ Connect—Task is waiting for a connection to be completed. ■ Delete—Task has been deleted and is being cleaned up. ■ LowPrio—Task will be dispatched to read its socket after other higher-priority tasks.

show task user@host> **show task**

Pri	Task Name	Pro	Port	So	Flags
10	IF				
15	LABEL				
15	ISO				
15	INET			7	
20	Aggregate				
20	RT				
30	ICMP	1		9	
39	ISIS I/O			12	
40	IS-IS			10	
40	BGP RT Background				<LowPrio>
40	BGP.0.0.0.0+179		179	15	<Accept LowPrio>
50	BGP_69.192.168.201.234+179		179	17	<LowPrio>
50	BGP_70.192.168.201.233+179		179	16	<LowPrio>
50	BGP_Group_69_153				<LowPrio>
50	BGP_Group_70_153				<LowPrio>
50	ASPaths				
60	KRT	255		1	
60	Redirect				
70	MGMT.local			14	<LowPrio>
70	MGMT_Listen./var/run/rpd_mgmt			13	<Accept LowPrio>
70	SNMP Subagent./var/run/sub_rpd.sock			8	<LowPrio>

show task io

Syntax	show task io <logical-system (all <i>logical-system-name</i>)>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display I/O statistics for routing protocol tasks on the Routing Engine.
Options	<p>none—Display I/O statistics for routing protocol tasks on the Routing Engine on all logical systems.</p> <p>logical-system (all <i>logical-system-name</i>)—(Optional) Perform this operation on all logical systems or on a particular logical system.</p>
Required Privilege Level	view
List of Sample Output	show task io on page 669
Output Fields	Table 139 on page 669 describes the output fields for the show task io command. Output fields are listed in the approximate order in which they appear.

Table 139: show task io Output Fields

Field Name	Field Description
Task Name	Name of the task.
Reads	Number of input ready notifications.
Writes	Number of output ready notifications.
Rcvd	Number of requests to the kernel for input.
Sent	Number of requests to the kernel for output.
Dropped	Number of sent requests that failed.

```

show task io user@host> show task io
Task Name      Reads  Writes  Rcvd   Sent  Dropped
LMP Client      1       1       0       0       0
IF              0       0       0       0       0
INET6           0       0       0       0       0
INET            0       0       0       0       0
ISO             0       0       0       0       0
Memory          0       0       0       0       0
RPD Unix Domain Server./var/ru  0       0       0       0       0
RPD Unix Domain Server./var/ru  1       0       0       0       0
RPD Unix Domain Server./var/ru  2       0       0       0       0
RPD Server.0.0.0.0+666          0       0       0       0       0
Aggregate       0       0       0       0       0
RT              0       0       0       0       0
ICMP            0       0       0       0       0

```

Router-Advertisement	0	0	0	0	0
ICMPv6	0	0	0	0	0
IS-IS I/O./var/run/ppmd_contro	1307	1	0	0	0
l2vpn global task	0	0	0	0	0
IS-IS	0	0	0	0	0
BFD I/O./var/run/bfdd_control	1307	1	0	0	0
TED	0	0	0	0	0
ASPaths	0	0	0	0	0
Resolve tree 1	0	0	0	0	0
KStat	0	0	0	0	0
KRT Request	0	0	63	0	0
KRT Ifstate	106	0	295	0	0
KRT	0	0	0	0	0
Redirect	0	0	0	0	0
...					

show task memory

Syntax	show task memory <brief detail history summary> <logical-system (all <i>logical-system-name</i>)>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display memory utilization for routing protocol tasks on the Routing Engine.
Options	<p>none—Display standard information about memory utilization for routing protocol tasks on the Routing Engine on all logical systems.</p> <p>brief detail history summary—(Optional) Display the specified level of output. Use the history option to display a history of memory utilization information.</p> <p>logical-system (all <i>logical-system-name</i>)—(Optional) Perform this operation on all logical systems or on a particular logical system.</p>
Required Privilege Level	view
List of Sample Output	<p>show task memory on page 672</p> <p>show task memory detail on page 673</p>
Output Fields	Table 140 on page 671 describes the output fields for the command. Output fields are listed in the approximate order in which they appear.

Table 140: show task memory Output Fields

Field Name	Field Description	Level of Output
Memory Currently In Use	Memory currently in use.	none specified
Memory Maximum Ever Used	Maximum memory ever used.	none specified
Memory Available	Memory currently available.	none specified
Size (kB)	Memory capacity in 1000-byte kilobytes.	none specified
%Available	Percentage of memory currently available.	none specified
When	Timestamp.	none specified

Table 140: show task memory Output Fields (continued)

Field Name	Field Description	Level of Output
Overall Memory Report	Memory utilization by memory size: <ul style="list-style-type: none"> ■ Size—Block size, in bytes. ■ TPT—indicates transient memory, and P indicates full page. ■ Allocs—Number of blocks allocated for named objects. ■ Mallocs—Number of blocks allocated for anonymous objects. ■ Alloc Bytes—Number of blocks allocated times block size. ■ MaxAllocs—Maximum value of Allocs. ■ MaxBytes—Maximum value of Alloc Bytes. ■ FreeBytes—Total number of bytes unused on memory pages for this block size. 	detail
Allocator Memory Report	Memory utilization by named objects: <ul style="list-style-type: none"> ■ Size—Size of the named object in bytes. ■ Alloc Size—Actual memory used by that object in bytes. ■ DTP—indicates debug, D T indicates transient, and P indicates full page. ■ Alloc Blocks—Number of named objects allocated. ■ AllocBytes—Number of blocks allocated times block size. ■ MaxAlloc Blocks—Maximum value of Alloc Blocks. ■ Max Alloc Bytes—Maximum value of AllocBytes. 	detail
Malloc Usage Report	Memory utilization for miscellaneous use: <ul style="list-style-type: none"> ■ Allocs—Number of allocations. ■ Bytes—Total bytes consumed. ■ MaxAllocs—Maximum value of Allocs. ■ MaxBytes—Maximum value of Bytes. ■ FuncCalls—Cumulative number of Allocs. 	detail
Dynamically allocated memory	Memory allocated dynamically by the system.	detail
Program data+BSS memory	Program and base station subsystem (BSS) memory.	detail
Page data overhead	Internal memory overhead.	detail
Page directory size	Internal memory overhead.	detail
Total bytes in use	Total memory, in bytes, that is currently in use and percentage of available memory (in parentheses).	detail

```

show task memory  user@host> show task memory
Memory              Size (kB)  %Available  When
Currently In Use:   29417    3%         now
Maximum Ever Used:  33882    4%         00/02/11 22:07:03
Available:          756281   100%       now

```

```

show task memory user@host> show task memory detail
detail ----- Overall Memory Report -----
  Size TP    Allocs  Mallocs  AllocBytes  MaxAllocs  MaxBytes  FreeBytes
    8      -      111     888      112      896     3208
   12      92     149     2892     247     2964     1204
   12 T      -      -      -        5        60        -
   16      7      11      288      23      368     3808
   20     100     33     2660     164     3280     1436
   20 T      -      -      -       40      800        -
   24     162     15     4248     177     4248     3944
   24 T      -      -      -        4       96        -
   28     371      -    10388     372    10416     1900
   32      6      23      928      30      960     3168
...
                                     606182                715302    118810

----- Allocator Memory Report -----
Name                Size Alloc DTP    Alloc  Alloc  Alloc MaxAlloc  MaxAlloc
                   Size      Size  Blocks  Bytes  Blocks  Bytes
patroot             8    12      84    1008      87    1044
sockaddr_un.i802     8    12        2      24        2      24
cos_nhm_nh           8    12        1      12        1      12
sockaddr_un.tag      8    12        3      36        4      48
gw_entry_list        8    12        1      12        1      12
bgp_riblist_01       8    12        1      12        2      24
ospf_intf_ev         8    12        -        -        6      72
krt_remnant_rt       8    12 T        -        -        5      60
...
                                     164108                221552

----- Malloc Usage Report -----
Name                Allocs    Bytes  MaxAllocs  MaxBytes  FuncCalls
MGMT.local           1         8         1         8         1
BGP.0.0.0.0+179      -         -         1         8         2
BGP RT Background    4      74748        4      74748        4
SNMP Subagent./var/run/ -        52        1      9172        56
OSPFv2 I/O./var/run/ppm 1     66536        2     66552     4551
OSPF                 6     67655        7     67703        68
KRT                  -         -        1      3784        18
ASPaths              3         80        3         80         3
-- sockaddr --       183      2100      184      2108     1645
BFD I/O./var/run/bfdd_c 1     65535        2     65551     4555
RT                   48         872        48         872         48
Scheduler            42         628        43         628         88
--Anonymous--        56      1100        58      1140        112
--System--           82     58364      114     60044     4654
...
                                     337678                352398

Dynamically allocated memory: 765952    Maximum: 765952
Program data+BSS memory: 1568768    Maximum: 1568768
Page data overhead: 53248    Maximum: 53248
Page directory size: 4096    Maximum: 4096
-----
Total bytes in use: 2392064 (0% of available memory)

```

show task replication

Syntax	show task replication
Release Information	Command introduced in JUNOS Release 8.5.
Description	Displays graceful Routing Engine switchover (GRES) and nonstop active routing (NSR) status. When you issue this command on the master Routing Engine, the status of nonstop active routing synchronization is also displayed.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show task replication (Issued on the master Routing Engine) on page 674 show task replication (Issued on the backup Routing Engine) on page 674
Output Fields	Table 141 on page 674 lists the output fields for the show task replication command. Output fields are listed in the approximate order in which they appear.

Table 141: show task replication Output Fields

Field Name	Field Description
Stateful replication	Displays whether or not graceful Routing Engine switchover is configured. The status can be Enabled or Disabled .
RE mode	Displays the Routing Engine on which the command is issued: Master , Backup , or Not applicable (when the routing platform has only one Routing Engine).
Protocol	Protocol that are supported by nonstop active routing.
Synchronization Status	Nonstop active routing synchronization status for the supported protocols. States are NotStarted , InProgress , and Complete .

**show task replication
(Issued on the master
Routing Engine)**

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

Protocol      Synchronization Status
OSPF          NotStarted
BGP           Complete
IS-IS         NotStarted
LDP           Complete
```

**show task replication
(Issued on the backup
Routing Engine)**

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

show version

Syntax	show version <brief detail>
Syntax (Routing Matrix)	show version <brief detail> <all-lcc lcc <i>number</i> scc>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display the hostname and version information about the software running on the router.
Options	<p>none—Display standard information about the hostname and version of the software running on the router.</p> <p>brief detail—(Optional) Display the specified level of output.</p> <p>all-lcc—(Optional) Display the hostnames and version information about the software running on all T640 routing nodes (or line-card chassis) that are connected to a TX Matrix platform.</p> <p>lcc <i>number</i>—(Optional) Display the hostname and version information about the software running on a T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.</p> <p>scc—(Optional) Display the hostname and version information about the software running on the TX Matrix platform (or switch-card chassis).</p>
Additional Information	By default, when you issue the show version command on a TX Matrix master Routing Engine, the command is broadcast to all the T640 master Routing Engines connected to it. Likewise, if you issue the same command on the TX Matrix backup Routing Engine, the command is broadcast to all the T640 backup Routing Engines that are connected to it.
Required Privilege Level	view
List of Sample Output	show version on page 676
Output Fields	Output field descriptions to be provided.

```

show version      user@customerA> show version
                    Hostname: router1
                    Model: m20
                    JUNOS Base OS boot [7.2-20050312.0]
                    JUNOS Base OS Software Suite [7.2-20050312.0]
                    JUNOS Kernel Software Suite [7.2R1.7]
                    JUNOS Packet Forwarding Engine Support (M20/M40) [7.2R1.7]
                    JUNOS Routing Software Suite [7.2R1.7]
                    JUNOS Online Documentation [7.2R1.7]
                    JUNOS Crypto Software Suite [7.2R1.7]

                    {master}
                    user@host> show version psd 1
                    psd1-re0:
                    -----
                    Hostname: china
                    Model: t640
                    JUNOS Base OS boot [9.1I20080311_1959_adthakur]
                    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 invoke-on

Syntax	show version invoke-on (all-routing-engines other-routing-engine)
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display the hostname and version information about the software running on a routing platform with two Routing Engines.
Options	<p>all-routing-engines—Display the hostnames and version information about the software running on all master and backup Routing Engines on a routing matrix or on a routing platform that has dual Routing Engines.</p> <p>other-routing-engine—Display the hostnames and version information about the software running 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 hostname and version information on the backup Routing Engine. On a routing matrix, if you issue this command on the TX Matrix platform master Routing Engine, the JUNOS software displays all the hostnames and version information on all the backup Routing Engines.</p>
Required Privilege Level	view
List of Sample Output	<p>show version invoke-on all-routing-engines (Routing Matrix) on page 677</p> <p>show version invoke-on other-routing-engine (Routing Matrix) on page 679</p>
Output Fields	Output field descriptions to be provided.
show version invoke-on all-routing-engines (Routing Matrix)	<pre> user@host> show version invoke-on all-routing-engines scc-re0: ----- Hostname: bob Model: TX Matrix JUNOS Base OS boot [7.1-20041024.0] JUNOS Base OS Software Suite [7.1-20041024.0] JUNOS Kernel Software Suite [7.1-20041024.0] JUNOS Packet Forwarding Engine Support (T-Series) [7.1-20041024.0] JUNOS Routing Software Suite [7.1-20041024.0] JUNOS Online Documentation [7.1-20041024.0] JUNOS Crypto Software Suite [7.1-20041024.0] JUNOS Support Tools Package [7.1-20041025.1] scc-re1: ----- Hostname: bob1 Model: TX Matrix JUNOS Base OS boot [7.1-20041024.0] JUNOS Base OS Software Suite [7.1-20041024.0] JUNOS Kernel Software Suite [7.1-20041024.0] JUNOS Packet Forwarding Engine Support (T-Series) [7.1-20041024.0] JUNOS Routing Software Suite [7.1-20041024.0] JUNOS Online Documentation [7.1-20041024.0] JUNOS Crypto Software Suite [7.1-20041024.0] JUNOS Support Tools Package [7.1-20041025.1] 1cc0-re0: </pre>

```

-----
Hostname: cas
Model: t640
JUNOS Base OS boot [7.1-20041024.0]
JUNOS Base OS Software Suite [7.1-20041024.0]
JUNOS Kernel Software Suite [7.1-20041024.0]
JUNOS Packet Forwarding Engine Support (T-Series) [7.1-20041024.0]
JUNOS Routing Software Suite [7.1-20041024.0]
JUNOS Online Documentation [7.1-20041024.0]
JUNOS Crypto Software Suite [7.1-20041024.0]

```

```
lcc0-re1:
```

```

-----
Hostname: cas1-lcc0
Model: t640
JUNOS Base OS boot [7.1-20041024.0]
JUNOS Base OS Software Suite [7.1-20041024.0]
JUNOS Kernel Software Suite [7.1-20041024.0]
JUNOS Packet Forwarding Engine Support (T-Series) [7.1-20041024.0]
JUNOS Routing Software Suite [7.1-20041024.0]
JUNOS Online Documentation [7.1-20041024.0]
JUNOS Crypto Software Suite [7.1-20041024.0]

```

```
lcc1-re0:
```

```

-----
Hostname: jas
Model: t640
JUNOS Base OS boot [7.1-20041024.0]
JUNOS Base OS Software Suite [7.1-20041024.0]
JUNOS Kernel Software Suite [7.1-20041024.0]
JUNOS Packet Forwarding Engine Support (T-Series) [7.1-20041024.0]
JUNOS Routing Software Suite [7.1-20041024.0]
JUNOS Online Documentation [7.1-20041024.0]
JUNOS Crypto Software Suite [7.1-20041024.0]

```

```
lcc1-re1:
```

```

-----
Hostname: jas1
Model: t640
JUNOS Base OS boot [7.1-20041024.0]
JUNOS Base OS Software Suite [7.1-20041024.0]
JUNOS Kernel Software Suite [7.1-20041024.0]
JUNOS Packet Forwarding Engine Support (T-Series) [7.1-20041024.0]
JUNOS Routing Software Suite [7.1-20041024.0]
JUNOS Online Documentation [7.1-20041024.0]
JUNOS Crypto Software Suite [7.1-20041024.0]

```

```
lcc2-re0:
```

```

-----
Hostname: dew
Model: t640
JUNOS Base OS boot [7.1-20041024.0]
JUNOS Base OS Software Suite [7.1-20041024.0]
JUNOS Kernel Software Suite [7.1-20041024.0]
JUNOS Packet Forwarding Engine Support (T-Series) [7.1-20041024.0]
JUNOS Routing Software Suite [7.1-20041024.0]
JUNOS Online Documentation [7.1-20041024.0]
JUNOS Crypto Software Suite [7.1-20041024.0]

```

```
lcc2-re1:
```

```

Hostname: dew1
Model: t640
JUNOS Base OS boot [7.1-20041024.0]
JUNOS Base OS Software Suite [7.1-20041024.0]
JUNOS Kernel Software Suite [7.1-20041024.0]
JUNOS Packet Forwarding Engine Support (T-Series) [7.1-20041024.0]
JUNOS Routing Software Suite [7.1-20041024.0]
JUNOS Online Documentation [7.1-20041024.0]
JUNOS Crypto Software Suite [7.1-20041024.0]

```

```
lcc3-re0:
```

```

-----
Hostname: wa
Model: t640
JUNOS Base OS boot [7.1-20041024.0]
JUNOS Base OS Software Suite [7.1-20041024.0]
JUNOS Kernel Software Suite [7.1-20041024.0]
JUNOS Packet Forwarding Engine Support (T-Series) [7.1-20041024.0]
JUNOS Routing Software Suite [7.1-20041024.0]
JUNOS Online Documentation [7.1-20041024.0]
JUNOS Crypto Software Suite [7.1-20041024.0]

```

```
lcc3-re1:
```

```

-----
Hostname: wa1
Model: t640
JUNOS Base OS boot [7.1-20041024.0]
JUNOS Base OS Software Suite [7.1-20041025.1]
JUNOS Kernel Software Suite [7.1-20041024.0]
JUNOS Packet Forwarding Engine Support (T-Series) [7.1-20041024.0]
JUNOS Routing Software Suite [7.1-20041024.0]
JUNOS Online Documentation [7.1-20041024.0]
JUNOS Crypto Software Suite [7.1-20041024.0]

```

**show version invoke-on
other-routing-engine
(Routing Matrix)**

```

user@host> show version invoke-on other-routing-engine
scc-re1:

```

```

-----
Hostname: bob1
Model: TX Matrix
JUNOS Base OS boot [7.1-20041024.0]
JUNOS Base OS Software Suite [7.1-20041024.0]
JUNOS Kernel Software Suite [7.1-20041024.0]
JUNOS Packet Forwarding Engine Support (T-Series) [7.1-20041024.0]
JUNOS Routing Software Suite [7.1-20041024.0]
JUNOS Online Documentation [7.1-20041024.0]
JUNOS Crypto Software Suite [7.1-20041024.0]
JUNOS Support Tools Package [7.1-20041025.1]

```

```
lcc0-re1:
```

```

-----
Hostname: cas1-lcc0
Model: t640
JUNOS Base OS boot [7.1-20041024.0]
JUNOS Base OS Software Suite [7.1-20041024.0]
JUNOS Kernel Software Suite [7.1-20041024.0]
JUNOS Packet Forwarding Engine Support (T-Series) [7.1-20041024.0]
JUNOS Routing Software Suite [7.1-20041024.0]
JUNOS Online Documentation [7.1-20041024.0]
JUNOS Crypto Software Suite [7.1-20041024.0]
lcc1-re1:

```

```

Hostname: jas1
Model: t640
JUNOS Base OS boot [7.1-20041024.0]
JUNOS Base OS Software Suite [7.1-20041024.0]
JUNOS Kernel Software Suite [7.1-20041024.0]
JUNOS Packet Forwarding Engine Support (T-Series) [7.1-20041024.0]
JUNOS Routing Software Suite [7.1-20041024.0]
JUNOS Online Documentation [7.1-20041024.0]
JUNOS Crypto Software Suite [7.1-20041024.0]

```

```
lcc2-re1:
```

```

-----
Hostname: dew1
Model: t640
JUNOS Base OS boot [7.1-20041024.0]
JUNOS Base OS Software Suite [7.1-20041024.0]
JUNOS Kernel Software Suite [7.1-20041024.0]
JUNOS Packet Forwarding Engine Support (T-Series) [7.1-20041024.0]
JUNOS Routing Software Suite [7.1-20041024.0]
JUNOS Online Documentation [7.1-20041024.0]
JUNOS Crypto Software Suite [7.1-20041024.0]

```

```
lcc3-re1:
```

```

-----
Hostname: wa1
Model: t640
JUNOS Base OS boot [7.1-20041024.0]
JUNOS Base OS Software Suite [7.1-20041025.1]
JUNOS Kernel Software Suite [7.1-20041024.0]
JUNOS Packet Forwarding Engine Support (T-Series) [7.1-20041024.0]
JUNOS Routing Software Suite [7.1-20041024.0]
JUNOS Online Documentation [7.1-20041024.0]
JUNOS Crypto Software Suite [7.1-20041024.0]

```

start shell

Syntax	start shell (csh sh) <user <i>username</i> >
Release Information	Command introduced before JUNOS Release 7.4.
Description	Exit from the CLI environment and create a UNIX-level shell. To return to the CLI, type exit from the shell.
Options	<p>csh—Create a UNIX C shell.</p> <p>sh—Create a UNIX Bourne shell.</p> <p>user <i>username</i>—(Optional) Start the shell as another user.</p>
Additional Information	<p>When you are in the shell, the shell prompt has the following format:</p> <p><i>username@hostname%</i></p> <p>An example of the prompt is:</p> <p>root@router%</p>
Required Privilege Level	shell and maintenance
List of Sample Output	start shell csh on page 681
Output Fields	When you enter this command, you are provided feedback on the status of your request.
start shell csh	<pre> user@host> start shell csh % exit % username@hostname% start shell sh % exit user@host> </pre>

test configuration

Syntax	<code>test configuration <i>filename</i></code>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Verify that the syntax of a configuration file is correct. If the configuration contains any errors, a message is displayed to indicate the line number and column number in which the error was found.
Options	<i>filename</i> —Name of the configuration file.
Required Privilege Level	view
List of Sample Output	test configuration on page 682
Output Fields	When you enter this command, you are provided feedback on the status of your request.
test configuration	<pre> 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 </pre>

Part 3

Class of Service

- Class-of-Service Operational Mode Commands on page 685

Chapter 14

Class-of-Service Operational Mode Commands

Table 142 on page 685 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot class of service (CoS). Commands are listed in alphabetical order.

Table 142: Class-of-Service (CoS) Operational Mode Commands

Task	Command
Display the entire CoS configuration, including system-chosen defaults.	<code>show class-of-service</code>
(J-series routing platform only) Display trigger points and associated rates for CoS adaptive shapers.	<code>show class-of-service adaptive-shaper</code>
For each CoS classifier, display the mapping of code point value to forwarding class and loss priority.	<code>show class-of-service classifier</code>
Display the mapping of CoS code point aliases to corresponding bit patterns.	<code>show class-of-service code-point-aliases</code>
Display data points for each CoS random early detection (RED) drop profile.	<code>show class-of-service drop-profile</code>
(M320 routers and T-series routing platforms only) Display the mapping of CoS schedulers to switch fabric traffic priorities and a summary of scheduler parameters for each priority.	<code>show class-of-service fabric scheduler-map</code>
(M320 routers and T-series routing platforms only) Display CoS switch fabric queue statistics.	<code>show class-of-service fabric statistics</code>
Display the mapping of forwarding class names to queue numbers.	<code>show class-of-service forwarding-class</code>
Display entire CoS configuration as it exists in the forwarding table.	<code>show class-of-service forwarding-table</code>
Display the mapping of code point value to queue number and loss priority for each classifier as it exists in the forwarding table.	<code>show class-of-service forwarding-table classifier</code>

Table 142: Class-of-Service (CoS) Operational Mode Commands *(continued)*

Task	Command
For each logical interface, display either the table index of the classifier for a given code point type or the queue number (if it is a fixed classification) in the forwarding table.	<code>show class-of-service forwarding-table classifier mapping</code>
Display the data points of all random early detection (RED) drop profiles as they exist in the forwarding table.	<code>show class-of-service forwarding-table drop-profile</code>
(M320 routers and T-series routing platforms only) Display the scheduler map information as it exists in the forwarding table for switch fabric.	<code>show class-of-service forwarding-table fabric scheduler-map</code>
(J-series routing platform only) Display the mapping of code point value to loss priority as it exists in the forwarding table.	<code>show class-of-service forwarding-table loss-priority-map</code>
(J-series routing platform only) For each logical interface, display the loss priority table index.	<code>show class-of-service forwarding-table loss-priority-map mapping</code>
Display mapping of queue number and loss priority to code point value for each rewrite rule as it exists in the forwarding table.	<code>show class-of-service forwarding-table rewrite-rule</code>
For each logical interface, display the table identifier of the rewrite rule map for each code point type.	<code>show class-of-service forwarding-table rewrite-rule mapping</code>
For each physical interface, display the scheduler map information as it exists in the forwarding table.	<code>show class-of-service forwarding-table scheduler-map</code>
For Adaptive Services (AS) PIC link services IQ interfaces (lsq) only, display fragmentation properties for specific forwarding classes.	<code>show class-of-service fragmentation-map</code>
Display the logical and physical interface associations for the classifier, rewrite rules, and scheduler map objects.	<code>show class-of-service interface</code>
Display the configured shaping rate and the quality of service (QoS) adjusted shaping rate for each logical interface set configured for hierarchical class of service (CoS).	<code>show class-of-service interface-set</code>
(J-series routing platform only) Display mapping of code point value to loss priority.	<code>show class-of-service loss-priority-map</code>
Display the mapping of forwarding classes and loss priority to code point values.	<code>show class-of-service rewrite-rule</code>
(M-series and T-series routing platforms only) Display mapping of CoS objects to routing instances.	<code>show class-of-service routing-instance</code>

Table 142: Class-of-Service (CoS) Operational Mode Commands (*continued*)

Task	Command
Display mapping of schedulers to forwarding classes and a summary of scheduler parameters for each entry.	<code>show class-of-service scheduler-map</code>
For Gigabit Ethernet IQ and Channelized IQ PICs only, display traffic shaping and scheduling profiles.	<code>show class-of-service traffic-control-profile</code>
(J-series routing platform only) Display virtual channel information.	<code>show class-of-service virtual-channel</code>
(J-series routing platform only) Display virtual channel group information.	<code>show class-of-service virtual-channel-group</code>



NOTE: For information about how to configure CoS, see the *JUNOS Class of Service Configuration Guide*. For information about the related `show interfaces queue` command, see the *JUNOS Interfaces Command Reference*.

show class-of-service

Syntax show class-of-service

Release Information Command introduced before JUNOS Release 7.4.

Description Display the entire class-of-service (CoS) configuration, including system-chosen defaults. Executing this command is equivalent to executing all **show class-of-service** commands in succession.

Options This command has no options.

Required Privilege Level view

List of Sample Output show class-of-service on page 688

Output Fields See the output field descriptions for the remaining commands in this chapter.

```

show class-of-service user@host> show class-of-service
Forwarding class                               Queue
  best-effort                                0
  expedited-forwarding                       1
  assured-forwarding                         2
  network-control                            3
Code point type: dscp
  Alias      Bit pattern
  af11       001010
  af12       001100
  af13       001110
...
Code point type: dscp-ipv6
  Alias      Bit pattern
  af11       001010
  af12       001100
  af13       001110
...
Code point type: exp
  Alias      Bit pattern
  af11       100
  af12       101
  be         000
...
Code point type: ieee-802.1
  Alias      Bit pattern
  af11       100
  af12       101
  be         000
...
Classifier: dscp-default, Code point type: dscp, Index: 6
  Code point      Forwarding class      Loss priority
  000000          best-effort           low
  000001          best-effort           low
  000010          best-effort           low
....
Classifier: dscp-ipv6-default, Code point type: dscp-ipv6, Index: 7
  Code point      Forwarding class      Loss priority
  000000          best-effort           low

```

```

000001          best-effort          low
000010          best-effort          low
...
Loss-priority-map: frame-relay-de-default, Code point type: frame-relay-de, Index:
12
  Code point      Loss priority
  0               low
  1               high

Rewrite rule: dscp-default, Code point type: dscp, Index: 23
  Forwarding class      Loss priority      Code point
  best-effort           low                000000
  best-effort           high               000000
  expedited-forwarding  low               101110
...
Rewrite rule: dscp-ipv6-default, Code point type: dscp-ipv6, Index: 24
  Forwarding class      Loss priority      Code point
  best-effort           low                000000
  best-effort           high               000000
...
....
Drop profile: <default-drop-profile>, Type: discrete, Index: 1
  Fill level    Drop probability
    100         100

Scheduler map: <default>, Index: 2

  Scheduler: <default-be>, Forwarding class: best-effort, Index: 16
    Transmit rate: 95 percent, Rate Limit: none, Buffer size: 95 percent, Priority:
    low
      Drop profiles:
        Loss priority  Protocol    Index    Name
        Low           any         1        <default-drop-profile>
        Medium low    any         1        <default-drop-profile>
        Medium high   any         1        <default-drop-profile>
        High          any         1        <default-drop-profile>
...
Physical interface: fe-0/0/0, Index: 137
Queues supported: 8, Queues in use: 4
  Scheduler map: <default>, Index: 2

  Logical interface: fe-0/0/0.0, Index: 69
    Object      Name              Type              Index
    Adaptive-shaper  fr-shaper          35320
    Classifier       ipprec-compatibility  ip                11

Physical interface: fe-0/0/1, Index: 138
Queues supported: 8, Queues in use: 4
  Scheduler map: <default>, Index: 2
...

```

show class-of-service adaptive-shaper

Syntax	show class-of-service adaptive-shaper <adaptive-shaper-name>
Release Information	Introduced before JUNOS Release 7.4.
Description	(J-series routing platform only) Display trigger points and associated rates for class-of-service (CoS) adaptive shapers.
Options	none—Display all adaptive shaper information. adaptive-shaper-name—(Optional) Display information for the named adaptive shaper.
Required Privilege Level	view
List of Sample Output	show class-of-service adaptive-shaper on page 690
Output Fields	Table 143 on page 690 describes the output fields for the show class-of-service adaptive-shaper command. Output fields are listed in the approximate order in which they appear.

Table 143: show class-of-service adaptive-shaper Output Fields

Field Name	Field Description
Adaptive shaper	Name of the adaptive shaper.
Index	Internal index of the adaptive shaper.
Trigger type	Adaptive shaper trigger type. The trigger type can be the backward explicit congestion notification (BECN) bit in Frame Relay packet headers.
Shaping rate	CoS adaptive shaping rate.

```

show class-of-service adaptive-shaper
user@host> show class-of-service adaptive-shaper
Adaptive shaper: as, Index: 3155
  Trigger type    Shaping rate
  BECN           30 percent

```

show class-of-service classifier

Syntax	show class-of-service classifier <name <i>name</i> > <type dscp type dscp-ipv6 type exp type ieee-802.1 type inet-precedence>
Release Information	Command introduced before JUNOS Release 7.4.
Description	For each class-of-service (CoS) classifier, display the mapping of code point value to forwarding class and loss priority.
Options	<p>none—Display all classifiers.</p> <p>name <i>name</i>—(Optional) Display named classifier.</p> <p>type dscp—(Optional) Display all classifiers of the Differentiated Services code point (DSCP) type.</p> <p>type dscp-ipv6—(Optional) Display all classifiers of the DSCP for IPv6 type.</p> <p>type exp—(Optional) Display all classifiers of the Multiprotocol Label Switching (MPLS) experimental (EXP) type.</p> <p>type ieee-802.1—(Optional) Display all classifiers of the ieee-802.1 type.</p> <p>type inet-precedence—(Optional) Display all classifiers of the inet-precedence type.</p>
Required Privilege Level	view
List of Sample Output	show class-of-service classifier type ieee-802.1 on page 692
Output Fields	Table 144 on page 691 describes the output fields for the show class-of-service classifier command. Output fields are listed in the approximate order in which they appear.

Table 144: show class-of-service classifier Output Fields

Field Name	Field Description
Classifier	Name of the classifier.
Code point type	Type of the classifier: exp, dscp, dscp-ipv6, ieee-802.1, or inet-precedence.
Index	Internal index of the classifier.
Code point	Code point value used for classification
Forwarding class	Classification of a packet affecting the forwarding, scheduling, and marking policies applied as the packet transits the router.
Loss priority	Loss priority value used for classification. For most platforms, the value is high or low . For some platforms, the value is high , medium-high , medium-low , or low .

```

show class-of-service user@host> show class-of-service classifier type ieee-802.1
classifier type Classifier: ieee802.1-default, Code point type: ieee-802.1, Index: 3
ieee-802.1 Code Point Forwarding Class Loss priority
              000 best-effort low
              001 best-effort high
              010 expedited-forwarding low
              011 expedited-forwarding high
              100 assured-forwarding low
              101 assured-forwarding medium-high
              110 network-control low
              111 network-control high

Classifier: users-ieee802.1, Code point type: ieee-802.1
Code point Forwarding class Loss priority
100 expedited-forwarding low

```


show class-of-service code-point-aliases

Syntax	show class-of-service code-point-aliases <dscp dscp-ipv6 exp ieee-802.1 inet-precedence>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display the mapping of class-of-service (CoS) code point aliases to corresponding bit patterns.
Options	<p>none—Display code point aliases of all code point types.</p> <p>dscp—(Optional) Display Differentiated Services code point (DSCP) aliases.</p> <p>dscp-ipv6—(Optional) Display IPv6 DSCP aliases.</p> <p>exp—(Optional) Display MPLS EXP code point aliases.</p> <p>ieee-802.1—(Optional) Display IEEE-802.1 code point aliases.</p> <p>inet-precedence—(Optional) Display IPv4 precedence code point aliases.</p>
Required Privilege Level	view
List of Sample Output	show class-of-service code-point-aliases exp on page 694
Output Fields	Table 145 on page 693 describes the output fields for the show class-of-service code-point-aliases command. Output fields are listed in the approximate order in which they appear.

Table 145: show class-of-service code-point-aliases Output Fields

Field Name	Field Description
Code point type	Type of the code points displayed: dscp, dscp-ipv6, exp, ieee-802.1, or inet-precedence.
Alias	Alias for a bit pattern.
Bit pattern	Bit pattern for which the alias is displayed.

```
show class-of-service user@host> show class-of-service code-point-aliases exp  
code-point-aliases exp Code point type: exp  
Alias Bit pattern  
af11 100  
af12 101  
be 000  
be1 001  
cs6 110  
cs7 111  
ef 010  
ef1 011  
nc1 110  
nc2 111
```

show class-of-service drop-profile

Syntax	show class-of-service drop-profile <profile-name <i>profile-name</i> >
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display data points for each class-of-service (CoS) random early detection (RED) drop profile.
Options	none—Display all drop profiles. profile-name <i>profile-name</i> —(Optional) Display the specified profile only.
Required Privilege Level	view
List of Sample Output	show class-of-service drop-profile on page 696
Output Fields	Table 146 on page 695 describes the output fields for the show class-of-service drop-profile command. Output fields are listed in the approximate order in which they appear.

Table 146: show class-of-service drop-profile Output Fields

Field Name	Field Description
Drop profile	Name of a drop profile.
Type	Type of this drop profile: discrete or interpolated.
Index	Internal index of this drop profile.
Fill Level	Percentage fullness of a queue.
Drop probability	Drop probability at this fill level.

```

show class-of-service user@host> show class-of-service drop-profile
drop-profile Drop profile: <default-drop-profile>, Type: discrete, Index: 1
                Fill level      Drop probability
                  100             100
Drop profile: user-drop-profile, Type: interpolated, Index: 2989
                Fill level      Drop probability
                   0              0
                   1              1
                   2              2
                   4              4
                   5              5
                   6              6
                   8              8
                  10             10
                  12             15
                  14             20
                  15             23
                ... 64 entries total
                   90             96
                   92             96
                   94             97
                   95             98
                   96             98
                   98             99
                   99             99
                  100            100

```

show class-of-service fabric scheduler-map

Syntax	show class-of-service fabric scheduler-map
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M320 routers and T-series routing platforms only) Display the mapping of class-of-service (CoS) schedulers to switch fabric traffic priorities and a summary of scheduler parameters for each priority.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show class-of-service fabric scheduler-map on page 697
Output Fields	Table 147 on page 697 describes the output fields for the show class-of-service fabric scheduler-map command. Output fields are listed in the approximate order in which they appear.

Table 147: show class-of-service fabric scheduler-map Output Fields

Field Name	Field Description
Fabric priority	Indicates the fabric traffic priority. Currently, two priorities are supported: low and high.
Scheduler	Name of the scheduler
Index	Index of the indicated object. Objects that have indexes in this output include schedulers and drop profiles.
Drop profiles	Display the assignment of drop profile by name and index to a given loss priority and protocol pair: <ul style="list-style-type: none"> ■ Loss priority—Packet loss priority for drop profile assignment. ■ Protocol—Transport protocol for drop profile assignment. ■ Name—Name of the drop profile.

```

show class-of-service fabric scheduler-map
user@host> show class-of-service fabric scheduler-map
Fabric priority: low
Scheduler: fab-ef-scheduler, Index: 60211
Drop profiles:
  Loss priority  Protocol  Index  Name
  Low           non-TCP  44321  fab-ef-profile
  Low           TCP      44321  fab-ef-profile
  High          non-TCP  44321  fab-ef-profile
  High          TCP      44321  fab-ef-profile

Fabric priority: high
Scheduler: fab-ef-scheduler, Index: 60211
Drop profiles:
  Loss priority  Protocol  Index  Name
  Low           non-TCP  44321  fab-ef-profile
  Low           TCP      44321  fab-ef-profile

```

High	non-TCP	44321	fab-ef-profile
High	TCP	44321	fab-ef-profile

show class-of-service fabric statistics

Syntax	show class-of-service fabric statistics <destination <i>fpc-number</i> > <source <i>fpc-number</i> > <summary>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M320 routers and T-series routing platforms only) Display class-of-service (CoS) switch fabric queue statistics.
Options	<p>none—Same as summary.</p> <p><i>destination fpc-number</i>—(Optional) Display details for the specified destination Flexible PIC Concentrator (FPC). The FPC number is a value from 0 through 7.</p> <p><i>source fpc-number</i>—(Optional) Display details for the specified source FPC. The FPC number is a value from 0 through 7.</p> <p><i>summary</i>—(Optional) Display all switch fabric statistics.</p>
Required Privilege Level	view
List of Sample Output	show class-of-service fabric statistics on page 700
Output Fields	Table 148 on page 699 describes the output fields for the show class-of-service fabric statistics command. Output fields are listed in the approximate order in which they appear.

Table 148: show class-of-service fabric statistics Output Fields

Field Name	Field Description
Destination FPC Index	Index number associated with the destination FPC
Source PFC Index	Index number associated with the source FPC.
Total statistics	<p>Fabric queue statistic totals:</p> <ul style="list-style-type: none"> ■ Packets—Total packet count for high-priority and low-priority queues. ■ Bytes—Total byte count for high-priority and low-priority queues. ■ pps—Total packets-per-second count for high-priority and low-priority queues. ■ bps—Total bytes-per-second count for high-priority and low-priority queues.
Tx statistics	<p>Fabric queue statistics for transmitted traffic:</p> <ul style="list-style-type: none"> ■ Packets—Transmitted packet count for high-priority and low-priority queues. ■ Bytes—Transmitted byte count for high-priority and low-priority queues. ■ pps—Transmitted packets-per-second count for high-priority and low-priority queues. ■ bps—Transmitted bytes-per-second count for high-priority and low-priority queues.

Table 148: show class-of-service fabric statistics Output Fields (continued)

Field Name	Field Description
Drop statistics	<p>Fabric queue statistics for dropped traffic:</p> <ul style="list-style-type: none"> ■ Packets—Dropped packet count for high-priority and low-priority queues. ■ Bytes—Dropped byte count for high-priority and low-priority queues. ■ pps—Dropped packets-per-second count for high-priority and low-priority queues. ■ bps—Dropped bytes-per-second count for high-priority and low-priority queues.

**show class-of-service
fabric statistics**

```

user@host> show class-of-service fabric statistics
Destination FPC Index: 0, Source FPC Index: 0
Total statistics:  High priority      Low priority
Packets:          0                  0
Bytes :           0                  0
Pps :             0                  0
Bps :             0                  0
Tx statistics:    High priority      Low priority
Packets:          0                  0
Bytes :           0                  0
Pps :             0                  0
Bps :             0                  0
Drop statistics:  High priority      Low priority
Packets:          0                  0
Bytes :           0                  0
Pps :             0                  0
Bps :             0                  0

Destination FPC Index: 0, Source FPC Index: 1
Total statistics:  High priority      Low priority
Packets:          0                  0
Bytes :           0                  0
Pps :             0                  0
Bps :             0                  0
Tx statistics:    High priority      Low priority
Packets:          0                  0
Bytes :           0                  0
Pps :             0                  0
Bps :             0                  0
Drop statistics:  High priority      Low priority
Packets:          0                  0
Bytes :           0                  0
...

```


show class-of-service forwarding-class

Syntax	show class-of-service forwarding-class <forwarding-class-map-name>
Release Information	Command introduced before JUNOS Release 7.4. Forwarding class map option added in JUNOS Release 9.4.
Description	Display the mapping of forwarding class maps and names to queue numbers.
Options	<i>forwarding-class-map-name</i> —(Optional) Display the forwarding class configuration for a specific forwarding class map name. If this option is omitted, information for all forwarding class maps will be displayed.
Required Privilege Level	view
List of Sample Output	show class-of-service forwarding-class on page 701 show class-of-service forwarding-class <forwarding-class-map-name> on page 702
Output Fields	Table 149 on page 701 describes the output fields for the show class-of-service forwarding-class command. Output fields are listed in the approximate order in which they appear.

Table 149: show class-of-service forwarding-class Output Fields

Field Name	Field Description
Forwarding class map	Classification of a packet affecting the forwarding, scheduling, and marking policies applied as the packet transits the router.
ID	Forwarding class identifier.
Queue	Queue corresponding to the forwarding class name.
Restricted Queue	(T-series platforms only) Forwarding class restricted queue number. The queue number assigned if the PIC is restricted to four queues.
Fabric Priority	(M320 and T-series platforms only) Forwarding class queue priority.

show class-of-service forwarding-class	user@host> show class-of-service forwarding-class				
	Forwarding class map FCMAP1	ID	Queue	Restricted queue	Fabric Priority
	fc0	0	0	0	low
	fc2	1	1	1	low
	fc4	2	2	2	low
	fc6	3	3	3	low
	fc1	4	0	0	low
	fc3	5	1	1	low
	fc5	6	2	2	low
	fc7	7	3	3	low
	fc8	8	4	0	low
	fc9	9	4	0	low
	fc10	10	5	1	low
	fc11	11	5	1	low

fc12	12	6	2	low
fc13	13	6	2	low
fc14	14	7	3	low
fc15	15	7	3	low

```

show class-of-service forwarding-class
<forwarding-class-mapname>

```

user@host> **show class-of-service forwarding-class FCMAP1**

Forwarding class map FCMAP1	ID	Queue	Restricted queue	Fabric Priority
fc0	0	0	0	low
fc2	1	1	1	low
fc4	2	2	2	low
fc6	3	3	3	low
fc1	4	0	0	low
fc3	5	1	1	low
fc5	6	2	2	low
fc7	7	3	3	low
fc8	8	4	0	low
fc9	9	4	0	low
fc10	10	5	1	low
fc11	11	5	1	low
fc12	12	6	2	low
fc13	13	6	2	low
fc14	14	7	3	low
fc15	15	7	3	low

show class-of-service forwarding-table

Syntax	show class-of-service forwarding-table
Syntax (Routing Matrix)	show class-of-service forwarding-table <fcc number>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display the entire class-of-service (CoS) configuration as it exists in the forwarding table. Executing this command is equivalent to executing all show class-of-service forwarding-table commands in succession.
Options	fcc <i>number</i> —(Routing matrix only) (Optional) Display the forwarding table configuration for a specific T640 routing node (or line-card chassis) that is connected to a TX Matrix platform. Replace <i>number</i> with a value from 0 through 3.
Required Privilege Level	view
List of Sample Output	show class-of-service forwarding-table on page 703
Output Fields	See the output field descriptions for the remaining show class-of-service forwarding-table commands in this chapter.

```

user@host> show class-of-service forwarding-table
Classifier table index: 9, # entries: 8, Table type: EXP
Entry #   Code point   Forwarding-class #   PLP
0         000             0                   0
1         001             0                   1
2         010             1                   0
3         011             1                   1
4         100             2                   0
5         101             2                   1
6         110             3                   0
7         111             3                   1

Interface      Index      Table Index/
              Q num      Table type
sp-0/0/0.1001   66         11         IPv4 precedence
sp-0/0/0.2001   67         11         IPv4 precedence
sp-0/0/0.16383  68         11         IPv4 precedence
fe-0/0/0.0      69         11         IPv4 precedence

Interface: sp-0/0/0 (Index: 129, Map index: 2, Map type: FINAL,
Num of queues: 2):
  Entry 0 (Scheduler index: 16, Forwarding-class #: 0):
    Tx rate: 0 Kb (95%), Buffer size: 95 percent
  Priority low
    PLP high: 1, PLP low: 1, PLP medium-high: 1, PLP medium-low: 1
  Entry 1 (Scheduler index: 18, Forwarding-class #: 3):
    Tx rate: 0 Kb (5%), Buffer size: 5 percent
  Priority low
    PLP high: 1, PLP low: 1, PLP medium-high: 1, PLP medium-low: 1

Interface: fe-0/0/0 (Index: 137, Map index: 2, Map type: FINAL,
Num of queues: 2):

```

```

Entry 0 (Scheduler index: 16, Forwarding-class #: 0):
  Tx rate: 0 Kb (95%), Buffer size: 95 percent
Priority low
  PLP high: 1, PLP low: 1, PLP medium-high: 1, PLP medium-low: 1
Entry 1 (Scheduler index: 18, Forwarding-class #: 3):
  Tx rate: 0 Kb (5%), Buffer size: 5 percent
Priority low
  PLP high: 1, PLP low: 1, PLP medium-high: 1, PLP medium-low: 1
Interface: fe-0/0/1 (Index: 138, Map index: 2, Map type: FINAL,
Num of queues: 2):
Entry 0 (Scheduler index: 16, Forwarding-class #: 0):
  Tx rate: 0 Kb (95%), Buffer size: 95 percent
Priority low
  PLP high: 1, PLP low: 1, PLP medium-high: 1, PLP medium-low: 1
Entry 1 (Scheduler index: 18, Forwarding-class #: 3):
  Tx rate: 0 Kb (5%), Buffer size: 5 percent
Priority low
  PLP high: 1, PLP low: 1, PLP medium-high: 1, PLP medium-low: 1

...

RED drop profile index: 1, # entries: 1
      Drop
Entry  Fullness(%)  Probability(%)
  0           100           100

```

show class-of-service forwarding-table classifier

Syntax	show class-of-service forwarding-table classifier
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display the mapping of code point value to queue number and loss priority for each classifier as it exists in the forwarding table.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show class-of-service forwarding-table classifier on page 705
Output Fields	Table 150 on page 705 describes the output fields for the show class-of-service forwarding-table classifier command. Output fields are listed in the approximate order in which they appear.

Table 150: show class-of-service forwarding-table classifier Output Fields

Field Name	Field Description
Classifier table index	Index of the classifier table.
Entries	Total number of entries.
Table type	Type of code points in the table: DSCP, EXP, IEEE 802.1, IPv4 precedence, or IPv6 DSCP.
Entry #	Entry number.
Code point	Code point value used for classification.
Forwarding-class #	Forwarding class to which the code point is assigned.
PLP	Packet loss priority value set by classification. For most platforms, the value can be 0 or 1. For some platforms, the value is 0, 1, 2, or 3. The value 0 represents low PLP. The value 1 represents high PLP. The value 2 represents medium-low PLP. The value 3 represents medium-high PLP.

```

show class-of-service user@host> show class-of-service forwarding-table classifier
forwarding-table Classifier table index: 62436, # entries: 64, Table type: DSCP
classifier
Entry #   Code point   Forwarding-class #   PLP
  0         000000         0                   0
  1         000001         0                   0
  2         000010         0                   0
  3         000011         0                   0
  4         000100         0                   0
  5         000101         0                   0
  6         000110         0                   0

```

7	000111	0	0
8	001000	0	0
9	001001	0	0
10	001010	1	1
11	001011	0	0
...			
60	111100	0	0
61	111101	0	0
62	111110	0	0
63	111111	0	0

show class-of-service forwarding-table classifier mapping

Syntax	show class-of-service forwarding-table classifier mapping
Release Information	Command introduced before JUNOS Release 7.4.
Description	For each logical interface, display either the table index of the classifier for a given code point type or the queue number (if it is a fixed classification) in the forwarding table.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show class-of-service forwarding-table classifier mapping on page 707
Output Fields	Table 151 on page 707 describes the output fields for the show class-of-service forwarding-table classifier mapping command. Output fields are listed in the approximate order in which they appear.

Table 151: show class-of-service forwarding-table classifier mapping Output Fields

Field Name	Field Description
Table index/	If the type is Fixed, the number of the queue to which the interface is mapped. For all other types, this value is the classifier index number.
Interface	Name of the logical interface.
Index	Logical interface index.
Q num	Queue number to which this entry is assigned.
Table type	Type of code points in the table: DSCP, EXP, IEEE 802.1, IPv4 precedence, or IPv6 DSCP.

```

show class-of-service forwarding-table classifier mapping
user@host> show class-of-service forwarding-table classifier mapping
Table index/
Interface      Index      Q num      Table type
so-5/0/0.0     10         62436      DSCP
so-0/1/0.0     11         62436      DSCP
so-0/2/0.0     12         1          Fixed
so-0/2/1.0     13         62436      DSCP
so-0/2/1.0     13         62437      IEEE 802.1
so-0/2/2.0     14         62436      DSCP
so-0/2/2.0     14         62438      IPv4 precedence

```

show class-of-service forwarding-table drop-profile

Syntax show class-of-service forwarding-table drop-profile

Release Information Command introduced before JUNOS Release 7.4.

Description	Display the data points of all random early detection (RED) drop profiles as they exist in the forwarding table.
--------------------	--

Options This command has no options.

Required Privilege Level [view](#)

List of Sample Output show class-of-service forwarding-table drop-profile on page 708

Output Fields Table 152 on page 708 describes the output fields for the `show class-of-service forwarding-table drop-profile` command. Output fields are listed in the approximate order in which they appear.

Table 152: show class-of-service forwarding-table drop-profile Output Fields

Field Name	Field Description
RED drop profile index	Index of this drop profile.
# entries	Number of entries in a particular RED drop profile index
Entry	Drop profile entry number.
Fullness(%)	Percentage fullness of a queue.
Drop probability(%)	Drop probability at this fill level.

```

show class-of-service user@host> show class-of-service forwarding-table drop-profile
forwarding-table RED drop profile index: 4, # entries: 1
drop-profile Drop

```

Entry	Fullness(%)	Probability(%)
0	100	100

RED drop profile index: 8742, # entries: 3

Entry	Fullness(%)	Drop Probability(%)
0	10	10
1	20	20
2	30	30

RED drop profile index: 24627, # entries: 64

Entry	Fullness(%)	Drop Probability(%)
0	0	0
1	1	1
2	2	2
3	4	4

...		
61	98	99
62	99	99
63	100	100

RED drop profile index: 25393, # entries: 64

Entry	Fullness(%)	Drop Probability(%)
0	0	0
1	1	1
2	2	2
3	4	4
...		
61	98	98
62	99	99
63	100	100

show class-of-service forwarding-table fabric scheduler-map

Syntax	show class-of-service forwarding-table fabric scheduler-map
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M320 routers and T-series routing platforms only) Display the scheduler map information as it exists in the forwarding table for switch fabric.
Options	This command has no options.
Additional Information	For information about how PLP priority is assigned to packets, see the <i>JUNOS Class of Service Configuration Guide</i> .
Required Privilege Level	view
List of Sample Output	show class-of-service forwarding-table fabric scheduler-map on page 710
Output Fields	Table 153 on page 710 describes the output fields for the show class-of-service forwarding-table fabric scheduler-map command. Output fields are listed in the approximate order in which they appear.

Table 153: show class-of-service forwarding-table fabric scheduler-map Output Fields

Field Name	Field Description
Fabric priority	Fabric traffic priority: low and high.
Scheduler index	Index of the scheduler applied to a fabric traffic priority.
PLP high	Drop profile index for high-packet-loss-priority (PLP) packets.
PLP low	Drop profile index for low-PLP packets.
TCP PLP high	Drop profile index for low-PLP and Transmission Control Protocol (TCP) packets.
TCP PLP low	Drop profile index for high-PLP and TCP packets.

```

show class-of-service forwarding-table fabric scheduler-map
user@host> show class-of-service forwarding-table fabric scheduler-map
Fabric priority: low
  Scheduler index: 60211
    PLP high: 44321, PLP low: 44321, TCP PLP high: 44321, TCP PLP low: 44321

Fabric priority: high
  Scheduler index: 60211
    PLP high: 44321, PLP low: 44321, TCP PLP high: 44321, TCP PLP low: 44321

```

show class-of-service forwarding-table loss-priority-map

Syntax	show class-of-service forwarding-table loss-priority-map
Release Information	Command introduced before JUNOS Release 7.4.
Description	(J-series routing platform only) Display the mapping of code point value to loss priority as it exists in the forwarding table.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show class-of-service forwarding-table loss-priority-map on page 711
Output Fields	Table 154 on page 711 describes the output fields for the show class-of-service forwarding-table loss-priority-map command. Output fields are listed in the approximate order in which they appear.

Table 154: show class-of-service forwarding-table loss-priority-map Output Fields

Field Name	Field Description
Loss priority map table index	Loss priority map table index.
Entries	Number of table entries.
Table type	Table type: Frame-Relay DE.
Entry #	Table entry number.
Code point	Code point value.
PLP	Packet loss priority value. For most platforms, the value is 0 or 1. For some platforms, the value is 0, 1, 2, or 3. The value 0 represents low PLP. The value 1 represents high PLP. The value 2 represents medium-low PLP. The value 3 represents medium-high PLP.

show class-of-service forwarding-table loss-priority-map	<pre>user@host> show class-of-service forwarding-table loss-priority-map loss-priority-map table index: 2212, # entries: 2, Table type: Frame-Relay DE Entry # Code point PLP 0 0 2 1 1 3 loss-priority-map table index: 11038, # entries: 2, Table type: Frame-Relay DE Entry # Code point PLP 0 0 3 1 1 1</pre>
---	---

show class-of-service forwarding-table loss-priority-map mapping

Syntax	show class-of-service forwarding-table loss-priority-map mapping
Release Information	Command introduced before JUNOS Release 7.4.
Description	(J-series routing platform only) For each logical interface, display the loss priority table index.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show class-of-service forwarding-table loss-priority-map mapping on page 712
Output Fields	Table 155 on page 712 describes the output fields for the show class-of-service forwarding-table loss-priority-map mapping command. Output fields are listed in the approximate order in which they appear.

Table 155: show class-of-service forwarding-table loss-priority-map mapping Output Fields

Field Name	Field Description
Interface	Name of the logical interface.
Index	Logical interface index.
Table index	Loss priority table index.
Table type	Table type: Frame-Relay DE.

```

show class-of-service user@host> show class-of-service forwarding-table loss-priority-map mapping
forwarding-table      Interface      Index      Table index      Table type
loss-priority-map      fe-0/0/0.0      67         11038            Frame-Relay DE
mapping                t1-0/0/2.0      69         2212             Frame-Relay DE

```

show class-of-service forwarding-table rewrite-rule

Syntax	show class-of-service forwarding-table rewrite-rule
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display mapping of queue number and loss priority to code point value for each rewrite rule as it exists in the forwarding table.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show class-of-service forwarding-table rewrite-rule on page 713
Output Fields	Table 156 on page 713 describes the output fields for the show class-of-service forwarding-table rewrite-rule command. Output fields are listed in the approximate order in which they appear.

Table 156: show class-of-service forwarding-table rewrite-rule Output Fields

Field Name	Field Description
Rewrite table index	Index for this rewrite rule.
# entries	Number of entries in this rewrite rule.
Table type	Type of table: DSCP, EXP, EXP-PUSH-3, EXP-SWAP-PUSH-2,(J-series routing platform only), IEEE 802.1,IPv4 precedence, IPv6 DSCP, or Fixed.
Q#	Queue number to which this entry is assigned.
Low bits	Code point value for low-priority loss profile.
State	State of this code point: enabled, rewritten, or disabled
High bits	Code point value for high-priority loss profile.

show class-of-service forwarding-table rewrite-rule	<pre> user@host> show class-of-service forwarding-table rewrite-rule Rewrite table index: 3753, # entries: 4, Table type: DSCP Q# Low bits State High bits State 0 000111 Enabled 001010 Enabled 2 000000 Disabled 001100 Enabled 1 101110 Enabled 110111 Enabled 3 110000 Enabled 111000 Enabled </pre>
--	--

show class-of-service forwarding-table rewrite-rule mapping

Syntax	show class-of-service forwarding-table rewrite-rule mapping
Release Information	Command introduced before JUNOS Release 7.4.
Description	For each logical interface, display the table identifier of the rewrite rule map for each code point type.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show class-of-service forwarding-table rewrite-rule mapping on page 714
Output Fields	Table 157 on page 714 describes the output fields for the show class-of-service forwarding-table rewrite-rule mapping command. Output fields are listed in the approximate order in which they appear.

Table 157: show class-of-service forwarding-table rewrite-rule mapping Output Fields

Field Name	Field Description
Interface	Name of the logical interface.
Index	Logical interface index
Table index	Rewrite table index.
Type	Type of classifier: DSCP, EXP, EXP-PUSH-3, EXP-SWAP-PUSH-2, Frame-Relay DE (J-series routing platform only), IEEE 802.1, IPv4 precedence, IPv6 DSCP, or Fixed.

```

show class-of-service forwarding-table rewrite-rule mapping
user@host> show class-of-service forwarding-table rewrite-rule mapping
Interface      Index  Table index  Type
so-5/0/0.0     10     3753        DSCP
so-0/1/0.0     11     3753        DSCP
so-0/2/0.0     12     3753        DSCP
so-0/2/1.0     13     3753        DSCP
so-0/2/2.0     14     3753        DSCP
so-0/2/3.0     15     3753        DSCP

```

show class-of-service forwarding-table scheduler-map

Syntax	show class-of-service forwarding-table scheduler-map
Release Information	Command introduced before JUNOS Release 7.4.
Description	For each physical interface, display the scheduler map information as it exists in the forwarding table.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show class-of-service forwarding-table scheduler-map on page 716
Output Fields	Table 158 on page 715 describes the output fields for the <code>show class-of-service forwarding-table scheduler-map</code> command. Output fields are listed in the approximate order in which they appear.

Table 158: show class-of-service forwarding-table scheduler-map Output Fields

Field Name	Field Description
Interface	Name of the physical interface.
Index	Physical interface index.
Map index	Scheduler map index.
Num of queues	Number of queues defined in this scheduler map.
Entry	Number of this entry in the scheduler map.
Scheduler index	Scheduler policy index.
Forwarding-class #	Forwarding class number to which this entry is applied.
Tx rate	Configured transmit rate of the scheduler (in bps). The rate is a percentage of the total interface bandwidth, or the keyword remainder , which indicates that the scheduler receives the remaining bandwidth of the interface.
Max buffer delay	Amount of transmit delay (in milliseconds) or buffer size of the queue. This amount is a percentage of the total interface buffer allocation or the keyword remainder , which indicates that the buffer is sized according to what remains after other scheduler buffer allocations.
High priority is set	If this line appears in the output, the queue priority is high. Otherwise, it is low.
PLP high	Drop profile index for a high packet loss priority profile.
PLP low	Drop profile index for a low packet loss priority profile.
PLP medium-high	Drop profile index for a medium-high packet loss priority profile.
PLP medium-low	Drop profile index for a medium-low packet loss priority profile.

Table 158: show class-of-service forwarding-table scheduler-map Output Fields *(continued)*

Field Name	Field Description
TCP PLP high	Drop profile index for a high TCP packet loss priority profile.
TCP PLP low	Drop profile index for a low TCP packet loss priority profile.
Policy is exact	If this line appears in the output, exact rate limiting is enabled. Otherwise, no rate limiting is enabled.

**show class-of-service
forwarding-table
scheduler-map**

```

user@host> show class-of-service forwarding-table scheduler-map
Interface: so-5/0/0 (Index: 9, Map index: 17638, Num of queues: 2):
  Entry 0 (Scheduler index: 6090, Forwarding-class #: 0):
    Tx rate: 0 Kb (30%), Max buffer delay: 39 bytes (0%)
    Priority low
    PLP high: 25393, PLP low: 24627, TCP PLP high: 25393, TCP PLP low: 8742
    Policy is exact
  Entry 1 (Scheduler index: 38372, Forwarding-class #: 1):
    Traffic chunk: Max = 0 bytes, Min = 0 bytes
    Tx rate: 0 Kb (40%), Max buffer delay: 68 bytes (0%)
    Priority high
    PLP high: 25393, PLP low: 24627, TCP PLP high: 25393, TCP PLP low: 8742

Interface: at-6/1/0 (Index: 10, Map index: 17638, Num of queues: 2):
  Entry 0 (Scheduler index: 6090, Forwarding-class #: 0):
    Traffic chunk: Max = 0 bytes, Min = 0 bytes
    Tx rate: 0 Kb (30%), Max buffer delay: 39 bytes (0%)
    Priority high
    PLP high: 25393, PLP low: 24627, TCP PLP high: 25393, TCP PLP low: 8742
  Entry 1 (Scheduler index: 38372, Forwarding-class #: 1):
    Traffic chunk: Max = 0 bytes, Min = 0 bytes
    Tx rate: 0 Kb (40%), Max buffer delay: 68 bytes (0%)
    Priority low
    PLP high: 25393, PLP low: 24627, TCP PLP high: 25393, TCP PLP low: 8742

```


show class-of-service fragmentation-map

Syntax	show class-of-service fragmentation-map
Release Information	Command introduced in JUNOS Release 7.5.
Description	For Adaptive Services (AS) PIC link services IQ interfaces (lsq) only, display fragmentation properties for specific forwarding classes.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show class-of-service fragmentation-map on page 717
Output Fields	Table 159 on page 717 describes the output fields for the show class-of-service fragmentation-map command. Output fields are listed in the approximate order in which they appear.

Table 159: show class-of-service fragmentation-map Output Fields

Field Name	Field Description
Fragmentation map	Name of the CoS fragmentation map.
Index	Index number of the CoS fragmentation map.
Forwarding class	Name of the associated forwarding class.
Fragmentation threshold	Maximum size of each multilink fragment.
No Fragmentation	Packets of this class are not fragmented.
Multilink Class	For multilink multiclass PPP only, the multilink class number corresponding to the forwarding class.

```
show class-of-service fragmentation-map
user@host> show class-of-service fragmentation-map
  Fragmentation map: fragmap2, Index: 19801
    Forwarding class: fcDefault
    No Fragmentation

  Forwarding class: fcCopper
    Fragmentation threshold: 64, Multilink Class: 1

  Forwarding class: fcSilver
    Fragmentation threshold: 100, Multilink Class: 0

  Forwarding class: fcCritical
    Fragmentation threshold: 64, Multilink Class: 0

  Fragmentation map: fragmap, Index: 23147
    Forwarding class: fcDefault
    No Fragmentation
```

```
Forwarding class: fcSilver  
Fragmentation threshold: 100
```

```
Forwarding class: fcCritical  
Fragmentation threshold: 100
```

show class-of-service interface

Syntax	show class-of-service interface <interface-name>
Release Information	Command introduced before JUNOS Release 7.4. Forwarding class map information added in JUNOS Release 9.4.
Description	Display the logical and physical interface associations for the classifier, rewrite rules, and scheduler map objects.
Options	none—Display CoS associations for all physical and logical interfaces. interface-name—(Optional) Display CoS associations for the specified interface.
Required Privilege Level	view
List of Sample Output	show class-of-service interface (physical) on page 720 show class-of-service interface (logical) on page 720 show class-of-service interface (Gigabit Ethernet IQ) on page 720
Output Fields	Table 160 on page 719 describes the output fields for the show class-of-service interface command. Output fields are listed in the approximate order in which they appear.

Table 160: show class-of-service interface Output Fields

Field Name	Field Description
Physical interface	Name of a physical interface.
Index	Index of this interface or the internal index of this object.
Queues supported	Number of queues you can configure on the interface.
Queues in use	Number of queues currently configured.
Shaping rate	Maximum transmission rate on the physical interface. You can configure the shaping rate on the physical interface, or on the logical interface, but not both. Therefore, the Shaping rate field is displayed for the physical interface or the logical interface, but not both.
Scheduler map	Name of the output scheduler map associated with this interface.
Input shaping rate	For Gigabit Ethernet IQ2 PICs, maximum transmission rate on the input interface.
Input scheduler map	For Gigabit Ethernet IQ2 PICs, name of the input scheduler map associated with this interface.
Chassis scheduler map	Name of the scheduler map associated with the packet forwarding component queues.
Rewrite	Name and type of the rewrite rules associated with this interface.
Classifier	Name and type of classifiers associated with this interface.
Forwarding-class-map	Name of the forwarding map associated with this interface.

Table 160: show class-of-service interface Output Fields (continued)

Field Name	Field Description
Logical interface	Name of a logical interface.
Shaping rate	Maximum transmission rate on the logical interface. You can configure the shaping rate on the physical interface, or on the logical interface, but not both. Therefore, the Shaping rate field is displayed for the physical interface or the logical interface, but not both.
Object	Category of an object: Classifier, Fragmentation-map (for LSQ interfaces only), Scheduler-map, or Rewrite.
Name	Name of an object.
Type	Type of an object: dscp, dscp-ipv6, exp, ieee-802.1, ip, or inet-precedence.

```

show class-of-service interface (physical) user@host> show class-of-service interface so-0/2/3
Physical interface: so-0/2/3, Index: 135
Queues supported: 8, Queues in use: 4
Scheduler map: <default>, Index: 2032638653

Logical interface: fe-0/0/1.0, Index: 68
Shaping rate: 32000
Object      Name      Type
Index
Scheduler-map <default>
27 Rewrite   exp-default exp
21 Classifier exp-default exp
5 Classifier ipprec-compatibility ip
8 Forwarding-class-map exp-default exp
5

show class-of-service interface (logical) user@host> show class-of-service interface so-0/2/3.0
Logical interface: so-0/2/3.0, Index: 68
Shaping rate: 32000
Object      Name      Type
Index
Scheduler-map <default>
27 Rewrite   exp-default exp
21 Classifier exp-default exp
5 Classifier ipprec-compatibility ip
8 Forwarding-class-map exp-default exp
5

show class-of-service interface (Gigabit Ethernet IQ) user@host> show class-of-service interface ge-6/2/0
Physical interface: ge-6/2/0, Index: 175
Queues supported: 4, Queues in use: 4
Scheduler map: <default>, Index: 2

```

```
Input scheduler map: <default>, Index: 3  
Chassis scheduler map: <default-chassis>, Index: 4
```

show class-of-service interface-set

Syntax	show class-of-service interface-set <i><interface-set-name></i>
Release Information	Command introduced in JUNOS Release 9.4.
Description	Display the configured shaping rate and the adjusted shaping rate for each logical interface set configured for hierarchical class of service (CoS).
Options	none—Display CoS associations for all logical interface sets. <i>interface-set-name</i> —(Optional) Display CoS associations for the specified interface set.
Required Privilege Level	view
List of Sample Output	show class-of-service interface-set on page 723
Output Fields	Table 161 on page 722 lists the output fields for the show class-of-service interface-set command. Output fields are listed in the approximate order in which they appear.

Table 161: show class-of-service interface-set Output Fields

Field Name	Field Description
Interface-set	Name of a logical interface set composed of one or more logical interfaces for which hierarchical scheduling is enabled.
Index	Index of this interface set or the internal index of this object.
Physical interface	Name of a physical interface.
Queues supported	Number of queues you can configure on the interface.
Queues in use	Number of queues currently configured.
Output traffic control profile	Name of the output traffic-control profile attached to the logical interface set.
Adjusting application	<p>Name of the application that communicates shaping-rate adjustment information to the JUNOS class-of-service daemon (cosd) on the broadband services router (BSR). The BSR uses the information from this application to perform shaping-rate adjustments on the scheduler node that manages the interface set. The adjusting application can be one of the following:</p> <p>ancp LS-0—JUNOS Access Node Control Profile daemon (ancpd) that performs shaping-rate adjustments on schedule nodes that are logical interface sets configured to represent subscriber local loops. When the synchronization speed of the DSL line changes, ancpd communicates the local loop speed to cosd over the default logical system, LS-0, and then the BSR throttles the shaping rate on the scheduler node to the loop speed.</p>

Table 161: show class-of-service interface-set Output Fields (continued)

Field Name	Field Description
Adjustment type	Type of shaping-rate adjustment performed by the BSR on the scheduler node. The type of adjustment can be one of the following: absolute—The configured shaping rate is adjusted by an absolute value as opposed to by a percentage of the configured rate.
Configured shaping rate	The maximum transmission rate on the physical interface as configured by the output traffic-control profile attached to the scheduler node.
Adjustment value	Value of the shaping-rate adjustment information sent by the adjusting application to cosd.

```

show class-of-service user@host> show class-of-service interface-set example-ifset-ge-4/0/0-7
interface-set      Interface-set: example-ifset-ge-4/0/0-7, Index: 8
                    Physical interface: ge-4/0/0, Index: 270
                    Queues supported: 8, Queues in use: 8
                    Output traffic control profile: example-tcp-basic-rate, Index: 11395
                    Adjusting application: ancp LS-0
                    Adjustment type: absolute
                    Configured shaping rate: 50000000
                    Adjustment value: 888000

```

show class-of-service loss-priority-map

Syntax	show class-of-service loss-priority-map <name <i>name</i> > <type frame-relay-de>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(J-series routing platform only) Display mapping of code point value to loss priority.
Options	<p>none—Display all loss priority maps.</p> <p>name <i>name</i>—(Optional) Display the specified loss priority map.</p> <p>type frame-relay-de—(Optional) Display Frame Relay discard eligible code point.</p>
Required Privilege Level	view
List of Sample Output	show class-of-service loss-priority-map on page 724
Output Fields	Table 162 on page 724 describes the output fields for the show class-of-service loss-priority-map command. Output fields are listed in the approximate order in which they appear.

Table 162: show class-of-service loss-priority-map Output Fields

Field Name	Field Description
Loss-priority-map	Name of the loss priority map.
Code point type	Type: frame-relay-de.
Index	Internal index.
Code point	Code point value.
Loss priority	Loss priority of low, medium-low, medium-high, or high.

```

show class-of-service user@host> show class-of-service loss-priority-map
loss-priority-map Loss-priority-map: frame-relay-de-default, Code point type: frame-relay-de, Index:
9
  Code point      Loss priority
  0               low
  1               high

Loss-priority-map: bar, Code point type: frame-relay-de, Index: 2212
  Code point      Loss priority
  0               medium-low
  1               medium-high

Loss-priority-map: abc, Code point type: frame-relay-de, Index: 11038
  Code point      Loss priority

```


0	medium-high
1	high

show class-of-service rewrite-rule

Syntax	show class-of-service rewrite-rule <name <i>name</i> > <type <i>type</i> >
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display the mapping of forwarding classes and loss priority to code point values.
Options	<p>none—Display all rewrite rules.</p> <p>name <i>name</i>—(Optional) Display the specified rewrite rule.</p> <p>type <i>type</i>—(Optional) Display the rewrite rule of specified type. The rewrite rule type can be one of the following:</p> <ul style="list-style-type: none"> ■ dscp—For IPv4 traffic. ■ dscp-ipv6—For IPv6 traffic. ■ exp—For MPLS traffic. ■ frame-relay-de—(J-series routing platform only) For Frame Relay traffic. ■ ieee-802.1—For Layer 2 traffic. ■ inet-precedence—For IPv4 traffic.
Required Privilege Level	view
List of Sample Output	show class-of-service rewrite-rule type dscp on page 727
Output Fields	Table 163 on page 726 describes the output fields for the show class-of-service rewrite-rule command. Output fields are listed in the approximate order in which they appear.

Table 163: show class-of-service rewrite-rule Output Fields

Field Name	Field Description
Rewrite rule	Name of the rewrite rule.
Code point type	Type of rewrite rule: dscp, dscp-ipv6, exp, frame-relay-de, or inet-precedence.
Forwarding class	Classification of a packet affecting the forwarding, scheduling, and marking policies applied as the packet transits the router.
Index	Internal index for this particular rewrite rule.
Loss priority	Loss priority for rewriting.
Code point	Code point value to rewrite.

```

show class-of-service user@host> show class-of-service rewrite-rule type dscp
rewrite-rule type dscp Rewrite rule: dscp-default, Code point type: dscp
      Forwarding class      Loss priority      Code point
      gold                  high           000000
      silver                low            110000
      silver                high            111000
      bronze                low            001010
      bronze                high            001100
      lead                  high            101110

Rewrite rule: abc-dscp-rewrite, Code point type: dscp, Index: 3245
Forwarding class      Loss priority      Code point
gold                  low              000111
gold                  high              001010
silver                low              110000
silver                high              111000
bronze                high              001100
lead                  low              101110
lead                  high              110111

```

show class-of-service routing-instance

Syntax	show class-of-service routing-instance <routing-instance-name>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M-series and T-series routing platforms only) Display mapping of CoS objects to routing instances.
Options	<i>routing-instance-name</i> —(Optional) Name of a routing instance.
Required Privilege Level	view
List of Sample Output	show class-of-service routing-instance on page 728
Output Fields	Table 164 on page 728 describes the output fields for the show class-of-service routing-instance command. Output fields are listed in the approximate order in which they appear.

Table 164: show class-of-service routing-instance Output Fields

Field Name	Field Description
Index	Internal index.
Name	Name of an object.
Object	Category of an object: Classifier.
Routing instance	Name of a routing instance.
Type	Type: exp.

```

show class-of-service routing-instance
user@host> show class-of-service routing-instance
Routing Instance : vpn1
  Object      Name      Type      Index
  Classifier  exp-default exp        8

Routing Instance : vpn2
  Object      Name      Type      Index
  Classifier  test2    exp      57507

```

show class-of-service scheduler-map

Syntax	show class-of-service scheduler-map <name>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display the mapping of schedulers to forwarding classes and a summary of scheduler parameters for each entry.
Options	<p>none—Display all scheduler maps.</p> <p>name—(Optional) Display a summary of scheduler parameters for each forwarding class to which the named scheduler is assigned.</p>
Required Privilege Level	view
List of Sample Output	show class-of-service scheduler-map on page 730
Output Fields	Table 165 on page 729 describes the output fields for the show class-of-service scheduler-map command. Output fields are listed in the approximate order in which they appear.

Table 165: show class-of-service scheduler-map Output Fields

Field Name	Field Description
Scheduler map	Name of the scheduler map.
Index	Index of the indicated object. Objects having indexes in this output include scheduler maps, schedulers, and drop profiles.
Scheduler	Name of the scheduler.
Forwarding class	Classification of a packet affecting the forwarding, scheduling, and marking policies applied as the packet transits the router.
Transmit rate	Configured transmit rate of the scheduler (in bps). The rate is a percentage of the total interface bandwidth, or the keyword remainder , which indicates that the scheduler receives the remaining bandwidth of the interface.
Rate Limit	Rate limiting configuration of the queue. Possible values are none , meaning no rate limiting, and exact , meaning the queue only transmits at the configured rate.
Maximum buffer delay	Amount of transmit delay (in milliseconds) or the buffer size of the queue. The buffer size is shown as a percentage of the total interface buffer allocation, or by the keyword remainder to indicate that the buffer is sized according to what remains after other scheduler buffer allocations.
Priority	Scheduling priority: low or high .
Drop profiles	Table displaying the assignment of drop profile by name and index to a given loss priority and protocol pair.
Loss priority	Packet loss priority for drop profile assignment.

Table 165: show class-of-service scheduler-map Output Fields *(continued)*

Field Name	Field Description
Protocol	Transport protocol for drop profile assignment.
Name	Name of the drop profile.

```

show class-of-service scheduler-map user@host> show class-of-service scheduler-map
Scheduler map: dd-scheduler-map, Index: 84

Scheduler: aa-scheduler, Index: 8721, Forwarding class: aa-forwarding-class
Transmit rate: 30 percent, Rate Limit: none, Maximum buffer delay: 39 ms,
Priority: high
Drop profiles:
  Loss priority  Protocol  Index  Name
  Low           non-TCP   8724   aa-drop-profile
  Low           TCP      9874   bb-drop-profile
  High          non-TCP   8833   cc-drop-profile
  High          TCP      8484   dd-drop-profile

Scheduler: bb-scheduler, Forwarding class: aa-forwarding-class
Transmit rate: 40 percent, Rate limit: none, Maximum buffer delay: 68 ms,
Priority: high
Drop profiles:
  Loss priority  Protocol  Index  Name
  Low           non-TCP   8724   aa-drop-profile
  Low           TCP      9874   bb-drop-profile
  High          non-TCP   8833   cc-drop-profile
  High          TCP      8484   dd-drop-profile

```

show class-of-service traffic-control-profile

Syntax	show class-of-service traffic-control-profile <profile-name>
Release Information	Command introduced before JUNOS Release 7.4.
Description	For Gigabit Ethernet IQ and Channelized IQ PICs only, display traffic shaping and scheduling profiles.
Options	none—Display all profiles. profile-name—(Optional) Display information about a single profile.
Required Privilege Level	view
List of Sample Output	show class-of-service traffic-control-profile on page 731
Output Fields	Table 166 on page 731 describes the output fields for the show class-of-service traffic-control-profile command. Output fields are listed in the approximate order in which they appear.

Table 166: show class-of-service traffic-control-profile Output Fields

Field Name	Field Description
Traffic control profile	Name of the traffic-control profile.
Index	Index number of the traffic-control profile.
Scheduler map	Name of the associated scheduler map.
Delay Buffer rate	Configured delay-buffer rate, in bps.
Guaranteed rate	Configured guaranteed rate, in bps.

show class-of-service traffic-control-profile	<pre> user@host> show class-of-service traffic-control-profile Traffic control profile: Profile1, Index: 57625 Scheduler map: m1 Delay Buffer rate: 500000 Guaranteed rate: 1000000 Traffic control profile: Profile2, Index: 57624 Scheduler map: m2 Delay Buffer rate: 600000 Guaranteed rate: 2000000 Traffic control profile: Profile3, Index: 57627 Scheduler map: m3 Delay Buffer rate: 800000 Guaranteed rate: 3000000 Traffic control profile: Profile4, Index: 57626 </pre>
--	--

```
Scheduler map: m4  
Delay Buffer rate: 750000  
Guaranteed rate: 4000000
```


show class-of-service virtual-channel

Syntax	show class-of-service virtual channel <i><virtual-channel-name></i>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(J-series routing platform only) Display virtual channel information.
Options	none—Display all virtual channels. <i>virtual-channel-name</i> —(Optional) Display the specified virtual channel only.
Required Privilege Level	view
List of Sample Output	show class-of-service virtual-channel on page 733
Output Fields	Table 167 on page 733 describes the output fields for the show class-of-service virtual-channel command. Output fields are listed in the approximate order in which they appear.

Table 167: show class-of-service virtual-channel Output Fields

Field Name	Field Description
Virtual channel	Name of a virtual channel.
Index	Internal index.

```

show class-of-service user@host> show class-of-service virtual-channel
virtual-channel Virtual channel: vc-1, Index: 1
Virtual channel: vc-2, Index: 2

```

show class-of-service virtual-channel-group

Syntax	show class-of-service virtual channel group <i><virtual-channel-group-name></i>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(J-series routing platform only) Display virtual channel group information.
Options	none—Display all virtual channel groups. <i>virtual-channel-group-name</i> —(Optional) Display the specified virtual channel group only.
Required Privilege Level	view
List of Sample Output	show class-of-service virtual-channel-group on page 734
Output Fields	Table 168 on page 734 describes the output fields for the show class-of-service virtual-channel-group command. Output fields are listed in the approximate order in which they appear.

Table 168: show class-of-service virtual-channel-group Output Fields

Field Name	Field Description
Virtual channel group	Name of a virtual channel group.
Index	Internal index.

```

show class-of-service user@host> show class-of-service virtual-channel-group
virtual-channel-group Virtual channel group: vc-gp, Index: 16321
                        Virtual channel: vc-1
                        Scheduler map: sc-map
                        Shaping rate : 100 percent

```

Part 4

Services

- Application Identification Operational Mode Commands on page 737
- Border Signaling Gateway Operational Mode Commands on page 751
- Compressed Real-Time Transport Protocol Operational Mode Commands on page 761
- CoS Services Operational Mode Commands on page 767
- Data Link Switching Operational Mode Commands on page 773
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Chapter 15

Application Identification Operational Mode Commands

Table 169 on page 737 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot application identification operations.

Table 169: Application Identification Operational Mode Commands

Task	Command
Clear application-aware-access-list (AACL) statistics entries.	clear services application-aware-access-list statistics
Clear entries from application system cache.	clear services application-identification application-system-cache
Clear application identification counters.	clear services application-identification counter
Clear local-policy-decision-function (L-PDF) statistics entries.	clear services local-policy-decision-function statistics
Display AACL statistics.	show services application-aware-access-list statistics
Display the database of cached values stored by the application identification (APPID) system.	show services application-identification application-system-cache
Display APPID counter statistics.	show services application-identification counter
Display L-PDF flows.	show services local-policy-decision-function flows
Display L-PDF statistics.	show services local-policy-decision-function statistics



NOTE: For information about how to configure application identification services, see the *JUNOS Services Interfaces Configuration Guide*.

clear services application-identification application-system-cache

Syntax	clear services application-identification application-system-cache
Release Information	Command introduced in JUNOS Release 9.5.
Description	Clear entries from application system cache.
Options	This command has no options.
Required Privilege Level	clear
Related Topics	show services application-identification application-system-cache

clear services application-aware-access-list statistics

Syntax	clear services application-aware-access-list statistics
Release Information	Command introduced in JUNOS Release 9.5.
Description	Clear application aware access list (AACL) statistics.
Options	This command has no options.
Required Privilege Level	view
Related Topics	show services application-aware-access-list statistics

clear services application-identification counter

Syntax	clear services application-identification counter
Release Information	Command introduced in JUNOS Release 9.5.
Description	Clear application identification counters.
Options	This command has no options.
Required Privilege Level	clear
Related Topics	show services application-identification counter

clear services local-policy-decision-function statistics

Syntax	clear services local-policy-decision-function statistics
Release Information	Command introduced in JUNOS Release 9.5.
Description	Clear local policy decision function (L-PDF) statistics.
Options	This command has no options.
Required Privilege Level	view
Related Topics	show services local-policy-decision-function statistics

show services application-aware-access-list statistics

Syntax	show services application-aware-access-list statistics [<interface <i>interface-name</i> >] [<subscriber <i>subscriber-name</i> >]
Release Information	Command introduced in JUNOS Release 9.5.
Description	Display application-aware-access-list (AACL) statistics.
Options	<p>interface <i>interface-name</i>—(Optional) Displays AACL statistics for the specified interface(s) only.</p> <p>subscriber <i>subscriber-name</i>—(Optional) Displays AACL statistics for the specified subscriber(s) only.</p>
Required Privilege Level	view
List of Sample Output	<p>show services application-aware-access-list statistics by interface on page 742</p> <p>show services application-aware-access-list statistics by subscriber on page 743</p>
Output Fields	Table 170 on page 742 lists the output fields for the show services application-aware-access-list statistics command. Output fields are listed in the approximate order in which they appear.

Table 170: show services application-aware-access-list statistics Output Fields

Field Name	Field Description	Level of Output
Interface	Interface name.	Subscriber option
Subscriber	Subscriber identifier.	Interface option
Service-set-interface	Service set interface name.	All levels
Service set	Service set name.	All levels
Application group	Application group identifier.	All levels
Packets in	Number of ingress packets.	All levels
Bytes in	Number of ingress bytes.	All levels
Packets out	Number of egress packets.	All levels
Bytes out	Number of egress bytes.	All levels

```

show services      user@host> show services application-aware-access-list statistics interface
application-aware-access-list ge-0/0/0.100
statistics by interface Subscriber: user@juniper.net

                          service-set: IDP

```

```
service-set interface: ms-2/0/0
```

Application group	Application	Packets in	Bytes in
Packets out	Bytes out		
6	junos:ftp [63] 346	5	334

```
show services user@host> show services application-aware-access-list statistics subscriber  
application-aware-access-list user@juniper.net  
statistics by subscriber Interface: ge-1/1/0.0
```

```
Service-set-interface: ms-1/3/0
```

```
Service set: aacl-svc-set
```

```
Application-aware-access-list statistics
```

Application group	Packets in	Bytes in	Packets out	Bytes
out				
P2P	16284	400	32025	200
FTP	8700	20000	5231000	100

show services application-identification application-system-cache

Syntax	show application-identification application-system-cache
Release Information	Command introduced in JUNOS Release 9.5.
Description	Display the database of cached values stored by the application identification (APPID) system.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show application-identification application-system-cache on page 744
Output Fields	Table 171 on page 744 lists the output fields for the command-name command. Output fields are listed in the approximate order in which they appear.

Table 171: show application-identification application-system-cache Output Fields

Field Name	Field Description	Level of Output
IP address	IP address.	All levels
Port	Port number.	All levels
Protocol	Protocol name.	All levels
Application	Application number.	All levels
CPU	CPU number	All levels

```

show          user@host> show application-identification application-system-cache
application-identification pic: 2/0
application-system-cache
IP address      Port      Protocol  Application  CPU
10.1.1.2        81        TCP       63           18

```

show services application-identification counter

Syntax	show services application-identification counter
Release Information	Command introduced in JUNOS Release 9.5.
Description	Display application identification (APPID) counter statistics.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show services application-identification counter on page 746
Output Fields	Table 172 on page 745 lists the output fields for the show services application-identification counter command. Output fields are listed in the approximate order in which they appear.

Table 172: show services application-identification counter Output Fields

Field Name	Field Description	Level of Output
pic	PIC number.	All levels
Total sessions	Total number of sessions.	All levels
Total identified sessions	Total number of identified sessions.	All levels
Total unidentified sessions	Total number of unidentified sessions.	All levels
Total identified-by-signature sessions	Number of sessions identified by signature.	All levels
Total unidentified-by-signature sessions	Number of sessions not identified by signature.	All levels
Total identified-by-address sessions	Number of sessions identified by address.	All levels
Total unidentified-by-address sessions	Number of sessions not identified by address.	All levels
Total identified-by-port sessions	Number of sessions identified by port.	All levels
Total unidentified-by-port sessions	Number of sessions not identified by port.	All levels

Table 172: show services application-identification counter Output Fields (*continued*)

Field Name	Field Description	Level of Output
Total application system cache hits	Number of sessions found in application system cache.	All levels
Total application system cache misses	Number of sessions not found in application system cache.	All levels

```

show services      user@host> show services application-identification counter
application-identification Counter Statistics:
counter             pic: 1/1
                     Total sessions: 11
                     Total identified sessions: 11
                     Total un-identified sessions: 0
                     Total identified-by-signature sessions: 11
                     Total un-identified-by-signature sessions: 0
                     Total identified-by-address sessions: 0
                     Total un-identified-by-address sessions: 11
                     Total identified-by-port sessions: 1
                     Total un-identified-by-port sessions: 0
                     Total application system cache hits: 10
                     Total application system cache misses: 1

```

show services local-policy-decision-function flows

Syntax	show services local-policy-decision-function flows (interface <i>interface-name</i> subscriber <i>subscriber-name</i>)
Release Information	Command introduced in JUNOS Release 9.5.
Description	Display local-policy-decision-function (L-PDF) flows.
Options	interface <i>interface-name</i> —Display L-PDF flows for the specified interface(s) only. subscribersubscriber-name—Display L-PDF flows for the specified subscriber(s) only.
Required Privilege Level	view
List of Sample Output	show services local-policy-decision-function flows by interface on page 748 show services local-policy-decision-function flows by subscriber on page 748
Output Fields	Table 173 on page 747 lists the output fields for the show services local-policy-decision-function flows command. Output fields are listed in the approximate order in which they appear.

Table 173: show services local-policy-decision-function flows Output Fields

Field Name	Field Description	Level of Output
Interface	Interface name.	All levels
service-set	Service set name.	All levels
service-set-interface	Service set interface name.	All levels
Currently active flows	Number of currently active flows.	All levels
High watermark flows	Maximum number of flows.	All levels
Protocol	Protocol identifier.	Interface option
Source address	Source address.	Interface option
Source port	Source port.	Interface option
Destination address	Destination address.	Interface option
Destination port	Destination port.	Interface option
Application	Application name.	Interface option
Application group	Application group identifier.	Interface option

```

show services      user@host> show services local-policy-decision-function flows subscriber
local-policy-decision-function user@juniper.net
flows by interface Interface: ge-0/0/5.26

                        service-set: aac1_ms30
                        service-set interface: ms-3/0/0

                        Currently active flows: 0
                        High watermark flows: 0

show services      user@host> show services local-policy-decision-function flows interface ge-1/1/0
local-policy-decision-function Interface: ge-1/1/0.0
flows by subscriber service-set: IDP
                        service-set interface: ms-2/0/0

                        Currently active flows: 2
                        High watermark flows: 2

                        Protocol   Source address   Source port   Destination address   Destination port
                        Application Application group

                        tcp        10.1.1.2        81            20.1.1.2              32813
                        junos:ftp [63] unknown [1023]

                        tcp        20.1.1.2        32813         10.1.1.2              81
                        junos:ftp [63] unknown [1023]

```


show services local-policy-decision-function statistics

Syntax	show services local-policy-decision-function statistics (interface <i>interface-name</i> subscriber <i>subscriber-name</i>)
Release Information	Command introduced in JUNOS Release 9.5.
Description	Display local-policy-decision-function (L-PDF) statistics.
Options	interface <i>interface-name</i> —Display L-PDF statistics for the specified interface(s) only. subscribersubscriber-name—Display L-PDF statistics for the specified subscriber(s) only.
Required Privilege Level	view
List of Sample Output	show services local-policy-decision-function statistics by interface on page 749 show services local-policy-decision-function statistics by subscriber on page 750
Output Fields	Table 174 on page 749 lists the output fields for the show services local-policy-decision-function statistics command. Output fields are listed in the approximate order in which they appear.

Table 174: show services local-policy-decision-function statistics Output Fields

Field Name	Field Description	Level of Output
Interface	Interface name.	All levels
service-set	Service set name.	All levels
service-set-interface	Service set interface name.	All levels
Application group	Application group identifier.	All levels
Application	Application name.	All levels
Packets in	Number of ingress packets.	All levels
Bytes in	Number of ingress bytes.	All levels
Packets out	Number of egress packets.	All levels
Bytes out	Number of egress bytes.	All levels

```

show services      user@host> show services local-policy-decision-function statistics interface
local-policy-decision-function ge-1/1/0
statistics by interface Interface: ge-1/1/0.0

                        service-set: IDP
                        service-set interface: ms-2/0/0

```

Application group	Application	Packets in	Bytes in
Packets out	Bytes out		
6	junos:ftp [63] 346	5	334

show services user@host> **show services local-policy-decision-function statistics subscriber**
local-policy-decision-function user@juniper.net
statistics by subscriber Service-set-interface: ms-1/3/0
Service set: aacl-svc-set

Application-aware-access-list statistics

Application group	Packets in	Bytes in	Packets out	Bytes
out				
P2P		400	32025	200
	16284			
FTP		20000	5231000	100
	8700			

Chapter 16

Border Signaling Gateway Operational Mode Commands

Table 175 on page 751 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot border signaling gateway operations.

Table 175: Border Signaling Gateway Operational Mode Commands

Task	Command
Clear border signaling gateway statistical counters.	clear services border-signaling-gateway statistics
Display border signaling gateway processing statistics for a given contact.	show services border-signaling-gateway information by-contact
Display border signaling gateway processing statistics for a given request URI.	show services border-signaling-gateway information by-request-uri
Display border signaling gateway processing statistics for all calls.	show services border-signaling-gateway statistics calls
Display border signaling gateway processing statistics for failed calls.	show services border-signaling-gateway statistics calls-failed

clear services border-signaling-gateway statistics

Syntax	clear services border-signaling-gateway gateway <i>gateway</i> statistics
Release Information	Command introduced in JUNOS Release 9.4.
Description	This command clears a border signaling gateway (BSG) statistics for the specified gateway.
Options	<i>gateway-name</i> —The BSG for which statistics are to be cleared.
Required Privilege Level	view
List of Sample Output	clear services border-signaling-gateway gateway statistics on page 752
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear services border-signaling-gateway gateway statistics	user@host> clear services border-signaling-gateway statistics

show services border-signaling-gateway information by-contact

Syntax	show services border-signaling-gateway information by-contact <i>contact</i> <summary brief detailed>
Release Information	Command introduced in JUNOS Release 9.4.
Description	Display border signaling gateway (BSG) statistics for a device, filtered by contact.
Options	<p>gateway <i>gateway-name</i>—Display information about statistics associated with this VPG.</p> <p>summary—Displays only the number of active calls for the contact.</p> <p>brief—Display abbreviated information for the specified contact</p> <p>detailed—Display a detailed listing of BSG statistics for the specified contact.</p>
Required Privilege Level	view
List of Sample Output	<p>show services border-signaling-gateway information by-contact brief on page 754</p> <p>show services border-signaling-gateway information by-contact detailed on page 754</p>
Output Fields	Table 176 on page 753 lists the output fields for the show services border-signaling-gateway information by-contact command. Output fields are listed in the approximate order in which they appear.

Table 176: show services border-signaling-gateway information by-contact Output Fields

Field Name	Field Description	Level of Output
Signaling Source IP	Source IP for signaling.	none brief
Signaling Destination IP	Destination IP for signaling.	none brief
Call ID	Call ID	none brief
Dialog Informationl	Information on a specific call dialog, including the following. <ul style="list-style-type: none"> ■ Call-ID—Call ID. ■ Local URI—Local URI. ■ Remote URI—Local URI. ■ Local Tag—Local Tag. ■ Remote Tag—Local Tag. 	detailed
Next Hop	Next hop address.	detailed
Media Attributes	Information about media attributes. This grouping can occur up to five times. <ul style="list-style-type: none"> ■ IP Address—IP address. ■ Port ■ Status of the Media—{TBD} 	detailed

Table 176: show services border-signaling-gateway information by-contact Output Fields (continued)

Field Name	Field Description	Level of Output
Matched Policies	List of matched policies. When all policies are matched, “all” is displayed. Otherwise, each matched policy is listed by name.	detailed

```

show services          user@host> show services border-signaling-gateway information by-contact
border-signaling-gateway juniper.net brief
information by-contact   Signaling Source IP      : 172.223.3.22
brief                   Signaling Destination IP : 10.2.3.55
                           Call-ID          : 65689654

                           Signaling Source IP      : 172.223.3.22
                           Signaling Destination IP : 101.21.4.88
                           Call-ID          : 321456

```

```

show services          user@host> show services border-signaling-gateway information by-contact
border-signaling-gateway juniper.net detailed
information by-contact
detailed              Signaling Source IP      : 172.223.3.22
                           Signaling Destination IP : 10.2.3.55
                           Dialog Information
                             Call-ID          : 65689654
                             Local URI       : 168.3.5.4
                             Remote URI      : 168.3.5.66
                             Local Tag       : 20.50.70.1+1000001+1080000+dc322a2
                             Remote Tag      : 20.50.70.1+1000001+1080000+dc45666
                             URI             :
                             Next Hop        : 10.2.3.200
                             Media Attributes
                               IP Address    : 5.5.56.6
                               Port         : 5105
                               Status of the Media : Active
                             Matched Policies : All

```

show services border-signaling-gateway information by-request-uri

Syntax	show services border-signaling-gateway information by-request-uri <i>request-uri</i> <brief detailed>
Release Information	Command introduced in JUNOS Release 9.4.
Description	Display border signaling gateway (BSG) statistics for a device, filtered by URI.
Options	<p>gateway <i>gateway-name</i>—Display information about statistics associated with this VPG.</p> <p>summary—Displays only the number of active calls for the request URI.</p> <p>brief—Display abbreviated information for the request URI</p> <p>detailed—Display a detailed listing of BSG statistics for the request URI.</p>
Required Privilege Level	view
List of Sample Output	<p>show services border-signaling-gateway information by-request-uri brief on page 756</p> <p>show services border-signaling-gateway information by-request-uri detailed on page 756</p>
Output Fields	Table 177 on page 755 lists the output fields for the show services border-signaling-gateway information by-request-uri command. Output fields are listed in the approximate order in which they appear.

Table 177: show services border-signaling-gateway information by-request-URI Output Fields

Field Name	Field Description	Level of Output
Signaling Source IP	Source IP for signaling.	none brief
Signaling Destination IP	Destination IP for signaling.	none brief
Call ID	Call ID	none brief
Dialog Informationl	Information on a specific call dialog. <ul style="list-style-type: none"> ■ Call-ID—Call ID. ■ Local URI—Local URI. ■ Remote URI—Local URI. ■ Local Tag—Local Tag. ■ Remote Tag—Local Tag. 	detailed
Next Hop	Next hop address.	detailed
Media Attributes	Information about media attributes. This grouping can occur up to five times. <ul style="list-style-type: none"> ■ IP Address—IP address. ■ Port ■ Status of the Media—{TBD} 	detailed

Table 177: show services border-signaling-gateway information by-request-uri Output Fields (continued)

Field Name	Field Description	Level of Output
Matched Policies	List of matched policies. When all policies are matched, “all” is displayed. Otherwise, each matched policy is listed by name.	detailed

```

show services          user@host> show services border-signaling-gateway information by-request-uri
border-signaling-gateway sip:juniper.net brief
information             Signaling Source IP      : 172.223.3.22
by-request-uri brief    Signaling Destination IP : 10.2.3.55
                           Call-ID          : 65689654

                           Signaling Source IP      : 172.223.3.22
                           Signaling Destination IP : 101.21.4.88
                           Call-ID          : 321456

show services          user@host> show services border-signaling-gateway information by-request-uri
border-signaling-gateway sip:juniper.net detailed
information             Signaling Source IP      : 172.223.3.22
by-request-uri detailed Signaling Destination IP : 10.2.3.55
                           Dialog Information
                           Call-ID          : 65689654
                           Local URI       : 168.3.5.4
                           Remote URI     : 168.3.5.66
                           Local Tag      : 20.50.70.1+1000001+1080000+dc322a2
                           Remote Tag     : 20.50.70.1+1000001+1080000+dc45666
                           URI            :
                           Next Hop       : 10.2.3.200
                           Media Attributes
                           IP Address     : 5.5.56.6
                           Port          : 5105
                           Status of the Media : Active
                           Matched Policies : All

```


show services border-signaling-gateway statistics calls

Syntax	show services border-signaling-gateway statistics calls
Release Information	Command introduced in JUNOS Release 9.4.
Description	Display border signaling gateway (BSG) call statistics.
Options	gateway <i>gateway-name</i> —Name of the gateway for which calls are displayed.
Required Privilege Level	view
List of Sample Output	show services border-signaling-gateway statistics calls on page 757
Output Fields	Table 253 on page 991 lists the output fields for the show services border-signaling-gateway statistics calls command. Output fields are listed in the approximate order in which they appear.

Table 178: show services border-signaling-gateway statistics calls Output Fields

Field Name	Field Description
Statistics Start	Date and time when accumulation of the current set of statistics began.
Service Point	Service point identifier.
Direction	Direction of calls on this service point. Possible values: <ul style="list-style-type: none"> ■ Egress—Calls are outbound from this service point. ■ Ingress—Calls are inbound to this service point.
Failed Calls	Number of failed calls.
Completed Calls	Number of completed calls.
Active Calls	Number of active calls.

```

show services      user@host> show services border-signaling-gateway statistics calls
border-signaling-gateway
statistics calls  Statistics Start      : 22/4/2008 13:24

                    Service Point   : xxxx
                    Direction        : Egress
                    Failed Calls      : 100
                    Completed Calls   : 320000
                    Active Calls      : 23344

                    Service Point   : xxxx
                    Direction        : Ingress
                    Failed Calls      : 100
                    Completed Calls   : 320000
                    Active Calls      : 23344

```

show services border-signaling-gateway statistics calls-failed

Syntax	show services border-signaling-gateway statistics calls-failed
Release Information	Command introduced in JUNOS Release 9.4.
Description	Display border signaling gateway (BSG) failed call statistics.
Options	gateway <i>gateway-name</i> —The gateway for which statistics are displayed.
Required Privilege Level	view
List of Sample Output	show services border-signaling-gateway statistics calls-failed on page 758
Output Fields	Table 179 on page 758 lists the output fields for the show services border-signaling-gateway statistics calls-failed command. Output fields are listed in the approximate order in which they appear.

Table 179: show services border-signaling-gateway statistics calls-failed Output Fields

Field Name	Field Description
Statistics Start	Date and time when accumulation of the current set of statistics began.
Service Point	Service point identifier.
Direction	Direction of calls on this service point. Possible values: <ul style="list-style-type: none"> ■ Egress—Calls are outbound from this service point. ■ Ingress—Calls are inbound to this service point.
Protocol Errors	Number of calls that failed due to protocol errors.
Timeout	Number of calls that failed due to timeouts.
Policy Rejection	Number of calls that failed due to policy rejection.
Calls Limit	Number of calls that failed because the BSG was processing the maximum allowable number of active calls .
Media Limit	Number of calls that failed because the BSG had no media resources available.
Setup	Number of calls that failed because the call setup failed for reasons other than timeout.
Total	Total number of failed calls.

```

show services      user@host> show services border-signaling-gateway statistics calls-failed
border-signaling-gateway
statistics calls-failed
    Failures
    -----
    Statistics Start      : 22/4/2008 13:24
    Service Point        : xxxx

```

```
Direction          : Egress
Protocol Error      : 3
Timeout             : 30
Policy Rejection    : 40
Calls Limit         : 2
Media Limit         : 5
Setup               : 5
Total               : 100
```


Chapter 17

Compressed Real-Time Transport Protocol Operational Mode Commands

Table 180 on page 761 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot Compressed Real-Time Transport Protocol (CRTP) services. Commands are listed in alphabetical order.

Table 180: CRTP Operational Mode Commands

Task	Command
Clear CRTP flows statistics.	<code>clear services crtp statistics</code>
Display CRTP output.	<code>show services crtp</code>
Display CRTP flows.	<code>show services crtp flows</code>



NOTE: CRTP is supported on the following interfaces:

- M-series and T-series routing platforms—Link services intelligent queuing (IQ) (*lsq-fpc/pic/port*)
- J-series routing platform—Link services (*ls-pim/0/port*)



NOTE: For information about how to configure CRTP services, see the *JUNOS Services Interfaces Configuration Guide*.

clear services crtp statistics

Syntax	clear services crtp statistics <interface <i>interface-name</i> >
Release Information	Command introduced before JUNOS Release 7.4.
Description	Clear Compressed Real-Time Transport Protocol (CRTP) flow statistics.
Options	<p>none—Clear CRTP flow statistics on all interfaces.</p> <p>interface <i>interface-name</i>—(Optional) Clear CRTP flow statistics for the specified interface:</p> <ul style="list-style-type: none"> ■ On M-series and T-series routing platforms, a link services IQ (<i>lsq-fpc/pic/port</i>) or redundant link services IQ (<i>rlsq-fpc/pic/port</i>) interface ■ On the J-series routing platform, a link services (<i>ls-pim/0/port</i>) interface
Required Privilege Level	view
List of Sample Output	clear services crtp statistics on page 762
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear services crtp statistics	user@host> clear services crtp statistics

show services crtp

Syntax	show services crtp <extensive> <interface <i>interface-name</i> >
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display Compressed Real-Time Transport Protocol (CRTP) extensive output.
Options	<p>none—Display CRTP extensive output for all interfaces.</p> <p>extensive—(Optional) Display extensive CRTP information.</p> <p>interface <i>interface-name</i>—(Optional) Display CRTP flow statistics for the specified interface:</p> <ul style="list-style-type: none"> ■ On M-series and T-series routing platforms, a link services IQ (<i>lsq-fpc/pic/port</i>) or redundant link services IQ (<i>rlsq-fpc/pic/port</i>) interface ■ On the J-series routing platform, a link services (<i>ls-pim/0/port</i>) interface
Required Privilege Level	view
List of Sample Output	show services crtp extensive on page 764
Output Fields	Table 181 on page 763 lists the output fields for the show services crtp command. Output fields are listed in the approximate order in which they appear.

Table 181: show services crtp Output Fields

Field Name	Field Description	Level of Output
Interface	Name of the physical interface.	to be provided
Port minimum	Compression is applied to UDP packets with even ports in the specified range.	to be provided
Port maximum		
Maximum UDP compressed sessions	Maximum value of a context identifier in the space of context identifiers allocated for UDP.	to be provided
CRTP maximum period	Maximum interval between full headers. Suggested value is 256.	to be provided
CRTP maximum time	Maximum time interval between full headers. Suggested value is 5 seconds.	to be provided
Compression ratio	Ratio of received packet size to compressed packet size, in percentage. For example, if the packet size is 100 bytes when it is received, and is 40 bytes after compression, the compression ratio is $100 \div 40/100 * 100 = 60\%$.	to be provided

Table 181: show services crtp Output Fields (continued)

Field Name	Field Description	Level of Output
Decompression ratio	Ratio of received packet size to decompressed packet size, in percentage. For example, if the packet size is 40 bytes when it is received, and is 100 bytes after compression, the decompression ratio is $100 \div 40/100 * 100 = 60\%$.	to be provided
Discards	Number of frames that the incoming packet match code discarded because they were not recognized.	to be provided
Sessions	Total number of active CRTP sessions.	to be provided
IP bytes	Number of IP bytes sent and received.	to be provided
Compressed bytes	Number of compressed IP header bytes sent and received.	to be provided
CRTP packets	Number of CRTP packets sent and received.	to be provided
CUDP/CNTCP packets	Number of compressed UDP packets and compressed non-TCP packets sent and received.	to be provided
Full header packets	Number of full header packets sent and received. Full header packets communicate the uncompressed IP header plus any following headers and data to establish the uncompressed header state in the decompressor for a particular context.	to be provided
Context state packet	Number of context state packets sent and received. Context state packets are sent from the decompressor to the compressor to communicate a list of context IDs for which synchronization is lost or might be lost.	to be provided
IP packets	Number of IP packets sent and received.	to be provided
Compressed packets	Number of compressed packets sent and received.	to be provided

```

show services crtp user@host> show services crtp extensive
extensive Interface: lsq-1/1/0.1
Port minimum: 2000, Port maximum: 64009
Maximum UDP compressed sessions: 256
CRTP maximum period: 256, CRTP maximum time: 5
Compression ratio: 0, Decompression ratio: 0, Discards: 0
CRTP stats          Receive      Transmit
Sessions             1           1
IP bytes              60          60
Compressed bytes      61          60
CRTP packets         0           0
CUDP/CNTCP packets   0           0
Full header packets   1           1
Context state packets 0           0
IP packets            1           1
Compressed packets    1           1

```


show services crtp flows

Syntax	show services crtp flows <interface <i>interface-name</i> >
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display Compressed Real-Time Transport Protocol (CRTP) flows.
Options	<p>none—Display CRTP flows for all interfaces.</p> <p>interface <i>interface-name</i>—(Optional) Display CRTP flows for the specified interface:</p> <ul style="list-style-type: none"> ■ On M-series and T-series routing platforms, a link services IQ (<i>lsq-fpc/pic/port</i>) or redundant link services IQ (<i>rlsq-fpc/pic/port</i>) interface ■ On the J-series routing platform, a link services (<i>ls-pim/O/port</i>) interface
Required Privilege Level	view
List of Sample Output	show services crtp flows on page 765
Output Fields	Table 182 on page 765 lists the output fields for the show services crtp flows command. Output fields are listed in the approximate order in which they appear.

Table 182: show services crtp flows Output Fields

Field Name	Field Description
Interface	Name of the physical interface.
Flow	Received or transmitted flow.
Source	IP source address.
Destination	IP destination address.
SSRC ID	Synchronization source (SSRC) identifier. One of the fields in the RTP header used to select the context. The SSRC identifier is a randomly chosen value unique within a particular CRTP session.
Ctx ID	Session context ID. Indicates the session context in which to interpret the packet. The decompressor can use the context ID to index its table of stored session contexts directly.

```

show services crtp flows  user@host> show services crtp flows
Interface: lsq-1/1/0.1
Flow      Source      Destination      SSRC ID  Ctx ID
Receive   60.1.1.3:28004    80.1.1.3:26000    123      0
Transmit   80.1.1.3:26000    60.1.1.3:28004    123      2

```


Chapter 18

CoS Services Operational Mode Commands

Table 183 on page 767 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot class-of-service (CoS) services on the Adaptive Services PIC. Commands are listed in alphabetical order.

Table 183: CoS Services Operational Mode Commands

Task	Command
Clear CoS statistics.	<code>clear services cos statistics</code>
Display CoS statistics.	<code>show services cos statistics</code>



NOTE: CoS services are supported on the adaptive services interface on the following routing platforms:

- J-series routing platform—`sp-pim/0/slot`
- M-series and T-series routing platforms—`sp-fpc/pic/port`

CoS services are also supported on the redundant adaptive services interface (`rspnumber`) on M-series and T-series routing platforms.



NOTE: For information about how to configure CoS services, see the *JUNOS Services Interfaces Configuration Guide*.

clear services cos statistics

Syntax	clear services cos statistics <interface <i>interface-name</i> > <service-set <i>service-set-name</i> >
Release Information	Command introduced in JUNOS Release 8.1.
Description	Clear statistics for class-of-service (CoS) code point bit patterns and forwarding classes as configured in CoS services for the AS PIC.
Options	<p>none—Clear all services CoS statistics.</p> <p>interface <i>interface-name</i>—(Optional) Clear statistics for the specified interface only.</p> <p>service-set <i>service-set-name</i>—(Optional) Clear statistics for the specified service set only.</p>
Required Privilege Level	view
List of Sample Output	clear services cos statistics on page 768
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear services cos statistics	user@host> clear services cos statistics

show services cos statistics

Syntax	show services cos statistics <brief detail extensive> <diffserv forwarding-class> <interface <i>interface-name</i> > <service-set <i>service-set-name</i> > <summary>
Release Information	Command introduced in JUNOS Release 8.1.
Description	Display the mapping of class-of-service (CoS) code point aliases to corresponding bit patterns and the mapping of forwarding class names to queue numbers as configured in CoS services for the AS PIC.
Options	<p>none—Display all services CoS statistics.</p> <p>brief detail extensive—(Optional) Display the specified level of output.</p> <p>diffserv forwarding-class—(Optional) Display only the selected information, either DiffServ codepoints or forwarding classes.</p> <p>interface <i>interface-name</i>—(Optional) Display statistics for the specified interface only.</p> <p>service-set <i>service-set-name</i>—(Optional) Display statistics for the specified service set only.</p> <p>summary—(Optional) Display summary of statistics on a per-interface basis.</p>
Required Privilege Level	view
List of Sample Output	<p>show services cos statistics on page 770</p> <p>show services cos statistics brief on page 771</p> <p>show services cos statistics detail on page 771</p> <p>show services cos statistics extensive on page 771</p>
Output Fields	Table 184 on page 769 describes the output fields for the show services cos statistics command. Output fields are listed in the approximate order in which they appear.

Table 184: show services cos statistics Output Fields

Field Name	Field Description	Level of Output
Interface	Name of interface.	All levels
Service set	Name of service set.	All levels
DSCP	DiffServ code point bit pattern.	All levels
Packets in	Number of packets received.	All levels
Packets out	Number of packets transmitted.	All levels

Table 184: show services cos statistics Output Fields (continued)

Field Name	Field Description	Level of Output
Forwarding class	Forwarding class queue number.	All levels

```

show services cos user@host> show services cos statistics
statistics
Interface: sp-1/0/0, Service set: scos
DSCP          Packets in      Packets out
000000          0              0
000001          0              0
000010          0              0
000011          0              0
000100          0              0
000101          0              0
000110          0              0
000111          0              0
001000          0              0
001001          0              0
001010          0              0
001011          0              0
001100          0              0
001101          0              0
001110          0              0
001111          0              0
010000          0              0
010001          0              0
010010          0              0
010011          0              0
010100          0              0
010101          0              0
010110          0              0
010111          0              0
011000          0              0
011001          0              0
011010          0              0
011011          0              0
011100          0              0
011101          0              0
011110          0              0
011111          0              0
100000          0              0
100001          0              0
100010          0              0
100011          0              0
100100          0              0
100101          0              0
100110          0              0
100111          0              0
101000          0              0
101001          0              0
101010          0              0
101011          0              0
101100          0              0
101101          0              0
101110          0              0
101111          0              0
110000          0              0
110001          0              0

```

110010	0	0
110011	0	0
110100	0	0
110101	0	0
110110	0	0
110111	0	0
111000	0	0
111001	0	0
111010	0	0
111011	0	0
111100	0	0
111101	0	0
111110	0	0
111111	0	0
Forwarding class	Packets in	Packets out
0	0	0
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0
8	0	0
9	0	0
10	0	0
11	0	0
12	0	0
13	0	0
14	0	0
15	0	0

show services cos statistics brief The output for the `show services cos statistics brief` command is identical to that for the `show services cos statistics` command. For sample output, see `show services cos statistics`.

show services cos statistics detail The output for the `show services cos statistics detail` command is identical to that for the `show services cos statistics` command. For sample output, see `show services cos statistics`.

show services cos statistics extensive The output for the `show services cos statistics extensive` command is identical to that for the `show services cos statistics` command. For sample output, see `show services cos statistics`.

Chapter 19

Data Link Switching Operational Mode Commands

Table 185 on page 773 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot data link switching (DLSw) on J-series routing platforms. Commands are listed in alphabetical order.

Table 185: DLSw Operational Mode Commands

Task	Command
Clear DLSw reachability.	<code>clear dlsw reachability</code>
Display DLSw peer capability.	<code>show dlsw capabilities</code>
Display information about configured DLSw circuits.	<code>show dlsw circuits</code>
Display DLSw peer information.	<code>show dlsw peers</code>
Display information about the cached media access control (MAC) entries.	<code>show dlsw reachability</code>
Display logical link control type 2 (LLC2) redundancy information for DLSw.	<code>show llc2 redundancy</code>
Display LLC2 redundancy statistics.	<code>show llc2 redundancy interface statistics</code>
Display LLC2 redundancy MAC translation information.	<code>show llc2 redundancy mac-translation</code>
Display LLC2 redundancy tracking information.	<code>show llc2 redundancy track</code>



NOTE: DLSw is supported only on the J-series routing platform.



NOTE: For information about how to configure DLSw, see the *JUNOS Services Interfaces Configuration Guide* or the *J-series Services Router Advanced WAN Access Configuration Guide*.

clear dlsw reachability

Syntax	clear dlsw reachability
Release Information	Command introduced in JUNOS Release 8.0.
Description	Clear the data-link switching (DLSw) reachability cache.
Options	This command has no options.
Required Privilege Level	view
Related Topics	show dlsw reachability
List of Sample Output	clear dlsw reachability on page 774
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear dlsw reachability	user@host> clear dlsw reachability

show dls w capabilities

Syntax	show dls w capabilities
Release Information	Command introduced in JUNOS Release 7.4.
Description	(J-series routing platform only) Display information about data link switching (DLSw) capabilities of a specific remote peer or all peers.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show dls w capabilities on page 775
Output Fields	Table 186 on page 775 describes the output fields for the show dls w capabilities command. Output fields are listed in the approximate order in which they appear.

Table 186: show dls w capabilities Output Fields

Field Name	Field Description
Peer	IP address of the peer DLSw router.
Vendor ID	Numerical value assigned to Juniper Networks.
Version number	DLSw version.
Initial pacing window size	Receive window size for incoming transport connections with the DLSw peer.
Version string	Juniper Networks software version information.

```

show dls w capabilities  user@host> show dls w capabilities
Peer: 217.110.111.134
  Vendor ID                : 000585
  Version number           : 0200
  Initial pacing window size : 32
  Version string           :
    Juniper Networks, Inc. j2300 internet router
    JUNOS Software Release 7.4I0 [builder]
    Build date: 2005-07-15 07:13:17 UTC
    Copyright (c) 1996-2005 Juniper Networks, Inc.

```

show dlsw circuits

Syntax	show dlsw circuits <brief detail>
Release Information	Command introduced in JUNOS Release 7.4.
Description	(J-series routing platform only) Display information about configured data link switching (DLSw) circuits.
Options	none—Display information about all DLSw circuits. brief detail—(Optional) Display the specified level of output.
Required Privilege Level	view
List of Sample Output	show dlsw circuits on page 777 show dlsw circuits detail on page 777
Output Fields	Table 187 on page 776 describes the output fields for the show dlsw circuits command. Output fields are listed in the approximate order in which they appear.

Table 187: show dlsw circuits Output Fields

Field Name	Field Description	Level of Output
Circuit id	Circuit ID	detail
Local address	MAC address of the local DLSw peer.	All levels
LSAP	Number of the local service access point.	All levels
Remote address	MAC address of the remote DLSw peer.	All levels
DSAP	Number of the destination service access point.	All levels
Peer or remote peer address	IP address of the remote DLSw peer.	All levels
Circuit state	State of the circuit.	detail
Uptime	How long the circuit has been established.	All levels
Max BTU size	Maximum packet size.	detail
Circuit priority	Traffic priority on the circuit.	detail

Table 187: show dlsw circuits Output Fields (continued)

Field Name	Field Description	Level of Output
Statistics	Statistics: <ul style="list-style-type: none"> ■ I-frames received—Number of I-frames received. ■ I-frames sent—Number of I-frames sent. ■ Bytes in I-frames received—Number of bytes in I-frames received. ■ Bytes in I-frames sent—Number of bytes in I-frames sent. ■ I-frames rejected—Number of I-frames rejected. ■ Bytes in I-frames rejected—Number of bytes in I-frames rejected. ■ I-frames retransmitted—Number of I-frames retransmitted. ■ Bytes in retransmitted I-frames—Number of bytes in I-frames retransmitted. ■ Reject frames received—Number of reject frames received. ■ Reject frames sent—Number of reject frames sent. ■ XID frames received—Number of XID frames received. ■ XID frames sent—Number of XID frames sent. 	detail

show dlsw circuits

```
user@host> show dlsw circuits
Local address      LSAP  Remote address    DSAP  Peer      Uptime
22:22:00:00:00:06  04    44:44:00:00:00:06  04    10.255.18.2  00:06:42
```

show dlsw circuits detail

```
user@host> show dlsw circuits detail
Circuit ID: 9ad20498aa04
Local address: 22:22:00:00:00:06, LSAP: 04
Remote address: 44:44:00:00:00:06, DSAP: 04
Remote peer address: 18.255.18.2
Circuit state: Connected
Uptime: 00:09:02
Max BTU size: 1466
Circuit priority: 3
Statistics:
  I-frames received : 0
  I-frames sent : 0
  Bytes in I-frames received : 0
  Bytes in I-frames sent : 0
  I-frames rejected : 0
  Bytes in I-frames rejected : 0
  I-frames retransmitted : 0
  Bytes in retransmitted I-frames : 0
  Reject frames received : 0
  Reject frames sent : 0
  XID frames received : 2
  XID frames sent : 2
```

show dlsw peers

Syntax	show dlsw peers <brief detail> <peer-ip <i>ip-address</i> >
Release Information	Command introduced in JUNOS Release 7.4.
Description	(J-series routing platform only) Display data link switching (DLSw) peer status.
Options	none—Display information about all DLSw peers. brief detail—(Optional) Display the specified level of output. peer-ip <i>ip-address</i> —(Optional) Display information about only the specified DLSw peer.
Required Privilege Level	view
List of Sample Output	show dlsw peers brief on page 779 show dlsw peers detail on page 779
Output Fields	Table 188 on page 778 describes the output fields for the show dlsw peers command. Output fields are listed in the approximate order in which they appear.

Table 188: show dlsw peers Output Fields

Field Name	Field Description	Level of Output
Peer	IP address of the remote DLSw peer.	All levels
State	Status of the connection.	All levels
Circuits	Number of circuits on the DLSw network.	All levels
Uptime	How long the circuit has been established.	All levels
Local address	IP address of the local DLSw peer.	detail
Connected time	Length of time the connection is established.	detail
Receive initial pacing	Size of the initial pacing frame.	detail
No circuits timeout	Length of time before a circuit times out.	detail
Type-of-service value	CoS type-of-service (ToS) number.	detail
Peer cost	Preference for establishing a circuit with this peer.	detail
Load balancing	Whether load balancing is enabled and what algorithm is used.	detail
Circuit weight	Extent to which this peer should participate in establishing circuits.	detail

Table 188: show dlsw peers Output Fields (continued)

Field Name	Field Description	Level of Output
Statistics	Statistics: <ul style="list-style-type: none"> ■ Data packets received—Number of packets received. ■ Data packets sent—Number of packets sent. ■ Data bytes received—Number of bytes received. ■ Data bytes sent—Number of bytes sent. ■ Control packets received—Number of control packets received. ■ Control packets sent—Number of control packets sent. ■ CANUREACH_ex received—Number of CANUREACH messages received. ■ CANUREACH_ex sent—Number of CANUREACH messages sent. ■ ICANREACH_ex received—Number of ICANREACH messages received. ■ ICANREACH_ex sent—Number of ICANREACH messages sent. 	detail

show dlsw peers brief

```

user@host> show dlsw peers brief
Peer      State      Circuits    Uptime
17.255.17.2  Connected    0          00:00:00
18.255.18.2  Connected    1          00:12:03

```

show dlsw peers detail

```

user@host> show dlsw peers detail
Peer: 10.255.18.2
  State: Connected, Circuits: 1, Local address: 10.255.4.50
  Uptime: 00:15:05
  Receive initial pacing: 20, No circuits timeout: 0
  Type-of-service value: 0
  Peer cost: 100, Load balancing: Circuit Weight
  Circuit weight: 2
  Statistics:
    Data packets received : 0
    Data packets sent : 0
    Data bytes received : 0
    Data bytes sent : 0
    Control packets received : 7
    Control packets sent : 8
    CANUREACH_ex received : 0
    CANUREACH_ex sent : 1
    ICANREACH_ex received : 1
    ICANREACH_ex sent : 0

```

show dlsw reachability

Syntax	show dlsw reachability
Release Information	Command introduced in JUNOS Release 7.4.
Description	(J-series routing platform only) Display media access control (MAC) and IP addresses of remote data link switching (DLSw) peers.
Required Privilege Level	view
List of Sample Output	show dlsw reachability on page 780
Output Fields	Table 189 on page 780 describes the output fields for the show dlsw reachability command. Output fields are listed in the approximate order in which they appear.

Table 189: show dlsw reachability Output Fields

Field Name	Field Description
MAC index	Number assigned to the DLSw peer.
MAC address	MAC address of the DLSw peer.
Location	Peer location: local or remote.
Peer/interface	Peer interface name or IP address.

```

show dlsw reachability user@host> show dlsw reachability
MAC index MAC address      Location  Peer/Interface
      0  44:44:00:00:00:06  remote   17.255.17.2
                                         18.255.18.2
      1  22:22:00:00:00:06  local    fe-0/0/1.0

```


show llc2 redundancy

Syntax	show llc2 redundancy <brief detail> <interface statistics mac-translation track (dlsw-remote-destination dlsw-remote-peer interfaces)>
Release Information	Command introduced in JUNOS Release 7.5.
Description	(J-series routing platform only) Display logical link control type 2 (LLC2) redundancy information for data link switching (DLSw).
Options	none—Display basic LLC2 redundancy information. Same as brief. brief detail—(Optional) Display the specified level of output.
Required Privilege Level	view
List of Sample Output	show llc2 redundancy on page 782 show llc2 redundancy detail on page 782
Output Fields	Table 190 on page 781 describes the output fields for the show llc2 redundancy command. Output fields are listed in the approximate order in which they appear.

Table 190: show llc2 redundancy Output Fields

Field Name	Field Description	Level of Output
Interface	IP address of the remote DLSw peer.	All levels
Unit	Logical interface unit number.	brief
Group	Group number.	All levels
Int state or Interface state	Interface state: up or down.	All levels
Er state or state	Indicates master or backup router.	All levels
Index	Number assigned to the router.	detail
Priority	Order to take over as master.	detail
Advertisement interval	Length of time between sending hello packets.	detail
Preempt	Master took over because of a failure.	detail
Advertisement timer	Times the advertisement intervals.	detail
Master router uptime	Length of time the master router has been available.	detail
Tracking	Whether tracking options or enabled or disabled.	detail

```
show llc2 redundancy user@host> show llc2 redundancy
Interface  Unit  Group  Int state  ER state
fe-0/0/1.0  0    5      up        master

show llc2 redundancy user@host> show llc2 redundancy detail
detail Interface:fe-0/0/1.0 Index 69
Interface state: up, Group 5, State master,
Priority:255, Advertisement interval 5,
Preempt:yes, Advertisement timer 0.0,
Master router uptime:361476.770, Tracking: enabled
```

show llc2 redundancy interface statistics

Syntax	show llc2 redundancy interface statistics
Release Information	Command introduced in JUNOS Release 7.5.
Description	(J-series routing platform only) Display logical link control type 2 (LLC2) redundancy interface statistics for data link switching (DLSw).
Required Privilege Level	view
List of Sample Output	show llc2 redundancy interface statistics on page 783
Output Fields	Table 191 on page 783 lists the output fields for the show llc2 redundancy interface statistics command. Output fields are listed in the approximate order in which they appear.

Table 191: show llc2 redundancy interface statistics Output Fields

Field Name	Field Description
Interface	Name of the configured physical interface.
Index	Number assigned to the interface.
Group	Number of the redundancy group.
Interface ERED PDU statistics	
Advertisement sent	Number of packets sent to advertise the router on the network.
Advertisement received	Number of packets received as advertisements on the network.
Interface ERED PDU error statistics	
Invalid ERED TTL value received	Number of invalid Ethernet redundancy time-to-live (TTL) values.

```

show llc2 redundancy interface statistics
user@host> show llc2 redundancy interface statistics
Interface : fe-0/0/1.0, Index : 69, Group : 5
  Interface ERED PDU statistics
    Advertisement sent           : 2959
    Advertisement received       : 0
  Interface ERED PDU error statistics
    Invalid ERED TTL value received : 0

```

show llc2 redundancy mac-translation

Syntax	show llc2 redundancy mac-translation
Release Information	Command introduced in JUNOS Release 7.5.
Description	(J-series routing platform only) Display Logical Link Control type 2 (LLC2) redundancy MAC translation information for data link switching (DLSw).
Required Privilege Level	view
List of Sample Output	show llc2 redundancy mac-translation on page 784
Output Fields	Table 192 on page 784 lists the output fields for the show llc2 redundancy mac-translation command. Output fields are listed in the approximate order in which they appear.

Table 192: show llc2 redundancy mac-translation Output Fields

Field Name	Field Description
Local mac	MAC address of the local DLSw peer router.
Remote mac	MAC address of the remote DLSw peer router.
Interface	Physical interface configured for Ethernet redundancy.
Group	Assigned redundancy group number.

```

show llc2 redundancy mac-translation
user@host> show llc2 redundancy mac-translation
Local mac      Remote mac      Interface      group
44:44:44:44:44:44  44:44:44:44:10:25  fe-0/0/1.0    5
44:44:44:44:44:33  44:44:44:44:10:16  fe-0/0/1.0    5
44:44:44:44:44:48  44:44:44:44:10:39  fe-0/0/1.0    5
09:00:2b:00:00:04  09:00:2b:00:00:05  fe-0/0/1.0    5
00:00:5e:00:01:01  00:0d:88:45:ce:5c  fe-0/0/1.0    5

```

show llc2 redundancy track

Syntax	show llc2 redundancy <brief detail> <interface statistics mac-translation track (dlsw-remote-destination dlsw-remote-peer interfaces)>
Release Information	Command introduced in JUNOS Release 7.5.
Description	(J-series routing platform only) Display Logical Link Control type 2 (LLC2) redundancy tracking information for data link switching (DLSw).
Options	brief detail—Display the specified level of output. dlsw-remote-destination—Display LLC2 remote destination tracking information. dlsw-remote-peer—Display LLC2 remote peer tracking information. interfaces—Display LLC2 interface tracking information.
Required Privilege Level	view
List of Sample Output	show llc2 redundancy track dlsw-remote-destination on page 786 show llc2 redundancy track dlsw-remote-peer on page 786 show llc2 redundancy track interfaces on page 786
Output Fields	Table 193 on page 785 lists the output fields for the show llc2 redundancy track command. Output fields are listed in the approximate order in which they appear.

Table 193: show llc2 redundancy track Output Fields

Field Name	Field Description	Level of Output
Remote dest	MAC address of the remote peer router.	to be provided
Peer dest	IP address of the remote peer.	to be provided
Track if	Physical interface configured for tracking.	to be provided
Connectivity	Status of the connection.	to be provided
Cost	Value assigned to place the router in a redundancy hierarchy.	to be provided
Interface	Physical interfaces configured for DLSw redundancy.	to be provided
Group	Assigned redundancy group number.	to be provided
Cfg	Priority value configured on the router.	to be provided
Run	Value after all priority values are applied.	to be provided
ER state	Status of the router: master or backup.	to be provided

```

show llc2 redundancy      user@host> show llc2 redundancy track dlsw-remote-destination
track                    Remote dest      Reachability Cost  Interface  Group  Cfg  Run  ER state
dlsw-remote-destination  44:44:44:44:44:45 reachable    15   fe-0/0/1.0  5     255  255  master
                          44:44:44:44:44:49 unknown     35   fe-0/0/1.0  5     255  255  master

```

```

show llc2 redundancy      user@host> show llc2 redundancy track dlsw-remote-peer
track dlsw-remote-peer   Remote peer    Connectivity Cost  Interface  Group  Cfg  Run  ER state
                          10.255.110.38  yes      10   fe-0/0/1.0  5     255  245  master
                          2.2.2.3        no       10   fe-0/0/1.0  5     255  245  master
                          10.255.110.39  yes      10   fe-0/0/1.0  5     255  245  master

```

```

show llc2 redundancy      user@host> show llc2 redundancy track interfaces
track interfaces        Track if      State Cost  Interface  Group  Cfg  Run  ER state
                          e1-0/0/2.0   yes    10   fe-0/0/1.0  5     255  255  master

```

Chapter 20

Flow Collection and Monitoring Operational Mode Commands

Table 194 on page 787 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot flow collection and monitoring services. In the table, the commands are grouped by functionality. In the remainder of this chapter, they are listed strictly in alphabetical order.

Table 194: Flow Collection and Monitoring Operational Commands

Task	Command
Active Flow Monitoring	
Display information about aggregated flows.	show services accounting aggregation
Display information about flow aggregation templates.	show services accounting aggregation template
Display error statistics.	show services accounting errors
Display the number of active flow statistics.	show services accounting flow
Display information about the flows being processed by the accounting service.	show services accounting flow-detail
Display memory and flow record statistics.	show services accounting memory
Display packet size distribution histogram.	show services accounting packet-size-distribution
Display available PICs for the service and redundancy model.	show services accounting status
Display the CPU usage of the PIC.	show services accounting usage
Dynamic Flow Capture	
Clear dynamic flow capture information.	clear services dynamic-flow-capture
Display information for a content destination.	show services dynamic-flow-capture content-destination
Display information for a control source.	show services dynamic-flow-capture control-source

Table 194: Flow Collection and Monitoring Operational Commands *(continued)*

Task	Command
Display dynamic flow capture statistics.	show services dynamic-flow-capture statistics
Flow Collection	
Clear the flow collector statistics for one interface or all interfaces.	clear services flow-collector statistics
Switch to the primary server.	request services flow-collector change-destination primary interface
Switch to the secondary server.	request services flow-collector change-destination secondary interface
Transfer a test file to the primary or secondary FTP server configured as a flow collector.	request services flow-collector test-file-transfer
Display information about the files present on the collector service.	show services flow-collector file interface
Display the number of packets received by one or more flow collection interfaces from one or all monitoring interfaces.	show services flow-collector input interface
Display overall statistics for the flow collector application.	show services flow-collector interface
Passive Flow Monitoring	
Clear passive monitoring statistics.	clear passive-monitoring statistics
Display error statistics.	show passive-monitoring error
Display the number of active flow statistics.	show passive-monitoring flow
Display memory and flow record statistics.	show passive-monitoring memory
Display available PICs for the service and redundancy model.	show passive-monitoring status
Display the CPU usage of the PIC.	show passive-monitoring usage



NOTE: Active flow monitoring is supported on the adaptive services interface (**sp-fpc/picport**) on J-series, M-series, and T-series routing platforms, and on the flow monitoring (**mo-fpc/pic/port**) interface on the M-series and T-series routing platforms.

Flow collection is supported on the flow collector interface (**cp-fpc/pic/ /port**) on M40e, M160, and M320 routers and on the T-series routing platforms.

Passive flow monitoring is supported on the flow monitoring interface (**mo-fpc/pic/port**) on the M40e, M160, and M320 routers and on the T-series routing platforms.



NOTE: For information about how to configure flow collection and monitoring services, see the *JUNOS Services Interfaces Configuration Guide*.

clear services dynamic-flow-capture

Syntax	clear services dynamic-flow-capture capture-group <i>group-name</i> <criteria-identifier <i>identifier</i> > <destination-identifier <i>identifier</i> > <force> <static>
Release Information	Command introduced in JUNOS Release 7.4.
Description	(M320 routers and T-series routing platforms only) Clear dynamic flow capture information for specified capture group.
Options	capture-group <i>group-name</i> —Capture-group identifier. criteria-identifier <i>identifier</i> —(Optional) Criteria identifier. destination-identifier <i>identifier</i> —(Optional) Content destination identifier. force—(Optional) Force clearing of criteria. static—(Optional) Clear static criteria.
Required Privilege Level	network
List of Sample Output	clear services dynamic-flow-capture on page 790
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear services dynamic-flow-capture	user@host> clear services dynamic-flow-capture capture-group flow-a

clear passive-monitoring statistics

Syntax	clear passive-monitoring statistics (all interface <i>interface-name</i>)
Release Information	Command introduced in JUNOS Release 7.6.
Description	(M40e, M160, and M320 routers and T-series routing platforms only) Clear statistics for one passive monitoring interface or for all passive monitoring interfaces.
Options	<p>all—Clear statistics for all configured passive monitoring interfaces.</p> <p>interface <i>interface-name</i>—Clear statistics for the specified passive monitoring interface (<i>mo-fpc/pic/port</i>).</p>
Required Privilege Level	network
List of Sample Output	clear passive-monitoring statistics on page 791
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear passive-monitoring statistics	user@host> clear passive-monitoring statistics interface mo-5/0/0

clear services flow-collector statistics

Syntax	clear services flow-collector statistics (all interface <i>interface-name</i>)
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M40e, M160, and M320 routers and T-series routing platforms only) Clear statistics for one flow collector interface or for all flow collector interfaces.
Options	all—Clear statistics for all configured flow collector interfaces. interface <i>interface-name</i> —Clear statistics for the specified flow collector interface (<i>cp-fpc/pic/port</i>).
Required Privilege Level	network
List of Sample Output	clear services flow-collector statistics on page 792
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear services flow-collector statistics	<pre> user@host> clear services flow-collector statistics interface cp-5/0/0 Flow collector interface: cp-5/0/0 Interface state: Collecting flows Statistics cleared successfully </pre>

request services flow-collector change-destination primary interface

Syntax	request services flow-collector change-destination primary interface <i>cp-fpc/pic/port</i> <clear-files> <clear-logs> <immediately gracefully>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M40e, M160, and M320 routers and T-series routing platforms only) Switch to the primary File Transfer Protocol (FTP) server that is configured as a flow collector.
Options	<p>none—Switch to the primary FTP server.</p> <p><i>cp-fpc/pic/port</i>—Specify the flow collector interface name for the primary destination.</p> <p>clear-files—(Optional) Request clearing of existing data files in the FTP wait queue when the switch takes place.</p> <p>clear-logs—(Optional) Request clearing of existing logs when the switch takes place.</p> <p>immediately gracefully—(Optional) Specify whether you want the switch to take place immediately, or to affect only newly created files.</p>
Required Privilege Level	maintenance
List of Sample Output	request services flow-collector change-destination primary interface on page 793
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request services flow-collector change-destination primary interface	<pre>user@host> request services flow-collector change-destination primary interface cp-6/0/0 Flow collector interface: cp-6/0/0 Interface state: Collecting flows Destination change successful</pre>

request services flow-collector change-destination secondary interface

Syntax	request services flow-collector change-destination secondary interface <i>cp-fpc/pic/port</i> <clear-files> <clear-logs> <immediately gracefully>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M40e, M160, and M320 routers and T-series routing platforms only) Switch to the secondary File Transfer Protocol (FTP) server that is configured as a flow collector.
Options	<p>none—Switch to the secondary FTP server.</p> <p><i>cp-fpc/pic/port</i>—Specify the flow collector interface name (<i>cp-fpc/pic/port</i>) for the secondary destination.</p> <p>clear-files—(Optional) Request clearing of existing data files in the FTP wait queue when the switch takes place.</p> <p>clear-logs—(Optional) Request clearing of existing logs when the switch takes place.</p> <p>immediately gracefully—(Optional) Specify whether you want the switch to take place immediately, or to affect only newly created files.</p>
Required Privilege Level	maintenance
List of Sample Output	request services flow-collector change-destination secondary interface on page 794
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request services flow-collector change-destination secondary interface	<pre>user@host> request services flow-collector change-destination secondary interface cp-6/0/0 Flow collector interface: cp-6/0/0 Interface state: Collecting flows Destination change successful</pre>

request services flow-collector test-file-transfer

Syntax	<code>request services flow-collector test-file-transfer <i>filename</i> interface (all <i>cp-fpc/pic/port</i>) (channel-zero channel-one) (primary secondary)</code>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M40e, M160, and M320 routers and T-series routing platforms only) Transfer a test file to the primary or secondary File Transfer Protocol (FTP) server that is configured as a flow collector. This command verifies that the output side of the flow collector interface is operating properly.
Options	<p><i>filename</i>—Name of the test file to transfer.</p> <p><code>interface all <i>cp-fpc/pic/port</i></code>—Transfer a test file of flows from all configured flow collector interfaces or from only the specified interface.</p> <p><code>channel-zero channel-one</code>—Transfer a file from export channel 0 (unit 0) or channel 1 (unit 1) of the PIC.</p> <p><code>primary secondary</code>—Transfer a file to the primary or secondary server configured as a flow collector.</p>
Required Privilege Level	network
List of Sample Output	request services flow-collector test-file-transfer on page 795
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request services flow-collector test-file-transfer	<pre> user@router> request services flow-collector test-file-transfer test_file interface cp-7/1/0 channel-one primary Flow collector interface: cp-7/1/0 Interface state: Collecting flows Response: Test file transfer successfully scheduled </pre>

show passive-monitoring error

Syntax	show passive-monitoring error (* all mo-fpc/pic/port)
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M40e, M160, and M320 routers and T-series routing platforms only) Display passive monitoring error statistics.
Options	* all mo-fpc/pic/port—Display error statistics for monitoring interfaces. Use a wildcard character, specify all interfaces, or provide a specific interface name.
Required Privilege Level	view
List of Sample Output	show passive-monitoring error all on page 797
Output Fields	Table 195 on page 796 lists the output fields for the show passive-monitoring error command. Output fields are listed in the approximate order in which they appear.

Table 195: show passive-monitoring error Output Fields

Field Name	Field Description
Passive monitoring interface	Name of the passive monitoring interface.
Local interface index	Index counter of the local interface.
Interface state	State of the passive monitoring interface: <ul style="list-style-type: none"> ■ Monitoring—Specified interface is actively monitoring. ■ Disabled—Specified interface has been disabled from the CLI. ■ Not monitoring—The interface is operational, but not monitoring. This condition occurs when an interface first comes online, or when the interface is operational, but no logical unit has been configured under the physical interface. ■ Unknown—Unknown state. ■ Error—An error occurred during the process of determining the state of the interface.
Error information	
Packets dropped (no memory)	Number of packets dropped because of memory shortage.
Packets dropped (not IP)	Number of non-IP packets dropped.
Packets dropped (not IPv4)	Number of packets dropped because they failed the IPv4 version check.
Packets dropped (header too small)	Number of packets dropped because the packet length or IP header length was too small.
Memory allocation failures	Number of flow record memory allocation failures. A small number reflects failures to replenish the free list. A large number indicates the monitoring station is almost out of memory space.

Table 195: show passive-monitoring error Output Fields (continued)

Field Name	Field Description
Memory free failures	Number of flow record memory free failures.
Memory free list failures	Number of flow records received from free list that failed. Memory is nearly exhausted or too many new flows greater than 128 KB are being created per second.
Memory warning	Whether the flows have exceeded 1 million packets per second (Mpps) on a Monitoring Services PIC or 2 Mpps on a Monitoring Services II PIC. The response can be Yes or No.
Memory overload	Whether the memory has been overloaded. The response can be Yes or No.
PPS overload	Whether the PIC is receiving more packets per second than the configured threshold. The response can be Yes or No.
BPS overload	Whether the PIC is receiving more bits per second than the configured threshold. The response can be Yes or No.

```

show passive-monitoring error all      user@host> show passive-monitoring error all
Passive monitoring interface: mo-4/0/0, Local interface index: 44
Interface state: Monitoring
Error information
  Packets dropped (no memory): 0, Packets dropped (not IP): 0
  Packets dropped (not IPv4): 0, Packets dropped (header too small): 0
  Memory allocation failures: 0, Memory free failures: 0
  Memory free list failures: 0
  Memory warning: No, Memory overload: No, PPS overload: No, BPS overload: No

Passive monitoring interface: mo-4/1/0, Local interface index: 45
Interface state: Not monitoring
Error information
  Packets dropped (no memory): 0, Packets dropped (not IP): 0
  Packets dropped (not IPv4): 0, Packets dropped (header too small): 0
  Memory allocation failures: 0, Memory free failures: 0
  Memory free list failures: 0
  Memory warning: No, Memory overload: No, PPS overload: No, BPS overload: No

```

show passive-monitoring flow

Syntax	show passive-monitoring flow (* all mo-fpc/pic/port)
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M40e, M160, and M320 routers and T-series routing platforms only) Display passive flow statistics.
Options	* all mo-fpc/pic/port—Display passive flow statistics for monitoring interfaces. Use a wildcard character, specify all interfaces, or provide a specific interface name.
Required Privilege Level	view
List of Sample Output	show passive-monitoring flow all on page 799
Output Fields	Table 196 on page 798 lists the output fields for the show passive-monitoring flow command. Output fields are listed in the approximate order in which they appear.

Table 196: show passive-monitoring flow Output Fields

Field Name	Field Description
Passive monitoring interface	Name of the passive monitoring interface.
Local interface index	Index counter of the local interface.
Interface state	State of the passive monitoring interface: <ul style="list-style-type: none"> ■ Monitoring—Specified interface is actively monitoring. ■ Disabled—Specified interface has been disabled from the CLI. ■ Not monitoring—The interface is operational, but not monitoring. This condition occurs when an interface first comes online, or when the interface is operational, but no logical unit has been configured under the physical interface. ■ Unknown—Unknown state. ■ Error—An error occurred during the process of determining the state of the interface.
Flow information	
Flow packets	Number of packets received by an operational PIC.
Flow bytes	Number of bytes received by an operational PIC.
Flow packets 10-second rate	Number of packets per second handled by the PIC and displayed as a 10-second average.
Flow bytes 10-second rate	Number of bytes per second handled by the PIC and displayed as a 10-second average.
Active flows	Number of currently active flows tracked by the PIC.
Total flows	Total number of flows received by an operational PIC.

Table 196: show passive-monitoring flow Output Fields (continued)

Field Name	Field Description
Flows exported	Total number of flows exported by an operational PIC.
Flows packets exported	Total number of cflowd packets exported by an operational PIC.
Flows inactive timed out	Total number of flows that are exported because of inactivity.
Flows active timed out	Total number of long-lived flows that are exported because of an active timeout.

```

show passive-monitoring user@host> show passive-monitoring flow all
flow all Passive monitoring interface: mo-4/0/0, Local interface index: 44
Interface state: Monitoring
Flow information
Flow packets: 6533434, Flow bytes: 653343400
Flow packets 10-second rate: 0, Flow bytes 10-second rate: 0
Active flows: 0, Total flows: 1599
Flows exported: 1599, Flows packets exported: 55
Flows inactive timed out: 1599, Flows active timed out: 0

Passive monitoring interface: mo-4/1/0, Local interface index: 45
Interface state: Monitoring
Flow information
Flow packets: 6537780, Flow bytes: 653778000
Flow packets 10-second rate: 0, Flow bytes 10-second rate: 0
Active flows: 0, Total flows: 1601
Flows exported: 1601, Flows packets exported: 55
Flows inactive timed out: 1601, Flows active timed out: 0

```

show passive-monitoring memory

Syntax	<code>show passive-monitoring memory (* all mo-fpc/pic/port)</code>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M40e, M160, and M320 routers and T-series routing platforms only) Display passive monitoring memory and flow record statistics
Options	<code>* all mo-fpc/pic/port</code> —Display memory and flow record statistics for monitoring interfaces. Use a wildcard character, specify all interfaces, or provide a specific interface name.
Required Privilege Level	view
List of Sample Output	show passive-monitoring memory all on page 800
Output Fields	Table 197 on page 800 lists the output fields for the <code>show passive-monitoring memory</code> command. Output fields are listed in the approximate order in which they appear.

Table 197: show passive-monitoring memory Output Fields

Field Name	Field Description
Passive monitoring interface	Name of the passive monitoring interface.
Local interface index	Index counter of the local interface.
Memory utilization	
Allocation count	Number of flow records allocated.
Free count	Number of flow records freed.
Maximum allocated	Maximum number of flow records allocated since the monitoring station booted. This number represents the peak number of flow records allocated at a time.
Allocations per second	Flow records allocated per second during the last statistics interval on the PIC.
Frees per second	Flow records freed per second during the last statistics interval on the PIC.
Total memory used, Total memory free	Total memory currently used and total amount of memory currently free (in bytes).

```

user@host> show passive-monitoring memory all
Passive monitoring interface: mo-4/0/0, Local interface index: 44
Memory utilization
Allocation count: 1600, Free count: 1599, Maximum allocated: 1600
Allocations per second: 3200, Frees per second: 1438
Total memory used (in bytes): 103579176, Total memory free (in bytes):
163914184

```

show passive-monitoring status

Syntax	show passive-monitoring status (* all mo-fpc/pic/port)
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M40e, M160, and M320 routers and T-series routing platforms only) Display passive monitoring status.
Options	* all mo-fpc/pic/port—Display status for monitoring interfaces. Use a wildcard character, specify all interfaces, or provide a specific interface name.
Required Privilege Level	view
List of Sample Output	show passive-monitoring status all on page 802
Output Fields	Table 198 on page 801 lists the output fields for the show passive-monitoring status command. Output fields are listed in the approximate order in which they appear.

Table 198: show passive-monitoring status Output Fields

Output Field	Output Field Description
Passive monitoring interface	Name of the passive monitoring interface.
Local interface index	Index counter of the local interface.
Interface state	Monitoring state of the passive monitoring interface. <ul style="list-style-type: none"> ■ Monitoring—PIC is actively monitoring. ■ Disabled—PIC has been disabled using the CLI. ■ Not monitoring—PIC is operational, but not monitoring. This condition can happen while the PIC is coming online, or when the PIC is operational but has no logical unit configured under the physical interface. ■ Unknown
Group index	Integer that represents the monitoring group of which the PIC is a member. Group index is a mapping from the group name to an index. It is not related to the number of monitoring groups.
Export interval	Configured export interval for cflowd records, in seconds.
Export format	Configured export format (only cflowd version 5 is supported).
Protocol	Protocol the PIC is configured to monitor (only IPv4 is supported).
Engine type	Configured engine type that is inserted in output cflowd packets.
Engine ID	Configured engine ID that is inserted in output cflowd packets.

```
show passive-monitoring user@host> show passive-monitoring status all  
status all Passive monitoring interface: mo-4/0/0, Local interface index: 44  
Interface state: Monitoring  
Group index: 0  
Export interval: 15 secs, Export format: cflowd v5  
Protocol: IPv4, Engine type: 1, Engine ID: 1  
  
Passive monitoring interface: mo-4/1/0, Local interface index: 45  
Interface state: Disabled  
  
Passive monitoring interface: mo-4/2/0, Local interface index: 46  
Interface state: Not monitoring
```

show passive-monitoring usage

Syntax	<code>show passive-monitoring usage (* all mo-fpc/pic/port)</code>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M40e, M160, and M320 routers and T-series routing platforms only) Display passive monitoring usage statistics.
Options	<code>* all mo-fpc/pic/port</code> —Display usage statistics for monitoring interfaces. Use a wildcard character, specify all interfaces, or provide a specific interface name.
Required Privilege Level	view
List of Sample Output	show passive-monitoring usage all on page 803
Output Fields	Table 199 on page 803 lists the output fields for the <code>show passive-monitoring usage</code> command. Output fields are listed in the approximate order in which they appear.

Table 199: show passive-monitoring usage Output Fields

Output Field	Output Field Description
Passive monitoring interface	Name of the passive monitoring interface.
Local interface index	Index counter of the local interface.
CPU utilization	
Uptime	Time, in milliseconds, that the PIC has been operational.
Interrupt time	Total time that the PIC has spent processing packets since the last PIC reset.
Load (5 second)	CPU load on the PIC, averaged more than 5 seconds. The number is a percentage obtained by dividing the time spent on active tasks by the total elapsed time.
Load (1 minute)	CPU load on the PIC, averaged more than 1 minute. The number is a percentage obtained by dividing the time spent on active tasks by the total elapsed time.

```

show passive-monitoring user@host> show passive-monitoring usage
usage all      Passive monitoring interface: mo-4/0/0, Local interface index: 44
                  CPU utilization
                  Uptime: 653155 milliseconds, Interrupt time: 40213754 microseconds
                  Load (5 second): 20%, Load (1 minute): 17%

                  Passive monitoring interface: mo-4/1/0, Local interface index: 45
                  CPU utilization
                  Uptime: 652292 milliseconds, Interrupt time: 40223178 microseconds
                  Load (5 second): 22%, Load (1 minute): 15%

                  Passive monitoring interface: mo-4/2/0, Local interface index: 46
                  CPU utilization

```

```
Uptime: 649491 milliseconds, Interrupt time: 40173645 microseconds  
Load (5 second): 22%, Load (1 minute): 10098862%
```


show services accounting aggregation

Syntax	show services accounting aggregation <i>aggregation-type</i> < <i>aggregation-value</i> > <detail extensive terse> <limit <i>limit-value</i> > < name <i>service-name</i> > <order (bytes packets)>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display information about the aggregated active flows being processed by the accounting service.
Options	<p><i>aggregation-type</i> <<i>aggregation-value</i>>—Display information for a particular aggregation type and optional value:</p> <ul style="list-style-type: none"> ■ as <<i>source-as-value</i> <i>destination-as-value</i> <i>input-snmp-interface-index-value</i> <i>output-snmp-interface-index-value</i>>—Aggregate by autonomous system (AS). ■ destination-prefix <<i>destination-prefix-value</i> <i>destination-as-value</i> <i>output-snmp-interface-index-value</i>>—Aggregate by destination prefix. ■ protocol-port <<i>protocol-value</i> <i>source-port-value</i> <i>destination-port-value</i>>—Aggregate by protocol and port. ■ source-destination-prefix <<i>source-prefix-value</i> <i>destination-prefix-value</i> <i>destination-as-value</i> <i>source-as-value</i> <i>input-snmp-interface-index-value</i> <i>output-snmp-interface-index-value</i>>—Aggregate by source and destination prefix. ■ source-prefix <<i>source-prefix-value</i> <i>source-as-value</i> <i>input-snmp-interface-index-value</i>>—Aggregate by source prefix. <p>detail extensive terse—(Optional) Display the specified level of output.</p> <p>limit <i>limit-value</i>—(Optional) Limit the display output to this number of flows. The default is no limit.</p> <p>name <i>service-name</i>—(Optional) Display information about the aggregated flows for a particular service name.</p> <p>order (bytes packets)—(Optional) Display the flow with the ordering of the highest number, either by byte count or by packet count.</p>
Additional Information	For information about aggregation configuration options, see the <i>JUNOS Services Interfaces Configuration Guide</i> .
Required Privilege Level	view
List of Sample Output	show services accounting aggregation protocol-port detail on page 807 show services accounting aggregation source-destination-prefix on page 807 show services accounting aggregation source-destination- prefix order packet detail on page 807

show services accounting aggregation source-destination- prefix extensive
limit on page 807

show services accounting aggregation source-destination-prefix name
terse on page 808

Output Fields Table 200 on page 806 lists the output fields for the `show services accounting aggregation` command. Output fields are listed in the approximate order in which they appear.

Table 200: show services accounting aggregation Output Fields

Field Name	Field Description	Level of Output
Service Accounting interface	Name of the service accounting interface.	to be provided
Local interface index	Index corresponding to the service accounting interface.	to be provided
Service name	Name of a service that was configured at the [edit forwarding-options accounting] hierarchy level. The default display, (default sampling), indicates the service was configured at the [edit forwarding-options sampling-level] hierarchy level.	to be provided
Protocol	Protocol identifier and number.	to be provided
Source Port	Source port identifier and number.	to be provided
Destination Port	Destination port identifier and number.	to be provided
Source-AS	Source autonomous system (AS) number.	to be provided
Destination-AS	Destination AS number.	to be provided
Source Prefix	Source prefix.	to be provided
Destination Prefix	Destination prefix.	to be provided
Source address	Source address.	to be provided
Source prefix length	Source prefix length.	to be provided
Destination address	Destination address.	to be provided
Destination prefix length	Destination prefix length.	to be provided
Input SNMP interface index	SNMP index of the interface the packet came in on.	to be provided
Output SNMP interface index	SNMP index of the interface the packet went out on.	to be provided
Start time	Actual time when the packet in this aggregation was first seen.	to be provided
End time	Actual time when the packet in this aggregation was last seen.	to be provided
Flow count	Number of flows in the aggregation.	to be provided

Table 200: show services accounting aggregation Output Fields (continued)

Field Name	Field Description	Level of Output
Packet count	Number of packets in the aggregation.	to be provided
Byte count	Number of bytes in the aggregation.	to be provided

show services accounting aggregation protocol-port detail	<pre> user@host> show service accounting aggregation protocol-port detail Service Accounting interface: mo-2/0/0, Local interface index: 468 Service name: (default sampling) Protocol: 6, Source port: 20, Destination port: 20 Start time: 442349, End time: 6425714 Flow count: 194, Packet count: 4294964388, Byte count: 4294781184 Protocol: 0, Source port: 0, Destination port: 0 Start time: 442349, End time: 6425749 Flow count: 204, Packet count: 4294964324, Byte count: 4294777088 Protocol: 17, Source port: 123, Destination port: 123 Start time: 442364, End time: 6425784 Flow count: 186, Packet count: 4294964152, Byte count: 4294766080 </pre>
show services accounting aggregation source-destination-prefix	<pre> user@host> show service accounting aggregation source-destination-prefix Service Accounting interface: rsp0, Local interface index: 171 Service name: (default sampling) Interface state: Accounting Source Destination Input Output Flow Packet Byte prefix interface interface count count count 11.1.0.0/20 40.0.0.0/24 ge-5/0/1.0 ge-5/0/0.0 256 491761 31472704 11.1.0.0/20 40.0.1.36/32 ge-5/0/1.0 ge-5/0/0.0 1 1926 123264 11.1.0.0/20 40.0.1.59/32 ge-5/0/1.0 ge-5/0/0.0 1 1926 123264 11.1.0.0/20 40.0.3.63/32 ge-5/0/1.0 ge-5/0/0.0 1 1925 123200 11.1.0.0/20 40.0.3.32/32 ge-5/0/1.0 ge-5/0/0.0 1 1925 </pre>
show services accounting aggregation source-destination-prefix order packet detail	<pre> user@host> show service accounting aggregation source-destination-prefix order packet detail name t2 input-snmp-interface-index 538 Service Accounting interface: mo-2/0/0, Local interface index: 468 Service name: t2 Source Destination Input SNMP Output SNMP Flow Packet Byte Prefix Prefix Index Index Count Count Count 11.1.1.2/20 30.0.167.1/0 538 432 1 60 46483 11.1.1.2/20 30.0.168.1/0 538 432 1 60 5191 11.1.1.2/20 30.0.154.1/0 538 432 2 60 45504 11.1.1.2/20 30.0.76.1/0 538 432 1 60 42177 11.1.1.2/20 30.0.149.1/0 538 432 1 60 49184 11.1.1.2/20 30.0.113.1/0 538 432 2 60 48757 </pre>
show services accounting aggregation	<pre> user@host> show service accounting aggregation source-destination-prefix name t2 extensive limit 3 </pre>

**source-destination-
prefix extensive limit**

Service Accounting interface: mo-2/0/0, Local interface index: 542
Service name: t2

Source address: 11.1.1.2, Source prefix length: 20
Destination address: 44.200.176.1, Destination prefix length: 0
Input SNMP interface index: 24, Output SNMP interface index: 26
Source-AS: 69, Destination-AS: 69
Start time: Fri Feb 21 14:16:57 2003, End time: Fri Feb 21 14:22:50 2003
Flow count: 0, Packet count: 6, Byte count: 5340

Source address: 11.1.1.2, Source prefix length: 20
Destination address: 45.243.160.1, Destination prefix length: 0
Input SNMP interface index: 24, Output SNMP interface index: 26
Source-AS: 69, Destination-AS: 69
Start time: Fri Feb 21 14:16:57 2003, End time: Fri Feb 21 14:22:50 2003
Flow count: 0, Packet count: 6, Byte count: 5490

Source address: 11.1.1.2, Source prefix length: 20
Destination address: 45.162.160.1, Destination prefix length: 0
Input SNMP interface index: 24, Output SNMP interface index: 26
Source-AS: 69, Destination-AS: 69
Start time: Fri Feb 21 14:16:57 2003, End time: Fri Feb 21 14:22:50 2003
Flow count: 0, Packet count: 6, Byte count: 4079

**show services
accounting aggregation
source-destination-prefix
name terse**

user@host> **show service accounting aggregation source-destination-prefix name T3
terse**

Service Accounting interface: rsp0, Local interface index: 171
Service name: T3

Interface state: Accounting

Source	Destination	Input	Output	Flow	Packet
Byte					
count	prefix	interface	interface	count	count
11.1.0.0/20	50.0.0.0/24	ge-5/0/1.0	ge-5/0/0.0	256	639822
40948608					
11.1.0.0/20	50.0.2.67/32	ge-5/0/1.0	ge-5/0/0.0	1	
2485	159040				
11.1.0.0/20	50.0.2.92/32	ge-5/0/1.0	ge-5/0/0.0	1	
2485					

show services accounting aggregation template

Syntax	show services accounting aggregation template <template-name <i>template-name</i> >
Release Information	Command introduced in JUNOS Release 8.3.
Description	Display information for flow aggregation version 9 templates.
Options	<template-name <i>template-name</i> >—Display information for specified template only.
Required Privilege Level	view
List of Sample Output	show services accounting aggregation template on page 809
Output Fields	Table 201 on page 809 lists the output fields for the <code>show services accounting aggregation template</code> command. Output fields are listed in the approximate order in which they appear.

Table 201: show services accounting aggregation template Output Fields

Field Name	Field Description
MPLS Label 1	Position of first MPLS label.
MPLS Label 2	Position of second MPLS label.
MPLS Label 3	Position of third MPLS label.
Packet Count	Number of packets sent.

```

show services      user@host> show services accounting aggregation template template-name mpls
accounting aggregation  MPLS      MPLS      MPLS      Packet
template              Label 1 Label 2 Label 3      Count
                           10001    10002    10003      1597

```

show services accounting errors

Syntax	show services accounting errors <name (* all <i>service-name</i>)>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display active flow error statistics.
Options	<p>none—Display error statistics for all services accounting instances.</p> <p>name (* all <i>service-name</i>)—(Optional) Display active flow error statistics. Use a wildcard character, specify all services, or provide a specific service name.</p>
Required Privilege Level	view
List of Sample Output	show services accounting errors on page 811
Output Fields	Table 202 on page 810 lists the output fields for the show services accounting errors command. Output fields are listed in the approximate order in which they appear.

Table 202: show services accounting errors Output Fields

Field	Field Description
Service Accounting interface	Name of the service accounting interface.
Local interface index	Index counter of the local interface.
Service name	Name of a service that was configured at the [edit forwarding-options accounting] hierarchy level. The default display, (default sampling), indicates the service was configured at the [edit forwarding-options sampling-level] hierarchy level.
Error Information	
Packets dropped (no memory)	Number of packets dropped because of memory shortage.
Packets dropped (not IP)	Number of non-IP packets dropped.
Packets dropped (not IPv4)	Number of packets dropped because they failed the IPv4 version check.
Packets dropped (header too small)	Number of packets dropped because the packet length or IP header length was too small.
Memory allocation failures	Number of flow record memory allocation failures. A small number reflects failures to replenish the free list. A large number indicates the monitoring station is almost out of memory space.
Memory free failures	Number of flow record memory free failures.
Memory free list failures	Number of flow records received from the free list that failed. Memory is nearly exhausted, or too many new flows greater than 128 KB are being created per second.

Table 202: show services accounting errors Output Fields *(continued)*

Field	Field Description
Memory overload	Whether the memory has been overloaded. The response can be Yes or No.
PPS overload	Whether the PIC is receiving more packets per second than the configured threshold. The response can be Yes or No.
BPS overload	Whether the PIC is receiving more bits per second than the configured threshold. The response can be Yes or No.

```

show services      user@host> show services accounting errors
accounting errors Service Accounting interface: mo-1/1/0, Local interface index: 15
                    Service name: (default sampling)
                    Error information
                    Packets dropped (no memory): 0, Packets dropped (not IP): 0
                    Packets dropped (not IPv4): 0, Packets dropped (header too small): 0
                    Memory allocation failures: 0, Memory free failures: 0
                    Memory free list failures: 0
                    Memory overload: No, PPS overload: No, BPS overload: No

```

show services accounting flow

Syntax	show services accounting flow <name (* all <i>service-name</i>)>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display active flow statistics.
Options	<p>none—Display active flow statistics for all service instances.</p> <p>name (* all <i>service-name</i>)—(Optional) Display services accounting active flow statistics. Use a wildcard character, specify all services, or provide a specific service name.</p>
Required Privilege Level	view
List of Sample Output	<p>show services accounting flow on page 813</p> <p>show services accounting flow name on page 813</p> <p>show services accounting flow name all on page 813</p>
Output Fields	Table 203 on page 812 lists the output fields for the show services accounting flow command. Output fields are listed in the approximate order in which they appear.

Table 203: show services accounting flow Output Fields

Output Field	Output Field Description
Service Accounting interface	Name of the service accounting interface.
Local interface index	Index counter of the local interface.
Service name	Name of a service that was configured at the [edit forwarding-options accounting] hierarchy level. The default display, (default sampling), indicates the service was configured at the [edit forwarding-options sampling-level] hierarchy level.
Flow Information	
Flow packets	Number of packets received by an operational PIC.
Flow bytes	Number of bytes received by an operational PIC.
Flow packets 10-second rate	Number of packets per second handled by the PIC and displayed as a 10-second average.
Flow bytes 10-second rate	Number of bytes per second handled by the PIC and displayed as a 10-second average.
Active flows	Number of currently active flows tracked by the PIC.
Total flows	Total number of flows received by an operational PIC.
Flows exported	Total number of flows exported by an operational PIC.

Table 203: show services accounting flow Output Fields (continued)

Output Field	Output Field Description
Flows packets exported	Total number of cflowd packets exported by an operational PIC.
Flows inactive timed out	Total number of flows that are exported because of inactivity.
Flows active timed out	Total number of long-lived flows that are exported because of an active timeout.

```

show services      user@host> show services accounting flow
accounting flow   Service Accounting interface: rsp0, Local interface index: 171
                    Service name: (default sampling)
                    Interface state: Accounting
                    Flow information
                      Flow packets: 87168293, Flow bytes: 5578770752
                      Flow packets 10-second rate: 45762, Flow bytes 10-second rate: 2928962
                      Active flows: 1000, Total flows: 2000
                      Flows exported: 19960, Flows packets exported: 582
                      Flows inactive timed out: 1000, Flows active timed out: 29000

show services      user@host> show services accounting flow count2
accounting flow name Service Accounting interface: mo-1/1/0, Local interface index: 15
                    Service name: count2
                    Flow information
                      Flow packets: 0, Flow bytes: 0
                      Flow packets 10-second rate: 0, Flow bytes 10-second rate: 0
                      Active flows: 0, Total flows: 0
                      Flows exported: 0, Flows packets exported: 0
                      Flows inactive timed out: 0, Flows active timed out: 0

show services      user@host> show services accounting flow name all
accounting flow name Service Accounting interface: rsp0, Local interface index: 171
all                 Service name: T2
                    Interface state: Accounting
                    Flow information
                      Flow packets: 37609891, Flow bytes: 2407033024
                      Flow packets 10-second rate: 45762, Flow bytes 10-second rate: 2928953
                      Active flows: 1000, Total flows: 1000
                      Flows exported: 6705, Flows packets exported: 198
                      Flows inactive timed out: 0, Flows active timed out: 13000

                    Service Accounting interface: rsp0, Local interface index: 171
                    Service name: T3
                    Interface state: Accounting
                    Flow information
                      Flow packets: 37750807, Flow bytes: 2416051712
                      Flow packets 10-second rate: 45762, Flow bytes 10-second rate: 2928940
                      Active flows: 1000, Total flows: 1000
                      Flows exported: 13437, Flows packets exported: 378
                      Flows inactive timed out: 0, Flows active timed out: 13000

                    Service Accounting interface: rsp0, Local interface index: 171
                    Service name: T4
                    Interface state: Accounting
                    Flow information
                      Flow packets: 0, Flow bytes: 0
                      Flow packets 10-second rate: 0, Flow bytes 10-second rate: 0

```

```
Active flows: 0, Total flows: 0
Flows exported: 0, Flows packets exported: 0
Flows inactive timed out: 0, Flows active timed out: 0

Service Accounting interface: rsp0, Local interface index: 171
Service name: count1
Interface state: Accounting
Flow information
  Flow packets: 0, Flow bytes: 0
  Flow packets 10-second rate: 0, Flow bytes 10-second rate: 0
  Active flows: 0, Total flows: 0
  Flows exported: 0, Flows packets exported: 0
  Flows inactive timed out: 0, Flows active timed out: 0
```

show services accounting flow-detail

Syntax show services accounting flow-detail
 <detail | extensive | terse>
 <filters>
 <limit *limit-value*>
 <name (* | all | *service-name*)>
 <order (bytes | packets)>

Release Information Command introduced before JUNOS Release 7.4.

Description Display information about the flows being processed by the accounting service.

Options detail | extensive | terse—(Optional) Display the specified level of output.

filters—(Optional) Filter the display output of the currently active flow records. The following filters query actively changing data structures and result in different results for multiple invocations:

- **destination-as**—Display flow records filtered by destination autonomous system information.
- **destination-port**—Display flow records filtered by destination port information.
- **destination-prefix**—Display flow records filtered by destination prefix information.
- **input-snmp-interface-index**—Display flow records filtered by SNMP input interface index information.
- **output-snmp-interface-index**—Display flow records filtered by SNMP output interface index information.
- **proto**—Display flow records filtered by protocol type.
- **source-as**—Display flow records filtered by source autonomous system information.
- **source-port**—Display flow records filtered by source port information.
- **source-prefix**—Display flow records filtered by source prefix information.
- **tos**—Display flow records filtered by type of service classification.

limit *limit-value*—(Optional) Limit the display output to the specified number of flows. The default is no limit.

name (* | all | *service-name*)—(Optional) Display information about the flows being processed. Use a wildcard character, specify all services, or provide a specific services name.

order (bytes | packets)—(Optional) Display the flow with the ordering of the highest number, either by byte count or by packet count.

Additional Information When no PIC is active, or when no route record has been downloaded from the PIC, this command reports no flows, even though packets are being sampled. This command displays information about two concurrent sessions only. If a third session is attempted, the command pauses with no output until one of the previous sessions is completed.

Required Privilege Level view

List of Sample Output show services accounting flow-detail on page 817
 show services accounting flow-detail limit on page 817
 show services accounting flow-detail name extensive on page 818
 show services accounting flow-detail limit order bytes on page 818
 show services accounting flow-detail source-port on page 818

Output Fields Table 204 on page 816 lists the output fields for the `show services accounting flow-detail` command. Output fields are listed in the approximate order in which they appear.

Table 204: show services accounting flow-detail Output Fields

Field Name	Field Description	Output Level
Service Accounting interface	Name of the service accounting interface.	All levels
Service name	Name of a service that was configured at the [edit forwarding-options accounting] hierarchy level. The default display, (default sampling), indicates the service was configured at the [edit forwarding-options sampling] hierarchy level.	All levels
Local interface index	Index counter of the local interface.	All levels
TOS	Type-of-service value from the IP header.	extensive
Input SNMP interface index	SNMP index of the interface on which the packet came in.	extensive
Output SNMP interface index	SNMP index of the interface on which the packet went out.	extensive
Source-AS	Source AS number.	extensive
Destination-AS	Destination AS number.	extensive
Protocol	Name of the protocol used for the packet flow from the corresponding source address.	All levels
Input interface	Interface on which the packets were received.	All levels
Output interface	Interface on which the packets were transmitted.	All levels
TCP flags	Number of TCP header flags detected in the flow.	extensive
Source address	Address where the flow originated.	All levels
Source port	Name of the source port.	All levels
Source prefix length	Source prefix length.	extensive

Table 204: show services accounting flow-detail Output Fields (continued)

Field Name	Field Description	Output Level
Destination address	Address where the flow is sent.	All levels
Destination prefix length	Destination prefix length.	extensive
Destination port	Name of the destination port.	All levels
Start time	Actual time when the packet in this aggregation was first seen.	detail extensive
End time	Actual time when the packet in this aggregation was last seen.	detail extensive
Packet count	Number of packets in the aggregation.	All levels
Byte count	Number of bytes in the aggregation.	All levels
Time since last active timeout	Amount of time elapsed since the last active timeout, in the format <i>hh:mm:ss</i> .	None specified
Packet count for last active timeout	Number of packets in the aggregation since the last active timeout.	None specified
Byte count for last active timeout	Number of bytes in the aggregation since the last active timeout.	None specified

**show services
accounting flow-detail**

In this sample, the output is split into three sections, with ellipses (...) indicating where the sections are continued.

```

user@host> show services accounting flow-detail
Service Accounting interface: rsp0, Local interface index: 171
Service name: (default sampling)
Interface state: Accounting
Protocol   Input           Source           Source   Output
           interface      address          port     interface...
tcp(6)     ge-5/0/1.0     11.1.1.2         0        ge-5/0/0.0
tcp(6)     ge-5/0/1.0     11.1.1.2         0        ge-5/0/0.0

Destination      Destination      Packet   Byte   Time since last
address          port            count    count active timeout...
40.0.3.149       0               2660    170240 00:00:58
40.0.3.138       0               2660    170240 00:00:58

Packet count for      Byte count for
last active timeout   last active timeout
2805                  179520
2805                  179520

```

**show services
accounting flow-detail
limit**

In this sample, the output is split into three sections, with ellipses (...) indicating where the sections are continued.

```

user@host> show services accounting flow-detail limit 1
Service Accounting interface: rsp0, Local interface index: 171
Service name: (default sampling)
Interface state: Accounting

```

```

Protocol   Input      Source      Source   Output
           interface address      port     interface...
tcp(6)     ge-5/0/1.0 11.1.1.2    0        ge-5/0/0.0

Destination      Destination      Packet   Byte   Time since last
address          port            count    count  active timeout...
40.0.3.149              0          2158   138112 00:00:47

Packet count for   Byte count for
last active timeout last active timeout
                2827                180928

```

**show services
accounting flow-detail
name extensive**

```

user@host> show services accounting flow-detail name cf-2 extensive
Service Accounting interface: mo-0/2/0, Local interface index: 145
Service name: cf-2
  TOS: 0, Protocol: udp(17), TCP flags: 0
  Source address: 10.10.10.1, Source prefix length: 0, Destination address:
20.20.20.20,
  Destination prefix length: 0, Source port: 1173, Destination port: 69
  Input SNMP interface index: 65, Output SNMP interface index: 0, Source-AS: 0,
Destination-AS: 0
  Start time: 62425, End time: 635265, Packet count: 165845, Byte count: 9453165

```

**show services
accounting flow-detail
limit order bytes**

The output of the following command is displayed over 141 columns, not the standard 80 columns. In this sample, the output is split into three sections, with ellipses (...) indicating where the sections are continued.

```

user@host> show services accounting flow-detail limit 5 order bytes
Service Accounting interface: mo-2/0/0, Local interface index: 356
Service name: (default sampling)

```

Protocol	Input interface	Source address	Source port	Output interface...
icmp(1)	ge-2/3/0.0	11.1.1.2	0	.local.
icmp(1)	ge-2/3/0.0	11.1.1.2	0	.local.
icmp(1)	ge-2/3/0.0	11.1.1.2	0	.local.
icmp(1)	ge-2/3/0.0	11.1.1.2	0	.local.
icmp(1)	ge-2/3/0.0	11.1.1.2	0	.local.

Destination address	Destination port	Packet count	Byte count	Time since last active timeout...
51.88.128.2	0	16	12148	Not applicable
52.78.144.2	0	16	15229	Not applicable
51.147.192.2	0	16	13296	Not applicable
51.136.16.2	0	16	13924	Not applicable
50.214.48.2	0	16	13428	Not applicable

Packet count for last active timeout	Byte count for last active timeout
Not applicable	Not applicable
Not applicable	Not applicable
Not applicable	Not applicable
Not applicable	Not applicable
Not applicable	Not applicable

**show services
accounting flow-detail
source-port**

```

user@host> show services accounting flow-detail name cf-2 detail source-port 1173
Service Accounting interface: mo-0/2/0, Local interface index: 145
Service name: cf-2
  Protocol: udp(17), Source address: 10.10.10.1, Source port: 1173, Destination
address:
20.20.20.20, Destination port: 69
  Start time: 62425, End time: 811115, Packet count: 142438, Byte count: 8118966

```

show services accounting memory

Syntax	show services accounting memory
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display memory and flow record statistics.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show services accounting memory on page 819
Output Fields	Table 205 on page 819 lists the output fields for the show services accounting memory command. Output fields are listed in the approximate order in which they appear.

Table 205: show services accounting memory Output Fields

Output Field	Output Field Description
Service Accounting interface	Name of the service accounting interface.
Memory Utilization	
Local interface index	Index counter of the local interface.
Allocation count	Number of flow records allocated.
Free count	Number of flow records freed.
Maximum allocated	Maximum number of flow records allocated since the monitoring station booted. This number represents the peak number of flow records allocated at a time.
Allocations per second	Flow records allocated per second during the last statistics interval on the PIC.
Frees per second	Flow records freed per second during the last statistics interval on the PIC.
Total memory used	Total amount of memory currently used (in bytes).
Total memory free	Total amount of memory currently free (in bytes).

```

show services      user@host> show services accounting memory
accounting memory Service Accounting interface: mo-2/0/0, Local interface index: 468
                    Memory utilization
                    Allocation count: 437340, Free count: 433699, Maximum allocated: 6782
                    Allocations per second: 3366, Frees per second: 6412
                    Total memory used (in bytes): 133460320,
                    Total memory free (in bytes): 133918352

```

show services accounting packet-size-distribution

Syntax	show services accounting packet-size-distribution <name (* all <i>service-name</i>)>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display a packet size distribution histogram.
Options	<p>none—Display a packet size distribution histogram of all accounting services.</p> <p>name (* all <i>service-name</i>)—(Optional) Display a packet size distribution histogram. Use a wildcard character, specify all services, or provide a specific services name.</p>
Required Privilege Level	view
List of Sample Output	show services accounting packet-size-distribution name on page 820
Output Fields	Table 206 on page 820 lists the output fields for the show services accounting packet-size-distribution command. Output fields are listed in the approximate order in which they appear.

Table 206: show services accounting packet-size-distribution Output Fields

Field Name	Field Description
Service Accounting interface	Name of the service accounting interface.
Service name	Name of a service that was configured at the [edit-forwarding-options accounting] hierarchy level. The default display, (default <i>sampling</i>), indicates the service was configured at the [edit-forwarding-options <i>sampling-level</i>] hierarchy level.
Local interface index	Index counter of the local interface.
Range start	Smallest packet length (in bytes) to count.
Range end	Largest packet length (in bytes) to count.
Number of packets	Count of packets detected in the size between <i>Range start</i> and <i>Range end</i> .
Percentage packets	Percentage of the total number of packets that are in this size range.

```

show services      user@host> show services accounting packet-size-distribution name test3
accounting        Service Accounting interface: mo-0/2/0, Local interface index: 163
packet-size-distribution Service name: test3
name              Range start      Range end      Number of packets      Percentage packets
                               32             64             2924                   100

```


show services accounting status

Syntax	show services accounting status <name (* all <i>service-name</i>)>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display available Physical Interface Cards (PICs) for accounting services.
Options	<p>none—Display available PICs for all accounting services.</p> <p>name (* all <i>service-name</i>)—(Optional) Display available PICs. Use a wildcard character, specify all services, or provide a specific services name.</p>
Required Privilege Level	view
List of Sample Output	show services accounting status name on page 822
Output Fields	Table 207 on page 821 lists the output fields for the show services accounting status command. Output fields are listed in the approximate order in which they appear.

Table 207: show services accounting status Output Fields

Field	Field Description
Service Accounting interface	Name of the service accounting interface.
Service name	Name of a service that was configured at the [edit-forwarding-options accounting] hierarchy level. The default display, (default sampling), indicates the service was configured at the [edit-forwarding-options sampling-level] hierarchy level.
Local interface index	Index counter of the local interface.
Interface state	<p>Accounting state of the passive monitoring interface.</p> <ul style="list-style-type: none"> ■ Accounting—PIC is actively accounting. ■ Disabled—PIC has been disabled from the CLI. ■ Not accounting—PIC is up but not accounting. This can happen while the PIC is coming online, or when the PIC is up but has no logical unit configured under the physical interface. ■ Unknown
Group index	Integer that represents the monitoring group of which the PIC is a member. Group index is a mapping from the group name to an index. It is not related to the number of monitoring groups.
Export interval (in seconds)	Configured export interval for cflowd records, in seconds.
Export format	Configured export format (only cflowd version 5 is supported).
Protocol	Protocol the PIC is configured to monitor (only IPv4 is supported).
Engine type	Configured engine type that is inserted in output cflowd packets.

Table 207: show services accounting status Output Fields *(continued)*

Field	Field Description
Engine ID	Configured engine ID that is inserted in output cflowd packets.

show services

accounting status name

```
user@host> show services accounting status name count1
Service Accounting interface: mo-2/0/0, Local interface index: 468
Service name: count1
Interface state: Accounting
Group index: 0
Export interval (in seconds): 60, Export format: cflowd v8
Protocol: IPv4, Engine type: 55, Engine ID: 5
```

show services accounting usage

Syntax	show services accounting usage <name <i>service-name</i> >
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display the CPU usage of PIC used for active flow monitoring.
Options	none—Display CPU usage for all service names. name <i>service-name</i> —(Optional) Display CPU usage for the specified service name.
Additional Information	When no route record has been downloaded from the PIC, this command reports no flows, even though packets are being sampled.
Required Privilege Level	view
List of Sample Output	show services accounting usage on page 824
Output Fields	Table 208 on page 823 lists the output fields for the show services accounting usage command. Output fields are listed in the approximate order in which they appear.

Table 208: show services accounting usage Output Fields

Output Field	Output Field Description
Service Accounting interface	Name of the service accounting interface.
Service name	Name of a service that was configured at the [edit-forwarding-options accounting] hierarchy level. The default display, (default sampling), indicates the service was configured at the [edit-forwarding-options sampling-level] hierarchy level.
Local interface index	Index counter of the local interface.
Uptime	Time that the PIC has been operational (in milliseconds).
Interrupt time	Total time that the PIC has spent processing packets since the last PIC reset (in microseconds).
Load (5 second)	CPU load on the PIC, averaged more than 5 seconds. The number is a percentage obtained by dividing the time spent on active tasks by the total elapsed time.
Load (1 minute)	CPU load on the PIC, averaged more than 1 minute. The number is a percentage obtained by dividing the time spent on active tasks by the total elapsed time.

```
show services      user@host> show services accounting usage  
accounting usage  Service Accounting interface: mo-1/1/0, Local interface index: 15  
                   Service name: (default sampling)  
                   CPU utilization  
                     Uptime: 600413856 milliseconds, Interrupt time: 2403 microseconds  
                     Load (5 second): 43%, Load (1 minute): 24%
```

show services dynamic-flow-capture content-destination

Syntax	show services dynamic-flow-capture content-destination capture-group <i>group-name</i> destination-identifier <i>identifier</i> <terse>
Release Information	Command introduced in JUNOS Release 7.4.
Description	(M320 routers and T-series routing platforms only) Display information about the content destination that receives packets from the dynamic flow capture (DFC) interface.
Options	capture-group <i>group-name</i> —Capture-group identifier. destination-identifier <i>identifier</i> —Content destination identifier. terse—(Optional) Display summary information.
Required Privilege Level	view
List of Sample Output	show services dynamic-flow-capture content-destination on page 826
Output Fields	Table 209 on page 825 lists the output fields for the show services dynamic-flow-capture content-destination command. Output fields are listed in the approximate order in which they appear.

Table 209: show services dynamic-flow-capture content-destination Output Fields

Output Field	Output Field Description	Level of Output
Capture group	Name of the capture group.	to be provided
Content destination	Name of the content destination.	to be provided
Criteria	Number of criteria specified.	to be provided
Bandwidth	Bandwidth used by the matched traffic.	to be provided
Matched packets	Number of matched packets sent to the content destination.	to be provided
Matched bytes	Number of matched bytes sent to the content destination.	to be provided
Congestion notifications	Number of notification messages sent.	to be provided

```
show services      user@host> show services dynamic-flow-capture content-destination capture-group  
dynamic-flow-capture g1 destination-identifier cd1 terse  
content-destination    Capture group: g1, Content destination: cd1, Criteria: 0, Bandwidth: 0, Matched  
                          packets: 0, Matched bytes: 0, Congestion notifications: 0
```

show services dynamic-flow-capture control-source

Syntax	show services dynamic-flow-capture control-source capture-group <i>group-name</i> control-source <i>identifier</i> <detail terse>
Release Information	Command introduced in JUNOS Release 7.4.
Description	(M320 routers and T-series routing platforms only) Display information about the control source that makes dynamic flow capture requests to the dynamic flow capture interface.
Options	capture-group <i>group-name</i> —Capture group identifier. control-source <i>identifier</i> —Control source identifier. detail terse—(Optional) Display the specified level of output.
Required Privilege Level	view
List of Sample Output	show services dynamic-flow-capture control-source on page 828 show services dynamic-flow-capture control-source detail on page 828
Output Fields	Table 210 on page 827 lists the output fields for the show services dynamic-flow-capture control-source scommand. Output fields are listed in the approximate order in which they appear.

Table 210: show services dynamic-flow-capture control-source Output Fields

Output Field	Output Field Description	Level of Output
Capture group	Name of the capture group.	to be provided
Control source	Name of the control source.	to be provided
Criteria added, Criteria add failed	Number of criteria added or added and failed.	to be provided
Active criteria	Number of active criteria.	to be provided
Static criteria, Dynamic criteria	Number of static or dynamic criteria.	to be provided
Control protocol requests	Total number of control protocol requests.	to be provided
Requests	Number of Add, Delete, List, Refresh, and No-op control protocol requests.	to be provided
Failed	Number of Add, Delete, List, Refresh, and No-op failed control protocol requests.	to be provided
Add request rate	Rate of add requests.	to be provided
Add request peak rate	Peak rate of add requests.	to be provided

Table 210: show services dynamic-flow-capture control-source Output Fields (continued)

Output Field	Output Field Description	Level of Output
Bandwidth across all criteria	Bandwidth used by all the requests.	to be provided
Total notifications	Total number of notifications sent and the number of notifications by category: Restart, Rollover, Timeout, Congestion, Congestion delete, and Dups (duplicates) dropped.	to be provided
Criteria deleted	Total number of criteria deleted and the number of deleted criteria by category: Timeout idle, Timeout total, Packets, and Bytes.	to be provided
Sequence number	Sequence number.	to be provided

```

show services      user@host> show services dynamic-flow-capture control-source source-identifier
dynamic-flow-capture cs0_cg0 capture-group cg_0
control-source      Capture group: cg_0, Control source: cs0_cg0
                      Criteria added: 28, Criteria add failed: 0, Active criteria: 0, Control protocol
                      requests: 28, Add request rate: 0,
                      Add request peak rate: 1, Bandwidth across all criteria: 0, Total notifications:
                      1, Criteria deleted: 28, Sequence number: 0

show services      user@host> show services dynamic-flow-capture control-source source-identifier
dynamic-flow-capture cs0_cg0 capture-group cg_0 detail
control-source detail Capture group: cg_0, Control source: cs0_cg0
                      Criteria added: 28, Criteria add failed: 0
                      Active criteria: 0
                      Static criteria: 0, Dynamic criteria: 0
                      Control protocol requests: 28
                      Add          Delete          List          Refresh          No-op
                      Requests      28           0           0           0           0
                      Failed        0           0           0           0           0

                      Add request rate: 0
                      Add request peak rate: 1
                      Bandwidth across all criteria: 0
                      Total notifications: 1
                      Restart: 1, Rollover: 0, No-op: 0, Timeout: 0, Congestion: 0, Congestion
                      delete: 0, Dups dropped: 0
                      Criteria deleted: 28
                      Timeout idle: 0, Timeout total: 0, Packets: 0, Bytes: 0
                      Sequence number: 0

```


show services dynamic-flow-capture statistics

Syntax	show services dynamic-flow-capture statistics capture-group <i>group-name</i>
Release Information	Command introduced in JUNOS Release 7.4.
Description	(M320 routers and T-series routing platforms only) Display statistics information about the capture group specified for dynamic flow capture.
Options	capture-group <i>group-name</i> —Capture group identifier.
Required Privilege Level	view
List of Sample Output	show services dynamic-flow-capture statistics on page 830
Output Fields	Table 211 on page 829 lists the output fields for the show services dynamic-flow-capture statistics command. Output fields are listed in the approximate order in which they appear.

Table 211: show services dynamic-flow-capture statistics Output Fields

Output Field	Output Field Description
Input	<p>Incoming dynamic flow capture packet statistics:</p> <ul style="list-style-type: none"> ■ Control protocol packets—Number of control protocol packets received. ■ Captured data packets—Number of data packets captured. ■ Control IRI packets—Number of control IRI packets received.
Control protocol drops	<p>Control protocol packets dropped for the following reasons:</p> <ul style="list-style-type: none"> ■ Not IP packets—Dropped packets were not IP packets. ■ Not UDP packets—Dropped packets were not User Datagram Protocol (UDP) packets. ■ Invalid destination address—Dropped packets had invalid destination addresses. ■ No memory—Packets dropped because of insufficient memory. ■ Unauthorized control source—Packets dropped because the control source was not authenticated. ■ Bad request—Packets dropped because the request was invalid. ■ Unknown control source—Packets dropped because the control source was not known. ■ Not DTCP—Dropped packets did not adhere to the control protocol format. ■ Bad command line—Packets dropped because of a version mismatch. ■ Bandwidth exceeded—Packets dropped because the bandwidth was exceeded. ■ Drop rate due to exceeded bandwidth—Rate of traffic dropped because the bandwidth was exceeded. ■ Other—Packets dropped for other reasons or undetermined causes.

Table 211: show services dynamic-flow-capture statistics Output Fields (*continued*)

Output Field	Output Field Description
Input drops	<p>Incoming dynamic flow capture packets dropped for the following reasons:</p> <ul style="list-style-type: none"> ■ Unknown packets—Packets dropped because the packet type was not recognized. ■ Captured data not IPv4—Packets dropped because they were not IPv4 packets. ■ Captured data too small—Packets dropped because they were smaller than the size reported in their headers. ■ Captured data drops—Data packets dropped because of undetermined causes. ■ Captured data not matched—Packets dropped because they did not match filter criteria. ■ Bandwidth exceeded—Packets dropped because the bandwidth was exceeded. ■ Drop rate due to exceeded bandwidth—Rate of traffic dropped because the bandwidth was exceeded.
Output	<p>Outgoing dynamic flow capture packet statistics:</p> <ul style="list-style-type: none"> ■ Control protocol packets—Number of control protocol packets sent. ■ Captured data packets—Number of captured data packets sent.
Output drops	<p>Outgoing packets dropped:</p> <ul style="list-style-type: none"> ■ Control protocol drops—Number of control protocol packets dropped. ■ Captured data drops—Number of captured data packets dropped.
Flow Statistics	<p>DFC flow statistics:</p> <ul style="list-style-type: none"> ■ Active flow cache entries ■ Active flow cache usage percentage ■ Flow cache entries allocated ■ Number of control sources ■ Number of content destinations ■ Number of criteria ■ Maximum criteria matching one flow ■ Cached flows purged for memory ■ Maximum filters matching one packet

**show services
dynamic-flow-capture
statistics**

```

user@host> show services dynamic-flow-capture statistics capture-group g1
Input:

Control protocol packets: 643, Captured data packets: 69977, Control IRI packets:
337

Control protocol drops:

Not IP packets: 0, Not UDP packets: 3, Invalid destination address: 0, No memory:
0, Unauthorized control source: 0,

Bad request: 0, Unknown control source: 0, Not DTCP: 0, Bad command line: 0,
Bandwidth exceeded: 0,

Drop rate due to exceeded bandwidth: 0, Other: 0

```

Input drops:

Unknown packets: 0, Captured data not IPv4: 0, Captured data too small: 0,
Captured data drops: 0, Captured data not matched: 0,

Bandwidth exceeded: 0, Drop rate due to exceeded bandwidth: 0

Output:

Control protocol packets: 644, Captured data packets: 1119624

Output drops:

Control protocol drops: 0, Captured data drops: 0

Flow Statistics:

Active flow cache entries: 40, Active flow cache usage percentage: 0, Flow cache
entries allocated: 40,

Number of control sources: 4, Number of content destinations: 64, Number of
criteria: 640,

Maximum criteria matching one flow: 16, Cached flows purged for memory: 0,
Maximum filters matching one packet: 16

show services flow-collector file interface

Syntax	show services flow-collector file interface (all <i>cp-fpc/pic/port</i>) <detail extensive terse>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M40e, M160, and M320 routers and T-series routing platforms only) Display information about flow collector files.
Options	all <i>cp-fpc/pic/port</i> —Display file information for all configured flow collector interfaces or for the specified interface. detail extensive terse—(Optional) Display the specified level of output.
Additional Information	No entries are displayed for files that have been successfully transferred.
Required Privilege Level	view
List of Sample Output	show services flow-collector file interface extensive on page 833
Output Fields	Table 212 on page 832 lists the output fields for the show services flow-collector file interface command. Output fields are listed in the approximate order in which they appear.

Table 212: show services flow-collector file interface Output Fields

Output Field	Output Field Description	Level of Output
Filename	Name of the file created on the flow collector interface.	All levels
Flows	Total number of collector flows for which records are present in the file.	none specified
Throughput	Throughput statistics: <ul style="list-style-type: none"> ■ Flow records—Number of flow records in the file. <ul style="list-style-type: none"> ■ per second—Average number of flow records per second. ■ peak per second—Peak number of flow records per second. ■ Uncompressed bytes—Total file size before compression. <ul style="list-style-type: none"> ■ per second—Average number of uncompressed bytes per second. ■ peak per second—Peak number of uncompressed bytes per second. ■ Compressed bytes—Total file size after compression. <ul style="list-style-type: none"> ■ per second—Average number of compressed bytes per second. ■ peak per second—Peak number of compressed bytes per second. 	extensive

Table 212: show services flow-collector file interface Output Fields (continued)

Output Field	Output Field Description	Level of Output
Status	<p>File statistics:</p> <ul style="list-style-type: none"> ■ Compressed blocks—(extensive output only) Data blocks in the file that have been compressed. The file is exported only when the compressed block count and block count become the same. ■ Block count—(extensive output only) Total number of data blocks in the file. ■ State—Processing state of the file. <ul style="list-style-type: none"> ■ Active—The flow collector interface is writing to the file. ■ Export 1—File export is in progress to the primary server. ■ Export 2—File export is in progress to the secondary server. ■ Wait—File is pending export. ■ Transfer attempts 0.—Number of attempts made to transfer the file. If the file is successfully transferred in the first attempt, this field is 0. 	All levels

**show services
flow-collector file
interface extensive**

```

user@host> show services flow-collector file interface cp-3/2/0 extensive
Filename: cFlowd-py69Ni69-0-20031112_014301-so_3_0_0_0.bcp.bi.gz
Throughput:
  Flow records: 188365, per second: 238, peak per second: 287
  Uncompressed bytes: 21267756, per second: 27007, peak per second: 32526
  Compressed bytes: 2965643, per second: 0, peak per second: 22999
Status:
  Compressed blocks: 156, Block count: 156
  State: Active, Transfer attempts: 0

```

show services flow-collector input interface

Syntax	show services flow-collector input interface (all cp-fpc/pic/port) <detail extensive terse>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M40e, M160, and M320 routers and T-series routing platforms only) Display the number of packets received by collector interfaces from monitoring interfaces.
Options	all cp-fpc/pic/port—Display packets received by all configured flow collector interfaces or by the specified interface. detail extensive terse—(Optional) Display the specified level of output.
Required Privilege Level	view
List of Sample Output	show services flow-collector input interface on page 834 show services flow-collector input interface all on page 834
Output Fields	Table 213 on page 834 lists the output fields for the show services flow-collector input interface command. Output fields are listed in the approximate order in which they appear.

Table 213: show services flow-collector input interface Output Fields

Output Field	Output Field Description	Level of Output
Interface	Name of the monitoring interface.	to be provided
Packets	Number of packets traveling from the monitoring interface to the flow collector interface.	to be provided
Bytes	Number of bytes traveling from the monitoring interface to the flow collector interface.	to be provided

```

show services      user@host> show services flow-collector input interface cp-3/2/0
flow-collector input
interface          Interface      Packets      Bytes
mo-3/0/0.0           21706        32328568
mo-3/1/0.0           21706        32329096

show services      user@host> show services flow-collector input interface all
flow-collector input
interface all      Flow collector interface: cp-6/1/0
                    Interface state: Collecting flows
                    Interface      Packets      Bytes
mo-3/0/0.0           274          416232
mo-3/3/0.0           274          416184
mo-1/0/0.0           274          416232
mo-1/1/0.0           274          416232
mo-1/2/0.0           274          416232
mo-1/3/0.0           274          416232
mo-3/1/0.0           274          416232
mo-4/0/0.0           274          416232

```

mo-4/1/0.0	274	416232
mo-4/2/0.0	274	416184
mo-4/3/0.0	274	416232
mo-5/0/0.0	274	416232
mo-5/1/0.0	274	416232
mo-5/2/0.0	274	416232
mo-5/3/0.0	274	416232
mo-6/0/0.0	274	416232

Flow collector interface: cp-6/3/0
Interface state: Collecting flows

show services flow-collector interface

Syntax	show services flow-collector interface (all <i>cp-fpc/pic/port</i>) <detail extensive terse>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M40e, M160, and M320 routers and T-series routing platforms only) Display overall statistics for the flow collector application.
Options	all <i>cp-fpc/pic/port</i> —Display statistics for flow collector applications on all interfaces or for the specified interface. detail extensive terse—(Optional) Display the specified level of output.
Required Privilege Level	view
List of Sample Output	show services flow-collector interface all detail on page 839 show services flow-collector interface all extensive on page 839 show services flow-collector interface all terse on page 841 show services flow-collector interface extensive on page 841
Output Fields	Table 214 on page 836 lists the output fields for the show services flow-collector interface command. Output fields are listed in the approximate order in which they appear.

Table 214: show services flow-collector interface Output Fields

Output Field	Output Field Description	Level of Output
Flow collector interface	Name of the flow collector interface.	All levels
Interface state	Collecting flow state for the interface.	All levels
Packets	Total number of packets received.	none specified
Flows Uncompressed Bytes	Total uncompressed data size for all files created on this PIC.	none specified
Compressed Bytes	Total compressed data size for all files created on this PIC.	none specified
FTP bytes	Total number of bytes transferred to the FTP server, including those dropped during transfer.	none specified
FTP files	Total number of FTP transfers attempted by the server.	none specified
Memory	Bytes used on the PIC and bytes free.	detail extensive

Table 214: show services flow-collector interface Output Fields (continued)

Output Field	Output Field Description	Level of Output
Input	<p>Incoming flow collector packet statistics:</p> <ul style="list-style-type: none"> ■ Packets—Number of packets received on the unit. <ul style="list-style-type: none"> ■ per second—Average number of packets per second. ■ peak per second—Peak number of packets per second. ■ Bytes—Number of bytes received on the unit. <ul style="list-style-type: none"> ■ per second—Average number of bytes per second. ■ peak per second—Peak number of bytes per second. ■ Flow records processed—Number of records in the flow collector packets that were processed by the flow-collector interface. <ul style="list-style-type: none"> ■ per second—Average number of flow records processed per second. ■ peak per second—Peak number of flow records per second. 	detail extensive
Allocation	<p>Data block statistics:</p> <ul style="list-style-type: none"> ■ Blocks allocated—Total number of data blocks (containing flow records) allocated to the files created on this PIC. <ul style="list-style-type: none"> ■ per second—Average number of blocks allocated per second. ■ peak per second—Peak number of blocks allocated per second. ■ Blocks freed—Total number of data blocks freed. <ul style="list-style-type: none"> ■ per second—Average number of blocks freed per second. ■ peak per second—Peak number of blocks freed per second. ■ Blocks unavailable—Total number of data block requests denied, typically because of a memory shortage. <ul style="list-style-type: none"> ■ per second—Average number of blocks unavailable per second. ■ peak per second—Peak number of blocks unavailable per second. 	extensive
Files	<p>File statistics, incremented since the PIC last booted:</p> <ul style="list-style-type: none"> ■ Files created—Total number of files created on this PIC. ■ Files exported— Number of files successfully created and exported. ■ Files destroyed—(extensive output only) Number of files successfully exported and files dropped by the flow collection interface. 	detail extensive
Throughput	<p>Throughput statistics:</p> <ul style="list-style-type: none"> ■ Uncompressed bytes—Total uncompressed data size for all files created on this PIC. <ul style="list-style-type: none"> ■ per second—Average number of uncompressed bytes per second. ■ peak per second—Peak number of uncompressed bytes per second. ■ Compressed bytes—Total compressed data size for all files created on this PIC. <ul style="list-style-type: none"> ■ per second—Average number of compressed bytes per second. ■ peak per second—Peak number of compressed bytes per second. 	detail extensive

Table 214: show services flow-collector interface Output Fields (continued)

Output Field	Output Field Description	Level of Output
Packet drops	<p>Number of packets dropped for the following causes:</p> <ul style="list-style-type: none"> ■ No memory—Packets dropped because of insufficient memory. ■ Not IP—Packets dropped because they are not IP packets. ■ Not IPv4—Packets dropped because they are not IP version 4 packets. ■ Too small—Packets dropped because each packet was smaller than the size reported in its header. ■ Fragments—Packets dropped because of fragmentation. Fragments are not reassembled. ■ ICMP—Packets dropped because they are not ICMP packets. ■ TCP—Packets dropped because they are not TCP packets. ■ Unknown—Packets dropped because of undetermined causes. ■ Not JUNOS flow—Packets dropped because they are not interpreted by the JUNOS software. The JUNOS software interprets only IPv4, UDP cflowd version 5 packets. 	extensive
File transfer	<p>File transfer statistics:</p> <ul style="list-style-type: none"> ■ FTP bytes—Total number of bytes transferred to the FTP server, including those dropped during transfer. ■ FTP files—Total number of FTP transfers attempted by the server. ■ FTP failure—Total number of FTP failures encountered by the server. 	detail extensive
Flow collector interface	Physical interface acting as a flow collector.	detail
Export channel	<p>Export channel 0 is unit 0. Export channel 1 is unit 1. Flow receive channel is unit 2. Server status statistics are the following:</p> <ul style="list-style-type: none"> ■ Current server Primary or Secondary—Current FTP server being used. Value is ■ Primary server state—State of the server: <ul style="list-style-type: none"> ■ OK—Server is operating without problems. ■ FTP error—Server encountered an FTP protocol error while sending files. ■ Network error—Flow-collector interface has errors when contacting the primary FTP server. ■ Unknown—First file transfer has not been sent to the primary server. ■ Secondary server state—State of the server: <ul style="list-style-type: none"> ■ OK—Server is operating without errors. ■ FTP error—Server encountered an FTP protocol error while sending files. ■ Network error—Flow-collector interface has errors when contacting the secondary FTP server. ■ Unknown—First file transfer has not been sent to the secondary server. ■ Not configured—Secondary server is not configured. 	detail extensive

**show services
flow-collector interface
all detail**

```

user@host> show services flow-collector interface all detail
Flow collector interface: cp-6/1/0
Interface state: Collecting flows
Memory:
  Used: 51452732, Free: 440329088
Input:
  Packets: 4384, per second: 0, peak per second: 156
  Bytes: 6659616, per second: 0, peak per second: 249695
  Flow records processed: 131070, per second: 0, peak per second: 4914
Files:
  Files created: 1, per second: 0, peak per second: 0
  Files exported: 1, per second: 0, peak per second: 0
Throughput:
  Uncompressed bytes: 13742307, per second: 0, peak per second: 593564
  Compressed bytes: 3786177, per second: 0, peak per second: 162826
File Transfer:
  FTP bytes: 3786247, per second: 0, peak per second: 378620
  FTP files: 1, per second: 0, peak per second: 0
  FTP failure: 0
Export channel: 0
  Current server: Primary
  Primary server state: OK, Secondary server state: OK
Export channel: 1
  Current server: Primary
  Primary server state: Unknown, Secondary server state: OK

Flow collector interface: cp-6/3/0
Interface state: Collecting flows
Memory:
  Used: 51452732, Free: 440329088
Input:
  Packets: 0, per second: 0, peak per second: 0
  Bytes: 0, per second: 0, peak per second: 0
  Flow records processed: 0, per second: 0, peak per second: 0
Files:
  Files created: 0, per second: 0, peak per second: 0
  Files exported: 0, per second: 0, peak per second: 0
Throughput:
  Uncompressed bytes: 0, per second: 0, peak per second: 0
  Compressed bytes: 0, per second: 0, peak per second: 0
File Transfer:
  FTP bytes: 70, per second: 0, peak per second: 6
  FTP files: 0, per second: 0, peak per second: 0
  FTP failure: 0
Export channel: 0
  Current server: Primary
  Primary server state: Unknown, Secondary server state: OK
Export channel: 1
  Current server: Primary
  Primary server state: Unknown, Secondary server state: OK

```

**show services
flow-collector interface
all extensive**

```

user@host> show services flow-collector interface all extensive
Flow collector interface: cp-6/1/0
Interface state: Collecting flows
Memory:
  Used: 51452732, Free: 440329088
Input:
  Packets: 4384, per second: 0, peak per second: 156
  Bytes: 6659616, per second: 0, peak per second: 249695
  Flow records processed: 131070, per second: 0, peak per second: 4914
Allocation:

```

```

        Blocks allocated: 108, per second: 0, peak per second: 0
        Blocks freed: 108, per second: 0, peak per second: 10
        Blocks unavailable: 0, per second: 0, peak per second: 0
Files:
    Files created: 1, per second: 0, peak per second: 0
    Files exported: 1, per second: 0, peak per second: 0
    Files destroyed: 1, per second: 0, peak per second: 0
Throughput:
    Uncompressed bytes: 13742307, per second: 0, peak per second: 593564
    Compressed bytes: 3786177, per second: 0, peak per second: 162826
Packet drops:
    No memory: 0, Not IP: 0
    Not IPv4: 0, Too small: 0
    Fragments: 0, ICMP: 0
    TCP: 0, Unknown: 0
    Not JUNOS flow: 0
File Transfer:
    FTP bytes: 3786247, per second: 0, peak per second: 378620
    FTP files: 1, per second: 0, peak per second: 0
    FTP failure: 0
Export channel: 0
    Current server: Primary
    Primary server state: OK, Secondary server state: OK
Export channel: 1
    Current server: Primary
    Primary server state: Unknown, Secondary server state: OK

Flow collector interface: cp-6/3/0
Interface state: Collecting flows
Memory:
    Used: 51452732, Free: 440329088
Input:
    Packets: 0, per second: 0, peak per second: 0
    Bytes: 0, per second: 0, peak per second: 0
    Flow records processed: 0, per second: 0, peak per second: 0
Allocation:
    Blocks allocated: 0, per second: 0, peak per second: 0
    Blocks freed: 0, per second: 0, peak per second: 0
    Blocks unavailable: 0, per second: 0, peak per second: 0
Files:
    Files created: 0, per second: 0, peak per second: 0
    Files exported: 0, per second: 0, peak per second: 0
    Files destroyed: 0, per second: 0, peak per second: 0
Throughput:
    Uncompressed bytes: 0, per second: 0, peak per second: 0
    Compressed bytes: 0, per second: 0, peak per second: 0
Packet drops:
    No memory: 0, Not IP: 0
    Not IPv4: 0, Too small: 0
    Fragments: 0, ICMP: 0
    TCP: 0, Unknown: 0
    Not JUNOS flow: 0
File Transfer:
    FTP bytes: 70, per second: 0, peak per second: 6
    FTP files: 0, per second: 0, peak per second: 0
    FTP failure: 0
Export channel: 0
    Current server: Primary
    Primary server state: Unknown, Secondary server state: OK
Export channel: 1

```

Current server: Primary
 Primary server state: Unknown, Secondary server state: OK

```

show services      user@host> show services flow-collector interface all terse
flow-collector interface Flow collector interface: cp-6/1/0
all terse           Interface state: Collecting flows
                    Packets      Bytes      Flows Uncompressed   Compressed   FTP bytes FTP files
                      Bytes      Bytes      Bytes      Bytes
                    4384    6659616    131070    13742307    3786177      3786247      1

Flow collector interface: cp-6/3/0
Interface state: Collecting flows
                    Packets      Bytes      Flows Uncompressed   Compressed   FTP bytes FTP files
                      Bytes      Bytes      Bytes      Bytes
                    0         0         0         0         0         70         0

show services      user@host> show services flow-collector interface cp-5/2/0 extensive
flow-collector interface Flow collector interface: cp-5/2/0
extensive           Interface state: Collecting flows
Memory:
    Used: 458311860, Free: 40810008
Input:
    Packets: 922629, per second: 2069, peak per second: 3266
    Bytes: 1376559252, per second: 3096940, peak per second: 4880051
    Flow records processed: 25764957, per second: 42564, peak per second: 98124
Allocation:
    Blocks allocated: 20862, per second: 31, peak per second: 72
    Blocks freed: 17161, per second: 40, peak per second: 202
    Blocks unavailable: 58786, per second: 652, peak per second: 1120
Files:
    Files created: 52, per second: 0, peak per second: 0
    Files exported: 42, per second: 0, peak per second: 0
    Files destroyed: 42, per second: 0, peak per second: 0
Throughput:
    Uncompressed bytes: 2592070401, per second: 7297307,
    peak per second: 8630023
    Compressed bytes: 659600068, per second: 1858458, peak per second: 2198471
Packet drops:
    No memory: 58786, Not IP: 0
    Not IPv4: 0, Too small: 0
    Fragments: 0, ICMP: 0
    TCP: 0, Unknown: 0
    Not JUNOS flow: 0
File Transfer:
    FTP bytes: 585981447, per second: 1313320, peak per second: 4857798
    FTP files: 48, per second: 0, peak per second: 0
    FTP failure: 8
Export channel: 0
    Current server: Primary
    Primary server state: FTP error, Secondary server state: Not configured
Export channel: 1
    Current server: Primary
    Primary server state: OK, Secondary server state: Not configured
  
```


Chapter 21

Intrusion Detection Service Operational Mode Commands

Table 215 on page 843 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot the intrusion detection service (IDS). Commands are listed in alphabetical order.

Table 215: IDS Operational Mode Commands

Task	Command
Clear (set to zero) IDS events and event information.	<code>clear services ids</code>
Clear the IDS events for a particular address that might be under attack.	<code>clear services ids destination-table</code>
Clear the IDS attack source and destination address pair table.	<code>clear services ids pair-table</code>
Clear all IDS events for addresses that are suspected attackers.	<code>clear services ids source-table</code>
Display IDS event information.	<code>show services ids</code>



NOTE: IDS is supported on the adaptive services interface on the following routing platforms:

- J-series routing platform—`sp-pim/0/slot`
- M-series and T-series routing platforms—`sp-fpc/pic/port`

IDS is also supported on the redundant adaptive services interface (`rspnumber`) on M-series and T-series routing platforms.



NOTE: For information about how to configure IDS, see the *JUNOS Services Interfaces Configuration Guide*.

clear services ids

Syntax	clear services ids <interface <i>interface-name</i> > <service-set <i>service-set-name</i> >
Release Information	Command introduced before JUNOS Release 7.4.
Description	Clear intrusion detection service (IDS) events.
Options	<p>none—Clear all IDS events for all adaptive services interfaces for all service sets, and clear and reset IDS.</p> <p>interface <i>interface-name</i>—(Optional) On M-series and T-series routing platforms, the <i>interface-name</i> can be <i>sp-fpc/pic/port</i> or <i>rspnumber</i>. On the J-series routing platform, the <i>interface-name</i> is <i>sp-pim/0/port</i>.</p> <p>service-set <i>service-set-name</i>—(Optional) Clear all IDS events for a particular service set.</p>
Required Privilege Level	view
List of Sample Output	clear services ids on page 844
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear services ids	user@host> clear services ids

clear services ids destination-table

Syntax	clear services ids destination-table <destination-prefix <i>destination-prefix-name</i> > <interface <i>interface-name</i> > <service-set <i>service-set-name</i> >
Release Information	Command introduced before JUNOS Release 7.4.
Description	Clear the intrusion detection service (IDS) events for a particular address that might be under attack.
Options	<p>none—Clear the attack destination address table.</p> <p>destination-prefix <i>destination-prefix-name</i>—(Optional) Clear the attack destination table for a particular destination prefix.</p> <p>interface <i>interface-name</i>—(Optional) Clear the attack destination table for a particular interface. On M-series and T-series routing platforms, the <i>interface-name</i> can be <i>sp-fpc/pic/port</i> or <i>rspnumber</i>. On the J-series routing platform, the <i>interface-name</i> is <i>sp-pim/0/port</i>.</p> <p>service-set <i>service-set-name</i>—(Optional) Clear the attack destination table for a particular service set.</p>
Required Privilege Level	view
List of Sample Output	clear services ids destination-table on page 845
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear services ids destination-table	user@host> clear services ids destination-table

clear services ids pair-table

Syntax	clear services ids pair-table <destination-prefix <i>destination-prefix-name</i> > <interface <i>interface-name</i> > <service-set <i>service-set-name</i> > <source-prefix <i>source-prefix-name</i> >
Release Information	Command introduced before JUNOS Release 7.4.
Description	Clear the intrusion detection service (IDS) attack source and destination address pair table.
Options	<p>none—Clear the attack source and destination address pair table.</p> <p>destination-prefix <i>destination-prefix-name</i>—(Optional) Clear the attack source and destination address pair table for a particular destination prefix.</p> <p>interface <i>interface-name</i>—(Optional) Clear the attack destination table for a particular interface. On M-series and T-series routing platforms, the <i>interface-name</i> can be <i>sp-fpc/pic/port</i> or <i>rspnumber</i>. On the J-series routing platform, the <i>interface-name</i> is <i>sp-pim/0/port</i>.</p> <p>service-set <i>service-set-name</i>—(Optional) Clear the attack source and destination address pair table for a particular service set.</p> <p>source-prefix <i>source-prefix-name</i>—(Optional) Clear the attack source and destination address pair table for a particular source prefix.</p>
Required Privilege Level	view
List of Sample Output	clear services ids pair-table on page 846
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear services ids pair-table	user@host> clear services ids pair-table

clear services ids source-table

Syntax	clear services ids source-table <interface <i>interface-name</i> > <service-set <i>service-set-name</i> > <source-prefix <i>source-prefix-name</i> >
Release Information	Command introduced before JUNOS Release 7.4.
Description	Clear all intrusion detection service (IDS) events for addresses that are suspected attackers.
Options	<p>none—Clear the attack source address table.</p> <p>interface <i>interface-name</i>—(Optional) On M-series and T-series routing platforms, the <i>interface-name</i> can be <i>sp-fpc/pic/port</i> or <i>rspnumber</i>. On the J-series routing platform, the <i>interface-name</i> is <i>sp-pim/0/port</i>.</p> <p>service-set <i>service-set-name</i>—(Optional) Clear the attack source address table for a particular service set.</p> <p>source-prefix <i>source-prefix-name</i>—(Optional) Clear the attack source address table for a particular source prefix.</p>
Required Privilege Level	view
List of Sample Output	clear services ids source-table on page 847
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear services ids source-table	user@host> clear services ids source-table

show services ids

Syntax show services ids (destination-table | pair-table | source-table)
 <brief | extensive | terse>
 <destination-prefix *destination-prefix-name*>
 <interface *interface-name*>
 <limit *number*>
 <order (anomalies | bytes | flows | packets)>
 <service-set *service-set-name*>
 <source-prefix *source-prefix-name*>
 <threshold *number*>

Release Information Command introduced before JUNOS Release 7.4.

Description Display information about intrusion detection service (IDS) events. All events gathered by IDS are reported as anomalies. For example, events such as **create forward** or **watch flow**, **FTP passive**, and **FTP active** are genuinely allowed by the stateful firewall but are logged as anomalies to track the rates and number for these events.

Options

- destination-table**—Display information for an address under possible attack.
- pair-table**—Display information for a particular suspected attack source and destination address pair.
- source-table**—Display information for an address that is a suspected attacker.
- brief | extensive | terse**—(Optional) Display the specified level of output.
- destination-prefix *destination-prefix-name***—(Optional) Display information for a particular destination prefix.
- interface *interface-name***—(Optional) On M-series and T-series routing platforms, the *interface-name* can be *sp-fpc/pic/port* or *rspnumber*. On the J-series routing platform, the *interface-name* is *sp-pim/O/port*.
- limit *number***—(Optional) Maximum number of entries to display. By default, all tables display the top 32 entries sorted by the number of events for the criteria chosen. To display additional entries, configure the limit option to set up to 256 entries.
- order**—(Optional) Display events according to one of the following table-ordering criteria. The default is anomalies.
 - **anomalies**—Display information for particular anomalies.
 - **bytes**—Order output by number of bytes received.
 - **flows**—Order output by number of flows.
 - **packets**—Order output by number of packets received.
- service-set *service-set-name***—(Optional) Display information about a particular service set.

source-prefix *source-prefix-name*—(Optional) Display information about a particular source prefix.

threshold *number*—(Optional) Limit the display to events with this number of anomalies, bytes, flows, or packets, whichever criterion you specify for order. For example, to display all events with more than 100 flows, specify `order flows` and `threshold 100`.

Required Privilege Level view

List of Sample Output

- `show services ids destination-table` on page 852
- `show services ids destination-table extensive` on page 852
- `show services ids destination-table extensive order anomalies` on page 852
- `show services ids pair-table extensive` on page 853
- `show services ids pair-table extensive limit` on page 853
- `show services ids source-table extensive` on page 854
- `show services ids source-table extensive limit` on page 854

Output Fields Table 216 on page 849 lists the output fields for the `show services ids` command. Output fields are listed in the approximate order in which they appear.

Table 216: show services ids Output Fields

Field Name	Field Description	Output Level
Interface	Name of an adaptive services interface.	All levels
Service set	Name of a service set. Individual empty service sets are not displayed, but if no service set has any flows, a flow table header is printed for each service set.	All levels
Sorting order	Primary mode to display information: Anomalies, Bytes, Flows, or Packets .	All levels
Source address	Name of the source address.	All levels
Dest address	Name of the destination address.	All levels
Time	Total time the information has been in the table.	All levels
Flags	Flags can be Forced , F (terse output only), SYNcookie , S (terse output only), Forced+SYNcookie , and F+S (terse output only). The SYNcookie flag is visible only in the destination table.	All levels
Application	Configured application, such as FTP or Telnet .	All levels
Bytes	Total number of bytes sent from the source to the destination address, in thousands (k) or millions (m).	All levels
Packets	Total number of packets sent from the source to the destination address, in thousands (k) or millions (m).	All levels
Flows	Total number of flows of packets sent from the source to the destination address, in thousands (k) or millions (m).	All levels
Anomalies	Total number of packets in the anomaly table, in thousands (k) or millions (m).	All levels

Table 216: show services ids Output Fields (*continued*)

Field Name	Field Description	Output Level
Anomaly description	<p>One or more of the following types of anomalies. For more information, see the detailed descriptions in the stateful firewall section of the <i>JUNOS System Log Messages Reference</i>.</p> <ul style="list-style-type: none"> ■ First packet of TCP session not SYN ■ ICMP echo request dropped, because sequence number duplicated ■ ICMP echo reply dropped. No matching sequence number ■ ICMP echo request dropped. Too many echo requests without echo reply ■ ICMP header length check failed ■ ICMP packet length greater than 64K ■ IP fragment assembly timeout ■ IP fragment length error ■ IP fragment overlap ■ IP packet length greater than 64K ■ IP packet too short ■ IP packet with broadcast destination address ■ IP packet with checksum error ■ IP packet with incorrect length ■ IP packet with TTL equal to 0 	extensive

Table 216: show services ids Output Fields (continued)

Field Name	Field Description	Output Level
Anomaly description (continued)	<ul style="list-style-type: none"> ■ IP packet with version other than 4 ■ Land attack (IP src address = dest address) ■ No matching SFW rule; attempting to create discard flow ■ Number of open sessions exceeds IDS limit; packet dropped ■ Packet rate exceeds IDS limit; packet dropped ■ Session creation rate exceeds IDS limit; packet dropped ■ SFW application message too long ■ SFW discard packet contains non-configured IP option types ■ SFW drop packet because of discard flow ■ SFW dropped TCP watch packet ■ SFW rules request FTP active mode data packets to be accepted; attempting to create forward flow ■ SFW rules request FTP passive mode data packets to be accepted; attempting to create forward flow ■ SFW rules request packet to be accepted; attempting to create forward or watch flow ■ SFW rules request packet to be discarded; attempting to create discard flow ■ SFW rules request packet to be rejected; attempting to create reject flow ■ SFW discard flow requires packet to be dropped ■ SFW SYN defense ■ Smurf attack (ping to IP broadcast address) ■ TCP FIN/RST or SYN/(URG FIN RST) flags set ■ TCP header length check failed ■ TCP port scan (port not in LISTEN state) ■ TCP seq number zero and FIN/PSH/RST flags set ■ TCP seq number zero and no flags set ■ TCP source or destination port zero ■ TCP SYN flood attack ■ UDP header length check failed ■ UDP port scan (port not in LISTEN state) ■ UDP source or destination port zero 	extensive
Count	Number of times that a particular anomaly occurred, in thousands (k) or millions (M).	extensive
Rate (eps)	Anomaly events per second. The IDS subsystem attempts to maintain a weighted average of rates, which might not reflect the exact incoming rate of attack at low rates. However, at high rates exceeding 160 events per second, the rates generally match.	extensive
Elapsed	Time since the same type of event last occurred.	extensive
Total IDS table entries	Number of entries in the IDS table. This number is not necessarily the sum of all entries displayed.	All levels

Table 216: show services ids Output Fields (continued)

Field Name	Field Description	Output Level
Total failed IDS table entry insertions	Number of IDS entries not allowed into the table because the table was full	All levels
Total number of events (closed flows and anomalies detected)	Total number of events since the system was started or since the <code>show ids services</code> command was executed.	All levels

```

show services ids destination-table
user@host> show services ids destination-table
Interface: sp-1/3/0, Service set: null-sfw
Sorting order: Packets
Source address      Dest address   Time    Flags           Application
any                -> 10.58.255.146 36m12s SYN cookie
Bytes: 35.0 m, Packets: 822.0 k, Flows: 274.0 k, Anomalies: 2251.0 k

Total IDS table entries: 87
Total failed IDS table entry insertions 0
Total number of events (closed flows and anomalies detected): 2606018

show services ids destination-table extensive
user@host> show services ids destination-table extensive
Interface: sp-1/3/0, Service set: null-sfw
Sorting order: Packets
Source address      Dest address   Time    Flags           Application
any                -> 10.58.255.146 35m52s SYN cookie
Bytes: 34.0 m, Packets: 798.0 k, Flows: 266.0 k, Anomalies: 2251.0 k
Anomalies
First packet of TCP session not SYN      160.0 k    0         14s
TCP source or destination port zero      634.0 k    154.6     3m37s
UDP source or destination port zero      633.0 k    170.0     3m37s
ICMP header length check failed          2875      0.9       3m37s
IP fragment assembly timeout             820.0 k    12.8      3m18s
UDP header length check failed           385        0.5       3m53s
TCP header length check failed           383        0.5       3m53s

Total IDS table entries:
87
Total failed IDS table entry insertions
0
Total number of events (closed flows and anomalies detected):
2598063

show services ids destination-table extensive order anomalies
user@host> show services ids destination-table extensive order anomalies
Interface: sp-0/2/0, Service set: ss1
IDS sorting order: Anomalies
Source address      Dest address   Time    Flags           Application
15.1.1.1           -> 15.99.1.1     1m28s   junos-ftp
Bytes: 1065, Packets: 18, Flows: 1, Anomalies: 10
Anomaly description      Count  Rate(eps) Elapsed
creating forward or watch flow      1     15.6     1m28s
Number of open sessions exceeds IDS limit      9      0.8      18s

```



```
Total IDS table entries: 3
Total failed IDS table entry insertions 0
Total number of events (closed flows and anomalies): 11
```

**show services ids
pair-table extensive**

```
user@host> show services ids pair-table extensive
```

```
Interface: sp-3/2/0, Service set: ss_all_limits
```

```
IDS sorting order: Packets
```

Source address	Dest address	Time	Flags	Application
15.1.1.4	-> 15.99.1.4	2m20s		junos-ftp

```
Bytes: 5.7k, Packets: 102.0, Flows: 41.0, Anomalies: 462.0
```

Anomaly description	Count	Rate	Elapsed
creating forward or watch flow	41.0	8.8	2m17s
Packet rate exceeds IDS src limit	21.0	7.1	2m17s
Session creation rate exceeds IDS src limit	359.0	99.7	2m16s
TCP SYN flood attack	41.0	1.9	1m30s

```
Total IDS table entries: 3
Total failed IDS table entry insertions 0
Total number of events (closed flows and anomalies): 462
```

**show services ids
pair-table extensive limit**

```
user@host> show services ids pair-table extensive limit 3
```

```
Interface: sp-1/3/0, Service set: null-sfw
```

```
Sorting order: Packets
```

Source address	Dest address	Time	Flags	Application
10.58.255.18	-> 10.58.255.146	38m41s	SYN cookie	

```
Bytes: 286.0 m, Packets: 2823.0 k, Flows: 324.0 k, Anomalies: 387.0 k
```

Anomalies	Count	Rate(eps)	Elapsed
First packet of TCP session not SYN	160.0 k	0.1	25s
TCP source or destination port zero	69.0 k	14.1	6m26s
UDP source or destination port zero	68.0 k	12.7	6m26s
ICMP header length check failed	318	0.1	7m6s
IP fragment assembly timeout	88.0 k	1.3	6m7s
UDP header length check failed	39	0.0	6m58s
TCP header length check failed	46	0.0	6m45s

```
10.58.255.23 -> 10.58.255.146 18m48s SYN cookie
```

```
Bytes: 104.0 m, Packets: 421.0 k, Flows: 230, Anomalies: 124.0 k
```

Anomalies	Count	Rate(eps)	Elapsed
TCP source or destination port zero	37.0 k	9.8	6m26s
UDP source or destination port zero	37.0 k	8.4	6m26s
IP fragment assembly timeout	48.0 k	1.0	6m7s
ICMP header length check failed	190	0.2	6m47s
UDP header length check failed	29	0.0	6m51s
TCP header length check failed	23	0.0	6m59s

```
10.58.255.25 -> 10.58.255.146 18m48s SYN cookie
```

```
Bytes: 104.0 m, Packets: 420.0 k, Flows: 232, Anomalies: 123.0 k
```

Anomalies	Count	Rate(eps)	Elapsed
TCP source or destination port zero	37.0 k	9.8	6m26s
UDP source or destination port zero	37.0 k	8.6	6m26s
IP fragment assembly timeout	48.0 k	1.5	6m7s
ICMP header length check failed	173	0.1	6m43s
UDP header length check failed	24	0.0	6m43s
TCP header length check failed	19	0.0	6m56s

```

Total IDS table entries:
87
Total failed IDS table entry insertions
0
Total number of events (closed flows and anomalies detected):
2659291

```

**show services ids
source-table extensive**

```

user@host> show services ids source-table extensive
Interface: sp-3/2/0, Service set: ss_all_limits
IDS sorting order: Packets
Source address      Dest address      Time  Flags      Application
15.1.1.4            ->               any   2m43s      junos-ftp

Bytes: 5.7k, Packets: 102.0, Flows: 41.0, Anomalies: 462.0
Anomaly description      Count    Rate    Elapsed
creating forward or watch flow      41.0      8.8      2m40s

Packet rate exceeds IDS src limit      21.0      7.1      2m40s

Session creation rate exceeds IDS src limit      359.0     99.7      2m39s

TCP SYN flood attack      41.0      1.9      1m53s

```

```

Total IDS table entries:      3
Total failed IDS table entry insertions      0
Total number of events (closed flows and anomalies):      462

```

**show services ids
source-table extensive
limit**

```

user@host> show services ids source-table extensive limit 3
Interface: sp-1/3/0, Service set: null-sfw
Sorting order: Packets
Source address      Dest address      Time  Flags      Application

10.58.255.18        ->               any   40m 0s SYN cookie
Bytes: 250.0 m, Packets: 1978.0 k, Flows: 356.0 k, Anomalies: 387.0 k
Anomalies      Count    Rate(eps) Elapsed
TCP source or destination port zero      37.0 k      9.8      6m26s
First packet of TCP session not SYN      160.0 k      0.0      40s
TCP source or destination port zero      69.0 k     62.5      7m45s
UDP source or destination port zero      68.0 k     56.2      7m45s
ICMP header length check failed          319      0.1      7m49s
IP fragment assembly timeout             89.0 k      4.4      7m26s
UDP header length check failed           39      0.0      8m17s
TCP header length check failed           46      0.0      8m4s

10.58.255.30        ->               any   20m 7s SYN cookie
Bytes: 107.0 m, Packets: 427.0 k, Flows: 264, Anomalies: 125.0 k
Anomalies      Count    Rate(eps) Elapsed
UDP source or destination port zero      38.0 k     65.5      7m45s
TCP source or destination port zero      37.0 k     38.1      7m45s
IP fragment assembly timeout             49.0 k      4.1      7m26s
TCP header length check failed           24      0.0      9m23s
ICMP header length check failed          165      0.1      8m6s
UDP header length check failed           26      0.0      8m13s

10.58.255.17        ->               any   20m10s SYN cookie
Bytes: 107.0 m, Packets: 426.0 k, Flows: 262, Anomalies: 125.0 k
Anomalies      Count    Rate(eps) Elapsed
TCP source or destination port zero      38.0 k     55.      7m45s

```

UDP source or destination port zero	38.0 k	55.1	7m45s
ICMP header length check failed	147	0.1	7m50s
IP fragment assembly timeout	49.0 k	2.8	7m26s
TCP header length check failed	22	0.0	9m33s
UDP header length check failed	22	0.0	8m1s

Total IDS table entries:
87

Total failed IDS table entry insertions
0

Total number of events (closed flows and anomalies detected):
2691423

Interface: sp-1/3/0, Service set: blue

NAT pool	Address	Port	Ports in use
d2-pool	10.59.16.100-10.59.16.100	4000-4002	1

Chapter 22

IP Security Operational Mode Commands

Table 217 on page 857 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot IP Security (IPSec) services. In the table, the commands are grouped by the interfaces on which they are supported. In the remainder of this chapter, the commands are listed in alphabetical order.

- Adaptive Services Interfaces:
 - J-series routing platform—*sp-pim/0/slot*.
 - M-series and T-series routing platforms—*sp-fpc/pic/port*. IPSec is also supported on the redundant adaptive services interface (*rspnumber*).
- Encryption Interfaces (M-series and T-series routing platforms only)
es-fpc/pic/port.

Table 217: IPSec Services Operational Mode Commands

Task	Command
Adaptive Services Interface	
Delete certificate authority (CA) digital certificates from the routing platform.	<code>clear security pki ca-certificate</code>
Delete manually generated local digital certificate requests from the routing platform.	<code>clear security pki certificate-request</code>
Delete all CRLs from the routing platform	<code>clear security pki crl</code>
Delete local digital certificates, certificate requests, and the corresponding public/private key pairs from the routing platform.	<code>clear security pki local-certificate</code>
Delete local and remote certificates from the IPSec configuration memory cache.	<code>clear services ipsec-vpn certificates</code>
Clear IPSec statistics.	<code>clear services ipsec-vpn ipsec statistics</code>
Clear either Internet Key Exchange (IKE) or IPSec VPN security associations.	<code>clear services ipsec-vpn ike security-associations</code> <code>clear services ipsec-vpn ipsec security-associations</code>

Table 217: IPSec Services Operational Mode Commands *(continued)*

Task	Command
Request a digital certificate from a CA online by using the Simple Certificate Enrollment Protocol (SCEP).	<code>request security pki ca-certificate enroll</code>
Manually load a CA digital certificate from a specified location.	<code>request security pki ca-certificate load</code>
Manually install a CRL on the routing platform.	<code>request security pki crl load</code>
Manually generate a local digital certificate request in the Public-Key Cryptography Standards #10 (PKCS-10) format.	<code>request security pki generate-certificate-request</code>
Generate a Public Key Infrastructure (PKI) public and private key pair for a local digital certificate.	<code>request security pki generate-key-pair</code>
Request a CA to enroll and install a local digital certificate online by using the SCEP.	<code>request security pki local-certificate enroll</code>
Manually load a local digital certificate from a specified location.	<code>request security pki local-certificate load</code>
Switch between the primary and backup IPSec VPN tunnels.	<code>request services ipsec-vpn ipsec switch tunnel</code>
Display information about certificate authority (CA) digital certificates installed in the routing platform.	<code>show security pki ca-certificate</code>
Display information about manually generated local digital certificate requests that are stored in the routing platform.	<code>show security pki certificate-request</code>
Display information about the local digital certificates and the corresponding public keys installed in the routing platform.	<code>show security pki local-certificate</code>
Display local and remote certificates installed in the IPSec configuration memory cache that are used for the IKE negotiation.	<code>show services ipsec-vpn certificates</code>
Display IKE VPN security associations for service sets.	<code>show services ipsec-vpn ike security-associations</code>
Display IPSec VPN security associations for service sets.	<code>show services ipsec-vpn ipsec security-associations</code>
Display IPSec VPN statistics for service sets.	<code>show services ipsec-vpn ipsec statistics</code>
Encryption Interface	
Clear Internet Key Exchange (IKE) security associations.	<code>clear ike security-associations</code>
Clear IPSec security associations.	<code>clear ipsec security-associations</code>

Table 217: IPSec Services Operational Mode Commands (*continued*)

Task	Command
Switch between primary and backup interfaces and tunnels.	<code>request ipsec switch</code>
Obtain a public key certificate from a certification authority.	<code>request security certificate (signed)</code> <code>request security certificate (unsigned)</code>
Generate a public and private key pair.	<code>request security key-pair</code>
Add a certificate provided by the Juniper Networks certificate authority.	<code>request system certificate add</code>
Display IKE security association information.	<code>show ike security-associations</code>
Display the IPSec certificate database.	<code>show ipsec certificates</code>
Display primary and backup interface and tunnel information.	<code>show ipsec redundancy</code>
Display IPSec security association information.	<code>show ipsec security-associations</code>
Display installed certificates signed by the Juniper Networks certificate authority.	<code>show system certificate</code>



NOTE: For information about how to configure IPSec services, see the *JUNOS Services Interfaces Configuration Guide* for adaptive services interfaces and the *JUNOS System Basics Configuration Guide* for encryption interfaces.

clear ike security-associations

Syntax	clear ike security-associations <i><destination-ip-address></i>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(Encryption interface on M-series and T-series routing platforms only) Clear information about the current Internet Key Exchange (IKE) security association. This command is valid for dynamic security associations only.
Options	<p>none—Clear all IKE security associations.</p> <p><i>destination-ip-address</i>—(Optional) Clear the IKE security association at the specified destination address.</p>
Required Privilege Level	view
Related Topics	show ike security-associations
List of Sample Output	clear ike security-associations on page 860
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear ike security-associations	user@host> clear ike security-associations

clear ipsec security-associations

Syntax	clear ipsec security-associations <i><sa-name></i>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(Encryption interface on M-series and T-series routing platforms only) Clear information about the current IP Security (IPSec) security association. This command is valid for dynamic security associations only. When this command is issued, a new security association is created.
Options	none—Clear all IPSec security associations. <i>sa-name</i> —(Optional) Clear the specified security association.
Required Privilege Level	view
Related Topics	show ipsec security-associations
List of Sample Output	clear ipsec security-associations on page 861
Output Fields	See the show ipsec security-associations for an explanation of output fields.
clear ipsec security-associations	<p>The following output from the show ipsec security-associations detail command is displayed before and after the clear ipsec security-associations command is issued:</p> <pre> user@host> show ipsec security-associations detail Security association: sa-dynamic, Interface family: Up Direction: inbound, SPI: 242379418, State: Installed Mode: tunnel, Type: dynamic Protocol: ESP, Authentication: hmac-md5-96, Encryption: None Soft lifetime: Expires in 22979 seconds Hard lifetime: Expires in 28739 seconds Direction: outbound, SPI: 368592771, State: Installed Mode: tunnel, Type: dynamic Protocol: ESP, Authentication: hmac-md5-96, Encryption: None Soft lifetime: Expires in 22979 seconds Hard lifetime: Expires in 28739 seconds user@host> clear ipsec security-associations user@host> show ipsec security-associations detail Security association: sa-dynamic, Interface family: Up Direction: inbound, SPI: 1031597683, State: Installed Mode: tunnel, Type: dynamic Protocol: ESP, Authentication: hmac-md5-96, Encryption: None Soft lifetime: Expires in 23037 seconds Hard lifetime: Expires in 28797 seconds Direction: outbound, SPI: 1618419878, State: Installed Mode: tunnel, Type: dynamic Protocol: ESP, Authentication: hmac-md5-96, Encryption: None </pre>

Soft lifetime: Expires in 23037 seconds
Hard lifetime: Expires in 28797 seconds

clear security pki ca-certificate

Syntax	clear security pki ca-certificate (all ca-profile <i>ca-profile-name</i>)
Release Information	Command introduced in JUNOS Release 7.5.
Description	(Adaptive services interfaces only) Delete certificate authority (CA) digital certificates from the routing platform.
Options	all—Delete all CA digital certificates from the routing platform. ca-profile <i>ca-profile-name</i> —Delete the specified CA profile.
Required Privilege Level	clear
Related Topics	request security pki ca-certificate enroll request security pki ca-certificate load show security pki ca-certificate
List of Sample Output	clear security pki ca-certificate all on page 863
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear security pki ca-certificate all	user@host> clear security pki ca-certificate all

clear security pki certificate-request

Syntax	clear security pki certificate-request (all certificate-id <i>certificate-id-name</i>)
Release Information	Command introduced in JUNOS Release 7.5.
Description	(Adaptive services interfaces only) Delete manually generated local digital certificate requests from the routing platform.
Options	<p>all—Delete all local digital certificate requests from the routing platform.</p> <p>certificate-id <i>certificate-id-name</i>—Delete the specified local digital certificate and corresponding public/private key pair.</p>
Required Privilege Level	clear
Related Topics	show security pki certificate-request
List of Sample Output	clear security pki certificate-request all on page 864
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear security pki certificate-request all	user@host> clear security pki certificate-request all

clear security pki crl

Syntax	clear security pki crl (all ca-profile <i>ca-profile-name</i>)
Release Information	Command introduced in JUNOS 8.1
Description	(Adaptive services interfaces only) Delete certificate revocation lists (CRLs) from the routing platform.
Options	<p>all—Delete all CRLs from the routing platform.</p> <p>ca-profile <i>ca-profile-name</i>—Delete CRLs associated with the specified CA profile.</p>
Required Privilege Level	clear
List of Sample Output	clear security pki crl ca-profile all on page 865
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear security pki crl ca-profile all	user@host> clear security pki crl ca-profile all

clear security pki local-certificate

Syntax	clear security pki local-certificate (all certificate-id <i>certificate-id-name</i>)
Release Information	Command introduced in JUNOS Release 7.5.
Description	(Adaptive services interfaces only) Delete local digital certificates, certificate requests, and the corresponding public/private key pairs from the routing platform.
Options	<p>all—Delete all local digital certificates, certificate requests, and the corresponding public/private key pairs from the routing platform.</p> <p>certificate-id <i>certificate-id-name</i>—Delete the specified local digital certificate and corresponding public/private key pair.</p>
Required Privilege Level	clear
Related Topics	<p>request security pki local-certificate enroll</p> <p>show security pki local-certificate</p>
List of Sample Output	clear security pki local-certificate all on page 866
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear security pki local-certificate all	<pre>user@host> clear security pki local-certificate all</pre>

clear services ipsec-vpn certificates

Syntax	clear services ipsec-vpn certificates (all service-set <i>service-set</i>) <certificate-cache-entry <i>number</i> >
Release Information	Command introduced in JUNOS Release 7.5.
Description	(Adaptive services interfaces only) Delete digital certificates from the IPSec configuration memory cache. Issuing this command also clears the certificate revocation list (CRL) from the cache along with the certificates.
Options	<p>all—Delete digital certificates for all service sets.</p> <p>service-set <i>service-set</i>—Delete digital certificates for the specified service set.</p> <p>certificate-cache-entry <i>number</i>—(Optional) Delete digital certificates matching a specified cache entry number. To view the certificate cache entry numbers, issue the show services ipsec-vpn certificates command.</p>
Required Privilege Level	clear
Related Topics	show services ipsec-vpn certificates
List of Sample Output	clear services ipsec-vpn certificates all on page 867
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear services ipsec-vpn certificates all	user@host> clear services ipsec-vpn certificates all

clear services ipsec-vpn ike security-associations

Syntax	clear services ipsec-vpn ike security-associations <peer-address-name> <service-set service-set-name>
Release Information	Command introduced before JUNOS Release 7.4. service-set option added in JUNOS Release 8.5.
Description	(Adaptive services interfaces only) Clear Internet Key Exchange (IKE) security associations.
Options	<i>peer-address-name</i> —(Optional) Clear only the security association specified by the peer address. <i>service-set service-set-name</i> —(Optional) Clear only the security association specified by the service-set name.
Required Privilege Level	view
Related Topics	show services ipsec-vpn ike security-associations
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear services ipsec-vpn ike security-associations	user@host> clear services ipsec-vpn ike security-associations

clear services ipsec-vpn ipsec statistics

Syntax	clear services ipsec-vpn ipsec statistics <remote-gateway <i>address</i> > <service-set <i>service-set-name</i> >
Release Information	Command introduced in JUNOS Release 8.1.
Description	(Adaptive services interface only) Clear IP Security (IPSec) statistics.
Options	remote-gateway <i>address</i> —(Optional) Clear statistics for the specified remote system. service-set <i>service-set-name</i> —(Optional) Clear statistics for the specified service set.
Required Privilege Level	view
Related Topics	show services ipsec-vpn ipsec statistics
List of Sample Output	clear services ipsec-vpn ipsec statistics on page 869
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear services ipsec-vpn ipsec statistics	user@host> clear services ipsec-vpn ipsec statistics

clear services ipsec-vpn ipsec security-associations

Syntax	clear services ipsec-vpn security-associations <peer-address-name> <remote-gateway remote-gateway-address> <service-set-name> <tunnel-index tunnel-index-number>
Release Information	Command introduced before JUNOS Release 7.4. remote-gateway, service-set-name, and tunnel-index options added in JUNOS Release 8.4.
Description	(Adaptive services interfaces only) Clear IP Security (IPSec) security associations. You can combine the options for greater specificity.
Options	<p>peer-address-name—(Optional) Clear only the security association specified by the peer address.</p> <p>remote-gateway remote-gateway-address—(Optional) Clear only the security association specified by the remote gateway address.</p> <p>service-set-name—(Optional) Clear only the security association specified by the service-set name.</p> <p>tunnel-index tunnel-index-number—(Optional) Clear only the security association specified by the tunnel index number.</p>
Required Privilege Level	view
Related Topics	show services ipsec-vpn ipsec security-associations
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear services ipsec-vpn ipsec security-associations	user@host> clear services ipsec-vpn ipsec security-associations

request security certificate (signed)

Syntax	request security certificate enroll filename <i>filename</i> subject <i>subject</i> alternative-subject <i>alternative-subject</i> certification-authority <i>certification-authority</i> encoding (binary pem) key-file <i>key-file</i> domain-name <i>domain-name</i>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(Encryption interface on M-series and T-series routing platforms only) Obtain a signed certificate from a certificate authority (CA). The signed certificate validates the CA and the owner of the certificate. The results are saved in a specified file to the <code>/var/etc/ikecert</code> directory.
Options	<p>filename <i>filename</i>—File that stores the certificate.</p> <p>subject <i>subject</i>—Distinguished name (dn), which consists of a set of components—for example, an organization (o), an organization unit (ou), a country (c), and a locality (l).</p> <p>alternative-subject <i>alternative-subject</i>—Tunnel source address.</p> <p>certification-authority <i>certification-authority</i>—Name of the certificate authority profile in the configuration.</p> <p>encoding (binary pem)—File format used for the certificate. The format can be a binary file or privacy-enhanced mail (PEM), an ASCII base64-encoded format. The default format is binary.</p> <p>key-file <i>key-file</i>—File containing a local private key.</p> <p>domain-name <i>domain-name</i>—Fully qualified domain name.</p>
Required Privilege Level	maintenance
List of Sample Output	request security certificate (signed) on page 871
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request security certificate (signed)	<pre> user@host> request security certificate enroll filename host.crt subject c=uk,o=london alternative-subject 10.50.1.4 certification-authority verisign key-file host-1.prv domain-name host.juniper.net CA name: juniper.net CA file: ca_verisign local pub/private key pair: host.prv subject: c=uk,o=london domain name: host.juniper.net alternative subject: 10.50.1.4 Encoding: binary Certificate enrollment has started. To view the status of your enrollment, check the key management process (kmd) log file at /var/log/kmd. <----- </pre>

request security certificate (unsigned)

Syntax	<code>request security certificate enroll filename <i>filename</i> ca-file <i>ca-file</i> ca-name <i>ca-name</i> encoding (binary perm) url <i>url</i></code>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(Encryption interface on M-series and T-series routing platforms only) Obtain a certificate from a certificate authority (CA). The results are saved in a specified file to the <code>/var/etc/ikecert</code> directory.
Options	<p><code>filename <i>filename</i></code>—File that stores the public key certificate.</p> <p><code>ca-file <i>ca-file</i></code>—Name of the certificate authority profile in the configuration.</p> <p><code>ca-name <i>ca-name</i></code>—Name of the certificate authority.</p> <p><code>encoding (binary pem)</code>—File format used for the certificate. The format can be a binary file or privacy-enhanced mail (PEM), an ASCII base64-encoded format. The default value is <code>binary</code>.</p> <p><code>url <i>url</i></code>—Certificate authority URL.</p>
Required Privilege Level	<code>maintenance</code>
List of Sample Output	<code>request security certificate (unsigned)</code> on page 872
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request security certificate (unsigned)	<pre> user@host> request security certificate enroll filename ca_verisign ca-file verisign ca-name juniper.net url http://pilotsiteipsec.verisign.com/cgi-bin/pkiclient.exe URL: http://pilotsiteipsec.verisign.com/cgi-bin/pkiclient.exe CA name: juniper.net CA file: verisign Encoding: binary Certificate enrollment has started. To view the status of your enrollment, check the key management process (kmd) log file at /var/log/kmd. <----- </pre>

request security key-pair

Syntax	request security key-pair <i>filename</i> <size <i>key-size</i> > <type (rsa dsa)>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(Encryption interface on M-series and T-series routing platforms only) Generate a public and private key pair for a digital certificate.
Options	<p><i>filename</i>—Name of a file in which to store the key pair.</p> <p>size <i>key-size</i>—(Optional) Key size, in bits. The key size can be 512, 1024, or 2048. The default value is 1024.</p> <p>type—(Optional) Algorithm used to encrypt the key:</p> <ul style="list-style-type: none"> ■ rsa—RSA algorithm. This is the default. ■ dsa—Digital signature algorithm with Secure Hash Algorithm (SHA).
Required Privilege Level	maintenance
List of Sample Output	request security key-pair on page 873
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request security key-pair	user@host> request security key-pair security-key-file

request security pki ca-certificate enroll

Syntax	<code>request security pki ca-certificate enroll ca-profile <i>ca-profile-name</i></code>
Release Information	Command introduced in JUNOS Release 7.5.
Description	(Adaptive services interfaces only) Request a digital certificate from a certificate authority (CA) online by using the Simple Certificate Enrollment Protocol (SCEP).
Options	<code>ca-profile <i>ca-profile-name</i></code> —CA profile name.
Required Privilege Level	maintenance
Related Topics	<code>clear security pki ca-certificate</code> <code>show security pki ca-certificate</code>
List of Sample Output	request security pki ca-certificate enroll on page 874
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request security pki ca-certificate enroll	<pre> user@host> request security pki ca-certificate enroll ca-profile entrust Received following certificates: Certificate: C=us, O=juniper, CN=First Officer Fingerprint: 46:71:15:34:f0:a6:41:76:65:81:33:4f:68:47:c4:df:78:b8:e3:3f Certificate: C=us, O=juniper, CN=First Officer Fingerprint: bc:78:87:9b:a7:91:13:20:71:db:ac:b5:56:71:42:ad:1a:b6:46:17 Certificate: C=us, O=juniper Fingerprint: 00:8e:6f:58:dd:68:bf:25:0a:e3:f9:17:70:d6:61:f3:53:a7:79:10 Do you want to load the above CA certificate ? [yes,no] (no) yes </pre>

request security pki ca-certificate load

Syntax	request security pki ca-certificate load ca-profile <i>ca-profile-name</i> filename <i>path/filename</i>
Release Information	Command introduced in JUNOS Release 7.5.
Description	(Adaptive services interfaces only) Manually load a certificate authority (CA) digital certificate from a specified location.
Options	<p>ca-profile <i>ca-profile-name</i>—Load the specified CA profile.</p> <p>filename <i>path/filename</i>—Directory location and filename of the CA digital certificate.</p>
Required Privilege Level	maintenance
Related Topics	<p>clear security pki ca-certificate</p> <p>show security pki ca-certificate</p>
List of Sample Output	request security pki ca-certificate load on page 875
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request security pki ca-certificate load	user@host> request security pki ca-certificate load ca-profile ca-private filename pki-file

request security pki crl load

Syntax	<code>request security pki crl load ca-profile <i>ca-profile-name</i> filename <i>path/filename</i></code>
Release Information	Command introduced in JUNOS Release 8.1.
Description	(Adaptive services interfaces only) Manually install a certificate revocation list (CRL) on the routing platform from a specified location.
Options	<p><code>ca-profile <i>ca-profile-name</i></code> —Load the specified certificate authority (CA) profile.</p> <p><code>filename <i>path/filename</i></code> —Directory location and filename of the CRL.</p>
Required Privilege Level	maintenance
List of Sample Output	request security pki crl load on page 876
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request security pki crl load	<code>user@host> request security pki crl load ca-profile ca-private filename pki-file</code>

request security pki generate-certificate-request

Syntax request security pki generate-certificate-request certificate-id *certificate-id-name*
 domain-name *domain-name* subject *subject-distinguished-name*
 <filename (*path* | terminal)>
 <ip-address *ip-address*>
 <validity-end-time *end-time*>
 <validity-start-time *start-time*>

Release Information Command introduced in JUNOS Release 7.5.

Description (Adaptive services interfaces only) Manually generate a local digital certificate request in the Public-Key Cryptography Standards #10 (PKCS-10) format.

Options certificate-id *certificate-id-name*—Name of the local digital certificate and the public/private key pair.

domain-name *domain-name*—Fully qualified domain name (FQDN). The FQDN provides the identity of the certificate owner for Internet Key Exchange (IKE) negotiations and provides an alternative to the subject name.

subject *subject-distinguished-name*—Distinguished name format that contains the common name, department, company name, state, and country:

- CN—Common name
- OU—Organizational unit name
- O—Organization name
- ST—State
- C—Country

filename (*path* | terminal)—(Optional) Location where the local digital certificate request should be placed or the login terminal.

ip-address *ip-address*—(Optional) IP address of the routing platform.

validity-end-time *end-time*—(Optional) End time that the digital certificate is valid, in the format *YYYY-MO-DD.HH:MN:SS*. If you do not specify an end time value, the end time is assigned by the default CA policy.

- *YYYY*—Year (for example, 2005)
- *MO*—Month (01 through 12)
- *DD*—Day (01 through 31)
- *HH*—Hours (00 through 23)
- *MN*—Minutes (00 through 59)
- *SS*—Seconds (00 through 59)

validity-start-time *start-time*—(Optional) Start time that the digital certificate is valid, in the format *YYYY-MO-DD.HH:MN:SS*. If you do not specify the start time value, the current time is used.

- *YYYY*—Year (for example, 2005)
- *MO*—Month (01 through 12)
- *DD*—Day (01 through 31)
- *HH*—Hours (00 through 23)
- *MN*—Minutes (00 through 59)
- *SS*—Seconds (00 through 59)

Required Privilege Level maintenance

Related Topics clear security pki certificate-request

show security pki certificate-request

List of Sample Output request security pki generate-certificate-request on page 878

Output Fields When you enter this command, you are provided feedback on the status of your request.

request security pki generate-certificate-request user@host> request security pki generate-certificate-request certificate-id local-entrust2 domain-name router2.juniper.net filename entrust-req2 subject cn=router2.juniper.net

```
Generated certificate request
-----BEGIN CERTIFICATE REQUEST-----
MIIBoTCCAQoCAQAwGjEYMBYGA1UEAxMPdHxLmp1bm1wZXIubmV0MIGfMA0GCSqG
SIb3DQEBAQUAA4GNADCBiQKBgQCiUFklQws1Ud+AqN5DDxRs2kVyKEhh9qoVFnz+
Hz4c9vsy3B8E1wTJlkmIt2cB3yifB6zePd+6WYpf57Crwre7YqPkiXM31F6z3YjX
H+1BPNbCxNwYvyrnSyVYDbFj8o0Xyqog8ACDfVL2JBWrPNBYy7imq/K9soDBbAs6
5hZqqwIDAQABoEcwRQYJKoZIhvcNAQkOMTgwNjA0BgNVHQ8BAf8EBAMCB4AwJAYD
VR0RAQH/BBowGIIWdHxLmVuZ2xhYi5qdW5pcGVyLm5ldANBgkqhkiG9w0BAQQF
AA0BgQBc2rq1v5S0QXH7LCb/FdqAL8ZM6GoaNs5d6cGwq4bB6a7UQFgtoH406gQ3G
3iH0Zfz4xMIBpJYuGd1dkqgvcDoH3AgTsLkfn7Wi3x5H2qeQVs9bvL4P5nvEZLND
EIMUHwteolZCiZ70f09Fer9cXWHSQs1UtXtgPqQJy2xIeImLgw==
-----END CERTIFICATE REQUEST-----
Fingerprint:
0d:90:b8:d2:56:74:fc:84:59:62:b9:78:71:9c:e4:9c:54:ba:16:97 (sha1)
1b:08:d4:f7:90:f1:c4:39:08:c9:de:76:00:86:62:b8 (md5)
```

request security pki generate-key-pair

Syntax	request security pki generate-key-pair certificate-id <i>certificate-id-name</i> <size (512 1024 2048)>
Release Information	Command introduced in JUNOS Release 7.5.
Description	(Adaptive services interfaces only) Generate a Public Key Infrastructure (PKI) public and private key pair for a local digital certificate.
Options	certificate-id <i>certificate-id-name</i> —Name of the local digital certificate and the public/private key pair. size—(Optional) Key pair size. The key pair size can be 512, 1024, or 2048 bits.
Required Privilege Level	maintenance
List of Sample Output	request security pki generate-key-pair on page 879
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request security pki generate-key-pair	user@host> request security pki generate-key-pair certificate-id billy size 2048 Generated key pair billy, key size 2048 bits

request security pki local-certificate enroll

Syntax request security pki local-certificate enroll *ca-profile ca-profile-name*
certificate-id certificate-id-name challenge-password *password* domain-name
domain-name subject *subject-distinguished-name*
 <ip-address *ip-address*>
 <validity-end-time *end-time*>
 <validity-start-time *start-time*>

Release Information Command introduced in JUNOS Release 7.5.

Description (Adaptive services interfaces only) Request that a CA enroll and install a local digital certificate online by using the Simple Certificate Enrollment Protocol (SCEP).

Options *ca-profile ca-profile-name*—CA profile name.

certificate-id certificate-id-name —Name of the local digital certificate and the public/private key pair.

challenge-password *password*—Password set by the administrator and normally obtained from the SCEP enrollment web page of the CA. The password is 16 characters in length.

domain-name *domain-name*—Fully qualified domain name (FQDN). The FQDN provides the identity of the certificate owner for Internet Key Exchange (IKE) negotiations and provides an alternative to the subject name.

subject *subject-distinguished-name* —Distinguished name format that contains the common name, department, company name, state, and country:

- CN—Common name
- OU—Organizational unit name
- O—Organization name
- ST—State
- C—Country

ip-address *ip-address*—(Optional) IP address of the routing platform.

validity-end-time *end-time*—(Optional) Endpoint in time when the digital certificate becomes invalid. You must configure the time in the following format: *YYYY-MO-DD.HH:MN:SS*. If you do not specify an end time value, the end time is assigned by the default CA policy.

- *YYYY*—Year (for example, 2005)
- *MO*—Month (01 through 12)
- *DD*—Day (01 through 31)
- *HH*—Hours (00 through 23)

- *MN*—Minutes (00 through 59)
- *SS*—Seconds (00 through 59)

validity-start-time *start-time*—(Optional) Start time that the digital certificate is valid, in the following format: YYYY-MO-DD.HH:MN:SS. If you do not specify the start time value, the current time is used.

- *YYYY*—Year (for example, 2005)
- *MO*—Month (01 through 12)
- *DD*—Day (01 through 31)
- *HH*—Hours (00 through 23)
- *MN*—Minutes (00 through 59)
- *SS*—Seconds (00 through 59)

Additional Information Specifying a **validity-end-time** and a **validity-start-time** is optional. However, you cannot configure only an end time or a start time. You must configure both an end time and a start time if you do not want to use the default values.

Required Privilege Level maintenance

Related Topics show security pki local-certificate

List of Sample Output request security pki local-certificate enroll on page 881

Output Fields When you enter this command, you are provided feedback on the status of your request.

request security pki local-certificate enroll user@host> request security pki local-certificate enroll certificate-id r3-entrust-scep ca-profile entrust domain-name router3.juniper.net subject "CN=router3,OU=Engineering,O=juniper,C=US" challenge-password 123

Certificate enrollment has started. To view the status of your enrollment, check the key management process (kmd) log file at /var/log/kmd. Please save the challenge-password for revoking this certificate in future. Note that this password is not stored on the router.

request security pki local-certificate load

Syntax	<code>request security pki local-certificate load certificate-id <i>certificate-id-name</i> filename <i>path</i></code>
Release Information	Command introduced in JUNOS Release 7.5.
Description	(Adaptive services interfaces only) Manually load a local digital certificate from a specified location.
Options	<p><code>certificate-id <i>certificate-id-name</i></code>—Name of the public/private key pair mapped to the local digital certificate.</p> <p><code>filename <i>path/filename</i></code>—Directory location and filename of the local digital certificate provided by the CA.</p>
Required Privilege Level	maintenance
List of Sample Output	request security pki local-certificate load on page 882
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request security pki local-certificate load	<pre>user@host> request security pki local-certificate load filename /tmp/router2-cert certificate-id local-entrust2 Local certificate local-entrust2 loaded successfully</pre>

request ipsec switch

Syntax	<code>request ipsec switch (interface <es-fpc/pic/port> security-associations <sa-name>)</code>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(Encryption interface on M-series and T-series routing platforms only) Manually switch from the primary to the backup encryption services interface, or switch from the primary to the backup IP Security (IPSec) tunnel.
Options	<p><code>interface <es-fpc/pic/port></code>—Switch to the backup encryption interface.</p> <p><code>security-associations <sa-name></code>—Switch to the backup tunnel.</p>
Required Privilege Level	view
Related Topics	show ipsec redundancy
List of Sample Output	request ipsec switch on page 883
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request ipsec switch	<code>user@host> request ipsec switch security-associations sa-private</code>

request services ipsec-vpn ipsec switch tunnel

Syntax	request services ipsec-vpn ipsec switch tunnel local-gateway <i>address</i> remote-gateway <i>address</i> <routing-instance <i>instance-name</i> >
Release Information	Command introduced before JUNOS Release 7.4. routing-instance option added in Release 8.1.
Description	(Adaptive services interface only) Manually switch between primary and backup IP Security (IPSec) tunnels.
Options	local-gateway <i>address</i> —Gateway address of the local system. remote-gateway <i>address</i> —Gateway address of the remote system. routing-instance <i>instance-name</i> —(Optional) VRF instance associated with local gateway address.
Required Privilege Level	view
Related Topics	show services ipsec-vpn ipsec security-associations
List of Sample Output	request services ipsec-vpn ipsec switch tunnel on page 884
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request services ipsec-vpn ipsec switch tunnel	user@host> request services ipsec-vpn ipsec switch tunnel local-gateway 10.1.1.1 remote gateway 10.100.10.1

request system certificate add

Syntax	request system certificate add (<i>filename</i> terminal)
Release Information	Command introduced before JUNOS Release 7.4.
Description	(Encryption interface on M-series and T-series routing platforms only) Add a certificate provided by the Juniper Networks certificate authority (CA).
Options	<i>filename</i> —Filename (URL, local, or remote). terminal—Use login terminal.
Required Privilege Level	maintenance
List of Sample Output	request system certificate add on page 885
Output Fields	When you enter this command, you are provided feedback on the status of your request.
request system certificate add	user@host> request system certificate add terminal

show ike security-associations

Syntax	show ike security-associations <brief detail> <peer-address>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(Encryption interface on M-series and T-series routing platforms only) Display information about Internet Key Exchange (IKE) security associations.
Options	<p>none—Display standard information about all IKE security associations.</p> <p>brief detail—(Optional) Display the specified level of output.</p> <p>peer-address—(Optional) Display IKE security associations for the specified peer address.</p>
Required Privilege Level	view
Related Topics	clear ike security-associations
List of Sample Output	<p>show ike security-associations on page 889</p> <p>show ike security-associations detail on page 889</p>
Output Fields	Table 218 on page 886 lists the output fields for the <code>show ike security-associations</code> command. Output fields are listed in the approximate order in which they appear.

Table 218: show ike security-associations Output Fields

Field Name	Field Description	Level of Output
IKE peer	Remote end of the IKE negotiation.	detail
Role	Part played in the IKE session. The router triggering the IKE negotiation is the initiator, and the router accepting the first IKE exchange packets is the responder.	detail
Remote Address	Responder's address.	none specified
State	State of the IKE security association: ■ Matured —The IKE security association is established. ■ Not matured —The IKE security association is in the process of negotiation.	none specified
Initiator cookie	When the IKE negotiation is triggered, a random number is sent to the remote node.	All levels

Table 218: show ike security-associations Output Fields (*continued*)

Field Name	Field Description	Level of Output
Responder cookie	<p>The remote node generates its own random number and sends it back to the initiator as a verification that the packets were received.</p> <p>Of the numerous security services available, protection against denial of service (DoS) is one of the most difficult to address. A “cookie” or anticlogging token (ACT) is aimed at protecting the computing resources from attack without spending excessive CPU resources to determine the cookie's authenticity. An exchange prior to CPU-intensive public key operations can thwart some DoS attempts (such as simple flooding with invalid IP source addresses).</p>	All levels
Exchange type	<p>Specifies the number of messages in an IKE exchange, and the payload types that are contained in each message. Each exchange type provides a particular set of security services, such as anonymity of the participants, perfect forward secrecy of the keying material, and authentication of the participants. JUNOS software supports two types of exchanges:</p> <ul style="list-style-type: none"> ■ Main—The exchange is done with six messages. Main encrypts the payload, protecting the identity of the neighbor. ■ Aggressive—The exchange is done with three messages. Aggressive does not encrypt the payload, leaving the identity of the neighbor unprotected. 	All Levels
Authentication method	Type of authentication determines which payloads are exchanged and when they are exchanged. The JUNOS software supports only pre-shared keys .	detail
Local	Prefix and port number of the local end.	detail
Remote	Prefix and port number of the remote end.	detail
Lifetime	Number of seconds remaining until the IKE security association expires.	detail
Algorithms	<p>Header for the IKE algorithms output.</p> <ul style="list-style-type: none"> ■ Authentication—Type of authentication algorithm used: md5 or sha1. ■ Encryption—Type of encryption algorithm used: des-cbc, 3des-cbc, or None. ■ Pseudo random function—Function that generates highly unpredictable random numbers: hmac-md5 or hmac-sha1. 	detail
Traffic statistics	<p>Number of bytes and packets received and transmitted on the IKE security association.</p> <ul style="list-style-type: none"> ■ Input bytes, Output bytes—Number of bytes received and transmitted on the IKE security association. ■ Input packets, Output packets—Number of packets received and transmitted on the IKE security association. 	detail

Table 218: show ike security-associations Output Fields (continued)

Field Name	Field Description	Level of Output
Flags	<p>Notification to the key management process of the status of the IKE negotiation:</p> <ul style="list-style-type: none"> ■ caller notification sent—Caller program notified about the completion of the IKE negotiation. ■ waiting for done—Negotiation is done. The library is waiting for the remote end retransmission timers to expire. ■ waiting for remove—Negotiation has failed. The library is waiting for the remote end retransmission timers to expire before removing this negotiation. ■ waiting for policy manager—Negotiation is waiting for a response from the policy manager. 	detail
IPSec security associates	Number of IPSec security associations created and deleted with this IKE security association.	detail
Phase 2 negotiations in progress	<p>Number of phase 2 IKE negotiations in progress and status information:</p> <ul style="list-style-type: none"> ■ Negotiation type—Type of phase 2 negotiation. The JUNOS software currently supports quick mode. ■ Message ID—Unique identifier for a phase 2 negotiation. ■ Local identity—Identity of the local phase 2 negotiation. The format is <i>id-type-name (proto-name:port-number,[0..id-data-len] = iddata-presentation)</i> ■ Remote identity—Identity of the remote phase 2 negotiation. The format is <i>id-type-name (proto-name:port-number,[0..id-data-len] = iddata-presentation)</i> ■ Flags—Notification to the key management process of the status of the IKE negotiation: <ul style="list-style-type: none"> ■ caller notification sent—Caller program notified about the completion of the IKE negotiation. ■ waiting for done—Negotiation is done. The library is waiting for the remote end retransmission timers to expire. ■ waiting for remove—Negotiation has failed. The library is waiting for the remote end retransmission timers to expire before removing this negotiation. ■ waiting for policy manager—Negotiation is waiting for a response from the policy manager. 	detail

```

show ike          user@host> show ike security-associations
security-associations
Remote Address  State      Initiator cookie  Responder cookie  Exchange type
4.4.4.4         Matured    93870456fa000011 723a20713700003e Main

show ike          user@host> show ike security-associations detail
security-associations
detail
IKE peer 4.4.4.4
  Role: Initiator, State: Matured
  Initiator cookie: cf22bd81a7000001, Responder cookie: fe83795c2800002e
  Exchange type: Main, Authentication method: Pre-shared-keys
  Local: 4.4.4.5:500, Remote: 4.4.4.4:500
  Lifetime: Expires in 187 seconds
  Algorithms:
    Authentication      : md5
    Encryption          : 3des-cbc
    Pseudo random function: hmac-md5
  Traffic statistics:
    Input bytes  :          1000
    Output bytes :          1280
    Input packets:           5
    Output packets:          9
  Flags: Caller notification sent
  IPsec security associations: 2 created, 0 deleted
  Phase 2 negotiations in progress: 1

Negotiation type: Quick mode, Role: Initiator, Message ID: 3582889153
  Local: 4.4.4.5:500, Remote: 4.4.4.4:500
  Local identity: ipv4_subnet(tcp:80,[0..7]=10.1.1.0/24)
  Remote identity: ipv4_subnet(tcp:100,[0..7]=10.1.2.0/24)
  Flags: Caller notification sent, Waiting for done

```

show ipsec certificates

Syntax	show ipsec certificates <brief detail> <crl <i>crl-name</i> <i>serial-number</i> >
Release Information	Command introduced before JUNOS Release 7.4.
Description	(Encryption interface on M-series and T-series routing platforms only) Display information about the IPSec certificate database.
Options	<p>none—Display standard information about all of the entries in the IPSec certificate database.</p> <p>brief detail—(Optional) Display the specified level of output.</p> <p>crl <i>crl-name</i> <i>serial-number</i>—(Optional) Display information about the entries on the certificate revocation list (CRL) or for the specified serial number. A CRL is a timestamped list identifying revoked certificates. The CRL is signed by a certificate authority (CA) or CRL issuer and made freely available in a public repository. Each revoked certificate is identified in a CRL by its certificate serial number.</p>
Required Privilege Level	view
Related Topics	clear ipsec security-associations
List of Sample Output	show ipsec certificates detail on page 891
Output Fields	Table 219 on page 890 lists the output fields for the show ipsec certificates command. Output fields are listed in the approximate order in which they appear.

Table 219: show ipsec certificates Output Fields

Field Name	Field Description	Level of Output
Database	Display information about the IPSec certificate database. <ul style="list-style-type: none"> ■ Total entries—Number of database entries, including entries that are not trusted or that are in the process of being deleted. ■ Active entries—Number of database entries, excluding entries that are marked as deleted. ■ Locked entries—Number of statically configured database entries that cannot expire, such as CA certificates that are root or trusted. 	All levels
Subject	Distinguished name for the certificate for C, O, CN, as described in RFC 3280, <i>Internet x.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile</i> .	All levels
ID	Identification number of the database entry. ID is generated by the internal certificate database.	All levels
References	Reference number the certificate manager has for the particular entry.	detail

Table 219: show ipsec certificates Output Fields (continued)

Field Name	Field Description	Level of Output
Serial	Unique serial number assigned to each certificate by the CA.	All levels
Flags	State of the certificate. <ul style="list-style-type: none"> ■ Trusted—Passed validity checks. ■ Not trusted—Failed validity checks. ■ Root—Entry is locked and may have been learned through IKE or a locally configured CA certificate. ■ Non-root—Entry is not locked. ■ Crl-issuer—Entity issues CRLs. ■ Non-crl-issuer—Entity does not issue CRLs. 	detail
Validity period starts	Start time that the certificate is valid, in the format <i>yyy mon dd, hh:mm:ss GMT</i> .	detail
Validity period ends	End time that the certificate is valid, in the format <i>yyy mon dd, hh:mm:ss GMT</i> .	detail
Alternative name information	Auxiliary identity for the certificate: <i>dns-name</i> , <i>email-address</i> , <i>ip-address</i> , or <i>uri</i> (uniform resource identifier).	detail
Issuer	Information about the entity that has signed and issued the CRL as described in RFC 2459, <i>Internet X.509 Public Key Infrastructure Certificate and CRL Profile</i> .	detail

```

show ipsec certificates user@host> show ipsec certificates detail
detail Database: Total entries: 3 Active entries: 4 Locked entries: 1
Subject: C=us, O=x
ID: 5, References: 0, Serial: 22314868
Flags: Trusted Non-root Crl-issuer
Validity period starts: 2003 Mar 1st, 01:20:42 GMT
Validity period ends: 2003 Mar 31st, 01:50:42 GMT
Alternative name information:
IP address: 10.20.210.1
Issuer: C=FI, O=Company-ABC, CN=Company ABC class 2

Subject: C=us, O=x
ID: 4, References: 0, Serial: 22315496
Flags: Trusted Non-root Crl-issuer
Validity period starts: 2003 Mar 1st, 01:21:45 GMT
Validity period ends: 2003 Mar 31st, 01:51:45 GMT
Alternative name information:
IP address: 10.20.210.20
Issuer: C=FI, O=Company-ABC, CN=Company ABC class 2

Subject: C=FI, O=SSH Company-ABC, CN=Company ABC class 2
ID: 1, References: 1, Serial: 1538512
Flags: Trusted Root Non-crl-issuer
Validity period starts: 2001 Aug 1st, 07:08:32 GMT
Validity period ends: 2004 Aug 1st, 07:08:32 GMT
Alternative name information:
Email address: certifier-support@ssh.com
Issuer: C=FI, O=Company-ABC, CN=Company ABC class 2

```

show ipsec redundancy

Syntax	show ipsec redundancy (interface <i><es-fpc/pic/port></i> security association <i><sa-name></i>)
Release Information	Command introduced before JUNOS Release 7.4.
Description	(Encryption interface on M-series and T-series routing platforms only) Display information about IPSec redundancy.
Options	<p>interface <i><es-fpc/pic/port></i>—Display information about all encryption interfaces, or optionally, about a particular encryption interface.</p> <p>security association <i><sa-name></i>—Display information about all remote tunnels, or optionally, about a particular remote tunnel.</p>
Required Privilege Level	view
Related Topics	request ipsec switch
List of Sample Output	<p>show ipsec redundancy interface on page 893</p> <p>show ipsec redundancy security-associations on page 893</p>
Output Fields	Table 220 on page 892 lists the output fields for the show ipsec redundancy command. Output fields are listed in the approximate order in which they appear.

Table 220: show ipsec redundancy Output Fields

Field Name	Field Description
Failure counter	Number of times a PIC switched between primary and backup interfaces, or the number of times the tunnel switched between the primary and remote peers since the software has been activated.
Primary interface '	Name of the interface configured to be the primary interface.
Backup interface	Name of the interface configured to be the backup interface.
State	State of the primary or backup interface can be Active , Offline , or Standby . Both ES PICs are initialized to Offline . For primary and remote peers, State can be Active or Standby . Both peers are in a state of Standby by default (there is not yet a connection between the two peers).
Security association	Name of the security association.
Local IP	Local IP address.
Primary remote IP	IP address of the configured primary remote peer.
Backup remote IP	IP address of the configured backup remote peer.


```
show ipsec redundancy user@host> show ipsec redundancy interface  
interface           Failure counter: 0  
                      Primary interface: es-1/3/0, State: Active  
                      Backup interface : es-1/1/0, State: Standby  
  
show ipsec redundancy user@host> show ipsec redundancy security-associations sa-dynamic  
security-associations Security association: sa-dynamic, Failure counter: 0  
                      Local IP: 4.4.4.4  
                      Primary remote IP: 4.4.4.5, State: Standby  
                      Backup remote IP : 3.3.3.3, State: Standby
```

show ipsec security-associations

Syntax	show ipsec security-associations <brief detail> <sa-name>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(Encryption interface on M-series and T-series routing platforms only) Display information about the IPSec security associations applied to the local or transit traffic stream.
Options	<p>none—Display standard information about all IPSec security associations.</p> <p>brief detail—(Optional) Display the specified level of output.</p> <p>sa-name—(Optional) Display the specified IPSec security association.</p>
Required Privilege Level	view
List of Sample Output	<p>show ipsec security-associations sa-name on page 896</p> <p>show ipsec security-associations sa-name detail on page 896</p>
Output Fields	Table 221 on page 894 lists the output fields for the show ipsec security-associations command. Output fields are listed in the approximate order in which they appear.

Table 221: show ipsec security-associations Output Fields

Field Name	Field Description	Level of Output
Security association	Name of the security association.	All levels
Interface family	<p>Status of the interface family of the security association. If the interface family field is absent, it is a transport mode security association. The interface family can have one of three options:</p> <ul style="list-style-type: none"> ■ Up—The security association is referenced in the interface family and the interface family is up. ■ Down—The security association is referenced in the interface family and the interface family is down. ■ No reference—The security association is not referenced in the interface family. 	All levels
Local gateway	Gateway address of the local system.	All levels
Remote gateway	Gateway address of the remote system.	All levels
Local identity	Prefix and port number of the local end	All levels
Remote identity	Prefix and port number of the remote end.	All levels
Direction	Direction of the security association: inbound or outbound .	All levels
SPI	Value of the security parameter index.	All levels

Table 221: show ipsec security-associations Output Fields (continued)

Field Name	Field Description	Level of Output
AUX-SPI	Value of the auxiliary security parameter index. <ul style="list-style-type: none"> ■ When the value is AH or ESP, AUX-SPI is always 0. ■ When the value is AH+ESP, AUX-SPI is always a positive integer. 	All levels
State	Status of the security association: <ul style="list-style-type: none"> ■ Installed—The security association is installed in the security association database. (For transport mode security associations, the value of State must always be Installed.) ■ Not installed—The security association is not installed in the security association database. 	detail
Mode	Mode of the security association: <ul style="list-style-type: none"> ■ transport—Protects single host-to-host protections. ■ tunnel—Protects connections between security gateways. 	All levels
Type	Type of security association: <ul style="list-style-type: none"> ■ manual—Security parameters require no negotiation. They are static, and are configured by the user. ■ dynamic—Security parameters are negotiated by the IKE protocol. Dynamic security associations are not supported in transport mode. 	All levels
Protocol	Protocol supported: <ul style="list-style-type: none"> ■ transport mode—Supports Encapsulation Security Protocol (ESP) or Authentication Header (AH). ■ tunnel mode—Supports ESP or AH+ESP. 	All levels
Authentication	Type of authentication used: hmac-md5-96 , hmac-sha1-96 , or None .	detail
Encryption	Type of encryption used: des-cbc , 3des-csc , or None .	detail
Soft lifetime Hard lifetime	(dynamic output only) Each lifetime of a security association has two display options, hard and soft, one of which must be present for a dynamic security association. The hard lifetime specifies the lifetime of the SA. The soft lifetime , which is derived from the hard lifetime, informs the IPSec key management system that the SA is about to expire. This allows the key management system to negotiate a new SA before the hard lifetime expires. <ul style="list-style-type: none"> ■ Expires in seconds seconds—Number of seconds left until the security association expires. ■ Expires in kilobytes kilobytes—Number of kilobytes left until the security association expires. 	detail
Anti-replay service	State of the service that prevents packets from being replayed: Enabled or Disabled .	detail
Replay window size	Configured size, in packets, of the antireplay service window: 32 or 64 . The antireplay window size protects the receiver against replay attacks by rejecting old or duplicate packets. If the replay window size is 0, the antireplay service is disabled.	detail

```

show ipsec security-associations sa-name
user@host> show ipsec security-associations sa-cosmic brief
Security association: sa-cosmic, Interface family: Up
Local gateway: 21.21.1.1, Remote gateway: 21.21.2.1
Local identity: ipv4_subnet(any:0,[0..7]=0.0.0.0/0)
Remote identity: ipv4_subnet(any:0,[0..7]=0.0.0.0/0)
Direction SPI      AUX-SPI      Mode      Type      Protocol
inbound  2908734119  0          tunnel    dynamic   AH
outbound 3494029335  0          tunnel    dynamic   AH

show ipsec security-associations sa-name detail
user@host> show ipsec security-associations sa-cosmic detail
Security association: sa-cosmic, Interface family: Up

Local gateway: 21.21.1.1, Remote gateway: 21.21.2.1
Local identity: ipv4_subnet(any:0,[0..7]=0.0.0.0/0)
Remote identity: ipv4_subnet(any:0,[0..7]=0.0.0.0/0)
Direction: inbound, SPI: 2908734119, AUX-SPI: 0, State: Installed
Mode: tunnel, Type: dynamic
Protocol: AH, Authentication: hmac-md5-96, Encryption: None
Soft lifetime: Expired
Hard lifetime: Expires in 120 seconds
Anti-replay service: Disabled

Direction: outbound, SPI: 3494029335, AUX-SPI: 0, State: Installed
Mode: tunnel, Type: dynamic
Protocol: AH, Authentication: hmac-md5-96, Encryption: None
Soft lifetime: Expired
Hard lifetime: Expires in 120 seconds
Anti-replay service: Disabled

```

show security pki ca-certificate

Syntax	show security pki ca-certificate <brief detail> <ca-profile <i>ca-profile-name</i> >
Release Information	Command introduced in JUNOS Release 7.5.
Description	(Adaptive services interfaces only) Display information about certificate authority (CA) digital certificates installed in the routing platform.
Options	<p>none—(Same as brief) Display information about all CA digital certificates.</p> <p>brief detail—(Optional) Display the specified level of output.</p> <p>ca-profile <i>ca-profile-name</i>—(Optional) Display information about only the specified CA profile.</p>
Required Privilege Level	view
List of Sample Output	<p>show security pki ca-certificate on page 898</p> <p>show security pki ca-certificate detail on page 899</p>
Output Fields	Table 222 on page 897 lists the output fields for the show security pki ca-certificate command. Output fields are listed in the approximate order in which they appear.

Table 222: show security pki ca-certificate Output Fields

Field Name	Field Description	Level of Output
Certificate identifier	Name of the digital certificate.	All levels
Certificate version	Revision number of the digital certificate.	detail
Serial number	Unique serial number of the digital certificate.	detail
Issued by	Authority that issued the digital certificate.	none brief
Issued to	Device that was issued the digital certificate.	none brief
Issuer	<p>Authority that issued the digital certificate, including details of the authority organized using the distinguished name format. Possible subfields are:</p> <ul style="list-style-type: none"> ■ Common name—Name of the authority. ■ Organization—Organization of origin. ■ Organizational unit—Department within an organization. ■ State—State of origin. ■ Country—Country of origin. 	detail

Table 222: show security pki ca-certificate Output Fields (*continued*)

Field Name	Field Description	Level of Output
Subject	Details of the digital certificate holder organized using the distinguished name format. Possible subfields are: <ul style="list-style-type: none"> ■ Common name—Name of the requestor. ■ Organization—Organization of origin. ■ Organizational unit—Department within an organization. ■ State—State of origin. ■ Country—Country of origin. 	detail
Validity	Time period when the digital certificate is valid. Values are: <ul style="list-style-type: none"> ■ Not before—Start time when the digital certificate becomes valid. ■ Not after—End time when the digital certificate becomes invalid. 	All levels
Public key algorithm	Encryption algorithm used with the private key, such as <code>rsaEncryption(1024 bits)</code> .	All levels
Signature algorithm	Encryption algorithm that the CA used to sign the digital certificate, such as <code>sha1WithRSAEncryption</code> .	detail
Fingerprint	Secure Hash Algorithm (SHA1) and Message Digest 5 (MD5) hashes used to identify the digital certificate.	detail
Distribution CRL	Distinguished name information and the URL for the certificate revocation list (CRL) server.	detail
Use for key	Use of the public key, such as Certificate signing, CRL signing, Digital signature, or Key encipherment.	detail

```

show security pki      user@host> show security pki ca-certificate
ca-certificate      Certificate identifier: entrust
                        Issued to: juniper, Issued by: juniper
                        Validity:
                          Not before: 2005 Oct 18th, 23:54:22 GMT
                          Not after: 2025 Oct 19th, 00:24:22 GMT
                        Public key algorithm: rsaEncryption(1024 bits)

                        Certificate identifier: entrust
                        Issued to: First Officer, Issued by: juniper
                        Validity:
                          Not before: 2005 Oct 18th, 23:55:59 GMT
                          Not after: 2008 Oct 19th, 00:25:59 GMT
                        Public key algorithm: rsaEncryption(1024 bits)

                        Certificate identifier: entrust
                        Issued to: First Officer, Issued by: juniper
                        Validity:
                          Not before: 2005 Oct 18th, 23:55:59 GMT
                          Not after: 2008 Oct 19th, 00:25:59 GMT
                        Public key algorithm: rsaEncryption(1024 bits)

```

```

show security pki      user@host> show security pki ca-certificate detail
ca-certificate detail Certificate identifier: entrust
                        Certificate version: 3
                        Serial number: 4355 9235
                        Issuer:
                          Organization: juniper, Country: us
                        Subject:
                          Organization: juniper, Country: us
                        Validity:
                          Not before: 2005 Oct 18th, 23:54:22 GMT
                          Not after: 2025 Oct 19th, 00:24:22 GMT
                        Public key algorithm: rsaEncryption(1024 bits)
                          cb:9e:2d:c0:70:f8:ea:3c:f2:b5:f0:02:48:87:dc:68:99:a3:57:4f
                          0e:b9:98:0b:95:47:0d:1f:97:7c:53:17:dd:1a:f8:da:e5:08:d1:1c
                          78:68:1f:2f:72:9f:a2:cf:81:e3:ce:c5:56:89:ce:f0:97:93:fa:36
                          19:3e:18:7d:8c:9d:21:fe:1f:c3:87:8d:b3:5d:f3:03:66:9d:16:a7
                          bf:18:3f:f0:7a:80:f0:62:50:43:83:4f:0e:d7:c6:42:48:c0:8a:b2
                          c7:46:30:38:df:9b:dc:bc:b5:08:7a:f3:cd:64:db:2b:71:67:fe:d8
                          04:47:08:07:de:17:23:13
                        Signature algorithm: sha1WithRSAEncryption
                        Fingerprint:
                          00:8e:6f:58:dd:68:bf:25:0a:e3:f9:17:70:d6:61:f3:53:a7:79:10 (sha1)
                          71:6f:6a:76:17:9b:d6:2a:e7:5a:72:97:82:6d:26:86 (md5)
                        Distribution CRL:
                          C=us, O=juniper, CN=CRL1
                          http://CA-1/CRL/juniper_us_crlfile.crl
                        Use for key: CRL signing, Certificate signing
Certificate identifier: entrust
                        Certificate version: 3
                        Serial number: 4355 925c
                        Issuer:
                          Organization: juniper, Country: us
                        Subject:
                          Organization: juniper, Country: us, Common name: First Officer
                        Validity:
                          Not before: 2005 Oct 18th, 23:55:59 GMT
                          Not after: 2008 Oct 19th, 00:25:59 GMT
                        Public key algorithm: rsaEncryption(1024 bits)
                          c0:a4:21:32:95:0a:cd:ec:12:03:d1:a2:89:71:8e:ce:4e:a6:f9:2f
                          1a:9a:13:8c:f6:a0:3d:c9:bd:9d:c2:a0:41:77:99:1b:1e:ed:5b:80
                          34:46:f8:5b:28:34:38:2e:91:7d:4e:ad:14:86:78:67:e7:02:1d:2e
                          19:11:b7:fa:0d:ba:64:20:e1:28:4e:3e:bb:6e:64:dc:cd:b1:b4:7a
                          ca:8f:47:dd:40:69:c2:35:95:ce:b8:85:56:d7:0f:2d:04:4d:5d:d8
                          42:e1:4f:6b:bf:38:c0:45:1e:9e:f0:b4:7f:74:6f:e9:70:fd:4a:78
                          da:eb:10:27:bd:46:34:33
                        Signature algorithm: sha1WithRSAEncryption
                        Fingerprint:
                          bc:78:87:9b:a7:91:13:20:71:db:ac:b5:56:71:42:ad:1a:b6:46:17 (sha1)
                          23:79:40:c9:6d:a6:f0:ca:e0:13:30:d4:29:6f:86:79 (md5)
                        Distribution CRL:
                          C=us, O=juniper, CN=CRL1
                          http://CA-1/CRL/juniper_us_crlfile.crl
                        Use for key: Key encipherment
Certificate identifier: entrust
                        Certificate version: 3
                        Serial number: 4355 925b
                        Issuer:
                          Organization: juniper, Country: us
                        Subject:
                          Organization: juniper, Country: us, Common name: First Officer
                        Validity:

```

```
Not before: 2005 Oct 18th, 23:55:59 GMT
Not after: 2008 Oct 19th, 00:25:59 GMT
Public key algorithm: rsaEncryption(1024 bits)
ea:75:c4:f3:58:08:ea:65:5c:7e:b3:de:63:0a:cf:cf:ec:9a:82:e2
d7:e8:b9:2f:bd:4b:cd:86:2f:f1:dd:d8:a2:95:af:ab:51:a5:49:4e
00:10:c6:25:ff:b5:49:6a:99:64:74:69:e5:8c:23:5b:b4:70:62:8e
e4:f9:a2:28:d4:54:e2:0b:1f:50:a2:92:cf:6c:8f:ae:10:d4:69:3c
90:e2:1f:04:ea:ac:05:9b:3a:93:74:d0:59:24:e9:d2:9d:c2:ef:22
b9:32:c7:2c:29:4f:91:cb:5a:26:fe:1d:c0:36:dc:f4:9c:8b:f5:26
af:44:bf:53:aa:d4:5f:67
Signature algorithm: sha1WithRSAEncryption
Fingerprint:
  46:71:15:34:f0:a6:41:76:65:81:33:4f:68:47:c4:df:78:b8:e3:3f (sha1)
  ee:cc:c7:f4:5d:ac:65:33:0a:55:db:59:72:2c:dd:16 (md5)
Distribution CRL:
  C=us, O=juniper, CN=CRL1
  http://CA-1/CRL/juniper_us_crlfile.crl
Use for key: Digital signature
```


show security pki certificate-request

Syntax	show security pki certificate-request <brief detail> <certificate-id <i>certificate-id-name</i> >
Release Information	Command introduced in JUNOS Release 7.5.
Description	(Adaptive services interfaces only) Display information about manually generated local digital certificate requests that are stored in the routing platform.
Options	none—(same as brief) Display information about all local digital certificate requests. brief detail—(Optional) Display the specified level of output. certificate-id <i>certificate-id-name</i> —(Optional) Display information about only the specified local digital certificate request
Required Privilege Level	view
Related Topics	clear security pki certificate-request
List of Sample Output	show security pki certificate-request on page 902 show security pki certificate-request detail on page 902
Output Fields	Table 223 on page 901 lists the output fields for the show security pki certificate-request command. Output fields are listed in the approximate order in which they appear.

Table 223: show security pki certificate-request Output Fields

Field Name	Field Description	Level of Output
Certificate identifier	Name of the digital certificate.	All levels
Certificate version	Revision number of the digital certificate.	detail
Issued to	Device that was issued the digital certificate.	none brief
Subject	Details of the digital certificate holder organized using the distinguished name format. Possible subfields are: <ul style="list-style-type: none"> ■ Common name—Name of the authority. ■ Organization—Organization of origin. ■ Organizational unit—Department within an organization. ■ State—State of origin. ■ Country—Country of origin. 	detail
Alternate subject	Domain name or IP address of the device related to the digital certificate.	detail
Validity	Time period when the digital certificate is valid. Values are: <ul style="list-style-type: none"> ■ Not before—Time when the digital certificate becomes valid. ■ Not after—End time when the digital certificate becomes invalid. 	All levels

Table 223: show security pki certificate-request Output Fields (continued)

Field Name	Field Description	Level of Output
Public key algorithm	Encryption algorithm used with the private key, such as rsaEncryption(1024 bits).	All levels
Public key verification status	Public key verification status: Failed or Passed. The detail output also provides the verification hash.	All levels
Fingerprint	Secure Hash Algorithm (SHA1) and Message Digest 5 (MD5) hashes used to identify the digital certificate.	detail
Use for key	Use of the public key, such as Certificate signing, CRL signing, Digital signature, or Key encipherment.	detail

```

show security pki      user@host> show security pki certificate-request
certificate-request    Certificate identifier: local-microsoft-2
                        Issued to: router2.juniper.net
                        Public key algorithm: rsaEncryption(1024 bits)
                        Public key verification status: Passed

```

```

show security pki      user@host> show security pki certificate-request detail
certificate-request detail Certificate identifier: local-entrust3
                        Certificate version: 3
                        Subject:
                        Common name: router3.juniper.net
                        Alternate subject: router3.juniper.net
                        Public key algorithm: rsaEncryption(1024 bits)
                        Public key verification status: Passed
                        fb:79:df:d4:a9:03:0f:d3:69:7e:c1:e4:27:35:9c:d9:b1:a2:47:78
                        d2:6d:f3:e5:f4:68:4f:b3:04:45:88:57:99:82:39:a6:51:9e:5f:42
                        23:3f:d7:6e:3d:a5:54:a9:b1:2d:6e:90:dd:12:8a:bf:ef:2b:20:50
                        ba:f0:da:d9:0c:ad:5e:d6:c6:98:3a:ae:3f:90:dd:94:78:c1:ea:2e
                        7c:f0:2d:d4:79:d4:cd:f0:52:df:5e:72:f2:e7:ae:66:f7:61:f4:bc
                        72:57:3e:6c:6d:d3:24:58:8b:f4:ef:da:2a:6a:fa:eb:98:f8:34:84
                        79:54:da:4f:d3:6f:52:1f
                        Fingerprint:
                        7c:e8:f9:45:93:8d:a3:92:7f:18:29:02:f1:c8:e2:85:3d:ad:df:1f (sha1)
                        00:4e:df:a0:6b:ad:8c:50:da:7c:a1:cf:5d:37:b0:ea (md5)
                        Use for key: Digital signature

```

show security pki crl

Syntax	show security pki crl <brief detail> <ca-profile <i>ca-profile-name</i> >
Release Information	Command introduced in JUNOS Release 8.1.
Description	(Adaptive services interfaces only) Display information about the certificate revocation lists (CRLs) that are stored in the routing platform.
Options	<p>none—(same as brief) Display information about all CRLs.</p> <p>brief detail—(Optional) Display the specified level of output.</p> <p>ca-profile <i>ca-profile-name</i>—(Optional) Display CRL information about only the specified CA profile.</p>
Required Privilege Level	view
Related Topics	<p>clear security pki crl</p> <p>show security pki crl</p>
List of Sample Output	<p>show security pki crl on page 904</p> <p>show security pki crl detail on page 904</p>
Output Fields	Table 224 on page 903 shows the output fields for the <code>show security pki crl</code> command. Output fields are listed in the approximate order in which they appear.

Table 224: show security pki crl Output Fields

Field Name	Field Description	Level of Output
CA profile	Name of the configured CA profile.	All levels
CRL version	Revision number of the certificate revocation list.	All levels
CRL number	Number of the certificate revocation list	All levels
CRL Issuer	Device that was issued the certificate revocation list.	All levels
Issuer	<p>Details of the digital certificate holder organized using the distinguished name format. Possible subfields are:</p> <ul style="list-style-type: none"> ■ Common name—Name of the authority. ■ Organization—Organization of origin. ■ Organizational unit—Department within an organization. ■ State—State of origin. ■ Country—Country of origin. 	detail
Effective date	Date and time the certificate revocation list becomes valid.	All levels

Table 224: show security pki crl Output Fields *(continued)*

Field Name	Field Description	Level of Output
Next update	Date and time the routing platform will download the latest version of the certificate revocation list.	All levels
Revocation List	List of digital certificates that have been revoked before their expiration date. Values are: <ul style="list-style-type: none"> ■ Serial number—Unique serial number of the digital certificate ■ Revocation date—Date and time that the digital certificate was revoked. 	detail

```

show security pki crl CA profile entrust
                        CRL version: V2
                        CRL number: 24
                        CRL issuer: C=CA, O=juniper
                        Effective date: 2006 May 31st, 05:35:25 GMT
                        Next update: 2006 Jun 1st, 06:35:25 GMT

show security pki crl CA profile: entrust
detail                CRL version: V2
                        CRL number: 24
                        Issuer:
                        Organization: juniper, Country: ca
                        Validity:
                        Effective date: 2006 May 31st, 05:35:25 GMT
                        Next update: 2006 Jun 1st, 06:35:25 GMT
                        Revocation List:
                        Serial number    Revocation date
                        4451aca3 2006    May 25th, 09:13:38 GMT
                        4451aca4 2006    May 25th, 10:11:33 GMT
                        4451acb4 2006    May 29th, 11:28:54 GMT
                        4451aceb 2006    May 29th, 11:29:01 GMT
                        4451acfe 2006    May 29th, 11:29:17 GMT
                        4451acff 2006    May 31st, 05:29:55 GMT

```

show security pki local-certificate

Syntax	show security pki local-certificate <brief detail> <certificate-id <i>certificate-id-name</i> >
Release Information	Command introduced in JUNOS Release 7.5.
Description	(Adaptive services interfaces only) Display information about the local digital certificates and the corresponding public keys installed in the routing platform.
Options	<p>none—(same as brief) Display information about all local digital certificates and corresponding public keys.</p> <p>brief detail—(Optional) Display the specified level of output.</p> <p>certificate-id <i>certificate-id-name</i>—(Optional) Display information about only the specified the local digital certificate and corresponding public keys.</p>
Required Privilege Level	view
Related Topics	clear security pki local-certificate
List of Sample Output	<p>show security pki local-certificate on page 906</p> <p>show security pki local-certificate detail on page 907</p>
Output Fields	Table 225 on page 905 lists the output fields for the show security pki local-certificate command. Output fields are listed in the approximate order in which they appear.

Table 225: show security pki local-certificate Output Fields

Field Name	Field Description	Level of Output
Certificate identifier	Name of the digital certificate.	All levels
Certificate version	Revision number of the digital certificate.	detail
Serial number	Unique serial number of the digital certificate.	detail
Issued by	Authority that issued the digital certificate.	none brief
Issued to	Device that was issued the digital certificate.	none brief
Issuer	<p>Authority that issued the digital certificate, including details of the authority organized using the distinguished name format. Possible subfields are:</p> <ul style="list-style-type: none"> ■ Common name—Name of the authority. ■ Organization—Organization of origin. ■ Organizational unit—Department within an organization. ■ State—State of origin. ■ Country—Country of origin. 	detail

Table 225: show security pki local-certificate Output Fields (continued)

Field Name	Field Description	Level of Output
Subject	Details of the digital certificate holder organized using the distinguished name format. Possible subfields are: <ul style="list-style-type: none"> ■ Common name—Name of the authority. ■ Organization—Organization of origin. ■ Organizational unit—Department within an organization. ■ State—State of origin. ■ Country—Country of origin. 	detail
Alternate subject	Domain name or IP address of the device related to the digital certificate.	detail
Validity	Time period when the digital certificate is valid. Values are: <ul style="list-style-type: none"> ■ Not before—Start time when the digital certificate becomes valid. ■ Not after—End time when the digital certificate becomes invalid. 	All levels
Public key algorithm	Encryption algorithm used with the private key, such as <code>rsaEncryption (1024 bits)</code> .	All levels
Public key verification status	Public key verification status: <code>Failed</code> or <code>Passed</code> . The <code>detail</code> output also provides the verification hash.	All levels
Signature algorithm	Encryption algorithm that the CA used to sign the digital certificate, such as <code>sha1WithRSAEncryption</code> .	detail
Fingerprint	Secure Hash Algorithm (SHA1) and Message Digest 5 (MD5) hashes used to identify the digital certificate.	detail
Distribution CRL	Distinguished name information and URL for the certificate revocation list (CRL) server.	detail
Use for key	Use of the public key, such as <code>Certificate signing</code> , <code>CRL signing</code> , <code>Digital signature</code> , or <code>Key encipherment</code> .	detail

```

show security pki      user@host> show security pki local-certificate
local-certificate      Certificate identifier: local-entrust2
                          Issued to: router2.juniper.net, Issued by: juniper
                          Validity:
                            Not before: 2005 Nov 21st, 23:28:22 GMT
                            Not after:  2008 Nov 21st, 23:58:22 GMT
                          Public key algorithm: rsaEncryption(1024 bits)
                          Public key verification status: Passed

```

```

show security pki      user@host> show security pki local-certificate detail
local-certificate detail Certificate identifier: local-entrust3
                          Certificate version: 3
                          Serial number: 4355 94f9
                          Issuer:
                            Organization: juniper, Country: us
                          Subject:
                            Organization: juniper, Country: us, Common name: router3.juniper.net
                          Alternate subject: router3.juniper.net
                          Validity:
                            Not before: 2005 Nov 21st, 23:33:58 GMT
                            Not after: 2008 Nov 22nd, 00:03:58 GMT
                          Public key algorithm: rsaEncryption(1024 bits)
                          Public key verification status: Passed
                          fb:79:df:d4:a9:03:0f:d3:69:7e:c1:e4:27:35:9c:d9:b1:a2:47:78
                          d2:6d:f3:e5:f4:68:4f:b3:04:45:88:57:99:82:39:a6:51:9e:5f:42
                          23:3f:d7:6e:3d:a5:54:a9:b1:2d:6e:90:dd:12:8a:bf:ef:2b:20:50
                          ba:f0:da:d9:0c:ad:5e:d6:c6:98:3a:ae:3f:90:dd:94:78:c1:ea:2e
                          7c:f0:2d:d4:79:d4:cd:f0:52:df:5e:72:f2:e7:ae:66:f7:61:f4:bc
                          72:57:3e:6c:6d:d3:24:58:8b:f4:ef:da:2a:6a:fa:eb:98:f8:34:84
                          79:54:da:4f:d3:6f:52:1f
                          Signature algorithm: sha1WithRSAEncryption
                          Fingerprint:
                            61:3a:d0:b4:7a:16:9b:39:ba:81:3f:9d:ab:34:e5:c8:be:3b:a1:6d (sha1)
                            60:a0:ff:58:05:4a:65:73:9d:74:3a:e1:83:6f:1b:c8 (md5)
                          Distribution CRL:
                            C=us, O=juniper, CN=CRL1
                            http://CA-1/CRL/juniper_us_crlfile.crl
                          Use for key: Digital signature

```

show services ipsec-vpn certificates

Syntax	show services ipsec-vpn certificates <brief detail> <service-set service-set>
Release Information	Command introduced in JUNOS Release 7.5.
Description	(Adaptive services interfaces only) Display local and remote certificates installed in the IPsec configuration memory cache that are used for the IKE negotiation.
Options	<p>none—(same as brief) Display information about local and remote certificates associated with all service sets.</p> <p>brief detail—(Optional) Display the specified level of output.</p> <p>service-set service-set—(Optional) Display information about local and remote certificates associated with only the specified service set.</p>
Required Privilege Level	view
List of Sample Output	<p>show security ipsec-vpn certificates on page 909</p> <p>show security ipsec-vpn certificates detail on page 910</p>
Output Fields	Table 226 on page 908 lists the output fields for the <code>show services ipsec-vpn certificates</code> command. Output fields are listed in the approximate order in which they appear.

Table 226: show services ipsec-vpn certificates Output Fields

Field Name	Field Description	Level of Output
Service set	Name of the IPsec service set.	All levels
Total entries	Number of certificate cache entries.	All levels
Certificate cache entry	Identification number of the certificate cache entry.	All levels
Flags	Information about the digital certificate, including whether the certificate is a root certificate and trusted.	none brief
Issued to	Device that was issued the digital certificate.	none brief
Issued by	Authority that issued the digital certificate.	none brief
Certificate version	Revision number of the digital certificate.	detail
Serial number	Unique serial number of the digital certificate.	detail
Alternate subject	Domain name or IP address of the device related to the digital certificate.	All levels

Table 226: show services ipsec-vpn certificates Output Fields (*continued*)

Field Name	Field Description	Level of Output
Validity	Time period when the digital certificate is valid. Values are: <ul style="list-style-type: none"> ■ Not before—Start time when the digital certificate becomes valid. ■ Not after—End time when the digital certificate becomes invalid. 	none brief
Public key algorithm	Specifies the encryption algorithm used with the private key, such as rsaEncryption (1024 bits).	detail
Signature algorithm	Encryption algorithm that the CA used to sign the digital certificate, such as sha1WithRSAEncryption.	detail
Fingerprint	Secure Hash Algorithm (SHA1) and Message Digest 5 (MD5) hashes used to identify the digital certificate.	detail
Distribution CRL	Distinguished name information and the URL for the certificate revocation list (CRL) server.	detail
Use for key	Use of the public key, such as Certificate signing, CRL signing, Digital signature, or Key encipherment.	detail

```

show security ipsec-vpn certificates user@host> show services ipsec-vpn certificates
certificates Service set: serviceset-dynamic-BiEspsha3des, Total entries: 3
Certificate cache entry: 3
  Flags: Non-root Trusted
  Issued to: router3.juniper.net, Issued by: juniper
  Alternate subject: router3.juniper.net
  Validity:
    Not before: 2005 Nov 21st, 23:33:58 GMT
    Not after: 2008 Nov 22nd, 00:03:58 GMT

Certificate cache entry: 2
  Flags: Non-root Trusted
  Issued to: router2.juniper.net, Issued by: juniper
  Alternate subject: router2.juniper.net
  Validity:
    Not before: 2005 Nov 21st, 23:28:22 GMT
    Not after: 2008 Nov 21st, 23:58:22 GMT

Certificate cache entry: 1
  Flags: Root Trusted
  Issued to: juniper, Issued by: juniper
  Validity:
    Not before: 2005 Oct 18th, 23:54:22 GMT
    Not after: 2025 Oct 19th, 00:24:22 GMT

```

```

show security ipsec-vpn certificates detail
user@host> show services ipsec-vpn certificates detail
Service set: serviceset-dynamic-BiEspsha3des, Total entries: 3
Certificate cache entry: 3
  Certificate version: 3
  Serial number: 4355 94f9
  Alternate subject: router3.juniper.net
  Public key algorithm: rsaEncryption
  Signature algorithm: sha1WithRSAEncryption
  Fingerprint:
    61:3a:d0:b4:7a:16:9b:39:ba:81:3f:9d:ab:34:e5:c8:be:3b:a1:6d (sha1)
    60:a0:ff:58:05:4a:65:73:9d:74:3a:e1:83:6f:1b:c8 (md5)
  Distribution CRL:
    C=us, O=juniper, CN=CRL1
    http://CA-1/CRL/juniper_us_crlfile.crl
  Use for key: Digital signature

Certificate cache entry: 2
  Certificate version: 3
  Serial number: 4355 94f8
  Alternate subject: router2.juniper.net
  Public key algorithm: rsaEncryption
  Signature algorithm: sha1WithRSAEncryption
  Fingerprint:
    30:c3:a4:04:da:33:9d:60:23:5a:48:75:48:2c:f0:c6:96:6c:31:fa (sha1)
    9a:a2:ce:ef:7e:10:80:a0:c8:4d:2f:e7:e1:d3:69:9d (md5)
  Distribution CRL:
    C=us, O=juniper, CN=CRL1
    http://CA-1/CRL/juniper_us_crlfile.crl
  Use for key: Digital signature

Certificate cache entry: 1
  Certificate version: 3
  Flags: Root
  Serial number: 4355 9235
  Public key algorithm: rsaEncryption
  Signature algorithm: sha1WithRSAEncryption
  Fingerprint:
    00:8e:6f:58:dd:68:bf:25:0a:e3:f9:17:70:d6:61:f3:53:a7:79:10 (sha1)
    71:6f:6a:76:17:9b:d6:2a:e7:5a:72:97:82:6d:26:86 (md5)
  Distribution CRL:
    C=us, O=juniper, CN=CRL1
    http://CA-1/CRL/juniper_us_crlfile.crl
  Use for key: CRL signing, Certificate signing

```

show services ipsec-vpn ike security-associations

Syntax	show services ipsec-vpn ike security-associations <brief detail> <peer-address>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(Adaptive services interface only) Display information for Internet Key Exchange (IKE) security associations. If no security association is specified, the information for all security associations is displayed.
Options	<p>none—(same as brief) Display standard information for all IPSec security associations.</p> <p>brief detail—(Optional) Display the specified level of output.</p> <p>peer-address—(Optional) Display information about a particular security association address.</p>
Required Privilege Level	view
List of Sample Output	<p>show services ipsec-vpn ike security-associations on page 913</p> <p>show services ipsec-vpn ike security-associations detail on page 913</p>
Output Fields	Table 227 on page 911 lists the output fields for the show services ipsec-vpn ike security-associations command. Output fields are listed in the approximate order in which they appear.

Table 227: show services ipsec-vpn ike security-associations Output Fields

Field Name	Field Description	Level of Output
IKE peer	Remote end of the IKE negotiation.	detail
Role	Part played in the IKE session. The router triggering the IKE negotiation is the initiator, and the router accepting the first IKE exchange packets is the responder.	detail
Remote Address	Responder's address.	none specified
State	State of the IKE security association: <ul style="list-style-type: none"> ■ Matured—IKE security association is established. ■ Not matured—The IKE security association is in the process of negotiation. 	none specified
Initiator cookie	When the IKE negotiation is triggered, a random number is sent to the remote node.	All levels

Table 227: show services ipsec-vpn ike security-associations Output Fields (continued)

Field Name	Field Description	Level of Output
Responder cookie	<p>The remote node generates its own random number and sends it back to the initiator as a verification that the packets were received.</p> <p>Of the numerous security services available, protection against denial of service (DoS) is one of the most difficult to address. A “cookie” or anticlogging token (ACT) is aimed at protecting the computing resources from attack without spending excessive CPU resources to determine the cookie's authenticity. An exchange prior to CPU-intensive public key operations can thwart some DoS attempts (such as simple flooding with invalid IP source addresses).</p>	All levels
Exchange type	<p>Specifies the number of messages in an IKE exchange, and the payload types that are contained in each message. Each exchange type provides a particular set of security services, such as anonymity of the participants, perfect forward secrecy of the keying material, and authentication of the participants. JUNOS software supports two types of exchanges:</p> <ul style="list-style-type: none"> ■ Main—The exchange is done with six messages. Main encrypts the payload, protecting the identity of the neighbor. ■ Aggressive—The exchange is done with three messages. Aggressive does not encrypt the payload, leaving the identity of the neighbor unprotected. 	All levels
Authentication method	Type of authentication determines which payloads are exchanged and when they are exchanged. The JUNOS software supports only pre-shared keys .	detail
Local	Prefix and port number of the local end.	detail
Remote	Prefix and port number of the remote end.	detail
Lifetime	Number of seconds remaining until the IKE security association expires.	detail
Algorithms	<p>Header for the IKE algorithms output.</p> <ul style="list-style-type: none"> ■ Authentication—(detail output only) Type of authentication algorithm used: md5 or sha1. ■ Encryption—(detail output only) Type of encryption algorithm used: des-cbc, 3des-cbc, or None. ■ Pseudo random function—Function that generates highly unpredictable random numbers: hmac-md5 or hmac-sha1. 	detail
Traffic statistics	<p>Number of bytes and packets received and transmitted on the IKE security association.</p> <ul style="list-style-type: none"> ■ Input bytes, Output bytes—Number of bytes received and transmitted on the IKE security association. ■ Input packets, Output packets—Number of packets received and transmitted on the IKE security association. 	detail

Table 227: show services ipsec-vpn ike security-associations Output Fields (continued)

Field Name	Field Description	Level of Output
Flags	Notification to the key management process of the status of the IKE negotiation: <ul style="list-style-type: none"> ■ caller notification sent—Caller program notified about the completion of the IKE negotiation. ■ waiting for done—Negotiation is done. The library is waiting for the remote end retransmission timers to expire. ■ waiting for remove—Negotiation has failed. The library is waiting for the remote end retransmission timers to expire before removing this negotiation. ■ waiting for policy manager—Negotiation is waiting for a response from the policy manager. 	detail
IPSec security associates	Number of IPSec security associations created and deleted with this IKE security association.	detail
Phase 2 negotiations in progress	Number of phase 2 IKE negotiations in progress and status information: <ul style="list-style-type: none"> ■ Negotiation type—Type of phase 2 negotiation. The JUNOS software currently supports quick mode. ■ Message ID—Unique identifier for a phase 2 negotiation. ■ Local identity—Identity of the local phase 2 negotiation. The format is <i>id-type-name (proto-name:port-number,[0..id-data-len] = iddata-presentation)</i>. ■ Remote identity—Identity of the remote phase 2 negotiation. The format is <i>id-type-name (proto-name:port-number,[0..id-data-len] = iddata-presentation)</i>. ■ Flags—Notification to the key management process of the status of the IKE negotiation: <ul style="list-style-type: none"> ■ caller notification sent—Caller program notified about the completion of the IKE negotiation. ■ waiting for done—Negotiation is done. The library is waiting for the remote end retransmission timers to expire. ■ waiting for remove—Negotiation has failed. The library is waiting for the remote end retransmission timers to expire before removing this negotiation. ■ waiting for policy manager—Negotiation is waiting for a response from the policy manager. 	detail

```

show services ipsec-vpn ike security-associations
user@host> show services ipsec-vpn ike security-associations
Remote Address  State          Initiator cookie  Responder cookie  Exchange type
6.6.6.1         Matured         062d291d21275fc7  82ef00e3d1f1c981  Main
6.6.6.1         Matured         cd6d581d7bb1664d  88a707779f3ad8d1  Main

show services ipsec-vpn ike security-associations detail
user@host> show services ipsec-vpn ike security-associations detail
IKE peer 4.4.4.4
  Role: Initiator, State: Matured
  Initiator cookie: cf22bd81a7000001, Responder cookie: fe83795c2800002e
  Exchange type: Main, Authentication method: Pre-shared-keys
  Local: 4.4.4.5:500, Remote: 4.4.4.4:500
  Lifetime: Expires in 187 seconds
  Algorithms:

```

```
Authentication      : md5
Encryption          : 3des-cbc
Pseudo random function: hmac-md5
Traffic statistics:
Input bytes  :          1000
Output bytes :          1280
Input packets:           5
Output packets:          9
Flags: Caller notification sent
IPsec security associations: 2 created, 0 deleted
Phase 2 negotiations in progress: 1

Negotiation type: Quick mode, Role: Initiator, Message ID: 3582889153
Local: 4.4.4.5:500, Remote: 4.4.4.4:500
Local identity: ipv4_subnet(tcp:80,[0..7]=10.1.1.0/24)
Remote identity: ipv4_subnet(tcp:100,[0..7]=10.1.2.0/24)
Flags: Caller notification sent, Waiting for done
```

show services ipsec-vpn ipsec security-associations

Syntax	show services ipsec-vpn ipsec security-associations <brief detail extensive> <service-set <i>service-set-name</i> >
Release Information	Command introduced before JUNOS Release 7.4.
Description	(Adaptive services interface only) Display IPsec security associations for the specified service set. If no service set is specified, the security associations for all service sets are displayed.
Options	<p>none—Display standard information about IPsec security associations for all service sets.</p> <p>brief detail extensive—(Optional) Display the specified level of output.</p> <p>service-set <i>service-set-name</i>—(Optional) Display information about a particular service set.</p>
Required Privilege Level	view
List of Sample Output	show services ipsec-vpn ipsec security associations extensive on page 917
Output Fields	Table 228 on page 915 lists the output fields for the show services ipsec-vpn ipsec security-associations command. Output fields are listed in the approximate order in which they appear.

Table 228: show services ipsec-vpn ipsec security-associations Output Fields

Field Name	Field Description	Level of Output
Service set	Name of the service set for which the IPsec security associations are defined. If appropriate, includes the outside service interface VRF name.	All levels
Rule	Name of the rule set applied to the security association.	detail extensive
Term	Name of the IPsec term applied to the security association.	detail extensive
Tunnel index	Numeric identifier of the specific IPsec tunnel for the security association.	detail extensive
Local gateway	Gateway address of the local system.	All levels
Remote gateway	Gateway address of the remote system.	All levels
IPsec inside interface	Name of the logical interface hosting the IPsec tunnels.	All levels
Local identity	Prefix and port number of the local end	All levels
Remote identity	Prefix and port number of the remote end.	All levels
Primary remote gateway	IP address of the configured primary remote peer.	All levels

Table 228: show services ipsec-vpn ipsec security-associations Output Fields (continued)

Field Name	Field Description	Level of Output
Backup remote gateway	IP address of the configured backup remote peer.	All levels
State	State of the primary or backup interface: Active , Offline , or Standby . Both ES PICs are initialized to Offline . For primary and backup peers, State can be Active or Standby . If both peers are in a state of Standby , no connection exists yet between the two peers.	All levels
Failover counter	Number of times a PIC switched between primary and backup interfaces, or the number of times the tunnel switched between the primary and remote peers since the software has been activated.	All levels
Direction	Direction of the security association: inbound or outbound .	All levels
SPI	Value of the security parameter index.	All levels
AUX-SPI	Value of the auxiliary security parameter index. <ul style="list-style-type: none"> ■ When the value of Protocol is AH or ESP, AUX-SPI is always 0. ■ When the value of Protocol is AH+ESP, AUX-SPI is always a positive integer. 	All levels
Mode	Mode of the security association: <ul style="list-style-type: none"> ■ transport—Protects single host-to-host protections. ■ tunnel—Protects connections between security gateways. 	detail extensive
Type	Type of security association: <ul style="list-style-type: none"> ■ manual—Security parameters require no negotiation. They are static, and are configured by the user. ■ dynamic—Security parameters are negotiated by the IKE protocol. Dynamic security associations are not supported in transport mode. 	detail extensive
State	Status of the security association: <ul style="list-style-type: none"> ■ Installed—The security association is installed in the security association database. (For transport mode security associations, the value of State must always be Installed) ■ Not installed—The security association is not installed in the security association database. 	detail extensive
Protocol	Protocol supported: <ul style="list-style-type: none"> ■ transport mode supports Encapsulation Security Protocol (ESP) or Authentication Header (AH). ■ tunnel mode supports ESP or AH+ESP. 	All levels
Authentication	Type of authentication used: hmac-md5-96 , hmac-sha1-96 , or none .	detail extensive
Encryption	Type of encryption algorithm used: can be aes-cbc (128 bits) , aes-cbc (192 bits) , aes-cbc (256 bits) , des-cbc , 3des-cbc , or None .	detail

Table 228: show services ipsec-vpn ipsec security-associations Output Fields (continued)

Field Name	Field Description	Level of Output
Soft lifetime	Each lifetime of a security association has two display options, hard and soft, one of which must be present for a dynamic security association. The hard lifetime specifies the lifetime of the SA. The soft lifetime, which is derived from the hard lifetime, informs the IPSec key management system that the SA is about to expire. This information allows the key management system to negotiate a new SA before the hard lifetime expires.	detail extensive
Hard lifetime		
	<ul style="list-style-type: none"> ■ Expires in <i>seconds</i> seconds—Number of seconds left until the security association expires. ■ Expires in <i>kilobytes</i> kilobytes—Number of kilobytes left until the security association expires. 	
Anti-replay service	State of the service that prevents packets from being replayed: Enabled or Disabled.	detail extensive
Replay window size	Configured size, in packets, of the antireplay service window: 32 or 64. The antireplay window size protects the receiver against replay attacks by rejecting old or duplicate packets. If the replay window size is 0, antireplay service is disabled.	detail

```

show services ipsec-vpn ipsec security associations extensive
user@host> show services ipsec-vpn ipsec security-associations extensive
Service set: service-set-1
  Rule: _junos_, Term: term-1, Tunnel index: 1
  Local gateway: 101.101.101.2, Remote gateway: 14.14.14.4
  IPSec inside interface: sp-2/0/0.1 Local identity:
  ipv4_subnet(any:0,[0..7]=0.0.0.0/0)
  Remote identity: ipv4_subnet(any:0,[0..7]=0.0.0.0/0)
  Primary remote gateway: 101.101.101.1, State: Standby
  Backup remote gateway: 14.14.14.4, State: Active
  Failover counter: 1

  Direction: inbound, SPI: 3743521590, AUX-SPI: 0
  Mode: tunnel, Type: dynamic, State: Installed
  Protocol: ESP, Authentication: hmac-sha1-96, Encryption: 3des-cbc
  Soft lifetime: Expires in 23043 seconds
  Hard lifetime: Expires in 23178 seconds
  Anti-replay service: Enabled, Replay window size: 64

  Direction: outbound, SPI: 2551045240, AUX-SPI: 0
  Mode: tunnel, Type: dynamic, State: Installed
  Protocol: ESP, Authentication: hmac-sha1-96, Encryption: 3des-cbc
  Soft lifetime: Expires in 23043 seconds
  Hard lifetime: Expires in 23178 seconds
  Anti-replay service: Enabled, Replay window size: 64

```

show services ipsec-vpn ipsec statistics

Syntax	show services ipsec-vpn ipsec statistics <brief detail> <remote-gw remote-peer-address> <service-set service-set-name>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(Adaptive services interface only) Display IPSec statistics for the specified service set. If no service set is specified, the statistics for all service sets are displayed.
Options	<p>none—Display standard IPSec statistics for all service sets.</p> <p>brief detail—(Optional) Display the specified level of output.</p> <p>remote-gw remote-peer-address—Display IPSec statistics for an individual IPSec tunnel and an individual remote host.</p> <p>service-set service-set-name—(Optional) Display information about a particular service set.</p>
Required Privilege Level	view
List of Sample Output	<p>show services ipsec-vpn ipsec statistics detail on page 920</p> <p>show services ipsec-vpn ipsec statistics remote-gw on page 920</p>
Output Fields	Table 229 on page 918 lists the output fields for the show services ipsec-vpn ipsec statistics command. Output fields are listed in the approximate order in which they appear.

Table 229: show services ipsec-vpn ipsec statistics Output Fields

Field Name	Field Description	Level of Output
PIC	The physical interface on which the IPSec tunnel is configured.	All levels
Service set	Name of the service set for which the IPSec tunnel is defined.	All levels
Local gateway	Gateway address of the local system.	All levels
Remote gateway	Gateway address of the remote system.	All levels
Tunnel index	Numeric identifier of the specific IPSec tunnel for the security association.	All levels

Table 229: show services ipsec-vpn ipsec statistics Output Fields *(continued)*

Field Name	Field Description	Level of Output
ESP statistics	Encapsulation Security Payload (ESP) statistics: <ul style="list-style-type: none"> ■ Encrypted bytes—Total number of bytes encrypted by the local system across the IPsec tunnel. ■ Decrypted bytes—Total number of bytes decrypted by the local system across the IPsec tunnel. ■ Encrypted packets—Total number of packets encrypted by the local system across the IPsec tunnel. ■ Decrypted packets—Total number of packets decrypted by the local system across the IPsec tunnel. 	All levels
AH Statistics	Authentication Header statistics: <ul style="list-style-type: none"> ■ Input bytes—Total number of bytes received by the local system across the IPsec tunnel. ■ Output bytes—Total number of bytes transmitted by the local system across the IPsec tunnel. ■ Input packets—Total number of packets received by the local system across the IPsec tunnel. ■ Output packets—Total number of packets transmitted by the local system across the IPsec tunnel. 	All levels
Errors	<ul style="list-style-type: none"> ■ AH authentication failures—Total number of authentication header (AH) failures. An AH failure occurs when there is a mismatch of the authentication header in a packet transmitted across an IPsec tunnel. ■ Replay errors—Total number of replay errors. A replay error is generated when a duplicate packet is received within the replay window. ■ ESP authentication failures—Total number of Encapsulation Security Payload (ESP) failures. An ESP failure occurs when there is an authentication mismatch in ESP packets. ■ Decryption errors—Total number of decryption errors. ■ Bad headers—Total number of invalid headers detected. ■ Bad trailers—Total number of invalid trailers detected. 	All levels

```

show services ipsec-vpn ipsec statistics detail
user@host> show services ipsec-vpn ipsec statistics detail
PIC: sp-3/1/0, Service set: service-set-1
Local gateway: 21.21.1.1, Remote gateway: 21.21.2.1, Tunnel index: 1
ESP Statistics:
  Encrypted bytes:          0
  Decrypted bytes:          0
  Encrypted packets:        0
  Decrypted packets:        0
AH Statistics:
  Input bytes:              0
  Output bytes:             0
  Input packets:            0
  Output packets:           0
Errors:
  AH authentication failures: 0, Replay errors: 0
  ESP authentication failures: 0, Decryption errors: 0
  Bad headers: 0 Bad trailers: 0

show services ipsec-vpn ipsec statistics remote-gw 22.22.2.1
user@host> show services ipsec-vpn ipsec statistics remote-gw 22.22.2.1
PIC: sp-3/1/0, Service set: service-set-2
Local gateway: 22.22.1.1, Remote gateway: 22.22.2.1, Tunnel index: 2
ESP Statistics:
  Encrypted bytes:          0
  Decrypted bytes:          0
  Encrypted packets:        0
  Decrypted packets:        0
AH Statistics:
  Input bytes:              0
  Output bytes:             0
  Input packets:            0
  Output packets:           0
Errors:
  AH authentication failures: 0, Replay errors: 0
  ESP authentication failures: 0, Decryption errors: 0
  Bad headers: 0 Bad trailers: 0

```

show system certificate

Syntax	show system certificate <i><certificate-id></i>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(Encryption interface on M-series and T-series routing platforms only) Display installed certificates signed by the Juniper Networks certificate authority.
Options	<p>none—Display all installed certificates signed by the Juniper Networks certificate authority.</p> <p><i>certificate-id</i>—(Optional) Display the details of a particular certificate.</p>
Required Privilege Level	maintenance
List of Sample Output	show system certificate on page 921
Output Fields	Table 230 on page 921 lists the output fields for the show system certificate command. Output fields are listed in the approximate order in which they appear.

Table 230: show system certificate Output Fields

Field Name	Field Description
Certificate identifier	A unique identifier associated with a certificate. The certificate identifier is the common name of the subject.
Issuer	Information about the certificate issuer and the distinguished name (DN) of the issuer, respectively:
Subject	<ul style="list-style-type: none"> ■ 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.

show system certificate user@host> **show system certificate**
 Certificate identifier: Dallas-v3
 Issuer:

```
Organization: Juniper Networks, Organizational unit: Juniper CA,  
Country: US, State: CA, Locality: Sunnyvale, Common name: Dallas CA,  
E-mail address:ca@juniper.net  
Subject:  
Organization: Juniper Networks, Organizational unit: Juniper CA,  
Country: US, State: CA, Locality: Sunnyvale, Common name: Dallas-v3,  
E-mail address:ca@juniper.net  
Validity:  
Not before: Mar 13 03:23:25 2004 GMT  
Not after: Mar 24 03:23:25 2014 GMT  
Signature algorithm: sha1WithRSAEncryption  
Public key algorithm: dsaEncryption
```

Chapter 23

Layer 2 Tunneling Protocol Operational Mode Commands

Table 231 on page 923 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot Layer 2 Tunneling Protocol (L2TP) services. Commands are listed in alphabetical order.

Table 231: L2TP Services Operational Mode Commands

Task	Command
Clear L2TP multilink bundles.	clear services l2tp multilink
Clear L2TP sessions.	clear services l2tp session
Clear L2TP tunnels.	clear services l2tp tunnel statistics
Display L2TP multilink bundles.	show services l2tp multilink
Display RADIUS server and statistics information.	show services l2tp radius
Display active L2TP sessions.	show services l2tp session
Display L2TP summary information.	show services l2tp summary
Display active L2TP tunnels.	show services l2tp tunnel
Display active L2TP users.	show services l2tp user



NOTE: L2TP services are supported on the adaptive services (*sp-fpc/pic/port*) interface on M7i and M10i routers.



NOTE: For information about how to configure L2TP services, see the *JUNOS Services Interfaces Configuration Guide*.

clear services l2tp multilink

Syntax	clear services l2tp multilink (all <statistics> bundle-id <i>number</i> <statistics> statistics (all bundle-id <i>number</i>))
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M10i and M7i routers only) Close Layer 2 Tunneling Protocol (L2TP) multilink sessions or clear session statistics.
Options	<p>all <statistics>—Close all L2TP multilink sessions or clear statistics for all L2TP multilink sessions.</p> <p>bundle-id <i>number</i> <statistics>—L2TP multilink bundle ID. The value is an internally generated number from 1 to 65535. Close the specified L2TP multilink session, or using the statistics keyword with this option, clear statistics for the specified session.</p> <p>statistics (all bundle-id <i>number</i>)—Clear all session statistics or clear statistics for the specified multilink bundle ID.</p>
Required Privilege Level	view
Related Topics	show services l2tp multilink
List of Sample Output	clear services l2tp multilink statistics all on page 924
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear services l2tp multilink statistics all	<pre>user@host> clear services l2tp multilink statistics all Multilink 1 statistics cleared</pre>

clear services l2tp session

Syntax	clear services l2tp session (all statistics interface <i>sp-fpc/pic/port</i> local-gateway <i>gateway-address</i> local-gateway-name <i>gateway-name</i> local-session-id <i>session-id</i> <statistics> local-tunnel-id <i>tunnel-id</i> peer-gateway <i>gateway-address</i> peer-gateway-name <i>gateway-name</i> statistics (all local-session-id <i>session-id</i> user <i>username</i>) tunnel-group <i>group-name</i> user <i>username</i> <statistics>)
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M10i and M7i routers only) Close Layer 2 Tunneling Protocol (L2TP) sessions, or clear session statistics.
Options	<p>all statistics—Clear statistics for all L2TP sessions.</p> <p>interface <i>sp-fpc/pic/port</i>—Clear statistics for only the L2TP tunnels using the specified adaptive services interface.</p> <p>local-gateway <i>gateway-address</i>—Clear statistics for only the L2TP tunnels that have the specified local gateway address.</p> <p>local-gateway-name <i>gateway-name</i>—Clear statistics for only the L2TP tunnels that have the specified local gateway name.</p> <p>local-session-id <i>session-id</i> <statistics>—Identifier for the local endpoint of the L2TP session. Close the specified L2TP session, or, using the statistics keyword with this option, clear statistics for the specified session.</p> <p>local-tunnel-id <i>tunnel-id</i>—Clear statistics for only the L2TP tunnels that have the specified local tunnel identifier.</p> <p>peer-gateway <i>gateway-address</i>—Clear statistics for only the L2TP tunnels that have the specified peer gateway address.</p> <p>peer-gateway-name <i>gateway-name</i>—Clear statistics for only the L2TP tunnels that have the specified peer gateway name.</p> <p>statistics (all local-session-id <i>session-id</i> user <i>username</i>)—Clear all session statistics, clear statistics for the session using a specific local endpoint, or clear statistics for the session with a specific username.</p> <p>tunnel-group <i>group-name</i>—Clear statistics for only the L2TP tunnels that have the specified tunnel group.</p> <p>user <i>username</i> <statistics>—Username. Close the session for the specified username, or using the statistics keyword with this option, clear statistics for the session.</p>
Required Privilege Level	view
Related Topics	show services l2tp session

List of Sample Output clear services l2tp session statistics all on page 926

Output Fields When you enter this command, you are provided feedback on the status of your request.

clear services l2tp session statistics all user@host> **clear services l2tp session statistics all**
Session 26497 statistics cleared

clear services l2tp tunnel statistics

Syntax	clear services l2tp tunnel statistics (all interface <i>sp-fpc/pic/port</i> local-gateway <i>gateway-address</i> local-gateway-name <i>gateway-name</i> local-tunnel-id <i>tunnel-id</i> peer-gateway <i>gateway-address</i> peer-gateway-name <i>gateway-name</i> tunnel-group <i>group-name</i>)
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M10i and M7i routers only) Clear Layer 2 Tunneling Protocol (L2TP) statistics.
Options	<p>all—Clear statistics for all L2TP tunnels.</p> <p>interface <i>sp-fpc/pic/port</i>—Clear statistics for only the L2TP tunnels using the specified adaptive services interface.</p> <p>local-gateway <i>gateway-address</i>—Clear statistics for only the L2TP tunnels that have the specified local gateway address.</p> <p>local-gateway-name <i>gateway-name</i>—Clear statistics for only the L2TP tunnels that have the specified local gateway name.</p> <p>local-tunnel-id <i>tunnel-id</i>—Clear statistics for only the L2TP tunnels that have the specified local tunnel identifier.</p> <p>peer-gateway <i>gateway-address</i>—Clear statistics for only the L2TP tunnels that have the specified peer gateway address.</p> <p>peer-gateway-name <i>gateway-name</i>—Clear statistics for only the L2TP tunnels that have the specified peer gateway name.</p> <p>tunnel-group <i>group-name</i>—Clear statistics for only the L2TP tunnels that have the specified tunnel group.</p>
Required Privilege Level	view
Related Topics	show services l2tp tunnel
List of Sample Output	clear services l2tp tunnel statistics all on page 927
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear services l2tp tunnel statistics all	<pre>user@host> clear services l2tp tunnel statistics all Tunnel 9933 statistics cleared</pre>

show services l2tp multilink

Syntax	show services l2tp multilink <brief detail extensive statistics> <bundle-id <i>number</i> >
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M10i and M7i routers only) Display L2TP output organized by multilink bundle.
Options	<p>none—Same as brief.</p> <p>brief detail extensive statistics—(Optional) Display the specified level of output. Use the statistics option to display packets and bytes that have been encapsulated in the Multilink Protocol. Nonmultilink packets received on member sessions are not counted here.</p> <p>bundle-id <i>number</i>—(Optional) Display L2TP multilink bundle information for only the specified bundle.</p>
Required Privilege Level	view
Related Topics	clear services l2tp multilink
List of Sample Output	show services l2tp multilink extensive on page 930
Output Fields	Table 232 on page 928 lists the output fields for the show services l2tp multilink command. Output fields are listed in the approximate order in which they appear.

Table 232: show services l2tp multilink Output Fields

Field Name	Field Description
Bundle ID	Bundle identifier.
Links	Number of links in the multilink bundle.
Bundle endpoint	Endpoint discriminator that represents the device transmitting the packet.
Input MRRU	Maximum packet size that the input interface can process.
Output MRRU	Maximum packet size that the output interface can process.
Session local ID	Identifier of the local endpoint of the L2TP session, as assigned by the L2TP network server (LNS).
Session remote ID	Identifier of the remote endpoint of the L2TP session, as assigned by the L2TP access concentrator (LAC).

Table 232: show services l2tp multilink Output Fields (*continued*)

Field Name	Field Description
State	<p>Status of the L2TP session:</p> <ul style="list-style-type: none"> ■ Established—The session is operating. ■ closed—The session is being closed. ■ destroyed—The session is being destroyed. ■ clean-up—The session is being cleaned up. ■ Ins-ic-accept-new—A new session is being accepted. ■ Ins-ic-idle—The session has been created and is idle. ■ Ins-ic-reject-new—The new session is being rejected. ■ Ins-ic-wait-connect—The session is waiting for the peer's incoming call connected (ICCN) message.
Username	Name of the user logged in to the session.
Mode	Mode of the interface representing the multilink bundle: dedicated or shared .
Local IP	IP address of the local endpoint of the Point-to-Point Protocol (PPP) session.
Remote IP	IP address of the remote endpoint of the PPP session.
Local name	Name of the LNS instance in which the session was created.
Remote name	Name of the LAC from which the session was created.
Local MRU	Maximum receive unit (MRU) setting of the local device, in bytes.
Remote MRU	MRU setting of the remote device, in bytes.
Statistics since	<p>Date and time when collection of the following statistics began:</p> <ul style="list-style-type: none"> ■ Control Tx—Amount of control information transmitted, in packets and bytes. ■ Control Rx—Amount of control information received, in packets and bytes. ■ Data Tx—Amount of data transmitted, in packets and bytes. ■ Data Rx—Amount of data received, in packets and bytes. ■ Errors Tx—Number of errors transmitted, in packets. ■ Errors Rx—Number of errors received, in packets.

```

show services l2tp      user@host> show services l2tp multilink extensive
multilink extensive    Bundle ID: 1
                          Links: 2, Bundle endpoint: user@juniper.com
                          Input MRRU: 1524, Output MRRU: 1524
                          Session local ID: 46122, Session remote ID: 39307
                          State: Established, Username: user1@juniper.com, Mode: dedicated
                          Local IP: 10.58.255.129:1701, Remote IP: 10.58.255.131:1701
                          Local name: router3, Remote name: router4
                          Session local ID: 4254, Session remote ID: 39308
                          State: Established, Username: user2@juniper.com, Mode: dedicated
                          Local IP: 10.1.255.1:1701, Remote IP: 10.1.255.2:1701
                          Local name: router1, Remote name: router2
                          Statistics since: Mon May 17 11:47:35 2004
                                Packets      Bytes
                                Control Tx    7      196
                                Control Rx    3       90
                                Data Tx       0       0
                                Data Rx       0       0
                                Errors Tx     0       0
                                Errors Rx     0       0

```

show services l2tp radius

Syntax	show services l2tp radius <accounting (servers statistics)> <authentication (servers statistics)> <servers> <statistics>
Release Information	Command introduced in JUNOS Release 9.0.
Description	(M7i, M10i, and M120 routers only) Display RADIUS servers and statistics information for the RADIUS servers configured on the router.
Options	<p>You must include one of the following keywords to provide a valid completion for the command:</p> <p>accounting (servers statistics)—(Optional) Display RADIUS servers or statistical accounting information only.</p> <p>authentication (servers statistics)—(Optional) Display RADIUS servers or statistical authentication information only.</p> <p>servers—(Optional) Display RADIUS authentication and accounting server information only.</p> <p>statistics—(Optional) Display RADIUS authentication and accounting statistics information only.</p>
Required Privilege Level	view
List of Sample Output	<p>show services l2tp radius servers on page 932</p> <p>show services l2tp radius statistics on page 933</p>
Output Fields	Table 233 on page 931 lists the output fields for the show services l2tp radius command. Output fields are listed in the approximate order in which they appear.

Table 233: show services l2tp radius Output Fields

Field Name	Field Description
IP Address	IP address of the server.
State	(servers keyword only) Present state of the server.
UDP Port	Number of the UDP port used to send authentication or accounting messages to the server.
Retry Count	(servers keyword only) Number of times the RADIUS client resends a packet if no ACK is received.
Timeout	(servers keyword only) Length of time the client waits for an ACK before retransmission.
Pending Requests	(servers keyword only) Number of client pending authentication or accounting requests.

Table 233: show services l2tp radius Output Fields (continued)

Field Name	Field Description
Maximum Sessions	(servers keyword only) Maximum number of pending requests on each RADIUS client before the server moves to the next RADIUS client, which is 200 times the maximum number of clients that can be created on a server (which is 12).
Dead Time	(servers keyword only) Interval to wait before retrying a server after it fails to send a response to an authentication or accounting request.
Secret Type	(servers keyword only) Secret type configured on the RADIUS server.
Profile	(servers keyword only) Name of profile configured for the RADIUS server.
Access requests	(statistics keyword only) Number of access requests sent to the server.
Rollover requests	(statistics keyword only) Number of requests coming into the server as a result of the previous server timing out.
Retransmissions	(statistics keyword only) Number of retransmissions.
Access accepts	(statistics keyword only) Number of access accept messages received from the server.
Access rejects	(statistics keyword only) Number of access reject messages received from the server.
Access challenges	(statistics keyword only) Number of access challenges received from the server.
Malformed responses	(statistics keyword only) Number of responses with attributes having an invalid length or unexpected attributes (such as two attributes when the response is required to have at most one).
Bad authenticators	(statistics keyword only) Number of responses in which the authenticator is incorrect for the matching request. This can occur if the RADIUS secrets for the client and server do not match.
Requests pending	(statistics keyword only) Number of requests waiting for a response.
Request timeouts	(statistics keyword only) Number of requests that timed out.
Unknown responses	(statistics keyword only) Number of unknown responses. The RADIUS response type in the header is invalid or unsupported.
Packets dropped	(statistics keyword only) Number of packets dropped because they are too short or because the router receives a response for which there is no corresponding request. For example, if the router sends a request that times out, the router removes the request from the list and sends a new request. If the server is slow and sends a response to the first request after the router removes the request, the packet is dropped.

**show services l2tp
radius servers**

```
user@host> show services l2tp radius servers
RADIUS Authentication Servers
```

IP Address	State	UDP Port	Retry Count	Timeout	Pending Requests	Maximum Sessions	Dead Time	Secret Type
17.1.1.1	Active	1812	2	25	0	2400	300	radius-key
133.122.1.1	Active	1812	5	35	0	2400	300	radius-key

134.141.1.1	Active	1812	2	25	0	2400	300	radius-key
172.28.30.174	Active	1812	7	75	0	2400	300	radius-key
172.28.30.175	Active	1812	7	75	0	2400	300	radius-key
172.28.30.176	Active	1812	4	55	0	2400	300	radius-key
172.128.30.176	Active	1812	3	3	0	2400	300	none-set
172.128.130.174	Active	1812	7	75	0	2400	300	radius-key

RADIUS Accounting Servers

IP Address	State	UDP Port	Retry Count	Timeout	Pending Requests	Maximum Sessions	Dead Time	Secret Type
17.1.1.1	Active	1813	2	25	0	2400	300	radius-key
133.122.1.1	Active	1813	5	35	0	2400	300	radius-key
134.141.1.1	Active	1813	2	25	0	2400	300	radius-key
172.28.30.174	Active	1813	7	75	0	2400	300	radius-key
172.28.30.175	Active	1813	7	75	0	2400	300	radius-key
172.28.30.176	Active	1813	4	55	0	2400	300	radius-key
172.128.30.176	Active	1813	3	3	0	2400	300	none-set
172.128.130.174	Active	1813	7	75	0	2400	300	radius-key

RADIUS Accounting Servers

Profile: user1

**show services l2tp
radius statistics**user@host> **show services l2tp radius statistics**
RADIUS Authentication Statistics

Authentication statistics:

Server 17.1.1.1, UDP port: 1812

```

Access requests      : 40
Rollover requests   : 5
Retransmissions     : 2
Access accepts      : 39
Access rejects      : 1
Access challenges    : 3
Malformed responses : 0
Bad authenticators   : 0
Requests pending    : 1
Request timeouts    : 0
Unknown responses    : 0
Packets dropped      : 0

```

RADIUS Accounting Statistics

Accounting statistics:

Server 172.128.130.174, UDP port: 1813

```

Total requests       : 9
Start requests       : 6
Interim requests     : 1

```

```
Stop requests      : 2
Rollover requests  : 0
Retransmissions    : 1
Total response     : 9
Start responses    : 6
Interim responses  : 1
Stop responses     : 2
Malformed responses : 0
Bad authenticators : 0
Requests pending   : 1
Request timeouts   : 0
Unknown responses  : 0
Packets dropped    : 0
```

show services l2tp session

Syntax show services l2tp session
 <brief | detail | extensive | statistics>
 <interface *sp-fpc/pic/port*>
 <local-gateway *gateway-address*>
 <local-gateway-name *gateway-name*>
 <local-session-id *session-id*>
 <local-tunnel-id *tunnel-id*>
 <peer-gateway *gateway-address*>
 <peer-gateway-name *gateway-name*>
 <tunnel-group *group-name*>
 <user *username*>

Release Information Command introduced before JUNOS Release 7.4.

Description (M10i and M7i routers only) Display a list of active L2TP sessions.

Options none—Display standard information about all active L2TP sessions.

brief | detail | extensive | statistics—(Optional) Display the specified level of output. Use the **statistics** option to display packet and byte counts for each session.

interface *sp-fpc/pic/port*—(Optional) Display L2TP session information for only the specified adaptive services interface.

local-gateway *gateway-address*—(Optional) Display L2TP session information for only the specified local gateway address.

local-gateway-name *gateway-name*—(Optional) Display L2TP session information for only the specified local gateway name.

local-session-id *session-id*—(Optional) Display L2TP session information for only the specified local session identifier.

local-tunnel-id *tunnel-id*—(Optional) Display L2TP session information for only the specified local tunnel identifier.

peer-gateway *gateway-address*—(Optional) Display L2TP session information for only the specified peer gateway address.

peer-gateway-name *gateway-name*—(Optional) Display L2TP session information for only the specified peer gateway name.

tunnel-group *group-name*—(Optional) Display L2TP session information for only the specified tunnel group. To display information about L2TP CPU and memory usage, you can include the tunnel group name in the **show services service-sets memory-usage *group-name*** and **show services service-sets cpu-usage *group-name*** commands.

user *username*—(Optional) Display L2TP session information for only the specified username.

Required Privilege Level view

Related Topics clear services flow-collector statistics

List of Sample Output show services l2tp session on page 938
show services l2tp session extensive on page 938

Output Fields Table 234 on page 936 lists the output fields for the `show services l2tp session` command. Output fields are listed in the approximate order in which they appear.

Table 234: show services l2tp session Output Fields

Field Name	Field Description	Level of Output
Interface	Name of an adaptive services interface.	All levels
Tunnel group	Name of a tunnel group.	All levels
Tunnel local ID	Identifier of the local endpoint of the tunnel, as assigned by the L2TP network server (LNS).	All levels
Session local ID	Identifier of the local endpoint of the L2TP session, as assigned by the LNS.	All levels
Session remote ID	Identifier of the remote endpoint of the L2TP session, as assigned by the L2TP access concentrator (LAC).	All levels
State	State of the L2TP session: <ul style="list-style-type: none"> ■ Established—The session is operating. ■ closed—The session is being closed. ■ destroyed—The session is being destroyed. ■ clean-up—The session is being cleaned up. ■ Ins-ic-accept-new—A new session is being accepted. ■ Ins-ic-idle—The session has been created and is idle. ■ Ins-ic-reject-new—The new session is being rejected. ■ Ins-ic-wait-connect—The session is waiting for the peer's incoming call connected (ICCN) message. 	All levels
Bundle ID	Bundle identifier. Indicates the session is part of a multilink bundle. Sessions that have a blank Bundle field are not participating in the Multilink Protocol. Sessions in a multilink bundle might belong to different L2TP tunnels. For L2TP output organized by bundle ID, issue the <code>show services l2tp multilink extensive</code> command.	All levels
Mode	Mode of the interface representing the session: <code>shared</code> or <code>exclusive</code> .	extensive
Local IP	IP address of local endpoint of the Point-to-Point Protocol (PPP) session.	extensive
Remote IP	IP address of remote endpoint of the PPP session.	extensive
Username	Name of the user logged in to the session.	All levels
Assigned IP address	IP address assigned to remote client.	extensive
Local name	Name of the LNS instance in which the session was created.	extensive

Table 234: show services l2tp session Output Fields (continued)

Field Name	Field Description	Level of Output
Remote name	Name of the LAC from which the session was created.	extensive
Local MRU	Maximum receive unit (MRU) setting of the local device, in bytes.	extensive
Remote MRU	MRU setting of the remote device, in bytes.	extensive
Tx speed	Transmit speed of the physical PPP link, in bps.	extensive
Rx speed	Receive speed of the physical PPP link, in bps.	extensive
Bearer type	Type of bearer enabled: <ul style="list-style-type: none"> ■ 0—Might indicate that the call was not received over a physical link (for example, when the LAC and PPP are located in the same subsystem). ■ 1—Digital access requested ■ 2—Analog access requested ■ 4—Asynchronous Transfer Mode (ATM) bearer support 	extensive
Framing type	Type of framing enabled: <ul style="list-style-type: none"> ■ 1—Synchronous framing ■ 2—Asynchronous framing 	extensive
LCP renegotiation	Whether Link Control Protocol (LCP) renegotiation is configured: On or Off.	extensive
Authentication	Type of authentication algorithm used: Challenge Handshake Authentication Protocol (CHAP) or Password Authentication Protocol (PAP).	extensive
Interface ID	Identifier used to look up the logical interface for this session.	extensive
Interface unit	Logical interface for this session.	All levels
Call serial number	Unique serial number assigned to the call.	extensive
Policer bandwidth	Maximum policer bandwidth configured for this session.	extensive
Policer burst size	Maximum policer burst size configured for this session.	extensive
Firewall filter	Configured firewall filter name.	extensive
Session encapsulation overhead	Overhead allowance configured for this session, in bytes.	extensive
Session cell overhead	Cell overhead activation (On or Off).	extensive
Create time	Date and time when the call was created.	extensive
Up time	Length of time elapsed since the call became active, in hours, minutes, and seconds.	extensive

Table 234: show services l2tp session Output Fields (continued)

Field Name	Field Description	Level of Output
Idle time	Length of time elapsed since the call became idle, in hours, minutes, and seconds.	extensive
Statistics since	Date and time when collection of the following statistics began: <ul style="list-style-type: none"> ■ Control Tx—Amount of control information transmitted, in packets and bytes. ■ Control Rx—Amount of control information received, in packets and bytes. ■ Data Tx—Amount of data transmitted, in packets and bytes. ■ Data Rx—Amount of data received, in packets and bytes. ■ Errors Tx—Number of errors transmitted, in packets. ■ Errors Rx—Number of errors received, in packets. 	extensive

```

show services l2tp session      user@host> show services l2tp session
Interface: sp-1/2/0, Tunnel group: group1, Tunnel local ID: 8802
Local Remote Interface State      Bundle Username
ID   ID   unit
37966    5       2 Established

show services l2tp session extensive
user@host> show services l2tp session extensive
Interface: sp-1/2/0, Tunnel group: group1, Tunnel local ID: 62746
Session local ID: 56793, Session remote ID: 53304
State: Established, Bundle ID: 5, Mode: shared
Local IP: 10.128.1.1:1701, Remote IP: 10.128.1.2:1701
Username: usr1@juniper_1.net, Assigned IP address: 10.50.2.1/32
Local MRU: 4000, Remote MRU: 1500, Tx speed: 64000, Rx speed: 64000
Bearer type: 2, Framing type: 1
LCP renegotiation: Off, Authentication: CHAP, Interface ID: unit_20
Interface unit: 20, Call serial number: 4137941434
Policer bandwidth: 64000, Policer burst size: 51200
Firewall filter: f1
Session encapsulation overhead: 16, Session cell overhead: On
Create time: Tue Mar 23 14:13:15 2004, Up time: 01:16:41
Idle time: 00:00:00
Statistics since: Tue Mar 23 14:13:13 2004
                Packets      Bytes
Control Tx         4          88
Control Rx         2          28
Data Tx            0           0
Data Rx          461        29.0k
Errors Tx          0
Errors Rx          0

Interface: sp-1/2/0, Tunnel group: group_company_dns, Tunnel local ID: 37266
Session local ID: 39962, Session remote ID: 53303
State: Established, Bundle ID: 5, Mode: shared
Local IP: 10.128.11.1:1701, Remote IP: 10.128.11.2:1701
Username: usr1@company.com, Assigned IP address: 10.46.2.3/24
Local name: router-1, Remote name: router-2
Local MRU: 4470, Remote MRU: 4470, Tx speed: 155000000, Rx speed: 155000000
Bearer type: 2, Framing type: 1
LCP renegotiation: Off, Authentication: CHAP, Interface ID: unit_31
Interface unit: 31, Call serial number: 4137941433

```

```
Policer bandwidth: 64000, Policer burst size: 51200
Firewall filter: f1
Create time: Tue Mar 23 14:13:17 2004, Up time: 01:16:39
Idle time: 01:16:36
Statistics since: Tue Mar 23 14:13:15 2004
```

	Packets	Bytes
Control Tx	6	196
Control Rx	4	150
Data Tx	0	0
Data Rx	1	80
Errors Tx	0	
Errors Rx	0	

show services l2tp summary

Syntax	show services l2tp summary <interface <i>sp-fpc/pic/port</i> >
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M10i and M7i routers only) Display Layer 2 Tunneling Protocol (L2TP) summary information.
Options	none—Display L2TP summary information for all adaptive services interfaces. interface <i>sp-fpc/pic/port</i> —(Optional) Display L2TP summary information for only the specified adaptive services interface.
Required Privilege Level	view
List of Sample Output	show services l2tp summary on page 940
Output Fields	Table 235 on page 940 lists the output fields for the show services l2tp summary command. Output fields are listed in the approximate order in which they appear.

Table 235: show services l2tp summary Output Fields

Field Name	Field Description
Tunnels	Number of tunnels established on the routing platform.
Sessions	Number of sessions established on the routing platform.
Errors	Number of errors.
Control	Amount of control information transmitted and received, in packets and bytes.
Data	Amount of data transmitted and received, in packets and bytes.

```

show services l2tp summary  user@host> show services l2tp summary
Tunnels: 2, Sessions: 2, Errors: 0
      Tx packets    Rx packets    Memory (bytes)
Control           6k           9k           688k
Data              70k          70k           3054

```


show services l2tp tunnel

Syntax	<pre>show services l2tp tunnel <brief detail extensive statistics> <interface sp-fpc/pic/port> <local-gateway gateway-address> <local-gateway-name gateway-name> <local-tunnel-id tunnel-id> <peer-gateway gateway-address> <peer-gateway-name gateway-name> <tunnel-group group-name></pre>
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M10i and M7i routers only) Display a list of active Layer 2 Tunneling Protocol (L2TP) tunnels.
Options	<p>none—Display standard information about all active L2TP tunnels.</p> <p>brief detail extensive statistics—(Default) Display the specified level of output. Use the statistics option to display L2TP tunnel statistics.</p> <p>interface <i>sp-fpc/pic/port</i>—(Optional) Display L2TP tunnel information for only the specified adaptive services interface.</p> <p>local-gateway <i>gateway-address</i>—(Optional) Display L2TP tunnel information for only the specified local gateway address.</p> <p>local-gateway-name <i>gateway-name</i>—(Optional) Display L2TP tunnel information for only the specified local gateway name.</p> <p>local-tunnel-id <i>tunnel-id</i>—(Optional) Display L2TP tunnel information for only the specified local tunnel identifier.</p> <p>peer-gateway <i>gateway-address</i>—(Optional) Display L2TP tunnel information for only the specified peer gateway address.</p> <p>peer-gateway-name <i>gateway-name</i>—(Optional) Display L2TP tunnel information for only the specified peer gateway name.</p> <p>tunnel-group <i>group-name</i>—(Optional) Display L2TP tunnel information for only the specified tunnel group.</p>
Required Privilege Level	view
List of Sample Output	show services l2tp tunnel extensive on page 943
Output Fields	Table 236 on page 942 lists the output fields for the show services l2tp tunnel command. Output fields are listed in the approximate order in which they appear.

Table 236: show services l2tp tunnel Output Fields

Field Name	Field Description
Interface	Name of an adaptive services interface.
Tunnel group	Name of a tunnel group.
Local ID	Numeric identifier of the local endpoint of the tunnel, as assigned by the L2TP network server (LNS).
Remote ID	Numeric identifier of the remote endpoint of the tunnel, as assigned by the L2TP access concentrator (LAC).
Remote IP	IP address of the peer endpoint of the tunnel.
Sessions	Number of L2TP sessions established through the tunnel.
State	<p>State of the L2TP tunnel:</p> <ul style="list-style-type: none"> ■ cc_responder_accept_new—The tunnel has received and accepted the start control connection request (SCCRQ). ■ cc_responder_reject_new—The tunnel has received and rejected the SCCRQ. ■ cc_responder_idle—The tunnel has just been created. ■ cc_responder_wait_ctl_conn—The tunnel has sent the start control connection response (SCCRP) and is waiting for the start control connection connected (SCCCN) message. ■ clean-up—The tunnel is being cleaned up. ■ closed—The tunnel is being closed. ■ destroyed—The tunnel is being destroyed. ■ Established—The tunnel is operating. ■ Terminate—The tunnel is terminating. ■ Unknown—The tunnel is not connected to the router.
Local IP	IP address of the local endpoint of the tunnel.
Local name	Name used for local tunnel endpoint during tunnel negotiation.
Remote name	Name used for remote tunnel endpoint during tunnel negotiation.
Max sessions	Maximum number of sessions that can be established on this tunnel.
Window size	Number of control messages that can be sent without receipt of an acknowledgment.
Hello interval	Interval between the transmission of hello messages, in seconds.
Create time	Date and time when the tunnel was created. While the LNS and LAC are connected, this value should correspond to the router's uptime. If connection to the LAC is severed, the State changes to Unknown and the Create time value resets.
Up time	Amount of time elapsed since the tunnel became active, in hours, minutes, and seconds.

Table 236: show services l2tp tunnel Output Fields (continued)

Field Name	Field Description
Idle time	Amount of time elapsed since the tunnel became idle, in hours, minutes, and seconds.
Statistics since	<p>Date and time when collection of the following statistics began:</p> <ul style="list-style-type: none"> ■ Control Tx—Amount of control information transmitted, in packets and bytes. ■ Control Rx—Amount of control information received, in packets and bytes. ■ Data Tx—Amount of data transmitted, in packets and bytes. ■ Data Rx—Amount of data received, in packets and bytes. ■ Errors Tx—Number of errors transmitted, in packets. ■ Errors Rx—Number of errors received, in packets.

**show services l2tp
tunnel extensive**

```

user@host> show services l2tp tunnel extensive
Interface: sp-1/2/0, Tunnel group: group1
Tunnel local ID: 62746, Tunnel remote ID: 16930
Remote IP: 10.128.1.2:1701
Sessions: 1, State: Established
Local IP: 10.128.1.1:1701
Local name: router-1, Remote name: router-2
Max sessions: 50, Window size: 32, Hello interval: 60
Create time: Tue Mar 23 14:13:15 2004, Up time: 01:14:58
Idle time: 00:00:07
Statistics since: Tue Mar 23 14:13:13 2004
      Packets      Bytes
Control Tx         80      1152
Control Rx          3        272
Data Tx             0           0
Data Rx          450      28.0k
Errors Tx           0
Errors Rx           0

Interface: sp-1/2/0, Tunnel group: group_company_dns
Tunnel local ID: 37266, Tunnel remote ID: 36217
Remote IP: 10.128.11.2:1701
Sessions: 1, State: Established
Local IP: 10.128.11.1:1701
Local name: router-1, Remote name: router-2
Max sessions: unlimited, Window size: 32, Hello interval: 60
Create time: Tue Mar 23 14:13:15 2004, Up time: 01:14:59
Idle time: 01:14:55
Statistics since: Tue Mar 23 14:13:13 2004
      Packets      Bytes
Control Tx         81      1164
Control Rx          3        273
Data Tx             0           0
Data Rx             1         80
Errors Tx           0
Errors Rx           0

```

show services l2tp user

Syntax	show services l2tp user <brief detail extensive statistics> <user <i>username</i> >
Release Information	Command introduced before JUNOS Release 7.4.
Description	(M10i and M7i routers only) Display a list of active Layer 2 Tunneling Protocol (L2TP) users.
Options	<p>none—Display all active L2TP users.</p> <p>brief detail extensive statistics—(Optional) Display the specified level of output. Use the statistics option to display L2TP user statistics.</p> <p>user <i>username</i>—(Optional) Display L2TP user information for only the specified username.</p>
Required Privilege Level	view
List of Sample Output	show services l2tp user extensive on page 946
Output Fields	Table 237 on page 944 lists the output fields for the show services l2tp user command. Output fields are listed in the approximate order in which they appear.

Table 237: show services l2tp user Output Fields

Field Name	Field Description	Level of Output
Interface	Name of an adaptive services interface.	to be provided
Tunnel group	Name of a tunnel group.	to be provided
Tunnel local ID	Local identifier of the tunnel, as assigned by the L2TP network server (LNS).	to be provided
Session local ID	Local identifier of the session, as assigned by the L2TP network server (LNS).	to be provided
Session remote ID	Remote identifier of the session, as assigned by the L2TP access concentrator (LAC).	to be provided
State	State of the L2TP session: <ul style="list-style-type: none"> ■ Established—The session is operating. ■ closed—The session is being closed. ■ destroyed—The session is being destroyed. ■ clean-up—The session is being cleaned up. ■ Ins-ic-accept-new—A new session is being accepted. ■ Ins-ic-idle—The session has been created and is idle. ■ Ins-ic-reject-new—The new session is being rejected. ■ Ins-ic-wait-connect—The session is waiting for the peer's incoming call connected (ICCN) message. 	to be provided

Table 237: show services l2tp user Output Fields (continued)

Field Name	Field Description	Level of Output
Mode	Mode of the interface representing the session: shared or exclusive .	to be provided
Local IP	IP address of the local endpoint of the tunnel.	to be provided
Remote IP	IP address of the peer endpoint of the tunnel.	to be provided
Username	Name of the user logged in to the session.	to be provided
Assigned IP address	IP address assigned to remote client.	to be provided
Local name	Name of the local device.	to be provided
Remote name	Name of the remote device.	to be provided
Local MRU	Maximum receive unit (MRU) setting of the local device, in bytes.	to be provided
Remote MRU	MRU setting of the remote device, in bytes.	to be provided
Tx speed	Transmit speed of the tunnel session, in bps.	to be provided
Rx speed	Receive speed of the tunnel session, in bps.	to be provided
Bearer type	Type of bearer enabled: <ul style="list-style-type: none"> ■ 0—Might indicate that the call was not received over a physical link (for example, when the LAC and PPP are located in the same subsystem) ■ 1—Digital access requested ■ 2—Analog access requested ■ 4—Asynchronous Transfer Mode (ATM) bearer support 	to be provided
Framing type	Type of framing enabled: <ul style="list-style-type: none"> ■ 1—Synchronous framing ■ 2—Asynchronous framing 	to be provided
LCP renegotiation	Whether Link Control Protocol (LCP) renegotiation is configured: On or Off .	to be provided
Authentication	Type of authentication algorithm used: Challenge Handshake Authentication Protocol (CHAP) or Password Authentication Protocol (PAP).	to be provided
Interface ID	Name of the logical unit.	to be provided
Interface unit	Logical unit number.	to be provided
Call serial number	Unique serial number assigned to the call.	to be provided
Create time	Date and time when the call was created.	to be provided
Up time	Amount of time elapsed since the call became active, in hours, minutes, and seconds.	to be provided
Idle time	Amount of time elapsed since the call became idle, in hours, minutes, and seconds.	to be provided

Table 237: show services l2tp user Output Fields (continued)

Field Name	Field Description	Level of Output
Statistics since	Date and time when collection of the following statistics began:	to be provided
	<ul style="list-style-type: none"> ■ Control Tx—Amount of control information transmitted, in packets and bytes. ■ Control Rx—Amount of control information received, in packets and bytes. ■ Data Tx—Amount of data transmitted, in packets and bytes. ■ Data Rx—Amount of data received, in packets and bytes. ■ Errors Tx—Number of errors transmitted, in packets. ■ Errors Rx—Number of errors received, in packets. 	

```

show services l2tp user extensive user@host> show services l2tp user extensive
Interface: sp-1/2/0, Tunnel group: group1, Tunnel local ID: 62746
Session local ID: 56793, Session remote ID: 53304
State: Established, Mode: shared
Local IP: 10.128.1.1:1701, Remote IP: 10.128.1.2:1701
Username: usr1@juniper_1.net, Assigned IP address: 10.50.2.1/32
Local name: router-1, Remote name: router-2
Local MRU: 4000, Remote MRU: 1500, Tx speed: 64000, Rx speed: 64000
Bearer type: 2, Framing type: 1
LCP renegotiation: Off, Authentication: CHAP, Interface ID: unit_20
Interface unit: 20, Call serial number: 4137941434
Create time: Tue Mar 23 14:13:15 2004, Up time: 01:16:41
Idle time: 00:00:00
Statistics since: Tue Mar 23 14:13:13 2004
      Packets      Bytes
Control Tx         4        88
Control Rx         2        28
Data Tx            0         0
Data Rx          461      29.0k
Errors Tx           0
Errors Rx           0
Interface: sp-1/2/0, Tunnel group: group_company_dns, Tunnel local ID: 37266
Session local ID: 39962, Session remote ID: 53303
State: Established, Username: usr1@company_dns.com, Mode: shared
Local IP: 10.128.11.1:1701, Remote IP: 10.128.11.2:1701
Username: usr1@company_dns.com, Assigned IP address: 10.48.1.1/32
Local name: router-1, Remote name: router-2
Local MRU: 4470, Remote MRU: 4470, Tx speed: 155000000,
Rx speed: 155000000
Bearer type: 2, Framing type: 1
LCP renegotiation: Off, Authentication: CHAP, Interface ID: unit_31
Interface unit: 31, Call serial number: 4137941433
Create time: Tue Mar 23 14:13:17 2004, Up time: 01:16:39
Idle time: 01:16:36
Statistics since: Tue Mar 23 14:13:15 2004
      Packets      Bytes
Control Tx         6       196
Control Rx         4       150
Data Tx            0         0
Data Rx            1         80
Errors Tx           0
Errors Rx           0

```

Chapter 24

Link Services Operational Mode Commands

Table 238 on page 947 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot Link Services IQ (LSQ) PICs.

Table 238: Link Services Operational Mode Commands

Task	Command
Display information about Link Services IQ (LSQ) PIC CPU usage.	<code>show services link-services cpu-usage</code>



NOTE: LSQ functionality is supported on the adaptive services interface on the following routing platforms:

- J-series routing platform—`ls-pim/0/slot`
- M-series and T-series routing platforms—`lsq-fpc/pic/port`



NOTE: For information about how to configure link services, see the *JUNOS Services Interfaces Configuration Guide*.

show services link-services cpu-usage

Syntax	show services link-services cpu-usage <brief detail> <interface <i>interface-name</i> >
Release Information	Command introduced in JUNOS Release 8.4.
Description	Display information about Link Services IQ (LSQ) CPU usage (M-series and T-series routing platforms only).
Options	none—Display standard information about CPU usage for all LSQ interfaces. brief detail—(Optional) Display the specified level of output. interface <i>interface-name</i> —(Optional) Display information about the specified LSQ interface.
Required Privilege Level	view
List of Sample Output	show services link-services cpu-usage brief (AS PIC) on page 950 show services link-services cpu-usage brief (MultiServices PIC) on page 950 show services link-services cpu-usage detail (AS PIC) on page 950 show services link-services cpu-usage detail (MultiServices PIC) on page 950
Output Fields	Table 239 on page 948 lists the output fields for the show services link-services cpu-usage command. Output fields are listed in the approximate order in which they appear.

Table 239: show services link-services cpu-usage Output Fields

Field Name	Field Description	Level of Output
Role	CPU functional category.	brief
1 Second Average	Percentage of usage during 1-second duration.	All levels
5 Second Average	Percentage of usage during 5-second duration.	All levels
QoS	Quality of service (QoS) CPU, which takes care of queuing and scheduling of incoming IP packets on a per-bundle basis. It schedules packets with higher QoS values first.	All levels
Sequencer	Assigns sequence numbers to outgoing MLPPP fragments and interleaves link fragmentation and interleaving (LFI) traffic.	All levels
Load Balancer	Distributes load across different fragmenter CPUs.	All levels
Fragmenter	Main LSQ CPU; fragments IP packets into MLPPP fragments and also reassembles MLPPP fragments into IP packets.	All levels
Total	Sum of all CPU functions.	brief

Table 239: show services link-services cpu-usage Output Fields (continued)

Field Name	Field Description	Level of Output
Idle	Counts idle cycles when the CPU does not have any work.	detail
Timer	Takes care of periodic events driven by a timer, such as timeouts.	detail
System	System housekeeping thread.	detail
Input (QoS)	Acquires and queues incoming IP frames from hardware interfaces.	detail
Output (QoS)	Sends scheduled frames to the next processing CPU.	detail
Output Frags (QoS)	Sends outstanding frames to the fragmenter CPU.	detail
Bypass (QoS)	Sends outstanding frames for LFI.	detail
Free frame (QoS)	Frees dropped frames.	detail
CPUnumber	Identifier number of specific CPU.	detail
Drop (Fragmenter)	Drops frames that have been marked by the QoS CPU.	detail
Frag (Fragmenter)	Fragments IP frames into MLPPP fragments.	detail
Reass (Fragmenter)	Reassembles MLPPP fragments into IP frames.	detail
Freeback (Fragmenter)	Handles freeback of credits from other CPUs (MultiServices PICs only).	detail
Input LFI (Sequencer)	Receives LFI traffic from QoS CPU and transmits it with strict priority over MLPPP.	detail
Input Frag (Sequencer)	Receives MLPPP fragments from fragmenter CPUs, assigns sequence numbers, and appends MLPPP headers.	detail
Output Frag (Sequencer)	Load-balances and transmits fragments across links.	detail
Retry (Sequencer)	Retries transmission if hardware was busy in the previous attempt.	detail
Input Alloc (Load Balancer)	Acquires frames from hardware interfaces and validates them.	detail
Input (Load Balancer)	Performs error and sanity checks and check frames for PortMapping.	detail
Output (Load Balancer)	Sends frame to next processing CPU.	detail
Freeback (Load Balancer)	Handles freeback of credits from other CPUs.	detail

```

show services user@host> show services link-services cpu-usage interface lsq-0/0/0 brief
link-services cpu-usage
brief (AS PIC)
Role           1 Second Average      5 Second Average
QoS            1.0%
Sequencer      0.1%
Fragmenter     0.1%
Total          0.1%

```

```

show services user@host> show services link-services cpu-usage interface lsq-0/0/0 brief
link-services cpu-usage
brief (MultiServices PIC)
Role           1 Second Average      5 Second Average
QoS            0.1%
Fragmenter     0.1%
Load Balancer   0.0%
Total          0.1%

```

```

show services user@host> show services link-services cpu-usage interface lsq-0/0/0 detail
link-services cpu-usage
detail (AS PIC)
QoS           Idle  Timer  System  Input  Output  Output  Bypass  Free
              frame
              Frags

CPU0          99.1%  0.9%  0.0%  0.0%  0.0%  0.0%  0.0%  0.0%
CPU1          99.8%  0.1%  0.0%  0.0%  0.0%  0.0%  0.0%  0.0%
1 sec ave     99.5%  0.5%  0.0%  0.0%  0.0%  0.0%  0.0%  0.0%
5 sec ave     99.5%  0.5%  0.0%  0.0%  0.0%  0.0%  0.0%  0.0%

Fragmenter    Idle  Timer  System  Drop   Frag   Reass   Free
              back

CPU0          96.6%  0.1%  0.0%  0.0%  0.0%  3.3%  0.0%
CPU1          99.9%  0.1%  0.0%  0.0%  0.0%  0.0%  0.0%
CPU2          99.9%  0.1%  0.0%  0.0%  0.0%  0.0%  0.0%
CPU3          99.9%  0.1%  0.0%  0.0%  0.0%  0.0%  0.0%
CPU4          99.9%  0.1%  0.0%  0.0%  0.0%  0.0%  0.0%
CPU5          99.9%  0.1%  0.0%  0.0%  0.0%  0.0%  0.0%
CPU6          99.9%  0.1%  0.0%  0.0%  0.0%  0.0%  0.0%
CPU7          99.9%  0.1%  0.0%  0.0%  0.0%  0.0%  0.0%
CPU8          99.9%  0.1%  0.0%  0.0%  0.0%  0.0%  0.0%
1 sec ave     99.5%  0.1%  0.0%  0.0%  0.0%  0.4%  0.0%
5 sec ave     99.5%  0.1%  0.0%  0.0%  0.0%  0.4%  0.0%

Sequencer     Idle  System  Input  Input  Output  Retry
              LFI   Frag   Frag

CPU0          99.9%  0.1%  0.0%  0.0%  0.0%  0.0%
CPU1          100.0% 0.0%  0.0%  0.0%  0.0%  0.0%
1 sec ave     99.9%  0.1%  0.0%  0.0%  0.0%  0.0%
5 sec ave     99.9%  0.1%  0.0%  0.0%  0.0%  0.0%

```

```

show services user@host> show services link-services cpu-usage interface lsq-0/0/0 detail
link-services cpu-usage
detail (MultiServices PIC)
QoS           Idle  Timer  System  Input  Output  Output  Bypass  Free
              frame
              Frags

CPU0          99.9%  0.1%  0.0%  0.0%  0.0%  0.0%  0.0%  0.0%
CPU1          99.9%  0.1%  0.0%  0.0%  0.0%  0.0%  0.0%  0.0%
CPU2          99.9%  0.1%  0.0%  0.0%  0.0%  0.0%  0.0%  0.0%
CPU3          99.9%  0.1%  0.0%  0.0%  0.0%  0.0%  0.0%  0.0%
CPU4          99.9%  0.1%  0.0%  0.0%  0.0%  0.0%  0.0%  0.0%
1 sec ave     99.9%  0.1%  0.0%  0.0%  0.0%  0.0%  0.0%  0.0%
5 sec ave     99.9%  0.1%  0.0%  0.0%  0.0%  0.0%  0.0%  0.0%

Fragmenter    Idle  Timer  System  Drop   Frag   Reass   Free

```

back

CPU0	99.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
CPU1	99.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
CPU2	99.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
CPU3	99.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
CPU4	99.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
CPU5	99.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
CPU6	99.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
CPU7	99.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
CPU8	99.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
CPU9	99.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
CPU10	99.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
CPU11	99.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
CPU12	99.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
CPU13	99.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
CPU14	99.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
CPU15	99.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
CPU16	99.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
CPU17	99.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
1 sec ave	99.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
5 sec ave	99.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%

Load-Balancer	Idle	System	Input Alloc	Input	Output	Free back
CPU0	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CPU1	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1 sec ave	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
5 sec ave	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Chapter 25

Mobile IP Operational Mode Commands

Table 240 on page 953 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot mobile IP services.

Table 240: Mobile IP Operational Mode Commands

Task	Command
Clear information about mobile IP bindings.	clear mobile-ip binding
Display information about mobile IP home agent bindings	show mobile-ip home-agent bindings
Display general information about mobile IP home agent.	show mobile-ip home-agent overview
Display information about traffic specific to mobile IP home agents.	show mobile-ip home-agent traffic
Display information about mobile IP home agent virtual networks.	show mobile-ip home-agent virtual-network
Display information about the WiMAX Forum Network Architecture release.	show mobile-ip wimax release



NOTE: For information about how to configure mobile IP services, see the *JUNOS Subscriber Access Configuration Guide*.

clear mobile-ip binding

Syntax	clear mobile-ip binding (all ip-address <i>ip-address</i> nai <i>nai-string</i>) <logical-system <i>logical-system-name</i> > <routing-instance <i>routing-instance-name</i> >
Release Information	Command introduced in JUNOS Release 9.3.
Description	Clear the mobile IP binding.
Options	<p>all—Clear all mobile IP bindings.</p> <p>ip-address <i>ip-address</i>—Clear the mobile IP bindings for the specified IP home address (HoA).</p> <p>logical-system <i>logical-system-name</i>—(Optional) Clear the mobile IP bindings for the specified logical system.</p> <p>nai <i>nai-string</i>—Clear the mobile IP bindings for the specified network access identifier.</p> <p>routing-instance <i>routing-instance-name</i>—(Optional) Clear the mobile IP bindings for the specified routing instance.</p>
Required Privilege Level	view
List of Sample Output	clear mobile-ip binding on page 954
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear mobile-ip binding	user@host> clear mobile-ip binding all

show mobile-ip home-agent bindings

Syntax	show mobile-ip home-agent bindings <ip-address <i>ip-address</i> nai <i>nai-string</i> summary> <logical-system <i>logical-system-name</i> > <routing-instance <i>routing-instance-name</i> >
Release Information	Command introduced in JUNOS Release 9.3.
Description	Display information about mobile IP home agent bindings.
Options	<p>ip-address <i>ip-address</i>—(Optional) Display information for the specified mobile IP home address.</p> <p>logical-system <i>logical-system-name</i>—(Optional) Display information for the specified logical system.</p> <p>nai <i>nai-string</i>—(Optional) Display information for the specified mobile IP network access identifier.</p> <p>routing-instance <i>routing-instance-name</i>—(Optional) Display information for the specified routing instance.</p> <p>summary—(Optional) Display only summary (total bindings) information.</p>
Required Privilege Level	view
List of Sample Output	<p>show mobile-ip home-agent bindings on page 956</p> <p>show mobile-ip home-agent bindings ip-address on page 956</p> <p>show mobile-ip home-agent bindings nai on page 956</p> <p>show mobile-ip home-agent bindings summary on page 956</p>
Output Fields	Table 241 on page 955 lists the output fields for the show mobile-ip home-agent bindings command. Output fields are listed in the approximate order in which they appear.

Table 241: show mobile-ip home-agent bindings Output Fields

Field Name	Field Description
Home Address	Home address of the mobile node.
NAI	Network access identifier of the mobile node.
Home agent	Home agent address of the mobile node.
Care-of-address	Care of address used by the mobile node.
Lifetime Granted	Lifetime granted for the mobile node.
Lifetime Remaining	Remaining lifetime for the mobile node.
Tunnel Type	Type of tunnel requested by the mobile node.

Table 241: show mobile-ip home-agent bindings Output Fields *(continued)*

Field Name	Field Description
Tunnel ID	Tunnel ID the mobile node is using.
Tunnel Source	Tunnel source address the mobile node is using.
Tunnel Destination	Tunnel destination address the mobile node is using.
Identification	Identification value received from the mobile node.
Revocation Support	Whether registration revocation is supported for this binding.
Notify MN	Whether mobile node notification has been negotiated.
Total Bindings	Total number of mobile IP home agent bindings.

```

show mobile-ip      user@host> show mobile-ip home-agent bindings
home-agent bindings
Home address  NAI          Home agent  Care-of-address
10.1.1.3      abcde@def.com  10.1.1.1   50.50.50.1
30.1.1.3      -              55.55.55.1 50.50.50.1
20.1.1.3      def@def.com    20.1.1.1   60.50.50.1

```

```

show mobile-ip      user@host> show mobile-ip home-agent bindings ip-address 10.1.1.3
home-agent bindings
ip-address
Home address      : 10.1.1.3
NAI               : abcde@def.com
Home agent        : 10.1.1.1
Care-of-address   : 50.50.50.1
Lifetime Granted  : 180
Lifetime Remaining : 20
Tunnel Type       : IP-IP
Tunnel ID         : 10
Tunnel Source     : 10.1.1.1
Tunnel Destination : 50.50.50.1
Identification    : ABCD1234.4321ABCD
Revocation Support : Enabled
Notify MN of Revocation : Enabled

```

```

show mobile-ip      user@host> show mobile-ip home-agent bindings nai abcde@def.com
home-agent bindings nai
Home address      : 10.1.1.3
NAI               : abcde@def.com
Home agent        : 10.1.1.1
Care-of-address   : 50.50.50.1
Lifetime Granted  : 180
Lifetime Remaining : 20
Tunnel Type       : IP-IP
Tunnel ID         : 10
Tunnel Source     : 10.1.1.1
Tunnel Destination : 50.50.50.1
Identification    : ABCD1234.4321ABCD
Revocation Support : Enabled
Notify MN         : Enabled

```

```

show mobile-ip      user@host> show mobile-ip home-agent bindings summary
home-agent bindings
summary
Total bindings : 3

```


show mobile-ip home-agent overview

Syntax	show mobile-ip home-agent overview <logical-system <i>logical-system-name</i> > <routing-instance <i>routing-instance-name</i> >
Release Information	Command introduced in JUNOS Release 9.3.
Description	Display overview information for mobile IP home agent.
Options	logical-system <i>logical-system-name</i> —(Optional) Display information for the specified logical system. routing-instance <i>routing-instance-name</i> —(Optional) Display information for the specified routing instance.
Required Privilege Level	view
List of Sample Output	show mobile-ip home-agent overview on page 957
Output Fields	Table 242 on page 957 lists the output fields for the show mobile-ip home-agent overview command. Output fields are listed in the approximate order in which they appear.

Table 242: show mobile-ip home-agent overview Output Fields

Field Name	Field Description
Status	Total number of registration requests received.
Service Enabled on	Total number of registration requests forwarded.
Home Agents	Total number of registration requests denied.
Authentication	Total number of registration replies sent.

```
show mobile-ip home-agent overview
user@host> show mobile-ip home-agent overview
Status           : Active
Service Enabled on : ge-0/0/3.0, ge-0/0/2.0
Home agents      : 10.1.1.1, 20.1.1.1, 55.55.55.1
Authentication    : AAA
```

show mobile-ip home-agent traffic

Syntax	show mobile-ip home-agent traffic <logical-system <i>logical-system-name</i> > <routing-instance <i>routing-instance-name</i> >
Release Information	Command introduced in JUNOS Release 9.3.
Description	Display information about mobile IP home agent protocol statistics.
Options	<p>logical-system <i>logical-system-name</i>—(Optional) Display information for the specified logical system.</p> <p>routing-instance <i>routing-instance-name</i>—(Optional) Display information for the specified routing instance.</p>
Required Privilege Level	view
List of Sample Output	show mobile-ip home-agent traffic on page 959
Output Fields	Table 243 on page 958 lists the output fields for the show mobile-ip home-agent traffic command. Output fields are listed in the approximate order in which they appear.

Table 243: show mobile-ip home-agent traffic Output Fields

Field Name	Field Description
Registration request received	Total number of registration requests received.
Registration request forwarded	Total number of registration requests forwarded.
Registration request denied	Total number of registration requests denied.
Registration replies sent	Total number of registration replies sent.
Registration Errors unspecified	Total number of registration requests denied by the home agent for reasons unspecified.
Registration Errors Administrative prohibited	Total number of registration requests denied by home agent as “administrative prohibited.”
Registration Errors Insufficient Resource	Total number of registration requests denied by the home agent for insufficient resources.
Registration Errors Bad request form	Total number of registration requests denied by the home agent due to a bad request form.

Table 243: show mobile-ip home-agent traffic Output Fields *(continued)*

Field Name	Field Description
Registration Errors Too many Bindings	Total number of registration requests denied by the home agent for having too many bindings.
Registration Errors Unknown HA	Total number of registration requests denied by the home agent for having an unknown home agent.
Registration Errors ID mismatch	Total number of registration requests denied by the home agent for having a mismatched ID.
Registration Errors Authentication failed MN	Total number of registration requests denied by the home agent because the mobile node failed authentication.
Registration Errors Authentication failed FA	Total number of registration requests denied by the home agent because the foreign agent failed authentication.

```

show mobile-ip      user@host> show mobile-ip home-agent traffic
home-agent traffic  Registration Request
                        Received   : 10
                        Forwarded  : 5
                        Denied     : 5
                        Registration Replies
                        Sent        : 5
                        Registration Errors
                        Unspecified : 0
                        Administrative prohibited : 0
                        Insufficient Resource      : 0
                        Bad request form          : 0
                        Too many Bindings         : 0
                        Unknown HA                 : 0
                        ID mismatch                : 0
                        Unavailable Reverse tunnel : 0
                        Unavailable Encapsulation : 0
                        Reverse Tunnel Mandatory   : 0
                        Authentication failed MN    : 0
                        Authentication failed FA    : 0

```

show mobile-ip home-agent virtual-network

Syntax	show mobile-ip home-agent virtual-network <logical-system <i>logical-system-name</i> > <routing-instance <i>routing-instance-name</i> >
Release Information	Command introduced in JUNOS Release 9.3.
Description	Display information about mobile IP home agent virtual networks.
Options	<p>logical-system <i>logical-system-name</i>—(Optional) Display information for the specified logical system.</p> <p>routing-instance <i>routing-instance-name</i>—(Optional) Display information for the specified routing instance.</p>
Required Privilege Level	view
List of Sample Output	show mobile-ip home-agent virtual-network on page 961
Output Fields	Table 244 on page 960 lists the output fields for the show mobile-ip home-agent virtual-network command. Output fields are listed in the approximate order in which they appear.

Table 244: show mobile-ip home-agent virtual-network Output Fields

Field Name	Field Description
Home agent address	Home agent address of the mobile node.
Registration Lifetime	Maximum registration lifetime that home agent allows.
Time Tolerance	Number of seconds the time stamp may differ.
Address Pool	Address pool configured.
Total MNs	Current number of mobile nodes that the home agent is serving.
Home address	Home address of the mobile node.
NAI	Network access identifier of the mobile node.
Care-of-address	Care of address used by the mobile node.
RegLifetime Granted	Lifetime granted for the mobile node.
RegLifetime Remaining	Remaining lifetime for the mobile node.

```

show mobile-ip      user@host> show mobile-ip home-agent virtual-network
home-agent          Home Agent Address      : 55.55.55.55
virtual-network     Registration Lifetime   : 1800
                       Time Tolerance         : 120
                       Address Pool           : 10.1.1.10 - 10.1.1.50
                       Total MN's             : 2

                       MN's :
                       Home address          : 60.60.60.1
                       NAI                   : abcde@def.com
                       Care-of-address        : 50.50.50.1
                       Reglifetime granted    : 120
                       Reglifetime remaining: 100

                       Home address          : 70.70.70.1
                       NAI                   : def@def.com
                       Care-of-address        : 80.80.80.1
                       Reglifetime granted    : 120
                       Reglifetime remaining: 100

```

show mobile-ip wimax release

Syntax	show mobile-ip wimax release <logical-system <i>logical-system-name</i> > <routing-instance <i>routing-instance-name</i> >
Release Information	Command introduced in JUNOS Release 9.5.
Description	Display the WiMAX Forum Network Architecture release that is supported by the current Mobile IP implementation.
Options	logical-system <i>logical-system-name</i> —(Optional) Display information for the specified logical system. routing-instance <i>routing-instance-name</i> —(Optional) Display information for the specified routing instance.
Required Privilege Level	view
List of Sample Output	show mobile-ip home-agent bindings summary on page 962
Output Fields	Table 245 on page 962 lists the output fields for the show mobile-ip wimax release command. Output fields are listed in the approximate order in which they appear.

Table 245: show mobile-ip wimax release Output Fields

Field Name	Field Description
Release	WiMAX Forum Network Architecture release number.
Version	WiMAX Forum Network Architecture version number.

```

show mobile-ip      user@host> show mobile-ip wimax release
home-agent bindings Release 1, Version 1.2
summary

```

Chapter 26

Network Address Translation Operational Mode Commands

Table 246 on page 963 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot Network Address Translation (NAT) services.

Table 246: NAT Operational Mode Commands

Task	Command
Display information about NAT pools.	<code>show services nat pool</code>



NOTE: NAT is supported on the adaptive services interface on the following routing platforms:

- J-series routing platform—`sp-pim/0/slot`
- M-series and T-series routing platforms—`sp-fpc/pic/port`

NAT is also supported on the redundant adaptive services interface (`rsnumber`) on M-series and T-series routing platforms.



NOTE: For information about how to configure NAT services, see the *JUNOS Services Interfaces Configuration Guide*.

show services nat pool

Syntax	show services nat pool <brief detail> <pool-name> pgcp <ports-per-session remotely-controlled>
Release Information	Command introduced before JUNOS Release 7.4. pgcp option added in JUNOS Release 8.5.
Description	Display information about Network Address Translation (NAT) pools.
Options	<p>none—Display standard information about all NAT pools.</p> <p>brief detail—(Optional) Display the specified level of output.</p> <p>pool-name—(Optional) Display information about the specified NAT pool.</p> <p>pgcp—(Optional) Display information about a NAT pool that is exclusive to the BGF.</p> <p>ports-per-session—(Optional) Display the number of ports allocated per session from the NAT pool.</p> <p>remotely-controlled—(Optional) Display if the NAT pool is explicitly specified by the gateway controller.</p>
Required Privilege Level	view
List of Sample Output	<p>show services nat pool brief on page 965</p> <p>show services nat pool detail on page 965</p>
Output Fields	Table 247 on page 964 lists the output fields for the show services nat pool command. Output fields are listed in the approximate order in which they appear.

Table 247: show services nat pool Output Fields

Field Name	Field Description	Level of Output
Interface	Name of an adaptive services interface.	All levels
Service set	Name of a service set. Individual empty service sets are not displayed, but if none of the service sets has any flows, a flow table header is printed for each service set.	All levels
NAT pool	Name of the Network Address Translation pool.	All levels
Type or Translation type	Address translation type: dynamic or static .	All levels
Address or Address range	IPv4 or IPv6 address range of the pool.	All levels

Table 247: show services nat pool Output Fields (continued)

Field Name	Field Description	Level of Output
Port or Port range	Port range of the pool. Applicable only for dynamic NAT pools. Not displayed for static NAT pools.	All levels
Ports used' or Ports in use	Number of ports allocated in this pool with this name. Applicable only for dynamic NAT pools. Not displayed for static NAT pools.	All levels
Out of port errors	Number of port allocation errors. Applicable only for dynamic NAT pools. Not displayed for static NAT pools.	detail
Max ports used	Maximum number of ports used. Applicable only for dynamic NAT pools. Not displayed for static NAT pools.	detail
Addresses in use	Number of addresses in use for dynamic source address NAT pools.	detail

```

show services nat pool user@host> show services nat pool brief
brief Interface: sp-1/3/0, Service set: blue
      NAT pool Type    Address                               Port      Ports used
      pool1    static   100.100.100.100-100.100.100.100
      pool2    static   200.200.200.200-200.200.200.200
      pool3    dynamic  210.210.210.210-210.210.210.230 65530-65535      0

show services nat pool user@host> show services nat pool detail
detail Interface: sp-1/2/0, Service set: set1
      NAT pool: pool1, Translation type: static
      Address range: 100.100.100.100-100.100.100.100
      NAT pool: pool2, Translation type: static
      Address range: 200.200.200.200-200.200.200.200
      NAT pool: pool3, Translation type: dynamic
      Address range: 210.210.210.210-210.210.210.230, Port range: 65530-65535,
      Ports in use: 0, Out of port errors: 0, Max ports used: 0, Addresses in use:
0

```


Chapter 27

PGCP Operational Mode Commands for the BGF Feature

Table 248 on page 967 summarizes the PGCP command-line interface (CLI) commands you can use to monitor and troubleshoot the Packet Gateway Control Protocol (PGCP) service that is used for the border gateway function (BGF) feature. Commands are listed in alphabetical order.

Table 248: PGCP Services Operational Mode Commands

Task	Command
Clear information about PGCP gates.	<code>clear services pgcp gates</code>
Clear statistical information.	<code>clear services pgcp statistics</code>
Display information about the PGCP configuration for a gateway.	<code>show services pgcp active-configuration</code>
Display in-depth information about a particular gate on a packet gateway.	<code>show services pgcp gate</code>
Display summary information about all PGCP gates on a virtual BGF.	<code>show services pgcp gates</code>
Display information about H.248 root terminations.	<code>show services pgcp root-termination</code>
Display information about BGF statistics.	<code>show services pgcp statistics</code>
Display information about PGCP conversations.	<code>show services pgcp conversations</code>
Display information about PGCP flows.	<code>show services pgcp flows</code>
Display summary information about PGCP terminations.	<code>show services pgcp terminations</code>

**NOTE:**

PGCP services are supported on Adaptive Service (AS) PICS, MultiServices (*sp-fpc/pic/port*) PICS, and the MultiServices Dense Port Concentrator (MS-DPC) on the following routing platforms:

- Juniper Networks M120 Multiservice Edge Router
- Juniper Networks M320 Multiservice Edge Router
- Juniper Networks T640 Core Router



NOTE: For information about how to use PGCP services to monitor the BGF feature, see the *JUNOS Multiplay Solutions Guide*.

clear services pgcp gates

Syntax	clear services pgcp gates gateway <i>gateway-name</i>
Release Information	Command introduced in JUNOS Release 8.5.
Description	<p>Clear all gates on a virtual border gateway function (VBGF). Use this command only for debugging and testing purposes. The recommended way to clear the state of PGCP gates is to use the <code>set services-state out-of-service-graceful</code> statement at the <code>[edit services pgcp gateway <gateway-name>]</code> hierarchy.</p> <p>When you enter this command, the VBGF sends an H.248 FO/905 message to the gateway controller. The status of the VBGF then changes to In-Service (Disconnected). The VBGF then reregisters with the PGC by sending an RE/901 message, and the status of the VBGF changes to In-Service (Registered).</p>
Options	<p>gates—Clear gate information.</p> <p>gateway <i>gateway-name</i>—Display information about statistics associated with this virtual BGF.</p>
Required Privilege Level	view
List of Sample Output	clear services pgcp on page 969
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear services pgcp	user@host> clear services pgcp gates

clear services pgcp statistics

Syntax	clear services pgcp statistics gateway <i>gateway-name</i>
Release Information	Command introduced in JUNOS Release 9.3. gateway option added in JUNOS Release 9.5.
Description	Clear statistics for a specific virtual border gateway function (VBGF).
Options	<i>gateway-name</i> —Name of the VBGF for which you want to clear statistics.
Required Privilege Level	view
List of Sample Output	clear services pgcp statistics on page 970
Output Fields	When you enter this command, you receive either command prompt (indicating success) or an error message.
clear services pgcp statistics	user@host> clear services pgcp statistics gateway <i>gateway-name</i>

show services pgcp active-configuration

Syntax	show services pgcp active-configuration gateway <i>gateway-name</i>
Release Information	Command introduced in JUNOS Release 8.4. gateway option introduced in JUNOS Release 9.5.
Description	Display information about the active Packet Gateway Control Protocol (PGCP) configuration, which includes information received from the adaptive services process and information negotiated with the gateway controller.
Options	gateway <i>gateway-name</i> —Display information about gates associated with this virtual packet gateway (virtual BGF). You can specify '*' to display information for all virtual BGFs running on the Routing Engine.
Required Privilege Level	view
List of Sample Output	show services pgcp active-configuration on page 976
Output Fields	Table 249 on page 971 lists the output fields for the show services pgcp active-configuration command. Output fields are listed in the approximate order in which they appear.

Table 249: show services pgcp active-configuration Output Fields

Field Name	Field Description
Packet gateway media service configuration	Information about the media service configuration. <ul style="list-style-type: none"> ■ Media service name—Name of the media service applied to the packets. ■ Nat pool—Name of the Network Address Translation (NAT) pool used on a virtual interface.
Packet gateway virtual interface configuration	Information about the virtual interface configuration. <ul style="list-style-type: none"> ■ Virtual interface name—Name of the virtual interface. ■ Status—Service status of the virtual interface: In-Service, In-Service (Graceful Shutdown), Out-of-Service, Out-of-Service (Physical Interface). ■ Media Service name—Name of the media service configured for the virtual interface.

Table 249: show services pgcp active-configuration Output Fields (continued)

Field Name	Field Description
Packet gateway configuration	<p>Information about the active virtual BGF configuration.</p> <ul style="list-style-type: none"> ■ Name—Name of the virtual BGF. ■ IP address—IP address of the virtual BGF. ■ Port—Port of the virtual BGF. ■ Status—Service state of the virtual BGF: <ul style="list-style-type: none"> ■ In-Service (Disconnected)—The virtual BGF is configured to be in service; however, it is disconnected from the gateway controller. ■ In-Service (Registering)—The virtual BGF is in the process of registering with the gateway controller. ■ In-Service (Registered)—The virtual BGF has completed registration with the gateway controller. ■ In-Service (Graceful Shutdown)—The virtual BGF is in draining mode because of a graceful shutdown. ■ In-Service (Shutdown)—The virtual BGF is shut down because of a forced shutdown. ■ Out-Of-Service—The virtual BGF is not connected to the gateway controller. ■ Active gateway controller—Gateway controller that is currently controlling this virtual BGF. NULL means that there is no active gateway controller. ■ Replication socket <ul style="list-style-type: none"> ■ Connected (Ready)—The replication is ready and a switchover can be processed. ■ Connected (Syncing)—The replication is synchronizing. Performing a switchover is not safe. ■ Connected (Error)—An error occurred in the previous switchover. ■ Disconnected—The backup Routing Engine is down. There is no route to the backup Routing Engine. ■ Cleanup timeout—Time to wait before the virtual BGF removes gates following a disconnection from the gateway controller. ■ Gate inactivity delay—Time to wait before packet inactivity detection begins on a gate for which there is no latching event. ■ Gate inactivity duration—Time during which the virtual BGF monitors gates for packet inactivity. ■ Latching Deadlock duration—Time to wait before packet inactivity detection begins on a gate for which there is a latching event. <p>NOTE: This field contains delay information, even though the caption suggests it contains duration information.</p>
H248 timers configuration	<p>Information about the H.248 timers configuration.</p> <ul style="list-style-type: none"> ■ Max waiting delay (MWD)—Maximum time the virtual BGF waits before contacting a new gateway controller when the connection to the controlling gateway controller is lost. ■ Max retransmission delay (T-MAX)—Maximum delay time allowed a transaction resulting from retransmissions. ■ Initial average ack delay (IAAD)—Average network propagation delay time. ■ Maximum net propagation delay (M-NPD)—Maximum network propagation delay time.

Table 249: show services pgcp active-configuration Output Fields *(continued)*

Field Name	Field Description
H248 options configuration	<p>Information about the H.248 options configuration.</p> <ul style="list-style-type: none"> ■ Wildcard response service-change—Whether or not the virtual BGF issues service change notifications as wildcard notifications. ■ Event history—Whether or not the virtual BGF has enabled its history of all event notifications to be accessed by the gateway controller. ■ DSCP bit mirroring is off—Whether or not DSCP bit mirroring has been disabled.
H248 diffserv configuration	<p>Information about the H.248 Diffserv configuration.</p> <ul style="list-style-type: none"> ■ DSCP—DSCP value set in the Diffserv configuration. If there is no configured value, the default value is shown.
Notification Behavior	<p>Information about the regulation of media inactivity notifications sent to the gateway controller.</p> <ul style="list-style-type: none"> ■ Notification Regulation—Either the percentage of notification to be suppressed, expressed as a number from 0 through 100, or the value once, meaning that only the first of a series of media inactivity notifications is sent to the gateway controller.
Application data inactivity detection	<p>Information about the reporting of media inactivity events.</p> <ul style="list-style-type: none"> ■ IP flow stop detection—Default method for reporting media inactivity.
Event timestamp Notification	<p>Information about the availability of event timestamp information.</p> <ul style="list-style-type: none"> ■ Requested timestamp—Whether or not the virtual BGF has enabled timestamp information for events to be viewed by the gateway controller.

Table 249: show services pgcp active-configuration Output Fields *(continued)*

Field Name	Field Description
H248 segmentation	<p>Information about the H.248 segmentation configuration.</p> <ul style="list-style-type: none"> ■ MG segmentation timer—The time within which the gateway controller waits to receive outstanding message segments from the virtual BGF after it receives the SegmentationCompleteToken message. <ul style="list-style-type: none"> ■ minimum—Minimum value accepted from the gateway controller. ■ maximum—Maximum value accepted from the gateway controller. ■ default—Default value that is used when the gateway controller does not set a value. ■ MG maximum PDU size—The maximum size of the virtual BGF's incoming protocol data unit for the control association's transport protocol. The gateway controller should avoid building messages that exceed this size. <ul style="list-style-type: none"> ■ minimum—Minimum value accepted from the gateway controller. ■ maximum—Maximum value accepted from the gateway controller. ■ default—Default value that is used when the gateway controller does not set a value. ■ MGC segmentation timer—The time within which the virtual BGF waits to receive outstanding message segments from the gateway controller after it receives the SegmentationCompleteToken message. <ul style="list-style-type: none"> ■ minimum—Minimum value accepted from the gateway controller. ■ maximum—Maximum value accepted from the gateway controller. ■ default—Default value that is used when the gateway controller does not set a value. ■ MGC maximum PDU size—The maximum size of the gateway controller's incoming protocol data unit for the control association's transport protocol. The virtual BGF will not build messages that exceed this size. <ul style="list-style-type: none"> ■ minimum—Minimum value accepted from the gateway controller. ■ maximum—Maximum value accepted from the gateway controller. ■ default—Default value that is used when the gateway controller does not set a value.

Table 249: show services pgcp active-configuration Output Fields (continued)

Field Name	Field Description
H248 base-root	<p>Information about the H.248 base-root configuration.</p> <ul style="list-style-type: none"> ■ Normal MG execution time—The interval within which the gateway controller waits for a response to transactions from the virtual BGF (exclusive of network delay). <ul style="list-style-type: none"> ■ minimum—Minimum value accepted from the gateway controller. ■ maximum—Maximum value accepted from the gateway controller. ■ default—Default value that is used when the gateway controller does not set a value. ■ MG Provisional response timer—The time within which the gateway controller waits for a pending response from the virtual BGF if a transaction cannot be completed. <ul style="list-style-type: none"> ■ minimum—Minimum value accepted from the gateway controller. ■ maximum—Maximum value accepted from the gateway controller. ■ default—Default value that is used when the gateway controller does not set a value. ■ MG Originated pending limit—The number of transaction pending messages that the gateway controller can receive from the virtual BGF. <ul style="list-style-type: none"> ■ minimum—Minimum value accepted from the gateway controller. ■ maximum—Maximum value accepted from the gateway controller. ■ default—Default value that is used when the gateway controller does not set a value. ■ Normal MGC execution time—The interval within which the virtual BGF waits for a response to a transaction from the gateway controller (exclusive of network delay). <ul style="list-style-type: none"> ■ minimum—Minimum value accepted from the gateway controller. ■ maximum—Maximum value accepted from the gateway controller. ■ default—Default value that is used when the gateway controller does not set a value. ■ MGC Provisional response timer—The time within which the virtual BGF waits for a pending response from the gateway controller if a transaction cannot be completed. <ul style="list-style-type: none"> ■ minimum—Minimum value accepted from the gateway controller. ■ maximum—Maximum value accepted from the gateway controller. ■ default—Default value that is used when the gateway controller does not set a value. ■ MGC Originated pending limit—The number of transaction pending messages that the virtual BGF can receive from the gateway controller. <ul style="list-style-type: none"> ■ minimum—Minimum value accepted from the gateway controller. ■ maximum—Maximum value accepted from the gateway controller. ■ default—Default value that is used when the gateway controller does not set a value.
Fast update filters	<p>Information about the fast update filter (FUF) configuration.</p> <ul style="list-style-type: none"> ■ Maximum terms—Maximum number of FUF terms that can be installed for the virtual BGF. ■ Maximum term percentage—Maximum percentage of gates with FUF filters relative to all gates currently installed for the virtual BGF.
Overload control configuration	<p>Information about the overload control configuration.</p> <ul style="list-style-type: none"> ■ Queue limit percentage—Maximum percentage of the work queue for H.248 transactions that can be used before overload messages are generated. ■ Reject new calls threshold—Maximum percentage of the work queue for H.248 transactions that can be used before all new, non-emergency calls are rejected. ■ Reject all transactions threshold—Maximum percentage of the work queue for H.248 transactions that can be used before all non-emergency transactions are rejected.

Table 249: show services pgcp active-configuration Output Fields *(continued)*

Field Name	Field Description
Inactivity Timer	Information about inactivity timer configuration. <ul style="list-style-type: none"> ■ Default—Whether the inactivity timer is on or off by default. ■ Maximum inactivity time default—Default value for the inactivity timer. This value is used if the gateway controller does not send an inactivity timer value.
Packet gateway controller configuration	Information about the gateway controller configuration. <ul style="list-style-type: none"> ■ Controller name—Name of the gateway controller. ■ Controller IP address—IP address of the gateway controller. ■ Controller port—Listening port of the gateway controller to which the virtual BGF sends messages.
Packet gateway rule configuration	Information about the rule configuration. <ul style="list-style-type: none"> ■ Rule name—Name of the rule set. ■ Gateway name—Name of the virtual BGF that processes the rule set.
Packet gateway service set configuration	Information about the service set configuration. <ul style="list-style-type: none"> ■ Service set name—Name of the service set. ■ Service set id—Numeric identifier of the service set. ■ Rule name—Name of the rule set configured for the service set.
Packet gateway service pics status	Information about the services PICs' status. <ul style="list-style-type: none"> ■ Name—Name of the services interface. ■ Status—Status of the services interface: Connected.
Firewall	Information about firewall filter status for the virtual BGF. <ul style="list-style-type: none"> ■ Status—Status of the firewall associated with the virtual BGF: Connected or Unsupported Platform. ■ Number of terms—Number of match condition terms used in the virtual BGF. For each filter, a default term is installed to allow traffic to pass through (otherwise, all traffic is dropped because it is the default firewall action). For example, there are two terms listed when there are two filters. ■ Number of filters—Number of firewall filters used in the virtual BGF.

```

show services pgcp active-configuration  user@host> show services pgcp active-configuration gateway PG1
Packet gateway media service configuration:
  Media service name: ac_rtp_ms
  Nat pool           : ac_rtp_nat_pool

Packet gateway media service configuration:
  Media service name: bb_rtp_ms
  Nat pool           : bb_rtp_nat_pool

Packet gateway virtual interface configuration:
  Virtual Interface name: 2
  Status                 : In-Service
  Media Service Name     : bb_rtp_ms

Packet gateway virtual interface configuration:

```

```

Virtual Interface name: 0
  Status                : In-Service
  Media Service Name    : ac_rtp_ms

```

Packet gateway configuration:

```

Name                : givon
IP address          : 10.50.210.100
Port                : 2944
Status              : In-Service (Registered)
Active gateway controller : PGC1
Replication socket   : Connected (Syncing)
Synchronization state : Idle
Cleanup timeout [secs] : 0
Gate inactivity delay [secs] : 0
Gate inactivity duration (Q-MI ) [secs] : 6000
Latching Deadlock duration [secs] : 0

```

H248 timers configuration:

```

Max waiting delay (MWD) [millisec] : 10000
Max retransmission delay (T-MAX) [millisec] : 3600
Initial average ack delay (I-AAD) [millisec]: 1000
Max net propagation delay (M-NPD) [millisec]: 5000

```

H248 options configuration:

```

Wildcard response service-change : NO
Event history                      : NO
DSCP bit mirroring is off         : YES

```

H248 diffserv configuration:

```

dscp : do-not-change

```

Notification Behavior:

```

Notification Regulation : 0

```

Application data inactivity detection:

```

IP flow stop detection : default - immediate

```

Event timestamp Notification

```

Requested timestamp : requested

```

H248 segmentation :	minimum	maximum	default
MG segmentation timer [millisec]	: 500	30000	4000
MG maximum PDU size [bytes]	: 512	65507	1472
MGC segmentation timer [millisec]	: 500	30000	4000
MGC maximum PDU size [bytes]	: 512	65507	1472

H248 base root :	minimum	maximum	default
Normal MG execution time [millisec]	: 500	29000	500
MG Provisional response timer [millisec]	: 500	30000	2000
MG Originated pending limit	: 1	512	4
Normal MGC execution time [millisec]	: 500	29000	500
MGC Provisional response timer [millisec]	: 500	30000	4000
MGC Originated pending limit	: 1	512	4

Inactivity Timer:

```

Default : Off
Maximum inactivity time default : 0

```

Overload control configuration:

```

Queue limit percentage : 80
Reject new calls threshold : 90

```

Reject all commands threshold : 95

Packet gateway controller configuration:

Controller name : PGC1
Controller IP address : 10.50.210.101
Controller port : 32101

Packet gateway rule configuration:

Rule name : pgcp-rule
Gateway name : PG1

Packet gateway service set configuration:

Service set name : pgcp-svc-set-1
Service set id : 1
Rule name : pgcp-rule

Packet gateway service pics status:

Name : sp-4/0/0
Status : Connected

Firewall:

Status : Disabled
Number of terms : 0
Number of filters : 0

show services pgcp gate

Syntax	show services pgcp gates gateway-name <i>gateway-name</i> gate-id <i>gate-id</i> <brief extensive session-mirroring statistics >
Release Information	Command introduced in JUNOS Release 9.5.
Description	Display in-depth information about a Packet Gateway Control Protocol (PGCP) gate.
Options	<p>gateway <i>gateway-name</i>—(Optional) Display information about gates associated with this virtual border gateway function (VBGF).</p> <p>gate-id <i>gate-id</i>—(Optional) Display information about a particular gate.</p> <p>brief—(Optional) Display brief output.</p> <p>extensive—(Optional) Display extensive output.</p> <p>session-mirroring—(Optional) Display the session mirroring information for gates that are being mirrored. You must have a login with sufficient permission to view session mirroring information. The <code>set system login class <i>class-name</i> permissions pgcp-session-mirroring</code> command grants this permission.</p> <p>statistics—(Optional) Display statistics for gates.</p>
Required Privilege Level	view
Related Topics	show services pgcp gates
List of Sample Output	<p>show services pgcp gate on page 980</p> <p>show services pgcp gate extensive on page 980</p>
Output Fields	Table 250 on page 979 lists the output fields for the <code>show services pgcp gate</code> command. Output fields are listed in the approximate order in which they appear.

Table 250: show services pgcp gate Output Fields

Field Name	Field Description
Gate information	Information about the gate.
Direction	Direction of the gate.
State	State of the gate: <code>active</code> , <code>disabled</code> , or <code>closed</code> .
remote source address	IP address of the remote source of the gate.
remote source port	Port of the remote source of the gate.
remote dest address	IP address of the remote destination of the gate.
remote dest port	Port of the remote destination of the gate.

Table 250: show services pgcp gate Output Fields (continued)

Field Name	Field Description
local source address	IP address of the local source of the gate.
local source port	Port of the local source of the gate.
local dest address	IP address of the local destination of the gate.
local dest port	Port of the local destination of the gate.
transport	Transport protocol.
gate version	Numeric identifier for the version of the gate.
latch	Latch status: latch or none.
yellow action	Action to take in this state.
red action	Action to take in this state.
notifications	Number of notifications.
User Data	Numeric identifier for the user data.

show services pgcp gate user@host> **show services pgcp gate gateway pg1 gate-id 2817498611968**

```
Gate information:
Gate id: 2817498611968
Gate state: active
Action: drop
Service set id: 1
Media card: sp-1/3/0

Media handler: pgcp-svc-set-1

Termination-id-string: ntt/voice/gn/0/2/0/0001/bb/1311
```

show services pgcp gate extensive user@host> **show services pgcp gate gateway pg1 gate-id 2817498611968 extensive**

```
Gate information:
=====

Gate id: 2817498611968
Gate state: active
Direction: A->B
Action: drop
Remote source address: *
Remote source port: *
Remote destination address: 3.0.0.102
Remote destination port: 20000
Local source address: [20.50.150.1]
Local source port: [2334]
Local destination address: 10.50.150.1
Local destination port: 2334
```


Transport: rtp/avp
RTCP: On
Latch: none
DSCP: 0x40 (Effective 16)
Policing: Off
Fast update filter: Off

show services pgcp gates

Syntax	show services pgcp gates gateway <i>gateway-name</i> <brief count destination-routing-instance <i>vrf</i> extensive source-routing-instance <i>vrf</i> statistics session-mirroring>
Release Information	Command introduced in JUNOS Release 8.4. brief extensive count option in JUNOS Release 8.5. gateway option introduced in JUNOS Release 9.1 statistics option introduced in JUNOS Release 9.1. session-mirroring option introduced in JUNOS Release 9.2. destination-routing-instance option introduced in JUNOS Release 9.3. source-routing-instance option introduced in JUNOS Release 9.3. gateway option was revised in JUNOS Release 9.5.
Description	Display information about Packet Gateway Control Protocol (PGCP) gates.
Options	gateway <i>gateway-name</i> —(Optional) Display information about gates associated with this virtual BGF. brief—(Optional) Display brief output. count—(Optional) Display the number of gates currently installed. destination-routing-instance —(Optional) Display information for a particular destination VPN routing and forwarding instance (VRF). extensive—(Optional) Display extensive output. source-routing-instance —(Optional) Display information for a particular source VPN routing and forwarding instance (VRF).
Required Privilege Level	view pgcp-session-mirroring—To view session mirroring fields.
List of Sample Output	show services pgcp gates on page 986 show services pgcp gates gateway count on page 986 show services pgcp gates gateway extensive on page 986 show services pgcp gates gate-id statistics on page 988 show services pgcp gates session-mirroring on page 988
Output Fields	Table 251 on page 983 lists the output fields for the show services pgcp gates command. Output fields are listed in the approximate order in which they appear.

Table 251: show services pgcp gates Output Fields

Field Name	Field Description	Level of Output
Packet gateway configuration	Information about the virtual BGF configuration. <ul style="list-style-type: none">■ Name—Name of the virtual BGF.■ IP address—IP address of the virtual BGF.■ Port—Port of the virtual BGF.■ Status—Service state of the virtual BGF.	All levels

Table 251: show services pgcp gates Output Fields (continued)

Field Name	Field Description	Level of Output
Gate information	<p>Information about gates that are currently installed.</p> <ul style="list-style-type: none"> ■ Gate id—Numeric identifier of the gate. ■ Direction—Direction of the gate. <ul style="list-style-type: none"> ■ A is the termination that was created first. ■ B is the termination that was created second. ■ Gate state—State of the gate: Active, Disabled, or Closed. ■ Action—(extensive level only) Action applied to the gate: forward, add, or drop. ■ VRF—(extensive level only) If you have VPN aggregation configured, shows the source (ingress) VRF and the destination (egress) VRF. ■ Remote source address—(extensive level only) IPv4 or IPv6 address of the remote source. ■ Remote source port—(extensive level only) Remote source port. ■ Remote destination address—(extensive level only) IPv4 or IPv6 address of the remote destination. ■ Remote destination port—(extensive level only) Remote destination port. ■ Local source address—(extensive level only) IPv4 or IPv6 address of the local source. ■ Local source port—(extensive level only) Local source port. ■ Local destination address—(extensive level only) IPv4 or IPv6 address of the local destination. ■ Local destination address —(extensive level only) Local destination port. ■ Transport—(extensive level only) H.248 media descriptor field: udp, tcp, or rtp avp. ■ RTCP—(extensive level only) Additional (shadow) gate allocated for the Real-Time Control Protocol (RTCP): auto or off. ■ Latch—(extensive level only) State of the latch action on the gate: none, latch, or relatch. ■ DSCP—(extensive level only) DiffServ code point (DSCP) marking value for the gate. ■ Policing—(extensive level only) Status of policing on the gate: On or Off. ■ Gate SDR—(extensive level only) Current sustained data rate enforced on the gate. ■ Gate PDR—(extensive level only) Current peak data rate enforced on the gate. ■ Gate MBS—(extensive level only) Current maximum burst size enforced on the gate. ■ RTCP SDR—(extensive level only) Current sustained data rate enforced on RTCP gates. ■ RTCP PDR—(extensive level only) Current peak data rate enforced on RTCP gates. 	All levels (unless otherwise specified)

Table 251: show services pgcp gates Output Fields (continued)

Field Name	Field Description	Level of Output
	<ul style="list-style-type: none"> ■ RTCP MBS—(extensive level only) Current maximum burst size enforced on RTCP gates. ■ Fast update filter—(extensive level only) Status of the fast update filter: On or Off. ■ Service set id—Numeric identifier of the service set. ■ Media card—Name of the services interface. ■ Media handler—Name of the service set. ■ termination-id-string—Name of the termination. 	
Gate Statistics	Statistics for gates that are currently installed. <ul style="list-style-type: none"> ■ Output packets—Number of output packets from the PIC. ■ Input packets—Number of packets that the Packet Forwarding Engine dropped because they did not conform to rate limits plus the number of PIC input packets. ■ Dropped packets—Number of packets that the Packet Forwarding Engine and the PIC dropped because they did not conform to rate limits. ■ Lost RTP packets—Number of RTP packets that have been lost on this gate. 	statistics
Rate limiting statistics	Rate-limiting statistics for the gate. Shows the number of packets and the number of bytes that were marked for each show color.	statistics
FUF statistics	Fast update filter statistics for the gate. Shows the number of packets that were dropped because they did not conform to the rate limits.	statistics
RTCP statistics	RTCP sender statistics for the gate. <ul style="list-style-type: none"> ■ SSRC—Value in the Synchronization Source (SSRC) field of the RTCP packet. ■ Sender octets—Number of octets sent to this gate. ■ Sender packets—Number of packets sent to this gate. ■ Invalid packets—Number of invalid packets sent to this gate. 	statistics
RTCP Receiver statistics	RTCP receiver statistics for the gate. <ul style="list-style-type: none"> ■ SSRC—Value in the Synchronization Source (SSRC) field of the RTCP packet. ■ Lost packets—Number of RTCP packets lost on this gate. ■ Lost fraction—Fraction of lost packets since last sender or receiver report. ■ Jitter—Value of interarrival jitter. 	statistics
Gateway Name	(count keyword only) Name of the virtual BGF.	none specified
Session mirroring status	Status of the session mirroring feature, On or Off.	session-mirroring
Session mirroring correlation number	Encrypted correlation number received from the gateway controller in PGCP requests. The PGCP software uses the correlation number to determine whether session mirroring is performed on a gate.	session-mirroring

Table 251: show services pgcp gates Output Fields (continued)

Field Name	Field Description	Level of Output
Session mirroring target ID list	List of target IDs, one ID for each copy of the session mirroring packets that are collected.	session-mirroring
Session mirroring direction	Point at which session-mirroring packets are intercepted. <ul style="list-style-type: none"> ■ Egress—Packets are intercepted after NAT is performed on the packet. ■ Ingress—Packets are intercepted before NAT is performed on the packet. 	session-mirroring
Gate count	(count keyword only) Number of gates currently installed on the virtual BGF.	none specified

```

show services pgcp user@host> show services pgcp gates gateway bgf-1
gates Packet gateway configuration:
          Name : bgf-1
          IP address : 3.0.0.2
          Port : 2944
          Status : Connected

          Gate information:
          Gate id: 4295033088
          Gate state: Active
          Service set id: 1
          Media card: sp-0/3/0
          Media handler: pgcp-svc-set-1
          Termination-id-string: ip/0/rlmvi2/1

          Gate id: 4295033089
          Gate state: Active
          Service set id: 1
          Media card: sp-0/3/0
          Media handler: pgcp-svc-set-1
          Termination-id-string: ip/0/rlmvi0/2

          Gate id: 8590000384
          Gate state: Active
          Service set id: 1
          Media card: sp-0/3/0
          Media handler: pgcp-svc-set-1
          Termination-id-string: ip/0/rlmvi2/3

          Gate id: 8590000385
          Gate state: Active
          Service set id: 1
          Media card: sp-0/3/0
          Media handler: pgcp-svc-set-1
          Termination-id-string: ip/0/rlmvi0/4

show services pgcp user@host> show services pgcp gates gateway bgf-1 count
gates gateway count Gateway Name Gate count
                    bgf-1 4

show services pgcp user@host> show services pgcp gates gateway bgf-1 extensive
gates gateway
extensive Packet gateway configuration:

```

```

Name          : bgf-1
IP address    : 10.9.1.138
Port          : 2944
Status        : In-Service

```

Gate information:

=====

```

Gate id: 4295033089
Gate state: active
Direction: B->A
Action: forward
VRF: vrf-1 -> vrf-2
Remote source address: 4.0.0.102
Remote source port: *
Remote destination address: 3.0.0.101
Remote destination port: 20000
Local source address: [3.99.99.100]
Local source port: [1024]
Local destination address: 4.99.99.100
Local destination port: 1028
Transport: rtp/avp
RTCP: Off
Latch: none
DSCP: 0x00 (Effective 0)
Policing: On
Gate SDR : 10000 bytes per second
Gate PDR : 10000 bytes per second
Gate MBS : 1000 bytes
RTCP SDR : 500 bytes per second
RTCP PDR : 500 bytes per second
RTCP MBS : 1000 bytes
Fast update filter: Off

```

Gate information:

=====

```

Gate id: 4295033088
Gate state: active
Direction: A->B
Action: forward
VRF: vrf-2 -> vrf-1
Remote source address:
Remote source port: *
Remote destination address: 4.0.0.102
Remote destination port: 10000
Local source address: [4.99.99.100]
Local source port: [1028]
Local destination address: 3.99.99.100
Local destination port: 1024
Transport: rtp/avp
RTCP: Off
Latch: none
DSCP: 0x00 (Effective 0)
Policing: Off
Fast update filter: Off

```

```

show services pgcp   user@host> show services pgcp gates gate-id 98784313601 statistics
gates gate-id statistics Gate Statistics:

```

```

=====
Output packets: 582
Input packets: 582
Dropped packets: 0
Lost RTP packets: 0

```

```

RTCP statistics:

```

```

SSRC           : 32270
Sender octets  : 7500
Sender packets : 375
Invalid packets: 9

```

```

RTCP Receiver statistics:

```

SSRC	Lost packets	Lost fraction	Jitter
13043	0	0.000	0
16487	0	0.000	0
5655	0	0.000	0

```

Rate limiting statistics:

```

Mark Color	Number of Packets	Number of Bytes
Green	582	34920
Yellow	0	0
Red	0	0

```

FUF statistics:
Drop count: 0

```

```

show services pgcp   user@host> show services pgcp gates gateway pgl session-mirroring
gates session-mirroring Gate information:
Gate id: 4295033088
Session mirroring status: On
Session mirroring correlation number: 0x8040c020a060e010
Session mirroring target ID list: [008040c0, ffffffff80]
Session mirroring direction: Egress

```


show services pgcp root-termination

Syntax show services pgcp root-termination gateway *gateway-name*

Release Information Command introduced in JUNOS Release 8.5.

Description	Display information about the H.248 root termination.
--------------------	---

The `gateway` option was introduced in JUNOS Release 9.5.

Options *gateway gateway-name*—Display information about root terminations in H.248 transactions associated with this virtual BGF.

Required Privilege Level [view](#)

List of Sample Output show services pgcp root-termination on page 989

Output Fields Table 252 on page 989 lists the output fields for the `show services pgcp root-termination` command. Output fields are listed in the approximate order in which they appear.

Table 252: show services pgcp root-termination Output Fields

Field Name	Field Description
Root termination information	Information about the root terminations in H.248 transactions.

```

show services pgcp      user@host> show services pgcp root-termination bgf-1
root-termination      Root termination information:

    ROOT {
        MEDIA {
            TERMINATIONSTATE { SERVICESTATES = INSERVICE,

                                ROOT/MAXNUMBEROFCONTEXTS = 20000,

                                ROOT/MAXTERMINATIONSPERCONTEXT = 2,

                                ROOT/MGCPROVISIONALRESPONSELIMIT = 15,

                                ROOT/MGCPROVISIONALRESPONSETIMERVALUE = 2000,

                                ROOT/MGCPROVISIONALRESPONSELIMIT = 15,

                                ROOT/MGCPROVISIONALRESPONSETIMERVALUE = 2000,

                                ROOT/NORMALMGCEXECUTIONTIME = 1000,

                                ROOT/NORMALMGCEXECUTIONTIME = 1000,

                                SEG/MGCMAXPDUSIZE = 500,

```

```
    SEG/MGCSEGMENTATIONTIMERVALUE = 6000,  
    SEG/MGMAXPDUSIZE = 500,  
    SEG/MGSEGMENTATIONTIMERVALUE = 6000 }  
},
```

show services pgcp statistics

Syntax	show services pgcp statistics gateway <i>gateway-name</i> <brief extensive>
Release Information	Command introduced in JUNOS Release 8.4. brief extensive option introduced in JUNOS Release 9.3. gateway option introduced in JUNOS Release 9.5.
Description	Display information about statistics associated with the virtual BGF.
Options	gateway <i>gateway-name</i> —Display information about statistics associated with this virtual BGF. brief extensive—(Optional) Display the specified level of output. The default level is brief.
Required Privilege Level	view
List of Sample Output	show services pgcp statistics on page 993 show services pgcp statistics extensive on page 994
Output Fields	Table 253 on page 991 lists the output fields for the show services pgcp statistics command. Output fields are listed in the approximate order in which they appear.

Table 253: show services pgcp statistics Output Fields

Field Name	Field Description	Level of Output
Virtual BGF configuration	Information about the virtual BGF configuration. <ul style="list-style-type: none"> ■ Name—Name of the virtual BGF. ■ IP address—IP address of the virtual BGF. ■ Port—Port of the virtual BGF. ■ Status—Status of the virtual BGF: In-Service, Out-of-Service, 	all
H.248 statistics	Information about H.248 statistics. <ul style="list-style-type: none"> ■ Messages received—Number of H.248 messages received. ■ Messages sent—Number of H.248 messages sent. ■ Protocol errors—Number of errors detected for this virtual BGF, including: <ul style="list-style-type: none"> ■ Syntax errors detected in received messages. ■ Outgoing transactions that have failed for protocol reasons. 	all
Usage Counters	Information about usage of contexts and emergency contexts. <ul style="list-style-type: none"> ■ Contexts—The number of active contexts out of the total number of contexts. ■ Emergency contexts—The number of active contexts that are emergency contexts. 	

Table 253: show services pgcp statistics Output Fields *(continued)*

Field Name	Field Description	Level of Output
Received Commands	<p>Information about command requests received by the virtual BGF. The following information is shown for each possible command.</p> <ul style="list-style-type: none"> ■ Total—Total number of commands received, including commands with wildcard termination IDs. ■ Wildcards—Number of commands received that contain wildcard termination IDs. ■ Success—Number of success replies sent by the virtual BGF. ■ Error—Number of error replies sent by the virtual BGF. <p>Commands are not counted in the following cases:</p> <ul style="list-style-type: none"> ■ The command was not executed because of a previous error. ■ The command was not fully executed because of its own syntax error, which made it impossible to obtain the command type itself. 	all
Sent Commands	<p>Information about command requests sent by the virtual BGF. The following information is shown for each possible command.</p> <ul style="list-style-type: none"> ■ Total—Total number of commands sent, including commands with wildcard termination IDs. ■ Wildcards—Number of commands sent that contain wildcard termination IDs. ■ Success—Number of success replies received by the virtual BGF. ■ Error—Number of error replies received by the virtual BGF. <p>Commands are not counted in the following cases:</p> <ul style="list-style-type: none"> ■ The command was not executed because of a previous error. ■ The command was not fully executed because of its own syntax error, which made it impossible to obtain the command type itself. 	none brief
ROOT SVC	<p>Information about ServiceChange requests sent by the virtual BGF on the root termination.</p> <ul style="list-style-type: none"> ■ Total—Total number of commands sent, including commands with wildcard termination IDs. ■ Wildcards—Number of commands sent that contain wildcard termination IDs. ■ Success—Number of success replies received by the virtual BGF. ■ Error—Number of error replies received by the virtual BGF. <p>Commands are not counted in the following cases:</p> <ul style="list-style-type: none"> ■ The command was not executed because of a previous error. ■ The command was not fully executed because of its own syntax error, which made it impossible to obtain the command type itself. 	extensive

Table 253: show services pgcp statistics Output Fields (continued)

Field Name	Field Description	Level of Output
Termination SVC	<p>Information about ServiceChange requests sent by the virtual BGF on the IP termination.</p> <ul style="list-style-type: none"> ■ Total—Total number of commands sent, including commands with wildcard termination IDs. ■ Wildcards—Number of commands sent that contain wildcard termination IDs. ■ Success—Number of success replies received by the virtual BGF. ■ Error—Number of error replies received by the virtual BGF. <p>Commands are not counted in the following cases:</p> <ul style="list-style-type: none"> ■ The command was not executed because of a previous error. ■ The command was not fully executed because of its own syntax error, which made it impossible to obtain the command type itself. 	extensive
ROOT Notify	<p>Information about notifications sent by the virtual BGF on the root termination.</p> <ul style="list-style-type: none"> ■ ocp/mg overload—MG overload notifications. ■ Total—Total number of notifications sent, including notifications with wildcard termination IDs. ■ Wildcards—Number of notifications sent that contain wildcard termination IDs. ■ Success—Number of success replies received by the virtual BGF. ■ Error—Number of error replies received by the virtual BGF. <p>Commands are not counted in the following cases:</p> <ul style="list-style-type: none"> ■ The command was not executed because of a previous error. ■ The command was not fully executed because of its own syntax error, which made it impossible to obtain the command type itself. 	extensive
Termination Notify	<p>Information about notifications sent by the virtual BGF on the IP termination.</p> <ul style="list-style-type: none"> ■ nt/qualert—Quality alert notifications. ■ hangterm/thb—Termination heartbeat notifications. ■ adr/rsac—Remote source address changed notifications. ■ adid/ipstop—IP flow stop detection notifications. ■ Total—Total number of notifications sent, including notifications with wildcard termination IDs. ■ Wildcards—Number of notifications sent that contain wildcard termination IDs. ■ Success—Number of success replies received by the virtual BGF. ■ Error—Number of error replies received by the virtual BGF. <p>Commands are not counted in the following cases:</p> <ul style="list-style-type: none"> ■ The command was not executed because of a previous error. ■ The command was not fully executed because of its own syntax error, which made it impossible to obtain the command type itself. 	extensive

```

show services pgcp statistics user@host> show services pgcp statistics gateway bgf-1
                               Packet gateway configuration:
                               Name                               : bgf-1
                               IP address                         : 3.0.0.2

```

```

Port                               : 2944
Status                             : Connected

Usage counters:
Contexts                           : 11 / 6000
Emergency contexts                  : 0

H.248 statistics:
Messages received                   : 5
Messages sent                       : 3
Protocol errors                     : 0

```

Received Commands	Total	Wildcard	Success	Error
Add	0	0	0	0
AuditValue	1	0	1	0
Modify	1	0	1	0
ServiceChange	0	0	0	0
Subtract	0	0	0	0

Sent Commands	Total	Wildcard	Success	Error
Notify	0	0	0	0
ServiceChange	1	0	1	0

show services pgcp statistics extensive

```

user@host> show services pgcp statistics gateway bgf-1 extensive
Packet gateway configuration:
Name                               : bgf-1
IP address                         : 10.50.150.100
Port                               : 2944
Status                             : In-Service (Registered)

H.248 statistics:
Messages received                   : 5
Messages sent                       : 3
Protocol errors                     : 0

```

Received Commands	Total	Wildcard	Success	Error
Add	0	0	0	0
AuditValue	1	0	1	0
Modify	1	0	1	0
ServiceChange	0	0	0	0
Subtract	0	0	0	0

Sent Commands	Total	Wildcard	Success	Error
Notify	0	0	0	0
ServiceChange	1	0	1	0

ROOT SVC	Total	Wildcard	Success	Error
DC/900	0	0	0	0
FL/908	0	0	0	0
FL/909	0	0	0	0
FL/919	0	0	0	0
FL/920	0	0	0	0
FO/904	0	0	0	0
FO/905	0	0	0	0

FO/908	0	0	0	0
GR/905	0	0	0	0
HO/903	0	0	0	0
RS/900	0	0	0	0
RS/901	1	0	1	0
RS/902	0	0	0	0
RS/918	0	0	0	0
Termination SVC	Total	Wildcard	Success	Error
FO/904	0	0	0	0
FO/905	0	0	0	0
FO/906	0	0	0	0
FO/907	0	0	0	0
FO/910	0	0	0	0
FO/915	0	0	0	0
GR/905	0	0	0	0
RS/900	0	0	0	0
RS/918	0	0	0	0
ROOT Notify	Total	Wildcard	Success	Error
ocp/mg_overloaded	0	0	0	0
Termination Notify	Total	Wildcard	Success	Error
adid/ipstop	0	0	0	0
nt/qualert	0	0	0	0
latch-completed ADR	0	0	0	0
hangterm expiration	0	0	0	0

show services pgcp conversations

Syntax show services pgcp conversations gateway *gateway-name*
 <brief | extensive | terse>
 <destination-port *destination-port*>
 <destination-prefix *destination-prefix*>
 <destination-routing-instance *vrf*>
 <gate-id *gate-id*>
gateway-name
 <protocol *protocol*>
 <service-set *service-set*>
 <source-port *source-port*>
 <source-prefix *source-prefix*>
 <source-routing-instance *vrf*>

Release Information Command introduced in JUNOS Release 8.4.
gateway-name option added in JUNOS Release 9.2.

Description Display information about PGCP conversations.

Options gateway *gateway-name*—Display information about statistics associated with this virtual BGF.

none—Display standard information about all PGCP conversations.

brief | extensive | terse—(Optional) Display the specified level of output.

destination-port *destination-port*—(Optional) Display information for a particular destination port.

destination-prefix *destination-prefix*—(Optional) Display information for a particular destination prefix.

destination-routing-instance *vrf*—(Optional) Display information for a particular destination VPN routing and forwarding instance (VRF).

gate *gate-id*—(Optional) Display information about a particular gate.

gateway-name—Display information about a virtual BGF.

protocol *protocol*—(Optional) Display information about one of the following IP protocol types:

- *number*—Numeric protocol value from 0 to 255
- ah—IPSec Authentication Header protocol
- egp—An exterior gateway protocol
- esp—IPSec Encapsulating Security Payload protocol
- gre—A generic routing encapsulation protocol
- icmp—Internet Control Message Protocol

- `igmp`—Internet Group Management Protocol
- `ipip`—IP-over-IP Encapsulation Protocol
- `ospf`—Open Shortest Path First protocol
- `pim`—Protocol Independent Multicast protocol
- `rsvp`—Resource Reservation Protocol
- `sctp`—Stream Control Protocol
- `tcp`—Transmission Control Protocol
- `udp`—User Datagram Protocol

`service-set service-set`—(Optional) Display information for the specific service set.

`source-port source-port`—(Optional) Display information for a particular source port.
The range of values is from 0 to 65535.

`source-prefix source-prefix`—(Optional) Display information for a particular source prefix.

`source-routing-instance vrf`—(Optional) Display information for a particular source VPN routing and forwarding instance (VRF).

Required Privilege Level view

List of Sample Output show services pgcp conversations on page 998
show services pgcp conversations extensive on page 999

Output Fields Table 254 on page 997 lists the output fields for the `show services pgcp conversations` command. Output fields are listed in the approximate order in which they appear.

Table 254: show services pgcp conversations Output Fields

Field Name	Field Description	Level of Output
Interface	Name of a services interface.	All levels
Service set	Name of a service set. Individual empty service sets are not displayed. If no service set has any flows, a flow table header is printed for each service set.	All levels
Conversation	Information about a group of related flows. <ul style="list-style-type: none"> ■ ALG Protocol—Application-level gateway protocol. ■ Number of initiators—Number of flows that initiated a session. ■ Number of responders—Number of flows that responded in a session. 	All levels
Flow	Protocol used for this flow.	All levels
Source	Source prefix of the flow, in the format <code>source-prefix-port</code> .	All levels
Destination	Destination prefix of the flow.	All levels

Table 254: show services pgcp conversations Output Fields (continued)

Field Name	Field Description	Level of Output
State	Status of the flow: <ul style="list-style-type: none"> ■ Drop—Drop all packets in the flow without response. ■ Forward—Forward the packet in the flow without looking at it. ■ Reject—Drop all packets in the flow with response. ■ Watch—Inspect packets in the flow. 	All levels
Dir	Direction of the flow: input (I) or output (O).	All levels
Frm Count	Number of frames in the flow.	All levels
Gate id	Numeric identifier of the gate.	All levels
NAT source	Original and translated source IPv4 or IPv6 addresses are displayed if Network Address Translation (NAT) is configured on this particular flow or conversation.	All levels
NAT dest	Original and translated destination IPv4 or IPv6 addresses are displayed if NAT is configured on this particular flow or conversation.	All levels
Byte count	Number of bytes forwarded in the flow.	extensive
Flow role	Role of the flow that is under evaluation: Initiator, Master, Responder, or Unknown.	extensive
Timeout	Lifetime of the flow, in seconds.	extensive
Tman Policing	Whether traffic-management policing is ON or OFF	extensive
SDR	Sustained data rate being enforced for the gate.	extensive
SDR MBS	Sustained data rate maximum burst size being enforced for the gate.	extensive
PDR	Peak data rate being enforced for the gate.	extensive
PDR MBS	Peak data rate maximum burst size being enforced for the gate.	extensive

```

show services pgcp user@host> show services pgcp conversations
conversations      Interface: sp-0/3/0, Service set: pgcp-svc-set-1

Conversation: ALG protocol: any
Number of initiators: 2, Number of responders: 2
Flow      State  Dir      Frm count
UDP      4.0.0.102:0  ->  4.99.99.100:1024  Forward  I      20051
Gate id: 8590000385
  NAT source  4.0.0.102:0  ->  3.99.99.100:1024
  NAT dest    4.99.99.100:1024  ->  3.0.0.101:49174
UDP      4.0.0.102:0  ->  4.99.99.100:1025  Forward  I      0
Gate id: 8590000385
  NAT source  4.0.0.102:0  ->  3.99.99.100:1025
  NAT dest    4.99.99.100:1025  ->  3.0.0.101:49175
UDP      0.0.0.0:0  ->  3.99.99.100:1024  Forward  I      19551
Gate id: 8590000384

```

```

      NAT source      0.0.0.0:0      ->      4.99.99.100:1024
      NAT dest       3.99.99.100:1024 ->      4.0.0.102:49234
UDP      0.0.0.0:0      ->      3.99.99.100:1025 Forward I      0
Gate id: 8590000384
      NAT source      0.0.0.0:0      ->      4.99.99.100:1025
      NAT dest       3.99.99.100:1025 ->      4.0.0.102:49235

Conversation: ALG protocol: any
  Number of initiators: 1, Number of responders: 1
Flow                                          State   Dir      Frm count
UDP      3.0.0.101:0      ->      3.99.99.100:5060 Forward I      2
Gate id: 4295033088
      NAT source      3.0.0.101:0      ->      4.99.99.100:5060
      NAT dest       3.99.99.100:5060 ->      4.0.0.102:5060
UDP      4.0.0.102:0      ->      4.99.99.100:5060 Forward I      3
Gate id: 4295033089
      NAT source      4.0.0.102:0      ->      3.99.99.100:5060
      NAT dest       4.99.99.100:5060 ->      3.0.0.101:5060

```

**show services pgcp
conversations extensive**

```

user@host> show services pgcp conversations bgf-1 extensive
Interface: rsp1, Service set: pgcp-svc-set-1

  Number of initiators: 2, Number of responders: 2
Flow                                          State   Dir      Frm count
Gate id: 4295033088
UDP      4.0.0.102:0      ->      10.50.100.1:1024 Forward I      0
      NAT source      4.0.0.102:0      ->      20.50.100.1:1024
      NAT dest       10.50.100.1:1024 ->      4.0.0.101:10000
Byte count: 0
Flow role: Master, Timeout: 429496728
Tman Policing: ON
SDR      : 10000 bytes per second
SDR MBS: 1000 bytes
PDR      : 10000 bytes per second
PDR MBS: 1000 bytes
Gate id: 4295033088
UDP      4.0.0.102:0      ->      10.50.100.1:1025 Forward I      0
      NAT source      4.0.0.102:0      ->      20.50.100.1:1025
      NAT dest       10.50.100.1:1025 ->      4.0.0.101:10001
Byte count: 0
Flow role: Initiator, Timeout: 429496728
Tman Policing: ON
SDR      : 500 bytes per second
SDR MBS: 1000 bytes
PDR      : 500 bytes per second
PDR MBS: 1000 bytes
Gate id: 4295033089
UDP      4.0.0.101:0      ->      20.50.100.1:1024 Forward I      0
      NAT source      4.0.0.101:0      ->      10.50.100.1:1024
      NAT dest       20.50.100.1:1024 ->      4.0.0.102:10000
Byte count: 0
Flow role: Responder, Timeout: 6000
Tman Policing: OFF
Gate id: 4295033089
UDP      4.0.0.101:0      ->      20.50.100.1:1025 Forward I      0
      NAT source      4.0.0.101:0      ->      10.50.100.1:1025
      NAT dest       20.50.100.1:1025 ->      4.0.0.102:10001
Byte count: 0
Flow role: Responder, Timeout: 429496728
Tman Policing: OFF

```

show services pgcp flows

Syntax show services pgcp flows gateway *gateway-name*
 <brief | extensive | terse>
 <count>
 <destination-port *destination-port*>
 <destination-prefix *destination-prefix*>
 <destination-routing-instance *vrf*>
 <gate-id *gate-id*>
 <gateway-name>
 <protocol *protocol*>
 <service-set *service-set*>
 <source-port *source-port*>
 <source-prefix *source-prefix*>
 <source-routing-instance *vrf*>

Release Information Command introduced in JUNOS Release 8.4.
gate-id option added in Release 9.2.
gateway-name option added in JUNOS Release 9.2.
destination-routing-instance option added in JUNOS Release 9.3.
source-routing-instance option added in JUNOS Release 9.3.

Description Display information for PGCP flows.

Options gateway *gateway-name*—Display information about statistics associated with this virtual BGF.

none—Display standard information about all PGCP flows.

brief | extensive | terse—(Optional) Display the specified level of output.

count—(Optional) Display a count of the matching entries.

destination-port *destination-port*—(Optional) Display information for a particular destination port.

destination-prefix *destination-prefix*—(Optional) Display information for a particular destination prefix.

destination-routing-instance *vrf*—(Optional) Display information for a particular destination VPN routing and forwarding instance (VRF).

gate *gate-id*—(Optional) Display information about a particular gate.

gateway-name—(Optional) Display information about a particular virtual BGF.

protocol *protocol*—(Optional) Display information about one of the following IP protocol types:

- *number*—Numeric protocol value from 0 to 255
- ah—IPSec Authentication Header protocol

- **egp**—An exterior gateway protocol
- **esp**—IPSec Encapsulating Security Payload protocol
- **gre**—A generic routing encapsulation protocol
- **icmp**—Internet Control Message Protocol
- **igmp**—Internet Group Management Protocol
- **ipip**—IP-within-IP Encapsulation Protocol
- **ospf**—Open Shortest Path First protocol
- **pim**—Protocol Independent Multicast protocol
- **rsvp**—Resource Reservation Protocol
- **sctp**—Stream Control Protocol
- **tcp**—Transmission Control Protocol
- **udp**—User Datagram Protocol

service-set *service-set*—(Optional) Display information for a particular service set.

source-port *source-port*—(Optional) Display information for a particular source port.

source-prefix *source-prefix*—(Optional) Display information for a particular source prefix.

source-routing-instance *vrf*—(Optional) Display information for a particular source VPN routing and forwarding instance (VRF).

Required Privilege Level view

List of Sample Output show services pgcp flows on page 1002
show services pgcp flows extensive on page 1003

Output Fields Table 255 on page 1001 lists the output fields for the **show services pgcp flows** command. Output fields are listed in the approximate order in which they appear.

Table 255: show services pgcp flows Output Fields

Field Name	Field Description	Level of Output
Interface	Name of the services interface.	All levels
Service set	Name of a service set. Individual empty service sets are not displayed. If no service set has any flows, a flow table header is displayed for each service set.	All levels
Flow	Protocol used for this flow.	All levels
Source	Source prefix of the flow in the format <i>source-prefix:port</i> .	All levels
Dest	Destination prefix of the flow.	All levels

Table 255: show services pgcp flows Output Fields (continued)

Field Name	Field Description	Level of Output
State	Status of the flow: <ul style="list-style-type: none"> ■ Drop—Drop all packets in the flow without response. ■ Forward—Forward the packet in the flow without looking at it. ■ Reject—Drop all packets in the flow with response. ■ Watch—Inspect packets in the flow. 	All levels
Dir	Direction of the flow: input (I), output (O), or unknown (U).	All levels
Frm count	Number of frames in the flow.	All levels
Gate id	Numeric identifier of the gate.	All levels
NAT source	Original and translated source IPv4 or IPv6 addresses are displayed if Network Address Translation (NAT) is configured on this particular flow or conversation.	All levels
NAT dest	Original and translated destination IPv4 or IPv6 addresses are displayed if NAT is configured on this particular flow or conversation.	All levels
VRF	If you have VPN aggregation configured, shows the source (ingress) VRF and the destination (egress) VRF.	extensive
Byte count	Number of bytes forwarded in the flow.	extensive
Flow role	Role of the flow that is under evaluation: Initiator, Master, Responder, or Unknown.	extensive
Timeout	Lifetime of the flow, in seconds.	extensive
Tman Policing	Whether traffic-management policing is ON or OFF	extensive
SDR	Sustained data rate being enforced for the gate.	extensive
SDR MBS	Sustained data rate maximum burst size being enforced for the gate.	extensive
PDR	Peak data rate being enforced for the gate.	extensive
PDR MBS	Peak data rate maximum burst size being enforced for the gate.	extensive

```

show services pgcp flows user@host> show services pgcp flows gateway VBGF1
Interface: sp-0/3/0, Service set: pgcp-svc-set-1
Flow
  UDP          4.0.0.102:0    ->    4.99.99.100:1024  Forward  I          Frm count
Gate id: 8590000385                                     21531
  NAT source    4.0.0.102:0    ->    3.99.99.100:1024
  NAT dest      4.99.99.100:1024 ->    3.0.0.101:49174
  UDP          0.0.0.0:0      ->    3.99.99.100:1024  Forward  I          20999
Gate id: 8590000384
  NAT source    0.0.0.0:0      ->    4.99.99.100:1024
  NAT dest      3.99.99.100:1024 ->    4.0.0.102:49234
  UDP          4.0.0.102:0    ->    4.99.99.100:5060  Forward  I           3
Gate id: 4295033089

```

```

      NAT source      4.0.0.102:0      ->      3.99.99.100:5060
      NAT dest        4.99.99.100:5060  ->      3.0.0.101:5060
UDP      3.0.0.101:0      ->      3.99.99.100:5060 Forward I      2
Gate id: 4295033088
      NAT source      3.0.0.101:0      ->      4.99.99.100:5060
      NAT dest        3.99.99.100:5060  ->      4.0.0.102:5060
UDP      0.0.0.0:0      ->      3.99.99.100:1025 Forward I      0
Gate id: 8590000384
      NAT source      0.0.0.0:0      ->      4.99.99.100:1025
      NAT dest        3.99.99.100:1025  ->      4.0.0.102:49235
UDP      4.0.0.102:0      ->      4.99.99.100:1025 Forward I      0
Gate id: 8590000385
      NAT source      4.0.0.102:0      ->      3.99.99.100:1025
      NAT dest        4.99.99.100:1025  ->      3.0.0.101:49175

```

**show services pgcp
flows extensive**

```

user@host> show services pgcp flows bgf-1 extensive
Interface: rsp1, Service set: pgcp-svc-set-1
Flow                                     State   Dir      Frm count
Gate id: 4295033088
UDP      4.0.0.102:0      ->      10.50.100.1:1024 Forward U      0
      NAT source      4.0.0.102:0      ->      20.50.100.1:1024
      NAT dest        10.50.100.1:1024  ->      4.0.0.101:10000
VRF: vrf1 -> vrf2
  Byte count: 0
  Flow role: Master, Timeout: 429496728
  Tman Policing: ON
  SDR   : 10000 bytes per second
  SDR MBS: 1000 bytes
  PDR   : 10000 bytes per second
  PDR MBS: 1000 bytes
Gate id: 4295033088
UDP      4.0.0.102:0      ->      10.50.100.1:1025 Forward U      0
      NAT source      4.0.0.102:0      ->      20.50.100.1:1025
      NAT dest        10.50.100.1:1025  ->      4.0.0.101:10001
VRF: vrf1 -> vrf2
  Byte count: 0
  Flow role: Initiator, Timeout: 429496728
  Tman Policing: ON
  SDR   : 500 bytes per second
  SDR MBS: 1000 bytes
  PDR   : 500 bytes per second
  PDR MBS: 1000 bytes
Gate id: 4295033089
UDP      4.0.0.101:0      ->      20.50.100.1:1024 Forward U      0
      NAT source      4.0.0.101:0      ->      10.50.100.1:1024
      NAT dest        20.50.100.1:1024  ->      4.0.0.102:10000
VRF: vrf1 -> vrf2
  Byte count: 0
  Flow role: Responder, Timeout: 6000
  Tman Policing: OFF
Gate id: 4295033089
UDP      4.0.0.101:0      ->      20.50.100.1:1025 Forward U      0
      NAT source      4.0.0.101:0      ->      10.50.100.1:1025
      NAT dest        20.50.100.1:1025  ->      4.0.0.102:10001
VRF: vrf1 -> vrf2
  Byte count: 0
  Flow role: Responder, Timeout: 429496728
  Tman Policing: OFF

```

show services pgcp terminations

Syntax	show services pgcp terminations gateway <i>gateway-name</i> <brief h248 count> <termination-prefix <i>prefix</i> >
Release Information	Command introduced in JUNOS Release 8.4. brief h248 count option introduced in JUNOS Release 8.5. termination-prefix option introduced in JUNOS Release 8.5. gateway option revised in JUNOS Release 9.5.
Description	Display summary information about all Packet Gateway Control Protocol (PGCP) terminations.
Options	<p>gateway <i>gateway-name</i>—Display information about terminations associated with this virtual BGF.</p> <p>brief h248 count—(Optional) Display the specified level of output.</p> <p>termination-prefix <i>prefix</i>—(Optional) Display information based on the termination prefix.</p>
Required Privilege Level	view
List of Sample Output	<p>show services pgcp terminations on page 1005</p> <p>show services pgcp terminations brief on page 1006</p> <p>show services pgcp terminations count on page 1006</p> <p>show services pgcp terminations h248 on page 1006</p> <p>show services pgcp terminations termination-prefix brief on page 1007</p> <p>show services pgcp terminations termination-prefix h248 on page 1008</p>
Output Fields	Table 256 on page 1004 lists the output fields for the show services pgcp terminations command. Output fields are listed in the approximate order in which they appear.

Table 256: show services pgcp terminations Output Fields

Field Name	Field Description	Level of Output
Packet gateway configuration	Information about the BGF configuration. <ul style="list-style-type: none"> ■ Name—Name of the BGF. ■ IP address—IP address of the BGF. ■ Port—Port of the BGF. ■ Status—Status of the BGF. 	All levels except count
Termination name	Name of the termination.	none specified and brief
State	State of the termination: In-service or Out-of-service.	none specified and brief

Table 256: show services pgcp terminations Output Fields (continued)

Field Name	Field Description	Level of Output
Duration	Period of time that termination and gates exist, in milliseconds.	none specified and brief
Gate-id	Numeric identifier of the termination.	none specified and brief
Direction	<ul style="list-style-type: none"> ■ A is the termination that was created first. ■ B is the termination that was created second. 	none specified and brief
State	State of the gate: active, disabled, or closed.	none specified and brief
Action	Action applied to the gate: forward, add, or drop.	none specified and brief
Gateway name	Name of the BGF.	none specified and brief
Terminations count	Number of terminations.	count
Termination Information	Information about the termination in the form of an H.248 transaction.	h248

show services pgcp terminations user@host> **show services pgcp terminations gateway bgf-1**
 Packet gateway configuration:

```

Name           : bgf-1
IP address     : 3.0.0.2
Port          : 2944
Status        : In-Service
  
```

```

Termination name      State      Duration(msecs)
ip/4/vif-0/2          In-service  9628
  
```

```

Gate-id    Direction    State    Action
4295033088 A->B      active   forward
4295033089 B->A      active   forward
  
```

```

Termination name      State      Duration(msecs)
ip/4/vif-0/3          In-service  9632
  
```

```

Gate-id    Direction    State    Action
4295033088 A->B      active   forward
4295033089 B->A      active   forward
  
```

```

show services pgcp terminations brief
user@host> show services pgcp terminations bgf-1 brief
Packet gateway configuration:

      Name                               : pg1
      IP address                         : 3.0.0.2
      Port                              : 2944
      Status                            : In-Service

Termination name           State           Duration(msecs)
ip/4/vif-0/1               In-service    109735

Gate-id      Direction      State      Action
4295033088   A->B            active     forward
4295033089   B->A            active     drop

Termination name           State           Duration(msecs)
ip/4/vif-0/2               In-service    109736

Gate-id      Direction      State      Action
4295033088   A->B            active     forward
4295033089   B->A            active     drop

show services pgcp terminations count
user@host> show services pgcp terminations gateway bgf-1 count
Gateway Name                Terminations Count
bgf-1                        2

show services pgcp terminations h248
user@host> show services pgcp terminations gateway bgf-1 h248
Termination information:
ip/4/vif-0/2 {
  MEDIA {
    TERMINATIONSTATE { SERVICESTATES = INSERVICE },
    STREAM = 1 {
      LOCALCONTROL { MODE = SENDRECEIVE,
        DS/DSCP = 00,
        TMAN/MBS = 10,
        TMAN/PDR = 0,
        TMAN/POL = ON,
        TMAN/SDR = 1000,
        MGCINFO/DB = 00,
        GM/RSB = ON,
        GM/SAF = ON,
        GM/SAM = "[42.0.3.11]",
        GM/SPF = OFF,
        GM/ESAS = OFF,
        GM/ESPS = OFF },
      LOCAL {
        v=0
        c=IN IP4 40.1.1.100
        m=- 1024 rtp/avp -
        b=AS:0
      },
      REMOTE {
        v=0
        c=IN IP4 42.0.3.11
        m=- 10000 rtp/avp -
      }
    }
  }
}

```

```

b=AS:0
    }
    },
    SIGNALS { IPNAPT/LATCH { STREAM = 1, NAPT = OFF, NOTIFYCOMPLETION = { TIMEOUT
} } },
    EVENTS { HANGTERM/THB { TIMERX= 30 } }
}

```

Termination information:

```

ip/4/vif-0/2 {
    MEDIA {
        TERMINATIONSTATE { SERVICESTATES = INSERVICE },
        STREAM = 1 {
            LOCALCONTROL { MODE = SENDRECEIVE,
                DS/DSCP = 00,
                TMAN/MBS = 10,
                TMAN/PDR = 0,
                TMAN/POL = ON,
                TMAN/SDR = 1000,
                MGCINFO/DB = 00,
                GM/RSB = ON,
                GM/SAF = ON,
                GM/SAM = "[42.0.3.11]",
                GM/SPF = OFF,
                GM/ESAS = OFF,
                GM/ESPS = OFF },
            LOCAL {
                v=0
                c=IN IP4 40.1.1.100
                m=- 1024 rtp/avp -
                b=AS:0
            },
            REMOTE {
                v=0
                c=IN IP4 42.0.3.11
                m=- 10000 rtp/avp -
                b=AS:0
            }
        },
        SIGNALS { IPNAPT/LATCH { STREAM = 1, NAPT = OFF, NOTIFYCOMPLETION = { TIMEOUT
} } }.
        EVENTS { HANGTERM/THB { TIMERX= 30 } }
    }
}

```

```

show services pgcp terminations
termination-prefix brief
user@host> show services pgcp terminations brief gateway bgf-1 termination-prefix
ip/4/vif-0/2
Packet gateway configuration:

```

```

Name                : bgf-1
IP address           : 10.50.10.100
Port                 : 2944
Status               : Connected

```

Termination name	State	Duration(msecs)
------------------	-------	-----------------

ip/4/vif-0/2	In-service	42068	
Gate-id	Direction	State	Action
184683659520	A->B	active	forward
184683659521	B->A	active	forward

**show services pgcp terminations
termination-prefix h248**

```

user@host> show services pgcp termination gateway bgf-1 termination-prefix
ip/4/vif-0/2 h248
Termination information:
ip/4/vif-0/2 {
    MEDIA {
        TERMINATIONSTATE { SERVICESTATES = INSERVICE },
        STREAM = 1 {
            LOCALCONTROL { MODE = SENDRECEIVE,
                DS/DSCP = 00,
                TMAN/MBS = 10,
                TMAN/PDR = 0,
                TMAN/POL = ON,
                TMAN/SDR = 1000,
                MGCINFO/DB = 00,
                GM/RSB = ON,
                GM/SAF = ON,
                GM/SAM = "[42.0.3.11]",
                GM/SPF = OFF,
                GM/ESAS = OFF,
                GM/ESPS = OFF },
            LOCAL {
                v=0
                c=IN IP4 40.1.1.100
                m=- 1024 rtp/avp -
                b=AS:0
            },
            REMOTE {
                v=0
                c=IN IP4 42.0.3.11
                m=- 10000 rtp/avp -
                b=AS:0
            }
        },
        SIGNALS { IPNAPT/LATCH { STREAM = 1, NAPT = OFF, NOTIFYCOMPLETION = { TIMEOUT
        } } },
        EVENTS { HANGTERM/THB { TIMERX= 30 } }
    }
}

```

Chapter 28

Service Sets Operational Mode Commands

Table 257 on page 1009 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot service sets. Commands are listed in alphabetical order.

Table 257: Service Sets Operational Mode Commands

Task	Command
Clear service sets statistics.	<code>clear services service-sets statistics packet-drops</code>
Display service sets CPU utilization.	<code>show services service-sets cpu-usage</code>
Display services sets memory utilization.	<code>show services service-sets memory-usage</code>
Display service sets statistics.	<code>show services service-sets statistics packet-drops</code>
Displays services sets TCP MSS statistics.	<code>show services service-sets statistics tcp-mss</code>
Display service sets summary information.	<code>show services service-sets summary</code>



NOTE: Service sets are supported on the adaptive services interface on the following routing platforms:

- J-series routing platform—`sp-pim/0/slot`
- M-series and T-series routing platforms—`ms-fpc/pic/port` or `sp-fpc/pic/port`

Service sets are also supported on the redundant adaptive services interface (`rspnumber`) on M-series and T-series routing platforms.



NOTE: For information about how to configure service sets, see the *JUNOS Services Interfaces Configuration Guide*.

clear services service-sets statistics packet-drops

Syntax	clear services service-sets statistics packet-drops <interface <i>interface-name</i> >
Release Information	Command introduced in JUNOS Release 7.4.
Description	Clear dropped-packet statistics for one adaptive services interface or for all adaptive services interfaces.
Options	<p>none—Clear dropped-packet statistics for all configured adaptive services interfaces.</p> <p>interface <i>interface-name</i>—(Optional) Clear dropped-packet statistics for the specified adaptive services interface. On M-series and T-series routing platforms, the <i>interface-name</i> can be <i>ms-fpc/pic/port</i> , <i>sp-fpc/pic/port</i> or <i>rspnumber</i>. On J-series routing platforms, the <i>interface-name</i> is <i>sp-pim/0/port</i>.</p>
Required Privilege Level	network
Related Topics	show services service-sets statistics packet-drops
List of Sample Output	clear services service-sets statistics packet-drops on page 1010
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear services service-sets statistics packet-drops	<pre>user@host> clear services service-sets statistics packet-drops interface sp-5/0/0 Flow collector interface: cp-5/0/0 Interface state: Collecting flows Statistics cleared successfully</pre>

show services service-sets cpu-usage

Syntax	show services service-sets cpu-usage <interface <i>interface-name</i> > <service-set <i>service-set-name</i> >
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display service set CPU usage.
Options	none—Display CPU usage for all adaptive services interfaces and service sets. interface <i>interface-name</i> —(Optional) Display CPU usage for a particular interface. On M-series and T-series routing platforms, the <i>interface-name</i> can be <i>ms-fpc/pic/port</i> , <i>sp-fpc/pic/port</i> , or <i>rspnumber</i> . On the J-series routing platform, the <i>interface-name</i> is <i>sp-pim/0/port</i> . service-set <i>service-set-name</i> —(Optional) Display CPU usage for a particular service set. For the Layer 2 Tunneling Protocol (L2TP), you can use a tunnel group to represent a service set.
Required Privilege Level	view
List of Sample Output	show services service-sets cpu-usage on page 1011
Output Fields	Table 258 on page 1011 lists the output fields for the show services service-sets cpu-usage ccommand. Output fields are listed in the approximate order in which they appear.

Table 258: show services service-sets cpu-usage Output Fields

Field Name	Field Description
Interface	Name of an adaptive services interface.
Service set	Name of a service set.
CPU Utilization %	Percentage of the CPU resources being used.

show services service-sets cpu-usage	user@host> show services service-sets cpu-usage	
	Interface Service set	CPU utilization %
	sp-1/3/0 blue	0.00

show services service-sets memory-usage

Syntax	show services service-sets memory-usage <interface <i>interface-name</i> > <service-set <i>service-set-name</i> > <zone>
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display service set memory usage.
Options	<p>none—Display service set memory usage.</p> <p>interface <i>interface-name</i>—(Optional) Display memory usage for a particular interface. On M-series and T-series routing platforms, the <i>interface-name</i> can be <i>ms-fpc/pic/port</i>, <i>sp-fpc/pic/port</i>, or <i>rspnumber</i>. On the J-series routing platform, the <i>interface-name</i> is <i>sp-pim/0/port</i>.</p> <p>service-set <i>service-set-name</i>—(Optional) Display memory usage for a particular service set. For L2TP, you can use a tunnel group to represent a service set.</p> <p>zone—(Optional) Display the memory usage zone of the adaptive services interface or of an individual service set.</p>
Required Privilege Level	view
List of Sample Output	<p>show services service-sets memory-usage on page 1013</p> <p>show services service-sets memory-usage zone on page 1013</p>
Output Fields	Table 259 on page 1012 lists the output fields for the <code>show services service-sets memory-usage</code> command. Output fields are listed in the approximate order in which they appear.

Table 259: show services service-sets memory-usage Output Fields

Field Name	Field Description
Interface	Name of an adaptive services interface.
Service set	Name of a service set.
Bytes Used	Number of bytes of memory being used.
Memory zone	<p>Memory zone in which the adaptive services interface is currently operating:</p> <ul style="list-style-type: none"> ■ Green—All new flows are allowed. ■ Yellow—Unused memory is reclaimed. All new flows are allowed. ■ Orange—New flows are only allowed for service sets that are using less than their equal share of memory. ■ Red—No new flows are allowed.


```
show services user@host> show services service-sets memory-usage
service-sets Interface Service set Bytes Used
memory-usage sp-1/3/0 blue 14817036

show services user@host> show services service-sets memory-usage zone
service-sets Interface Memory zone
memory-usage zone sp-1/3/0 Green
```

show services service-sets statistics packet-drops

Syntax	show services service-sets statistics packet-drops <interface <i>interface-name</i> >
Release Information	Command introduced in JUNOS Release 7.4.
Description	Display the number of dropped packets for service sets exceeding CPU limits or memory limits.
Options	<p>none—Display the number of dropped service sets packets for all adaptive services interfaces.</p> <p>interface <i>interface-name</i>—(Optional) Display the number of dropped service sets packets for a particular interface. On M-series and T-series routing platforms, <i>interface-name</i> can be <i>ms-fpc/pic/port</i>, <i>sp-fpc/pic/port</i>, or <i>rspnumber</i>. On J-series routing platforms, <i>interface-name</i> is <i>sp-pim/0/port</i>.</p>
Required Privilege Level	view
Related Topics	clear services flow-collector statistics
List of Sample Output	show services service-sets statistics packet-drops interface on page 1014
Output Fields	Table 260 on page 1014 lists the output fields for the show services service-sets packet-drops command. Output fields are listed in the approximate order in which they appear.

Table 260: show services service-sets statistics packet-drops Output Fields

Field Name	Field Description
Interface	Name of an adaptive services interface.
Service set	Name of a service set.
CPU limit Drops	Number of packets dropped because the service set exceeded the average CPU limit.
Memory limit Drops	Number of packets dropped because the service set exceeded the memory limit.
Flow limit Drops	Number of packets dropped because the service set exceeded the flow limit.

```

show services      user@host> show services service-sets statistics packet-drops interface sp-1/0/0
service-sets statistics
packet-drops interface
Interface      Service Set      Cpu limit   Memory limit   Flow limit
Drops          sset1            Drops       Drops          Drops
sp-1/0/0       0                0           0              0

```

show services service-sets statistics tcp-mss

- Syntax

show services service-sets statistics tcp-mss
<interface *interface-name*>
- Release Information

Command introduced in JUNOS Release 9.5.
- Description

(M-series and T-series routing platforms only) Display TCP MSS statistics for service sets.
- Options

none—Display service set TCP MSS information for all adaptive services interfaces.

interface *interface-name*—(Optional) Display TCP MSS statistics for a particular interface. The *interface-name* can be *ms-fpc/pic/port*, *sp-fpc/pic/port* , or *rsp number*.
- Required Privilege Level

view
- List of Sample Output

show services service-sets statistics tcp-mss on page 1015
- Output Fields

Table 261 on page 1015 lists the output fields for the `show services service-sets statistics tcp-mss` command. Output fields are listed in the approximate order in which they appear.

Table 261: show services service-sets statistics tcp-mss Output Fields

Field Name	Field Description
Interface	Name of the adaptive services interface.
Service Set	Name of the configured service set.
SYN Received	Number of TCP SYN packets received.
SYN Modified	Number of TCP SYN packets with the MSS value modified to match the MSS value specified in the TCP MSS configuration.

show services
service-sets statistics
tcp-mss

user@host> show services service-sets statistics tcp-mss
Interface Service Set SYN Received SYN Modified
sp-1/2/0 asq_ipsec_svc_0 500 220

show services service-sets summary

Syntax	show services service-sets summary <interface <i>interface-name</i> >
Release Information	Command introduced before JUNOS Release 7.4.
Description	Display service set summary information.
Options	<p>none—Display service set summary information for all adaptive services interfaces.</p> <p>interface <i>interface-name</i>—(Optional) Display service set summary information for a particular interface. On M-series and T-series routing platforms, <i>interface-name</i> can be <i>ms-fpc/pic/port</i>, <i>sp-fpc/pic/port</i>, or <i>rspnumber</i>. On the J-series routing platform, <i>interface-name</i> is <i>sp-pim/O/port</i>.</p>
Required Privilege Level	view
List of Sample Output	<p>show services service-sets summary on page 1016</p> <p>show services service-sets summary interface on page 1017</p>
Output Fields	Table 262 on page 1016 lists the output fields for the show services service-sets summary command. Output fields are listed in the approximate order in which they appear.

Table 262: show services service-sets summary Output Fields

Field Name	Field Description
Interface	Name of an adaptive services interface.
Service type	Type of adaptive service, such as stateful firewall (SFW), Network Address Translation (NAT), Intrusion Detection Services (IDS), Layer 2 Tunneling Protocol (L2TP), Compressed Real-Time Transport Protocol (CRTP), or IP Security (IPSec).
Service sets configured	Total number of service sets configured on the PIC that use internal service set IDs and do not consume external service sets, including CRTP and L2TP.
Bytes used	Bytes used by a particular service, or all services.
Policy bytes used	Policy bytes used by a particular service, or all services.
CPU utilization	Percentage of the CPU resources being used.

```

show services      user@host> show services service-sets summary
service-sets summary

```

Interface	Service sets configured	Bytes used	Policy bytes used	CPU utilization
sp-1/3/0	3	170 (0.00 %)	3116 (0.02 %)	0.00 %
rsp0	3	798 (0.00 %)	2772 (0.01 %)	0.00 %

```

show services      user@host> show services service-sets summary interface sp-1/3/0
service-sets summary Interface: sp-1/3/0
interface

```

Service type	Service sets configured	Bytes used	CPU utilization
SFW/NAT/IDS	1	54 (0.00 %)	0.00 %
L2TP	1	58 (0.00 %)	0.00 %
CRTP	1	58 (0.00 %)	0.00 %
System	0	920831 (0.44 %)	0.04 %
Idle	0	0 (0.00 %)	99.95 %
Total	3	921001 (0.44 %)	99.99 %

Chapter 29

Stateful Firewall Operational Mode Commands

Table 263 on page 1019 summarizes the command-line interface (CLI) commands you can use to monitor and troubleshoot stateful firewall services. Commands are listed in alphabetical order.

Table 263: Stateful Firewall Services Operational Mode Commands

Task	Command
Clear stateful firewall flows.	<code>clear services stateful-firewall flows</code>
Clear stateful firewall Session Initiation Protocol (SIP) call information.	<code>clear services stateful-firewall sip-call</code>
Clear stateful firewall SIP register information.	<code>clear services stateful-firewall sip-register</code>
Clear stateful firewall statistics.	<code>clear services stateful-firewall statistics</code>
Display stateful firewall conversation information.	<code>show services stateful-firewall conversations</code>
Display stateful firewall flow information.	<code>show services stateful-firewall flows</code>
Display stateful firewall SIP call information.	<code>show services stateful-firewall sip-call</code>
Display stateful firewall SIP register information.	<code>show services stateful-firewall sip-register</code>
Display stateful firewall statistics.	<code>show services stateful-firewall statistics</code>
Display statistics information for the application protocol SIP.	<code>show services stateful-firewall statistics application-protocol sip</code>



NOTE: Stateful firewall services are supported on the adaptive services interface on the following routing platforms:

- J-series routing platform—*sp-pim/0/slot*
- M-series and T-series routing platforms—*ms-fpc/pic/port*, or *sp-fpc/pic/port*

Stateful firewall services are also supported on the redundant adaptive services interface (*rspnumber*) on M-series and T-series routing platforms. For information about how to configure stateful firewall services, see the *JUNOS Services Interfaces Configuration Guide*.

clear services stateful-firewall flows

Syntax clear services stateful-firewall flows
 <application-protocol *protocol*>
 <destination-port *destination-port*>
 <destination-prefix *destination-prefix*>
 <interface *interface-name*>
 <protocol *protocol*>
 <service-set *service-set*>
 <source-port *source-port*>
 <source-prefix *source-prefix*>

Release Information Command introduced before JUNOS Release 7.4.

Description Clear stateful firewall flows.

Options none—Clear all stateful firewall flows.

application-protocol—(Optional) Clear stateful firewall flows for one of the following application protocols:

- bootp—Bootstrap protocol
- dce-rpc—Distributed Computing Environment-Remote Procedure Call protocols
- dce-rpc-portmap—Distributed Computing Environment-Remote Procedure Call protocols portmap service
- dns—Domain Name System protocol
- exec—Exec
- ftp—File Transfer Protocol
- h323—H.323 standards
- icmp—Internet Control Message Protocol
- iiop—Internet Inter-ORB Protocol
- login—Login
- netbios—NetBIOS
- netshow—NetShow
- realaudio—RealAudio
- rpc—Remote Procedure Call protocol
- rpc-portmap—Remote Procedure Call protocol portmap service
- rtsp—Real-Time Streaming Protocol
- shell—Shell
- sip—Session Initiation Protocol
- snmp—Simple Network Management Protocol

- `sqlnet`—SQLNet
- `tftp`—Trivial File Transfer Protocol
- `traceroute`—Traceroute
- `winframe`—WinFrame

`destination-port` *destination-port*—(Optional) Clear stateful firewall flows for a particular destination port. The range of values is 0 to 65535.

`destination-prefix` *destination-prefix*—(Optional) Clear stateful firewall flows for a particular destination prefix.

`interface` *interface-name*—(Optional) Clear stateful firewall flows for a particular interface. On M-series and T-series routing platforms, the *interface-name* can be *sp-fpc/pic/port* or *rspnumber*. On the J-series routing platform, the *interface-name* is *sp-pim/0/port*.

`protocol`—(Optional) Clear stateful firewall flows for one of the following IP protocol types:

- *number*—Numeric protocol value from 0 to 255.
- `ah`—IPSec Authentication Header protocol
- `egp`—An exterior gateway protocol
- `esp`—IPSec Encapsulating Security Payload protocol
- `gre`—A generic routing encapsulation protocol
- `icmp`—Internet Control Message Protocol
- `igmp`—Internet Group Management Protocol
- `ipip`—IP-over-IP Encapsulation Protocol
- `ospf`—Open Shortest Path First protocol
- `pim`—Protocol Independent Multicast protocol
- `rsvp`—Resource Reservation Protocol
- `sctp`—Stream Control Protocol
- `tcp`—Transmission Control Protocol
- `udp`—User Datagram Protocol

`service-set` *service-set*—(Optional) Clear stateful firewall flows for a particular service set.

`source-port` *source-port*—(Optional) Clear stateful firewall flows for a particular source port. The range of values is from 0 through 65535.

`source-prefix` *source-prefix*—(Optional) Clear stateful firewall flows for a particular source prefix.

Required Privilege Level view

Related Topics show services stateful-firewall flows

List of Sample Output clear services stateful-firewall flows on page 1023

Output Fields Table 264 on page 1023 lists the output fields for the clear services stateful-firewall flows command. Output fields are listed in the approximate order in which they appear.

Table 264: clear services stateful-firewall flows Output Fields

Field Name	Field Description
Interface	Name of an adaptive services interface.
Service set	Name of the service set from which flows are being cleared.
Conv removed	Number of conversations removed.

clear services

stateful-firewall flows

```
user@host> clear services stateful-firewall flows
Interface  Service set      Conv removed
sp-0/3/0   svc_set_trust    0
sp-0/3/0   svc_set_untrust  0
```

clear services stateful-firewall sip-call

Syntax clear services stateful-firewall sip-call
 <application-protocol *protocol*>
 <destination-port *destination-port*>
 <destination-prefix *destination-prefix*>
 <interface *interface-name*>
 <protocol *protocol*>
 <service-set *service-set*>
 <source-port *source-port*>
 <source-prefix *source-prefix*>

Release Information Command introduced in JUNOS Release 7.4.

Description Clear Session Initiation Protocol (SIP) call information in stateful firewall flows.

Options none—Clear stateful firewall statistics for all interfaces and all service sets.

application-protocol—(Optional) Clear information about one of the following application protocols:

- bootp—(SIP only) Bootstrap protocol
- dce-rpc—(SIP only) Distributed Computing Environment-Remote Procedure Call protocols
- dce-rpc-portmap—(SIP only) Distributed Computing Environment-Remote Procedure Call protocols portmap service
- dns—(SIP only) Domain Name System protocol
- exec—(SIP only) Exec
- ftp—(SIP only) File Transfer Protocol
- h323—H.323 standards
- icmp—Internet Control Message Protocol
- iiop—Internet Inter-ORB Protocol
- login—Login
- netbios—NetBIOS
- netshow—NetShow
- realaudio—RealAudio
- rpc—Remote Procedure Call protocol
- rpc-portmap—Remote Procedure Call protocol portmap service
- rtsp—Real-Time Streaming Protocol
- shell—Shell
- sip—Session Initiation Protocol
- snmp—Simple Network Management Protocol

- sqlnet—SQLNet
- tftp—Trivial File Transfer Protocol
- traceroute—Traceroute
- winframe—WinFrame

destination-port *destination-port*—(Optional) Clear information for a particular destination port. The range of values is 0 to 65535.

destination-prefix *destination-prefix*—(Optional) Clear information for a particular destination prefix.

interface *interface-name*—(Optional) Clear information for a particular adaptive services interface. On M-series and T-series routing platforms, the *interface-name* can be *sp-fpc/pic/port* or *rspnumber*. On the J-series routing platform, the *interface-name* is *sp-pim/0/port*.

protocol—(Optional) Clear information about one of the following IP protocol types:

- ah—IPSec Authentication Header protocol
- egp—An exterior gateway protocol
- esp—IPSec Encapsulating Security Payload protocol
- gre—A generic routing encapsulation protocol
- icmp—Internet Control Message Protocol
- igmp—Internet Group Management Protocol
- ipip—IP-within-IP Encapsulation Protocol
- ipv6—IPv6 within IP
- ospf—Open Shortest Path First protocol
- pim—Protocol Independent Multicast protocol
- rsvp—Resource Reservation Protocol
- sctp—Stream Control Protocol
- tcp—Transmission Control Protocol
- udp—User Datagram Protocol

service-set *service-set*—(Optional) Clear information for a particular service set.

source-port *source-port*—(Optional) Clear information for a particular source port. The range of values is 0 to 65535.

source-prefix *source-prefix*—(Optional) Clear information for a particular source prefix.

Required Privilege Level view

Related Topics show services stateful-firewall sip-call

List of Sample Output clear services stateful-firewall sip-call on page 1026

Output Fields Table 265 on page 1026 lists the output fields for the `clear services stateful-firewall sip-call` command. Output fields are listed in the approximate order in which they appear.

Table 265: clear services stateful-firewall sip-call Output Fields

Field Name	Field Description
Interface	Name of an adaptive services interface.
Service set	Name of the service set from which flows are being cleared.
SIP calls removed	Number of SIP calls removed.

clear services stateful-firewall sip-call

```
user@host> clear services stateful-firewall sip-call
Interface  Service set      SIP calls removed
sp-0/3/0   test_sip_777      1
```

clear services stateful-firewall sip-register

Syntax clear services stateful-firewall sip-register
 <application-protocol *protocol*>
 <destination-port *destination-port*>
 <destination-prefix *destination-prefix*>
 <interface *interface-name*>
 <protocol *protocol*>
 <service-set *service-set*>
 <source-port *source-port*>
 <source-prefix *source-prefix*>

Release Information Command introduced in JUNOS Release 7.4.

Description Clear Session Initiation Protocol (SIP) register information in stateful firewall flows.

Options application-protocol—(Optional) Clear information about one of the following application protocols:

- bootp—(SIP only) Bootstrap protocol
- dce-rpc—(SIP only) Distributed Computing Environment-Remote Procedure Call protocols
- dce-rpc-portmap—(SIP only) Distributed Computing Environment-Remote Procedure Call protocols portmap service
- dns—(SIP only) Domain Name System protocol
- exec—(SIP only) Exec
- ftp—(SIP only) File Transfer Protocol
- h323—H.323 standards
- icmp—Internet Control Message Protocol
- iiop—Internet Inter-ORB Protocol
- login—Login
- netbios—NetBIOS
- netshow—NetShow
- realaudio—RealAudio
- rpc—Remote Procedure Call protocol
- rpc-portmap—Remote Procedure Call protocol portmap service
- rtsp—Real-Time Streaming Protocol
- shell—Shell
- sip—Session Initiation Protocol
- snmp—Simple Network Management Protocol
- sqlnet—SQLNet

- **tftp**—Trivial File Transfer Protocol
- **traceroute**—Traceroute
- **winframe**—WinFrame

destination-port *destination-port*—(Optional) Clear information for a particular destination port. The range of values is 0 to 65535.

destination-prefix *destination-prefix*—(Optional) Clear information for a particular destination prefix.

interface *interface*—(Optional) Clear information about a particular interface. On M-series and T-series routing platforms, the *interface-name* can be *sp-fpc/pic/port* or *rspnumber*. On the J-series routing platform, the *interface-name* is *sp-pim/0/port*.

protocol—(Optional) Clear information about one of the following IP protocol types:

- **ah**—IPSec Authentication Header protocol
- **egp**—An exterior gateway protocol
- **esp**—IPSec Encapsulating Security Payload protocol
- **gre**—A generic routing encapsulation protocol
- **icmp**—Internet Control Message Protocol
- **igmp**—Internet Group Management Protocol
- **ipip**—IP-within-IP Encapsulation Protocol
- **ipv6**—IPv6 within IP
- **ospf**—Open Shortest Path First protocol
- **pim**—Protocol Independent Multicast protocol
- **rsvp**—Resource Reservation Protocol
- **sctp**—Stream Control Protocol
- **tcp**—Transmission Control Protocol
- **udp**—User Datagram Protocol

service-set *service-set*—(Optional) Clear information for a particular service set.

source-port *source-port*—(Optional) Clear information for a particular source port. The range of values is 0 through 65535.

source-prefix *source-prefix*—(Optional) Clear information for a particular source prefix.

Required Privilege Level view

Related Topics show services stateful-firewall sip-register

List of Sample Output clear services stateful-firewall sip-register on page 1029

Output Fields Table 266 on page 1029 lists the output fields for the `clear services stateful-firewall sip-register` command. Output fields are listed in the approximate order in which they appear.

Table 266: clear services stateful-firewall sip-register Output Fields

Field Name	Field Description
Interface	Name of an adaptive services interface.
Service set	Name of the service set from which flows are being cleared.
SIP registration removed	Number of SIP registers removed.

clear services

stateful-firewall

sip-register

```
user@host> clear services stateful-firewall sip-register
Interface      Service set      SIP registration removed
sp-0/3/0       test_sip_777    1
```

clear services stateful-firewall statistics

Syntax	clear services stateful-firewall statistics <interface <i>interface-name</i> > <service-set <i>service-set</i> >
Release Information	Command introduced before JUNOS Release 7.4.
Description	Clear stateful firewall statistics.
Options	<p>none—Clear stateful firewall statistics for all interfaces and all service sets.</p> <p>interface <i>interface-name</i>—(Optional) Clear stateful firewall statistics for the specified interface. On M-series and T-series routing platforms, the <i>interface-name</i> can be <i>sp-fpc/pic/port</i> or <i>rspnumber</i>. On the J-series routing platform, the <i>interface-name</i> is <i>sp-pim/0/port</i>.</p> <p>service-set <i>service-set</i>—(Optional) Clear stateful firewall statistics for the specified service set.</p>
Required Privilege Level	view
Related Topics	show services stateful-firewall statistics
List of Sample Output	clear services stateful-firewall statistics on page 1030
Output Fields	When you enter this command, you are provided feedback on the status of your request.
clear services stateful-firewall statistics	user@host> clear services stateful-firewall statistics

show services stateful-firewall conversations

Syntax show services stateful-firewall conversations
 <brief | extensive | terse>
 <application-protocol *protocol*>
 <destination-port *destination-port*>
 <destination-prefix *destination-prefix*>
 <interface *interface-name*>
 <limit *number*>
 <pgcp>
 <protocol *protocol*>
 <service-set *service-set*>
 <source-port *source-port*>
 <source-prefix *source-prefix*>

Release Information Command introduced before JUNOS Release 7.4.
 pgcp option introduced in JUNOS Release 8.4.

Description Display information about stateful firewall conversations.

Options none—Display standard information about all stateful firewall conversations.

brief | extensive | terse—(Optional) Display the specified level of output.

application-protocol *protocol*—(Optional) Display information about one of the following application protocols:

- bootp—Bootstrap protocol
- dce-rpc—Distributed Computing Environment-Remote Procedure Call protocols
- dce-rpc-portmap—Distributed Computing Environment-Remote Procedure Call protocols portmap service
- dns—Domain Name System protocol
- exec—Exec
- ftp—File Transfer Protocol
- h323—H.323 standards
- icmp—Internet Control Message Protocol
- iiop—Internet Inter-ORB Protocol
- login—Login
- netbios—NetBIOS
- netshow—NetShow
- realaudio—RealAudio
- rpc—Remote Procedure Call protocol
- rpc-portmap—Remote Procedure Call protocol portmap service

- **rtsp**—Real-Time Streaming Protocol
- **shell**—Shell
- **sip**—Session Initiation Protocol
- **snmp**—Simple Network Management Protocol
- **sqlnet**—SQLNet
- **tftp**—Trivial File Transfer Protocol
- **traceroute**—Traceroute
- **winframe**—WinFrame

destination-port *destination-port*—(Optional) Display information for a particular destination port. The range of values is 0 to 65535.

destination-prefix *destination-prefix*—(Optional) Display information for a particular destination prefix.

interface *interface-name*—(Optional) Display information about a particular interface. On M-series and T-series routing platforms, the *interface-name* can be *sp-fpc/pic/port* or *rspnumber*. On the J-series routing platform, the *interface-name* is *sp-pim/0/port*.

limit *number*—(Optional) Maximum number of entries to display.

pgcp —(Optional) Display information about stateful firewall conversations for Packet Gateway Control Protocol (PGCP) flows.

protocol *protocol*—(Optional) Display information about one of the following IP protocol types:

- *number*—Numeric protocol value from 0 to 255
- **ah**—IPSec Authentication Header protocol
- **egp**—An exterior gateway protocol
- **esp**—IPSec Encapsulating Security Payload protocol
- **gre**—A generic routing encapsulation protocol
- **icmp**—Internet Control Message Protocol
- **igmp**—Internet Group Management Protocol
- **ipip**—IP-within-IP Encapsulation Protocol
- **ospf**—Open Shortest Path First protocol
- **pim**—Protocol Independent Multicast protocol
- **rsvp**—Resource Reservation Protocol
- **sctp**—Stream Control Protocol
- **tcp**—Transmission Control Protocol
- **udp**—User Datagram Protocol

`service-set service-set`—(Optional) Display information for the specific service set.

`source-port source-port`—(Optional) Display information for a particular source port. The range of values is 0 to 65535.

`source-prefix source-prefix`—(Optional) Display information for a particular source prefix.

Required Privilege Level view

List of Sample Output `show services stateful-firewall conversations` on page 1034
`show services stateful-firewall conversations destination-port` on page 1034

Output Fields Table 267 on page 1033 lists the output fields for the `show services stateful-firewall conversations` command. Output fields are listed in the approximate order in which they appear.

Table 267: show services stateful-firewall conversations Output Fields

Field Name	Field Description
Interface	Name of an adaptive services interface.
Service set	Name of a service set. Individual empty service sets are not displayed, but if no service set has any flows, a flow table header is printed for each service set.
Conversation	Information about a group of related flows. <ul style="list-style-type: none"> ■ ALG Protocol—Application-level gateway protocol. ■ Number of initiators—Number of flows that initiated a session. ■ Number of responders—Number of flows that responded in a session.
Flow or Flow Prot	Protocol used for this flow.
Source	Source prefix of the flow, in the format <i>source-prefix-port</i> .
Destination	Destination prefix of the flow.
State	Status of the flow: <ul style="list-style-type: none"> ■ Drop—Drop all packets in the flow without response. ■ Forward—Forward the packet in the flow without looking at it. ■ Reject—Drop all packets in the flow with response. ■ Watch—Inspect packets in the flow.
Dir	Direction of the flow: input (I) or output (O).
Source NAT	Original and translated source IPv4 or IPv6 addresses are displayed if Network Address Translation (NAT) is configured on this particular flow or conversation.
Frm Count	Number of frames in the flow.
Destin NAT	Original and translated destination IPv4 or IPv6 addresses are displayed if NAT is configured on this particular flow or conversation.

Table 267: show services stateful-firewall conversations Output Fields *(continued)*

Field Name	Field Description
Byte count	Number of bytes forwarded in the flow.
TCP established	Whether a TCP connection was established: Yes or No.
TCP window size	Negotiated TCP connection window size, in bytes.
TCP acknowledge	TCP acknowledgment sequence number.
TCP tickle	Whether TCP inquiry mode is on (enabled or disabled) and the time remaining to send the next inquiry, in seconds.
Master flow	Flow that initiated the conversation.
Timeout	Lifetime of the flow, in seconds.

**show services
stateful-firewall
conversations**

```
user@host> show services stateful-firewall conversations
Interface: sp-1/3/0, Service set: green
Conversation: ALG Protocol: any, Number of initiators: 1,
Number of responders: 1
```

```
Flow
Prot      Source                Dest                State      Dir      Frm count
TCP       10.58.255.50:33005->    10.58.255.178:23   Forward    I        13
    Source NAT    10.58.255.50:33005->    10.59.16.100:4000
    Destin NAT    10.58.255.178:23  ->    0.0.0.0:4000
Byte count:          918
TCP established, TCP window size: 65535, TCP acknowledge: 2502627025
TCP tickle enabled, 0 seconds,
Master flow, Timeout: 30 seconds
TCP       10.58.255.178:23  ->    10.59.16.100:4000 Forward    0         8
```

**show services
stateful-firewall
conversations
destination-port**

```
user@host> show services stateful-firewall conversations destination-port 21
Interface: sp-0/3/0, Service set: svc_set_trust

Interface: sp-0/3/0, Service set: svc_set_untrust
Conversation: ALG protocol: ftp
Number of initiators: 1, Number of responders: 1
```

```
Flow
TCP       10.50.10.2:2143  ->    10.50.20.2:21      Watch     O         0
TCP       10.50.20.2:21  ->    10.50.10.2:2143    Watch     I         0
TCP       10.50.20.2:21  ->    10.50.10.2:2143    Watch     I         0
```

show services stateful-firewall flows

Syntax show services stateful-firewall flows
 <brief | extensive | summary | terse>
 <application-protocol *protocol*>
 <count>
 <destination-port *destination-port*>
 <destination-prefix *destination-prefix*>
 <interface *interface-name*>
 <limit *number*>
 <pgcp>
 <protocol *protocol*>
 <service-set *service-set*>
 <source-port *source-port*>
 <source-prefix *source-prefix*>

Release Information Command introduced before JUNOS Release 7.4.
 pgcp option introduced in JUNOS Release 8.4.

Description Display stateful firewall flow table entries.

Options none—Display standard information about all stateful firewall flows.

brief | extensive | summary | terse—(Optional) Display the specified level of output.

application-protocol *protocol*—(Optional) Display information about one of the following application protocols:

- bootp—Bootstrap protocol
- dce-rpc—Distributed Computing Environment-Remote Procedure Call protocols
- dce-rpc-portmap—Distributed Computing Environment-Remote Procedure Call protocols portmap service
- dns—Domain Name System protocol
- exec—Exec
- ftp—File Transfer Protocol
- h323—H.323 standards
- icmp—Internet Control Message Protocol
- iiop—Internet Inter-ORB Protocol
- login—Login
- netbios—NetBIOS
- netshow—NetShow
- realaudio—RealAudio
- rpc—Remote Procedure Call protocol

- **rpc-portmap**—Remote Procedure Call protocol portmap service
- **rtsp**—Real-Time Streaming Protocol
- **shell**—Shell
- **sip**—Session Initiation Protocol
- **snmp**—Simple Network Management Protocol
- **sqlnet**—SQLNet
- **tftp**—Trivial File Transfer Protocol
- **traceroute**—Traceroute
- **winframe**—WinFrame

count—(Optional) Display a count of the matching entries.

destination-port *destination-port*—(Optional) Display information for a particular destination port. The range of values is from 0 to 65535.

destination-prefix *destination-prefix*—(Optional) Display information for a particular destination prefix.

interface *interface-name*—(Optional) Display information about a particular interface. On M-series and T-series routing platforms, *interface-name* can be *sp-fpc/pic/port* or *rspnumber*. On the J-series routing platform, *interface-name* is *sp-pim/0/port*.

limit *number*—(Optional) Maximum number of entries to display.

pgcp —(Optional) Display stateful firewall information for Packet Gateway Control Protocol (PGCP) flows.

protocol *protocol*—(Optional) Display information about one of the following IP protocol types:

- **number**—Numeric protocol value from 0 to 255
- **ah**—IPSec Authentication Header protocol
- **egp**—An exterior gateway protocol
- **esp**—IPSec Encapsulating Security Payload protocol
- **gre**—A generic routing encapsulation protocol
- **icmp**—Internet Control Message Protocol
- **igmp**—Internet Group Management Protocol
- **ipip**—IP-within-IP Encapsulation Protocol
- **ospf**—Open Shortest Path First protocol
- **pim**—Protocol Independent Multicast protocol
- **rsvp**—Resource Reservation Protocol
- **sctp**—Stream Control Protocol

- tcp—Transmission Control Protocol
- udp—User Datagram Protocol

service-set *service-set*—(Optional) Display information for a particular service set.

source-port *source-port*—(Optional) Display information for a particular source port.
The range of values is from 0 to 65535.

source-prefix *source-prefix*—(Optional) Display information for a particular source prefix.

Required Privilege Level view

Related Topics clear services stateful-firewall flows

List of Sample Output show services stateful-firewall flows on page 1038
show services stateful-firewall flows brief on page 1038
show services stateful-firewall flows extensive on page 1038
show services stateful-firewall flows count on page 1038
show services stateful-firewall flows destination port on page 1038
show services stateful-firewall flows source port on page 1038
show services stateful-firewall flows (Twice NAT) on page 1038

Output Fields Table 268 on page 1037 lists the output fields for the show services stateful-firewall flows command. Output fields are listed in the approximate order in which they appear.

Table 268: show services stateful-firewall flows Output Fields

Field Name	Field Description
Interface	Name of the interface.
Service set	Name of a service set. Individual empty service sets are not displayed. If no service set has any flows, a flow table header is displayed for each service set.
Flow Count	Number of flows in a session.
Flow or Flow Prot	Protocol used for this flow.
Source	Source prefix of the flow in the format <i>source-prefix:port</i> . For ICMP flows, port information is not displayed.
Dest	Destination prefix of the flow. For ICMP flows, port information is not displayed.
State	Status of the flow: <ul style="list-style-type: none">■ Drop—Drop all packets in the flow without response.■ Forward—Forward the packet in the flow without looking at it.■ Reject—Drop all packets in the flow with response.■ Watch—Inspect packets in the flow.
Dir	Direction of the flow: input (I) or output (O).
Frm count	Number of frames in the flow.

show services stateful-firewall flows user@host> **show services stateful-firewall flows**
Interface: sp-1/3/0, Service set: green

```
Flow
Prot      Source                Dest                State    Dir      Frm count
TCP       10.58.255.178:23  ->  10.59.16.100:4000 Forward  0
TCP       10.58.255.50:33005-> 10.58.255.178:23 Forward  I        1
Source NAT 10.58.255.50:33005-> 10.59.16.100:4000
Destin NAT 10.58.255.178:23  ->  0.0.0.0:4000
```

show services stateful-firewall flows brief The output for the show services stateful-firewall flows brief command is identical to that for the show services stateful-firewall flows command. For sample output, see show services stateful-firewall flows.

show services stateful-firewall flows extensive user@host> **show services stateful-firewall flows extensive**
Interface: sp-0/3/0, Service set: ss_nat

```
Flow count                                State    Dir      Frm
TCP       16.1.0.1:2330  ->  16.49.0.1:21      Forward  I
8
NAT source 16.1.0.1:2330  ->  16.41.0.1:2330
NAT dest   16.49.0.1:21  ->  16.99.0.1:21
Byte count: 455, TCP established, TCP window size: 57344
TCP acknowledge: 3251737524, TCP tickle enabled, tcp_tickle: 0
Flow role: Master, Timeout: 720
TCP       16.99.0.1:21  ->  16.41.0.1:2330    Forward  0
5
NAT source 16.99.0.1:21  ->  16.49.0.1:21
NAT dest   16.41.0.1:2330 ->  16.1.0.1:2330
Byte count: 480, TCP established, TCP window size: 57344
TCP acknowledge: 463128048, TCP tickle enabled, tcp_tickle: 0
Flow role: Responder, Timeout: 720
```

show services stateful-firewall flows count user@host> **show services stateful-firewall flows count**
Interface Service set Flow Count
sp-1/3/0 green 2

show services stateful-firewall flows destination port user@router> **show services stateful-firewall flows destination-port 21**
Interface: sp-0/3/0, Service set: svc_set_trust

```
Flow
Interface: sp-0/3/0, Service set: svc_set_untrust
Flow
TCP       10.50.10.2:2143 -> 10.50.20.2:21 Watch 0 Frm count 0
```

show services stateful-firewall flows source port user@router> **show services stateful-firewall flows source-port 2143**
Interface: sp-0/3/0, Service set: svc_set_trust

```
Flow
Interface: sp-0/3/0, Service set: svc_set_untrust
Flow
TCP       10.50.10.2:2143 -> 10.50.20.2:21 Watch 0 Frm count 0
```

show services stateful-firewall flows (Twice NAT) user@router> **show services stateful-firewall flows**
Flow

```
UDP       40.0.0.8:23439 -> 80.0.0.1:16485 Watch I Frm count 20
NAT source 40.0.0.8:23439 -> 172.16.1.10:1028
NAT dest   80.0.0.1:16485 -> 192.16.1.10:22415
```

```
UDP      192.16.1.10:22415  -> 172.16.1.10:1028    Watch    0          20
NAT source 192.16.1.10:22415  ->      80.0.0.1:16485
NAT dest   172.16.1.10:1028  ->      40.0.0.8:23439
```

show services stateful-firewall sip-call

Syntax show services stateful-firewall sip-call
 <brief | extensive | terse>
 <application-protocol *protocol*>
 <destination-port *destination-port*>
 <destination-prefix *destination-prefix*>
 <interface *interface-name*>
 <limit *number*>
 <protocol *protocol*>
 <service-set *service-set*>
 <source-port *source-port*>
 <source-prefix *source-prefix*>

Release Information Command introduced in JUNOS Release 7.4.

Description Display stateful firewall Session Initiation Protocol (SIP) call information.

Options count—(Optional) Display a count of the matching entries.

brief—(Optional) Display brief SIP call information.

extensive—(Optional) Display detailed SIP call information.

terse—(Optional) Display terse SIP call information.

application-protocol—(Optional) Display information about one of the following application protocols:

- bootp—(SIP only) Bootstrap protocol
- dce-rpc—(SIP only) Distributed Computing Environment-Remote Procedure Call protocols
- dce-rpc-portmap—(SIP only) Distributed Computing Environment-Remote Procedure Call protocols portmap service
- dns—(SIP only) Domain Name System protocol
- exec—(SIP only) Exec
- ftp—(SIP only) File Transfer Protocol
- h323—H.323 standards
- icmp—Internet Control Message Protocol
- iiop—Internet Inter-ORB Protocol
- login—Login
- netbios—NetBIOS
- netshow—NetShow
- realaudio—RealAudio
- rpc—Remote Procedure Call protocol

- `rpc-portmap`—Remote Procedure Call protocol portmap service
- `rtsp`—Real-Time Streaming Protocol
- `shell`—Shell
- `sip`—Session Initiation Protocol
- `snmp`—Simple Network Management Protocol
- `sqlnet`—SQLNet
- `tftp`—Trivial File Transfer Protocol
- `traceroute`—Traceroute
- `winframe`—WinFrame

`destination-port` *destination-port*—(Optional) Display information for a particular destination port. The range of values is from 0 to 65535.

`destination-prefix` *destination-prefix*—(Optional) Display information for a particular destination prefix.

`interface` *interface-name*—(Optional) Display information about a particular adaptive services interface. On M-series and T-series routing platforms, *interface-name* can be `sp-fpc/pic/port` or `rspnumber`. On the J-series routing platform, *interface-name* is `sp-pim/0/port`.

`limit` *number*—(Optional) Maximum number of entries to display.

`protocol`—(Optional) Display information about one of the following IP protocol types:

- `ah`—IPSec Authentication Header protocol
- `egp`—An exterior gateway protocol
- `esp`—IPSec Encapsulating Security Payload protocol
- `gre`—A generic routing encapsulation protocol
- `icmp`—Internet Control Message Protocol
- `igmp`—Internet Group Management Protocol
- `ipip`—IP-within-IP Encapsulation Protocol
- `ipv6`—IPv6 within IP
- `ospf`—Open Shortest Path First protocol
- `pim`—Protocol Independent Multicast protocol
- `rsvp`—Resource Reservation Protocol
- `sctp`—Stream Control Protocol
- `tcp`—Transmission Control Protocol
- `udp`—User Datagram Protocol

`service-set` *service-set*—(Optional) Display information for a particular service set.

source-port *source-port*—(Optional) Display information for a particular source port. The range of values is from 0 to 65535.

source-prefix *source-prefix*—(Optional) Display information for a particular source prefix.

Required Privilege Level view

Related Topics clear services stateful-firewall sip-call

List of Sample Output show services stateful-firewall sip-call extensive on page 1043

Output Fields Table 269 on page 1042 lists the output fields for the **show services stateful-firewall sip-call** command. Output fields are listed in the approximate order in which they appear.

Table 269: show services stateful-firewall sip-call Output Fields

Field Name	Field Description
Interface	Name of an adaptive services interface.
Service set	Name of a service set.
From	Initiator address.
To	Responder address.
Call ID	SIP call identification string.
Number of initiator flows	Number of control, contact, or media initiator flows.
Number of responder flows	Number of control, contact, or media responder flows.
<i>protocol</i>	Protocol used for this flow.
<i>source-prefix</i>	Source prefix of the flow in the format <i>source-prefix</i> : <i>port</i> .
<i>destination-prefix</i>	Destination prefix of the flow.
<i>state</i>	Status of the flow: <ul style="list-style-type: none"> ■ Drop—Drop all packets in the flow without a response. ■ Forward—Forward the packet in the flow without examining it. ■ Reject—Drop all packets in the flow with a response. ■ Unknown—Unknown status. ■ Watch—Inspect packets in the flow.
<i>direction</i>	Direction of the flow: input (I), output (O), or unknown (U).
<i>frame-count</i>	Number of frames in the flow.
Byte count	Number of bytes forwarded in the flow.

Table 269: show services stateful-firewall sip-call Output Fields (continued)

Field Name	Field Description
Flow role	Role of the flow that is under evaluation: Initiator, Master, Responder, or Unknown.
Timeout	Lifetime of the flow, in seconds.

```

show services      user@host> show services stateful-firewall sip-call extensive
stateful-firewall sip-call
extensive          Interface: sp-0/3/0, Service set: test_sip_777

From : 6507771234@10.200.100.1:0;000ff73ac89900021bb231dc-3ef68435
To : 4085551234@10.200.100.1:0;0011bb65c2a30007777bd0fc-5748b749
Call ID : 000ff73a-c8990004-0741adac-3e027c7e@10.20.70.2
Number of control initiator flows: : 1, Number of control responder flows:
: 1
UDP      10.20.70.2:50354 -> 10.200.100.1:5060 Watch I
2
    Byte count: 1112
    Flow role: Master, Timeout: 30
UDP      10.200.100.1:5060 -> 10.20.170.111:50354 Watch 0
0
    Byte count: 0
    Flow role: Responder, Timeout: 30
UDP      0.0.0.0:0 -> 10.20.170.111:5060 Watch 0
7
    Byte count: 2749
    Flow role: Responder, Timeout: 30
Number of contact initiator flows: 1, Number of contact responder flows: 1
UDP      0.0.0.0:0 -> 10.20.140.11:5060 Watch I
1
    Byte count: 409
    Flow role: Master, Timeout: 30
UDP      10.20.140.11:31864 -> 10.20.170.111:18808 Forward 0
622
    Byte count: 124400
    Flow role: Master, Timeout: 30
UDP      0.0.0.0:0 -> 10.20.170.111:18809 Forward 0
0
    Byte count: 0
    Flow role: Initiator, Timeout: 30
Number of media initiator flows: 4, Number of media responder flows: 0
UDP      10.20.70.2:18808 -> 10.20.140.11:31864 Forward I
628
    Byte count: 125600
    Flow role: Initiator, Timeout: 30
UDP      0.0.0.0:0 -> 10.20.140.11:31865 Forward I
0
    Byte count: 0
    Flow role: Initiator, Timeout: 30
0      0.0.0.0:0 -> 0.0.0.0:0 Unknown U
0
    Byte count: 0
    Flow role: Unknown, Timeout: 0
0      0.0.0.0:0 -> 0.0.0.0:0 Unknown U
Interface: sp-0/3/0, Service set: test_sip_888

```

show services stateful-firewall sip-register

Syntax show services stateful-firewall sip-register
 <brief | extensive | terse>
 <application-protocol *protocol*>
 <destination-port *destination-port*>
 <destination-prefix *destination-prefix*>
 <interface *interface-name*>
 <limit *number*>
 <protocol *protocol*>
 <service-set *service-set*>
 <source-port *source-port*>
 <source-prefix *source-prefix*>

Release Information Command introduced in JUNOS Release 7.4.

Description Display stateful firewall Session Initiation Protocol (SIP) register information.

Options count—(Optional) Display a count of the matching entries.

brief—(Optional) Display brief SIP register information.

extensive—(Optional) Display detailed SIP register information.

terse—(Optional) Display terse SIP register information.

application-protocol—(Optional) Display information about one of the following application protocols:

- bootp—(SIP only) Bootstrap protocol
- dce-rpc—(SIP only) Distributed Computing Environment-Remote Procedure Call protocols
- dce-rpc-portmap—(SIP only) Distributed Computing Environment-Remote Procedure Call protocols portmap service
- dns—(SIP only) Domain Name System protocol
- exec—(SIP only) Exec
- ftp—(SIP only) File Transfer Protocol
- h323—H.323 standards
- icmp—Internet Control Message Protocol
- iiop—Internet Inter-ORB Protocol
- login—Login
- netbios—NetBIOS
- netshow—NetShow
- realaudio—RealAudio
- rpc—Remote Procedure Call protocol

- `rpc-portmap`—Remote Procedure Call protocol portmap service
- `rtsp`—Real-Time Streaming Protocol
- `shell`—Shell
- `sip`—Session Initiation Protocol
- `snmp`—Simple Network Management Protocol
- `sqlnet`—SQLNet
- `tftp`—Trivial File Transfer Protocol
- `traceroute`—Traceroute
- `winframe`—WinFrame

`destination-port` *destination-port*—(Optional) Display information for a particular destination port.

`destination-prefix` *destination-prefix*—(Optional) Display information for a particular destination prefix. The range of values is from 0 to 65535.

`interface` *interface-name*—(Optional) Display information about a particular interface. On M-series and T-series routing platforms, the *interface-name* can be *sp-fpc/pic/port* or *rspnumber*. On the J-series routing platform, the *interface-name* is *sp-pim/0/port*.

`limit` *number*—(Optional) Maximum number of entries to display.

`protocol`—(Optional) Display information about one of the following IP protocol types:

- `ah`—IPSec Authentication Header protocol
- `egp`—An exterior gateway protocol
- `esp`—IPSec Encapsulating Security Payload protocol
- `gre`—A generic routing encapsulation protocol
- `icmp`—Internet Control Message Protocol
- `igmp`—Internet Group Management Protocol
- `ipip`—IP-within-IP Encapsulation Protocol
- `ipv6`—IPv6 within IP
- `ospf`—Open Shortest Path First protocol
- `pim`—Protocol Independent Multicast protocol
- `rsvp`—Resource Reservation Protocol
- `sctp`—Stream Control Protocol
- `tcp`—Transmission Control Protocol
- `udp`—User Datagram Protocol

`service-set` *service-set*—(Optional) Display information for a particular service set.

source-port *source-port*—(Optional) Display information for a particular source port. The range of values is from 0 to 65535.

source-prefix *source-prefix*—(Optional) Display information for a particular source prefix.

Required Privilege Level view

Related Topics clear services stateful-firewall sip-register

List of Sample Output show services stateful-firewall sip-register extensive on page 1046

Output Fields Table 270 on page 1046 lists the output fields for the **show services stateful-firewall sip-register** command. Output fields are listed in the approximate order in which they appear.

Table 270: show services stateful-firewall sip-register Output Fields

Field Name	Field Description
Interface	Name of an adaptive services interface.
Service set	Name of a service set.
SIP Register	Register information header.
Protocol	Protocol used for this flow.
Registered IP	Register IP address.
Port	Register port number.
Expiration timeout	Configured lifetime, in seconds.
Timeout remaining	Lifetime remaining, in seconds.
From	Initiator address.
To	Responder address.
Call ID	SIP call identification string.

```

show services      user@host> show services stateful-firewall sip-register extensive
stateful-firewall Interface: sp-0/3/0, Service set: test_sip_777
sip-register extensive SIP Register: Protocol: UDP, Registered IP: 10.20.170.111, Port: 5060, Acked
                          Expiration timeout: 36000, Timeout remaining: 35544
                          From: : 6507771234@10.200.100.1:0;
                          To: : 6507771234@10.200.100.1:0;
                          Call ID: : 000ff73a-c8990002-23b1d942-2ba1f91f@10.20.70.2

                          Interface: sp-0/3/0, Service set: test_sip_888

                          SIP Register: Protocol: UDP, Registered IP: 10.20.170.112, Port: 5060, Acked
                          Expiration timeout: 36000, Timeout remaining: 35549

```

```
From: : 8881234@10.200.100.1:0;  
To: : 8881234@10.200.100.1:0;  
Call ID: : 00112096-81fc0002-23b38905-7cb41f62@10.20.71.2
```

show services stateful-firewall statistics

Syntax show services stateful-firewall statistics
 <brief | detail | extensive | summary>
 <application-protocol *protocol*>
 <interface *interface-name*>
 <service-set *service-set*>

Release Information Command introduced before JUNOS Release 7.4.

Description Display stateful firewall statistics.

Options none—Display standard information about all stateful firewall statistics.

brief | detail | extensive | summary—(Optional) Display the specified level of output.

application-protocol *protocol*—(Optional) Display stateful firewall statistics for one of the following application protocols:

- bootp—Bootstrap protocol
- dce-rpc—Distributed Computing Environment-Remote Procedure Call protocols
- dce-rpc-portmap—Distributed Computing Environment-Remote Procedure Call protocols portmap service
- dns—Domain Name System protocol
- exec—Exec
- ftp—File Transfer Protocol
- h323—H.323 standards
- icmp—Internet Control Message Protocol
- iiop—Internet Inter-ORB Protocol
- login—Login
- netbios—NetBIOS
- netshow—NetShow
- realaudio—RealAudio
- rpc—Remote Procedure Call protocol
- rpc-portmap—Remote Procedure Call protocol portmap service
- rtsp—Real-Time Streaming Protocol
- shell—Shell
- sip—Session Initiation Protocol
- snmp—Simple Network Management Protocol
- sqlnet—SQLNet

- `tftp`—Trivial File Transfer Protocol
- `traceroute`—Traceroute
- `winframe`—WinFrame

`interface interface-name`—(Optional) Display information about a particular interface. On M-series and T-series routing platforms, the *interface-name* can be *sp-fpc/pic/port* or *rspnumber*. On the J-series routing platform, the *interface-name* is *sp-pim/0/port*.

`service-set service-set`—(Optional) Display information about a particular service set.

Required Privilege Level	view
Related Topics	clear services stateful-firewall statistics
List of Sample Output	show services stateful-firewall statistics extensive on page 1053
Output Fields	Table 271 on page 1049 lists the output fields for the <code>show services stateful-firewall statistics</code> command. Output fields are listed in the approximate order in which they appear.

Table 271: show services stateful-firewall statistics Output Fields

Field Name	Field Description
Interface	Name of an adaptive services interface.
Service set	Name of a service set.
New flows	Rule match counters for new flows: <ul style="list-style-type: none">■ <code>Accept</code>—New flows accepted.■ <code>Discard</code>—New flows discarded.■ <code>Reject</code>—New flows rejected.
Existing flows	Rule match counters for existing flows: <ul style="list-style-type: none">■ <code>Accept</code>—Match existing forward or watch flow.■ <code>Discard</code>—Match existing discard flow.■ <code>Reject</code>—Match existing reject flow.
Drops	Drop counters: <ul style="list-style-type: none">■ <code>IP option</code>—Packets dropped in IP options processing.■ <code>TCP SYN defense</code>—Packets dropped by SYN defender.■ <code>NAT ports exhausted</code>—Hide mode. The router has no available NAT ports for a given address or pool.

Table 271: show services stateful-firewall statistics Output Fields (continued)

Field Name	Field Description
Errors	<p>Total errors, categorized by protocol:</p> <ul style="list-style-type: none"> ■ IP—Total IP version 4 errors. ■ TCP—Total Transmission Control Protocol (TCP) errors. ■ UDP—Total User Datagram Protocol (UDP) errors. ■ ICMP—Total Internet Control Message Protocol (ICMP) errors. ■ Non-IP—Total non-IPv4 errors. ■ ALG—Total application-level gateway (ALG) errors.
IP Errors	<p>IPv4 errors:</p> <ul style="list-style-type: none"> ■ IP packet length inconsistencies—IP packet length does not match the Layer 2 reported length. ■ Minimum IP header length check failures—Minimum IP header length is 20 bytes. The received packet contains less than 20 bytes. ■ Reassembled packet exceeds maximum IP length—After fragment reassembly, the reassembled IP packet length exceeds 65,535. ■ Illegal source address 0—Source address is not a valid address. Invalid addresses are, loopback, broadcast, multicast, and reserved addresses. Source address 0, however, is allowed to support BOOTP and the destination address 0xffffffff. ■ Illegal destination address 0—Destination address is not a valid address. The address is reserved. ■ TTL zero errors—Received packet had a time-to-live (TTL) value of 0. ■ IP protocol number 0 or 255—IP protocol is 0 or 255. ■ Land attack—IP source address is the same as the destination address. ■ Smurf attack—Echo request is sent to a directed broadcast address. ■ Non-IP packets—Packet did not conform to the IP standard. ■ IP option—Packet dropped because of a nonallowed IP option. ■ Non-IPv4 packets—Packet was not IPv4. (Only IPv4 is supported.) ■ Bad checksum—Packet had an invalid IP checksum. ■ Illegal IP fragment length—Illegal fragment length. All fragments (other than the last fragment) must have a length that is a multiple of 8 bytes. ■ IP fragment overlap—Fragments have overlapping fragment offsets. ■ IP fragment reassembly timeout—Some of the fragments for an IP packet were not received in time, and the reassembly handler dropped partial fragments.

Table 271: show services stateful-firewall statistics Output Fields (continued)

Field Name	Field Description
TCP Errors	<p>TCP protocol errors:</p> <ul style="list-style-type: none"> ■ TCP header length inconsistencies—Minimum TCP header length is 20 bytes, and the IP packet received does not contain at least 20 bytes. ■ Source or destination port number is zero—TCP source or destination port is zero. ■ Illegal sequence number, flags combination—Dropped because of TCP errors, such as an illegal sequence number, which causes an illogical combination of flags to be set. ■ SYN attack (multiple SYN messages seen for the same flow)—Multiple SYN packets received for the same flow are treated as a SYN attack. The packets might be retransmitted SYN packets and therefore valid, but a large number is cause for concern. ■ First packet not SYN—First packets for a connection are not SYN packets. These packets might originate from previous connections or from someone performing an ACK/FIN scan. ■ TCP port scan (Handshake, RST seen from server for SYN)—In the case of a SYN defender, if an RST (reset) packet is received instead of a SYN/ACK message, someone is probably trying to scan the server. This behavior can result in false alarms if the RST packet is not combined with an intrusion detection service (IDS). ■ Bad SYN cookie response—SYN cookie generates a SYN/ACK message for all incoming SYN packets. If the ACK received for the SYN/ACK message does not match, this counter is incremented.
UDP Errors	<p>UDP protocol errors:</p> <ul style="list-style-type: none"> ■ IP data length less than minimum UDP header length (8 bytes)—Minimum UDP header length is 8 bytes. The received IP packets contain less than 8 bytes. ■ Source or destination port is zero—UDP source or destination port is 0. ■ UDP port scan (ICMP error seen for UDP flow)—ICMP error is received for a UDP flow. This could be a genuine UDP flow, but it is counted as an error.
ICMP Errors	<p>ICMP protocol errors:</p> <ul style="list-style-type: none"> ■ IP data length less than minimum ICMP header length (8 bytes)—ICMP header length is 8 bytes. This counter is incremented when received IP packets contain less than 8 bytes. ■ ICMP error length inconsistencies—Minimum length of an ICMP error packet is 48 bytes, and the maximum length is 576 bytes. This counter is incremented when the received ICMP error falls outside this range. ■ Ping duplicate sequence number—Received ping packet has a duplicate sequence number. ■ Ping mismatched sequence number—Received ping packet has a mismatched sequence number.

Table 271: show services stateful-firewall statistics Output Fields (continued)

Field Name	Field Description
ALG drops	<p>Accumulation of all the application-level gateway protocol (ALG) drops counted separately in the ALG context:</p> <ul style="list-style-type: none"> ■ BOOTP—Bootstrap protocol errors ■ DCE-RPC—Distributed Computing Environment-Remote Procedure Call protocols errors ■ DCE-RPC portmap—Distributed Computing Environment-Remote Procedure Call protocols portmap service errors ■ DNS—Domain Name System protocol errors ■ Exec—Exec errors ■ FTP—File Transfer Protocol errors ■ H323—H.323 standards errors ■ ICMP—Internet Control Message Protocol errors ■ IIOP—Internet Inter-ORB Protocol errors ■ Login—Login errors ■ Netbios—NetBIOS errors ■ Netshow—NetShow errors ■ Realaudio—RealAudio errors ■ RPC—Remote Procedure Call protocol errors ■ RPC portmap—Remote Procedure Call protocol portmap service errors ■ RTSP—Real-Time Streaming Protocol errors ■ Shell—Shell errors ■ SNMP—Simple Network Management Protocol errors ■ Sqlnet—SQLNet errors ■ TFTP—Trivial File Transfer Protocol errors ■ Traceroute—Traceroute errors


```

show services      user@host> show services stateful-firewall statistics extensive
stateful-firewall
statistics extensive
Interface: sp-1/3/0
Service set: interface-svc-set
New flows:
  Accept: 907, Discard: 0, Reject: 0
Existing flows:
  Accept: 3535, Discard: 0, Reject: 0
Drops:
  IP option: 0, TCP SYN defense: 0
  NAT ports exhausted: 0
Errors:
  IP: 0, TCP: 0
  UDP: 0, ICMP: 0
  Non-IP packets: 0, ALG: 0
IP errors:
  IP packet length inconsistencies: 0
  Minimum IP header length check failures: 0
  Reassembled packet exceeds maximum IP length: 0
  Illegal source address: 0
  Illegal destination address: 0
  TTL zero errors: 0, IP protocol number 0 or 255: 0
  Land attack: 0, Smurf attack: 0
  Non IP packets: 0, IP option: 0
  Non-IPv4 packets: 0, Bad checksum: 0
  Illegal IP fragment length: 0
  IP fragment overlap: 0
  IP fragment reassembly timeout: 0
TCP errors:
  TCP header length inconsistencies: 0
  Source or destination port number is zero: 0
  Illegal sequence number, flags combination: 0
  SYN attack (multiple SYNs seen for the same flow): 0
  First packet not SYN: 0
  TCP port scan (Handshake, RST seen from server for SYN): 0
  Bad SYN cookie response: 0
UDP errors:
  IP data length less than minimum UDP header length (8 bytes): 0
  Source or destination port is zero: 0
  UDP port scan (ICMP error seen for UDP flow): 0
ICMP errors:
  IP data length less than minimum ICMP header length (8 bytes): 0
  ICMP error length inconsistencies: 0
  Ping duplicate sequence number: 0
  Ping mismatched sequence number: 0
ALG drops:
  BOOTP: 0, DCE-RPC: 0, DCE-RPC portmap: 0
  DNS: 0, Exec: 0, FTP: 0
  H323: 0, ICMP: 0, IIOP: 0
  Login: 0, Netbios: 0, Netshow: 0
  Realaudio: 0, RPC: 0, RPC portmap: 0
  RTSP: 0, Shell: 0
  SNMP: 0, Sqlnet: 0, TFTP: 0
  Traceroute: 0

```

show services stateful-firewall statistics application-protocol sip

Syntax	show services stateful-firewall application-protocol sip
Release Information	Command introduced in JUNOS Release 7.4.
Description	Display stateful firewall Session Initiation Protocol (SIP) statistics.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show services stateful-firewall statistics application-protocol-sip on page 1055
Output Fields	Table 272 on page 1054 lists the output fields for the show services stateful-firewall statistics application-protocol-sip command. Output fields are listed in the approximate order in which they appear.

Table 272: show services stateful-firewall statistics application-protocol-sip Output Fields

Field Name	Field Description
Interface	Name of an adaptive services interface.
Service set	Name of the service set flow.
ALG	Name of the application-layer gateway.
Active SIP call count	Number of active SIP calls.
Active SIP registration count	Number of active SIP registrations.
REGISTER	Number of new, invalid, and retransmitted register requests sent to the SIP registrar.
INVITE	Number of new, invalid, and retransmitted invite messages sent by user agent clients.
ReINVITE	Number of new, invalid, and retransmitted reinvite messages sent by user agent clients.
ACK	Number of new, invalid, and retransmitted ACK messages received (in response to a SIP Call Invite message).
BYE	Number of new, invalid, and retransmitted requests to terminate SIP dialogues.
CANCEL	Number of new, invalid, and retransmitted SIP request cancellations.
SUBSCRIBE	Number of new, invalid, and retransmitted SIP requests to subscribe for event notifications.
NOTIFY	Number of new, invalid, and retransmitted event notifications in SIP dialogues.
OPTIONS	Number of new, invalid, and retransmitted requests to query SIP capabilities.
INFO	Number of new, invalid, and retransmitted requests carrying application-level information.

Table 272: show services stateful-firewall statistics application-protocol-sip Output Fields (continued)

Field Name	Field Description
UPDATE	Number of new, invalid, and retransmitted SIP dialogue updates.
REFER	Number of new, invalid, and retransmitted requests to the recipient to contact a third party.
Provisional responses	Number of new, invalid, and retransmitted responses from the user agent server to indicate the progress of a SIP transaction.
OK responses to INVITES	OK responses sent from the user agent clients to user agent servers in response to Invite messages. The server can then return an ACK message.
OK responses to non-INVITES	OK responses to SIP messages other than an Invite message.
Redirection responses	Responses from the user agent server to a user agent client requesting the client to contact a different SIP uniform resource identifier (URI).
Request failure responses	Responses that indicate a definite failure from a particular server. The client must not retry the same request without modification after receiving this response.
Server failure responses	Responses that indicate a server failure.
Global failure responses	Responses that indicate a server has definitive information about a particular user, not just the particular instance indicated in the Request URI.
Invalid responses	Responses that are invalid.
Response (all) retransmits	Retransmissions of all responses.
Parser	Syntax errors, content errors, and unknown methods counted by the message parser.

```

show services      user@host> show services stateful-firewall statistics application-protocol sip
stateful-firewall Interface: sp-0/3/0
statistics       Service set: test_sip_777, ALG: SIP
application-protocol-sip Active SIP call count: 0, Active SIP registration count: 1
                                     New      Invalid    Retransmit
REGISTER                2
INVITE                   1                0
ReINVITE                 1
ACK                      1                0        0
BYE                      0                0
CANCEL                   0                0
SUBSCRIBE                 0                0
NOTIFY                   0                0
OPTIONS                  0                0
INFO                     0                0
UPDATE                   0                0
REFER                    0                0
Provisional responses (18x): 1, OK responses to INVITES: 2
OK responses to non-INVITES: 2, Redirection (3xx) responses: 0
Request failure (4xx) responses: 0, Server failure (5xx) responses: 0
Global failure (6xx) responses: 0, Invalid responses: 0
Response (all) retransmits: 0

```

```

Parser:
  Syntax errors: 0, Content errors: 0, Unknown methods: 0
Service set: test_sip_888, ALG: SIP
Active SIP call count: 0, Active SIP registration count: 1

```

	New	Invalid	Retransmit
REGISTER	2		
INVITE	0		0
ReINVITE	0		
ACK	0	0	0
BYE	0	0	
CANCEL	0	0	
SUBSCRIBE	0	0	
NOTIFY	0	0	
OPTIONS	0	0	
INFO	0	0	
UPDATE	0	0	
REFER	0	0	

```

Provisional responses (18x): 0, OK responses to INVITEs: 0
OK responses to non-INVITEs: 2, Redirection (3xx) responses: 0
Request failure (4xx) responses: 0, Server failure (5xx) responses: 0
Global failure (6xx) responses: 0, Invalid responses: 0
Response (all) retransmits: 0
Parser:
  Syntax errors: 0, Content errors: 0, Unknown methods: 0

```

Part 5

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